

AC SERVO DRIVES Σ -7 SERIES



JQA-0422 JQA-EM0202

Σ -7 Series of AC Servo Drives

Everyone's preferred choice of Servo Drives

Since the release of the first Σ series of Servo Drives in 1992, Yaskawa Electric has consistently made innovations to existing technologies to find solutions for problems that users experience. Users have always sought high-speed, high-accuracy, and easy-to-use products, and this demand rises every year.

In 2013, the Σ series of Servo Drives evolved into the Σ -7 Servo Drives, which provides users with the ultimate experience in seven key areas and delivers the optimal solutions that only Yaskawa can offer. With the superlative performance and outstanding ease of use of the Σ -7 series, Yaskawa can offer solutions that will make the Σ -7 Servo Drives the preferred choice of customers at any point in the life cycle of their systems.

Ultimate system performance Pages M-4 to N Superlative performance with improved efficiency and speed

Attention developers/engineers

Refer to pages M-6 and M-7 for examples of the high performance of the Σ -7 series in "pick and place" applications. Contact Yaskawa for details on this and additional applications.

Ultimate ease of use

No tuning required with the Σ -7 series upgraded tuning-less function to achieve stable movement with no vibration.

Attention developers/engineers production maintenance personnel

You can check the level of performance of actual operations with the use of demonstration units. Contact Yaskawa for a demonstration.

Ultimate environmental performance Each product has improved specifications to meet even the most stringent environmental requirements. Servo Drives can now be used in different countries and regions, and under a variety of conditions.

Attention developers/engineers operators

Are there any operating environments that you have given up on? The Σ -7 servos have an increased ability to cope with temperature rises in systems, comply with the IP67 resistance to water immersion rating, and have greater global support (AC 240 V input and operable at an altitude of 2,000 meters*). Compact and energy saving systems can also be easily built with the Σ -7W two-axis SERVOPACKs.



ultimate

solutions

e-motional

* At this altitude, the servo drives will operate at reduced ratings.

Ultimate compatibility page M-13

Programs and parameters used with Σ -V SERVOPACKs are compatible with Σ -7 SERVOPACKs. The performance of your systems can be easily enhanced with a simple replacement.

Attention developers/engineers

There is no need to change your system design because the sizes of the Σ -V Servo Drives are the same as those of the Σ -7 series. The improved shape of the mounting screws makes them easier to secure. With the ensured compatibility of programs and parameters, it is easy to replace Σ -V Servo Drives with Σ -7 Servo Drives.



Ultimate lineup

You can choose from a rich product lineup of the Σ -7 series as well as from the compatible products of Yaskawa's partner companies to easily build just the right system for your needs.

Attention developers/engineers

Compatible products made by our partner companies are also available. You can prepare all the motion devices required for your system with our one-stop, all-in-one service.

It is now possible to drive rotary, Linear, or Direct Drive Servomotors using the same SERVOPACK model in the \varSigma -7 series. This helps to reduce the number of Servo Drives that are put in storage.



Ultimate support

Full support is available from selection to maintenance. Maintenance is easier because product information can be viewed by using a smartphone.

Attention developers/engineers maintenance personnel

with a smartphon

Services* that take full advantage of the latest technology, such as cloud storages, QR codes, and smartphones are readily available. They add another dimension of convenience and ease in terms of product information control and maintenance work. * MechatroCloud is available in Japan only.



Note: QR code is a registered trademark of Denso Wave Incorporated.

Ultimate safety and security

The Σ -7 Servo Drives satisfy the IEC 61508 safety integrity level 3 (SIL 3). Safety is also ensured with temperature sensors mounted in products. These Servo Drives can be used as system components with safety guaranteed.

Attention developers/engineers operators maintenance personnel

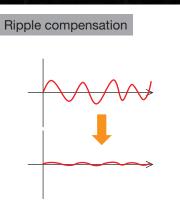
It is absolutely essential to ensure the safety of systems and protect against temperature increases. The Σ -7 Servo Drives are fully equipped with all the necessary safety measures, which reduces the amount of work required for system design and maintenance.

Ultimate system performance

The high-performance of Σ -7 SERVOPACKs translates into ultra-high-speed and ultra-high-accuracy control, which maximizes system performance.

Σ -7S Single-axis SERVOPACKs

- \star 3.1 kHz response frequency
- ★ Optimized for specific applications: New models in EX and FT series to be released
- ★ Improved vibration suppression



 Σ -7 SERVOPACKs can reduce speed ripples caused by motor cogging, even for machines for which speed loop gains cannot be set high. This ensures smooth operation.

Enhanced vibration suppression function

Notch filter

Suppresses high-frequency vibrations of 500 Hz or higher. Number of filters increased from 2 to 5.

Anti-resonance control

Suppresses vibrations at frequencies ranging from several hundred Hz to 1 kHz.

Vibrations can now be suppressed at multiple frequencies in comparison with one frequency in earlier models.

Vibration suppression

Suppresses vibrations at low frequencies (30 Hz and lower). Vibrations can now be suppressed at two different frequencies (in comparison with one frequency in earlier models).

These functions can be adjusted automatically using the autotuning function.

SERVOPACK

Σ -7W Two-axis SERVOPACKs

- ★ Two-axis SERVOPACKs (200 W x 2 axes to 1 kW x 2 axes)
- \star 3.1 kHz response frequency
- \star Improved vibration suppression

Σ -7C Two-axis SERVOPACKs with Built-in Controllers

- ★ 3.1 kHz response frequency
- ★ Build small-scale equipment system without PLC using one SERVOPACK.



SERVOMOTOR

Model

S

GMMV	10 W 🗖	30 W		
GM7J	50 W	🎫 750 W		
GM7A	50 W		7 kW	
GM7P	100 W	=== 1.5 kW		
GM7G	300 W			15



Refer to pages M-18 to M-21 for the details on the features of Direct Drive Servomotors and Linear Servomotors.



- ★ Compact dimensions (approx. 80% smaller than our earlier models.)
- ★ High-resolution 24-bit encoder incorporated

(16,777,216 pulses/rev)

★ Maximum torque: 350% (small capacity)

High-resolution, 24-bit encoder

 Σ -7 Servomotors (50 W or greater) use encoders with a resolution that are 16 times higher than those used in Σ -V Servomotors.

Encoder resolution comparison

 Σ -Vseries 20 bits = 1 million pulses/rev (approx.)

kW



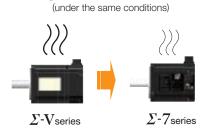
Solution for 50-W or greater models.

Servomotors with 24-bit batteryless absolute encoders have also been added to the lineup.

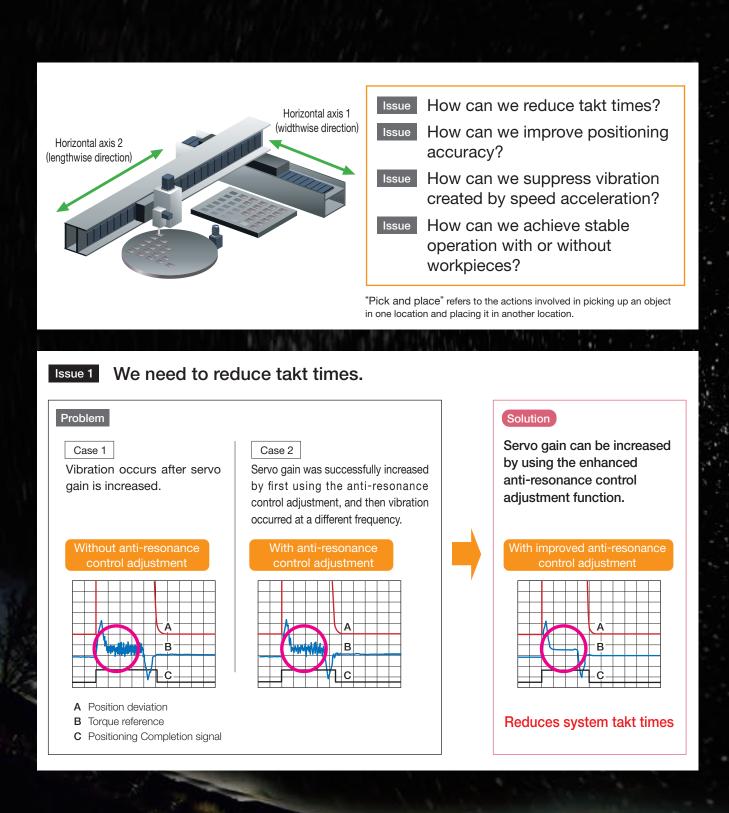
High efficiency and low heat generation

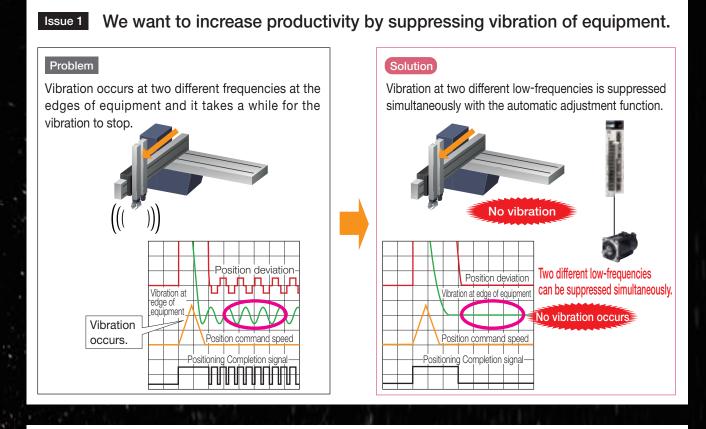
 Σ -7 Servomotors use an optimized magnetic circuit that improves motor efficiency and reduces heat generation. (comparison with typical models.)

About 20% reduction in temperature increase!



Example Solving problems in "pick and place" applications

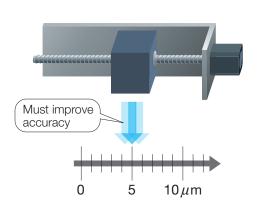


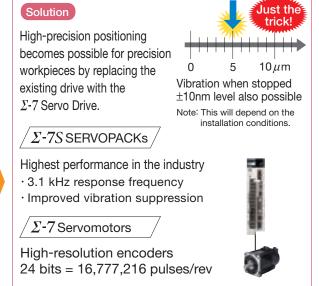


Issue 2 We want to improve positioning accuracy to handle parts that are becoming increasingly smaller.

Problem

Positioning accuracy needs to be improved because parts that are handled are becoming increasingly smaller.





For 20 mm lead ball screws 1.2 nm resolution

Ultimate ease of use

2

Yaskawa's original tuning-less function has undergone further development. Stable operations can be achieved without having to adjust gains.

No need to adjust servo gains

With Yaskawa's original tuning-less function, systems can run without vibration for a load with 30 times (max.) of load moment of inertia. Systems remain stable even with load changes during operation.

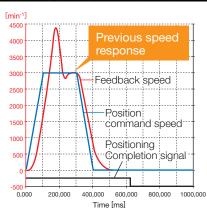
	\varSigma - $ m V$ Series	Σ - 7 Series
Allowable load moment of inertia ratio	30 times (max.)	30 times (max.)
Max. control gain	Speed loop gain 40 Hz (approx.)	Speed loop gain 70 Hz (approx.)

Setup time

reduced

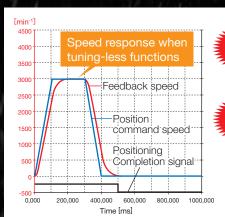
Takt time

reduced





When the allowable load moment of inertia ratio is 30 times:



Solution Example Robot

The robot's arm maintains stable movements even when the moment of inertia changes due to changes in the robot's posture.

- Improved response
 Response is about twice as fast as before and requires no adjustment.
- Improved stability
 Stable operation is assured even in systems with load fluctuations.
- No need for gain adjustments High-level performance is assured although no tuning is required.

Ultimate environmental performance

The Σ -7 Servo Drives can be used in harsh environments and conserve energy. Optimal systems can be easily set up in different countries and under a variety of conditions.

Satisfies specifications for use overseas and in harsh operating conditions

- · 240 VAC supply voltage also supported
- High-altitude use increased to 2,000 meters above sea level*
 Maximum ambient temperature raised to 60°C*
- * Derating required.

Waterproof protective structure upgrade to IP67 rating

[SGM7J, SGM7A (IP22 for 7.0 kW), and SGM7G models]

Protective Structure (IEC 60034-5)

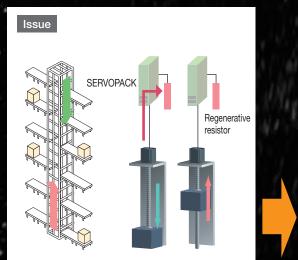


O Rating for protection from water: The units can be used even when they are immersed in water under specific conditions (immersed at a depth of 1 m below the surface of the water for 30 minutes).

Rating for protection from contact and entry of solid foreign objects: Safe dust-proof structure

Structure is completely protected from the entry of dust.

Solution Example Regenerative energy effectively used to help save energy



Regenerative power used to be converted to heat by using regenerative resistors. With global warming, CO₂ emissions must be cut by reducing power generation that produces CO₂, such as thermal power.



- By replacing the existing amplifiers with the Σ -7W 2-axis SERVOPACKs or using a DC bus connection, the regenerative energy of multiple axes can be used as the drive energy.
- This means that the energy inside the system can be utilized more effectively.
- Status of energy consumption in the system can be viewed on a display (image by using machine controllers.

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Energy consumption monitoring display (image)

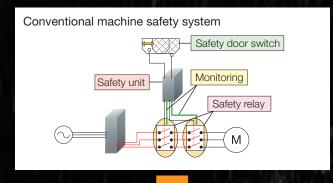
Ultimate safety and security

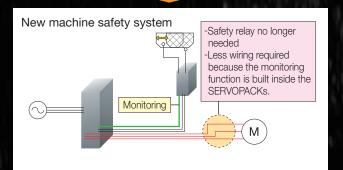
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Systems can be operated safely because the Σ -7 Servo Drives comply with safety standards and safety is ensured by monitoring.

Satisfies requirements of the SIL 3 of the IEC 61508 functional safety standards (first in Japan)

Certification will make it easier to set up systems that conform to safety standards for press machines and other systems in Europe and other regions. Certification also helps reduce the number of hours required for wiring and of peripheral devices. Complies with Stop Category 0 (Safe Torque Off)





	1	
	Safety standards	Performance level & category
Safety of machinery	EN ISO13849-1	PLe (CAT3)
	IEC 60204-1	Stop Category 0
	IEC 61508	SIL 3
Functional safety	IEC 62061	SIL CL3
, ,	IEC 61800-5-2	STO

• The safety function works even for a single problem.

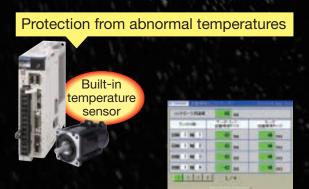
• The safety function is enhanced with compliance with the EN ISO 13849-1 PLe (performance level e).

Note: Although the safety performance level of the Σ -V series Servo Drives is PLd (performance level d), the benefits described in the figure on the left apply.

Systems that need to satisfy the required performance level e (PLr e) can easily be configured.

Protect systems from high temperatures

 Σ -7 SERVOPACKs and Servomotors are equipped with temperature sensors that can directly monitor temperatures of machines and detect abnormalities to prevent failures. Real-time temperatures can be viewed on a display by using Machine Controllers.



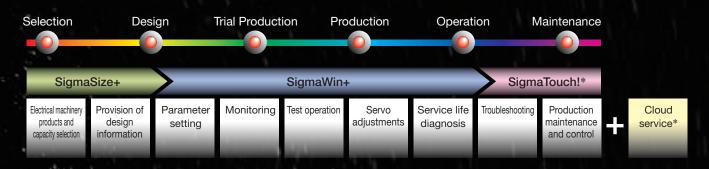
Temperature monitoring display (image)

M-10

Ultimate support

Cloud-based storage of product data facilitates data retrieval when needed.

Maintenance throughout a product's service life is improved and simplified with SigmaTouch!, Yaskawa's smartphone application.



Single or multiple orders possible after specifying parameters*

Customers can now place single or multiple orders for SERVOPACKs in the Σ -7 series after specifying parameters at the factory shipment stage. No longer is it necessary to write the parameters at the system assembly site, which means that production lead times can be reduced.

Product management and maintenance service*

Product information can be easily viewed by using SigmaTouch!, Yaskawa's smartphone application. To view, simply hold your smartphone over the QR code of the product.

Improve troubleshooting*

• If you have a smartphone, troubleshooting information can be accessed by reading a product's QR code.

• Automatic tracing is possible when a SERVOPACK alarm occurs. This allows you to detect and solve problems promptly.

Achieve planned maintenance by monitoring the remaining service life

The service life of the maintenance can be estimated, and the users are notified when the parts should be replaced. System failure can be prevented because parts can be replaced before products break.

* MechatroCloud is available in Japan only. For details, refer to pages M-14 to M-19.

MechatroCloud, Yaskawa Electric's New and Innovative Service Mechatro CLOUD

Note: MechatroCloud is available in Japan only.



Features:

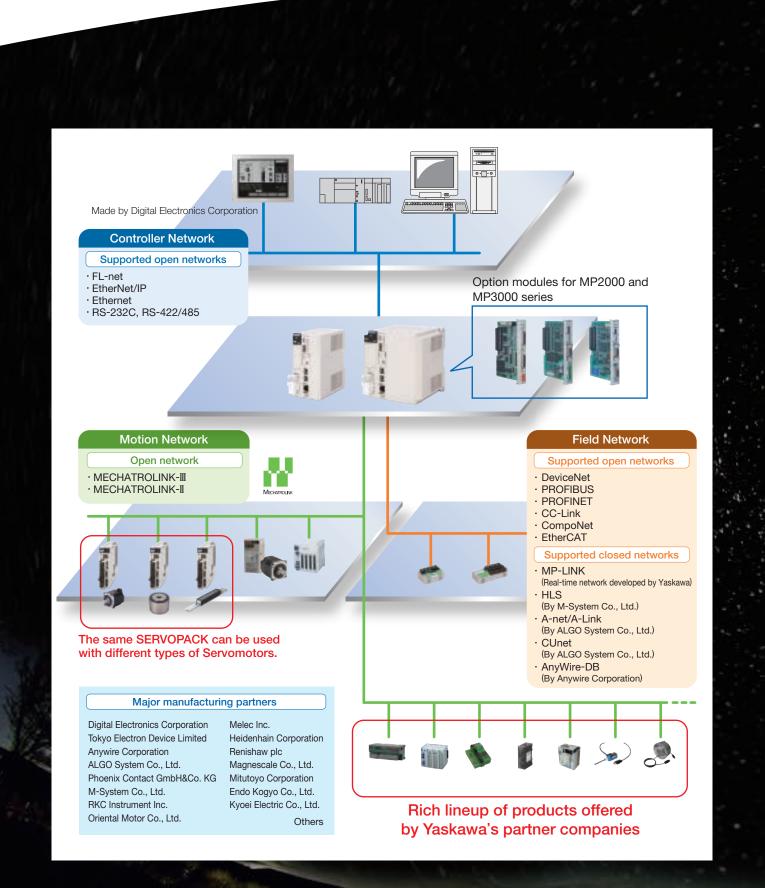
Service Life Monitor

Simply access the MechatroCloud service* and hold your smartphone over the QR code of the product. You can access the product data stored in the MechatroCloud, and view the manual for that product.

Note: MechatroCloud is a new cloud service provided by the Yaskawa Electric.

Ultimate lineup

You can construct a system that exactly meets your requirements using communications networks and the rich lineup of products offered by Yaskawa's partner companies.

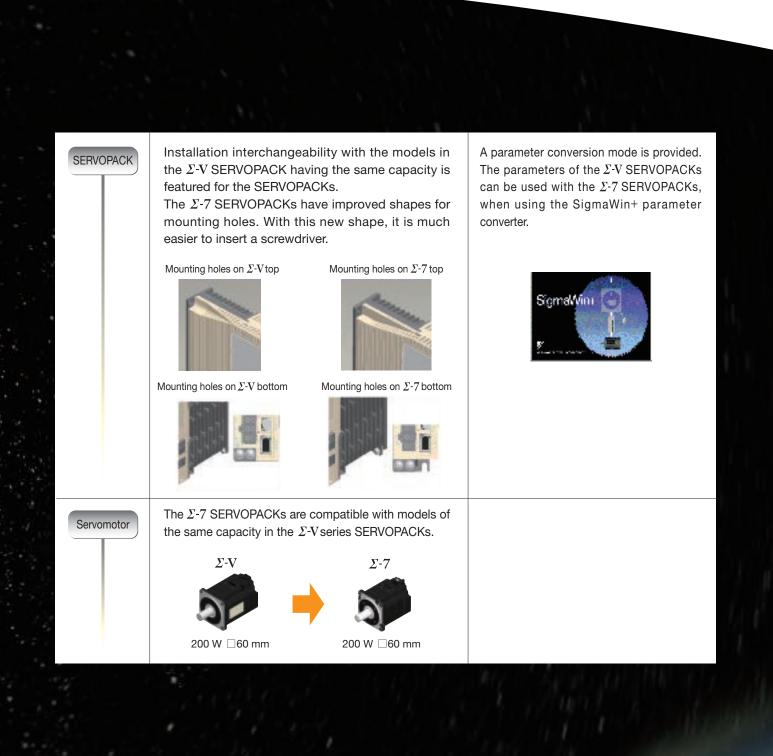


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Ult

Ultimate compatibility

Compatibility with earlier series is assured. You can improve the performance of your system by replacing devices currently used with Σ -7 Servo Drives.



MechatroCloud, Yaskawa Electric's New and Innovative Service MechatroCLOUD

Note: MechatroCloud is available in Japan only.

MechatroCloud is a cloud service offered by the Motion Control Division of Yaskawa Electric. With this service, it is now easier and more convenient to use Yaskawa's motion control products. A wide range of services are now available through Yaskawa's website, smartphone applications, and QR codes.





You can order customized SERVOPACKs from the website!



In the BTO (build to order) service available from Yaskawa, parameters for SERVOPACKs are set to the values specified by customers when placing orders. Customers can order customized SERVOPACKs by simply registering parameter specifications on the website. Standard product

Parameter file specified BTO p by customer*1





- Note: To use MechatroCloud service, you must register your name under the corporate membership of the e-mechatronics website, the Yaskawa Electric website for product and technical information.
- ★1. Use a parameter file for version 5.71 or later versions of SigmaWin+.
- *2. Alphanumeric characters and some symbols can be used for the text (equipment name and axis name).



MechatroCloud Introduction Videos – Now on YouTube

Use the standard bar code reader on your smartphone to read these codes and view videos on YouTube.

Note: "YouTube" is a trademark or a registered trademark of Google Inc.

BTO service

SigmaTouch!



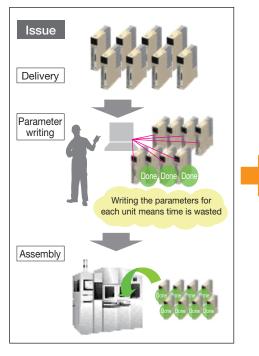


No need to write the parameters

BTO Service

Single or multiple orders possible after specifying parameters (BTO)

Customers can now place single or multiple orders for SERVOPACKs in the Σ -7 series after specifying parameters at the factory shipment stage. It is no longer necessary to write the parameters at the system assembly site, which means that production lead times can be reduced.



Solution

The Σ -7 SERVOPACKs are delivered with the customer-specified parameters already written prior to shipment.

This reduces the man-hours involved in system assembly work.

The names of the axes are printed on the boxes in which the products are delivered. This ensures that these are no mistakes made when installing the axes.



MechatroCloud, Yaskawa Electric's New and Innovative Service MechatroCLOUD

Note: MechatroCloud is available in Japan only.

BTO Service

How to use Yaskawa's BTO service

- ① Register required information under a corporate membership on the e-mechatronics website.*
- ② Determine parameters for your equipment.
- ③ Upload the parameter file to the MechatroCloud website and issue BTO numbers and BTO order numbers.
- Note: Use a parameter file for SigmaWin+ version 5.71 or later versions to upload parameter files.
- ④ Provide the BTO order number to your Yaskawa representative when requesting estimates and placing orders.

* Corporate member registration for MechatroCloud use

Corporate Members

Corporate Manager Management Group The Corporate Manager is in charge of the members that are registered under the company's corporate membership. The first person who registers as a corporate member is the Corporate Manager. There must be at least one Corporate Manager for each corporate membership. Corporate Managers are authorized to: Add or delete Corporate Managers or Corporate Users. Issue or delete BTO numbers.
Corporate User (company employees) A person who is added as a corporate member by the Corporate Manager. Corporate Users (company employees) are authorized to: Support of the superior of the
 Corporate User (system integrators) A person who is added as a corporate member by the Corporate Manager. Corporate users (system integrators) are authorized to: Issue or delete BTO numbers.
 Corporate User (sales representatives) A person who is added as a corporate member by the Corporate Manager. Corporate Users (sales representatives) are authorized to: Issue or delete BTO numbers.

Register required information under the corporate membership of the e-mechatronics website, the Yaskawa Electric website for product and technical information. For example, information on Yaskawa's BTO service can be shared by members of the same corporate membership by registering persons at the same company and/or persons at related companies under the same corporate membership.

There are two types of corporate membership: Corporate Manager and Corporate User.

The member(s) in charge of Corporate Members is called the Corporate Manager. The Corporate Manager is the first person to register as a Corporate Member. Persons who are invited to become Corporate Members under the same corporate membership are called "Corporate Users." A Corporate User can issue BTO numbers.



Easy troubleshooting with SigmaTouch! Anytime, Anywhere

Use SigmaTouch! for

free!

MechatroCloud Cloud server Yaskawa Electric plant Server Server SigmaTouch!

Innovative service that links users to cloud data!

Yaskawa is striving to incorporate the needs of our customers into our services in a timely manner. With the use of SigmaTouch!, users can quickly and easily access the MechatroCloud server, which contains the latest product information from Yaskawa Electric's plants and maintenance information from the e-mechatronics website. Yaskawa Electric's service will continue to be enhanced to accommodate the needs and expectations of our customers.

Simply read the QR code!

Easily search for product information using SigmaTouch!

Users can search for troubleshooting information for a specific model and view product manuals on a smartphone by using a smartphone camera to simply read the QR code of the product.

"SigmaTouch!" is a smartphone application for MechatroCloud. Product information, such as manufacturing information and parameter lists, can be viewed by simply reading the QR codes of Yaskawa Electric's products with a smartphone camera. Alarm details and troubleshooting information can also be viewed on the smartphone, which can greatly reduce recovery time.



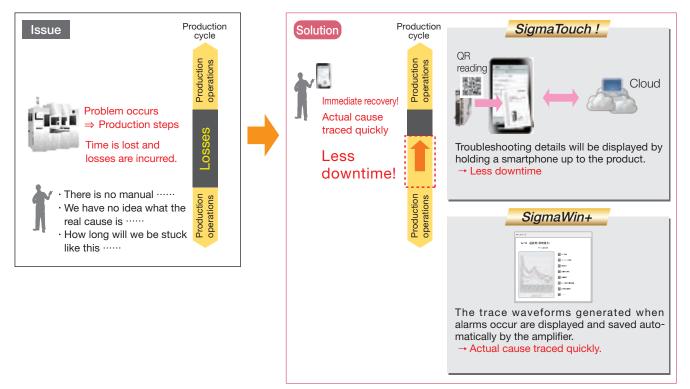
Note: The QR codes can be read with Android OS 4.0.3 or later versions. The Android must be connected to the network to use this service.

etc.

SigmaTouch!

Easier and faster troubleshooting options

Operators can use smartphones on-site to display the SERVOPACKs in the Σ -7 series manual and troubleshooting details. The trace waveforms generated when alarms occur can be saved automatically, and the real causes of problems can be tracked faster, which reduces downtime.







SigmaTouch!

Functions of SigmaTouch!

Members of the e-mechatronics website have immediate access to all functions. (Non-members can access some functions.)

 \odot : Can use all functions and view information of BTO products.

● : Can use all functions. △ : Can view some information.

Corporate Individual Non-members members members Product \bigcirc Namepla information Manuals Troubleshooting

Easy download from the Google Play Store

SigmaTouch! can be downloaded from Google Play Store, the contents distribution service for Android. You can access the Google Play Store through the e-mechatronics website, the Yaskawa Electric website for product and technical information.

Download SigmaTouch! to your smartphone to start your experience!

Note: "Android" and "Google Play" are trademarks or registered trademarks of Google Inc.

Download SigmaTouch! from the Google Play Store for free.



Link to the Google Play Store \rightarrow Read the QR code with the bar code reader of your smartphone.



Use the various functions and services of SigmaTouch! using your smartphone.



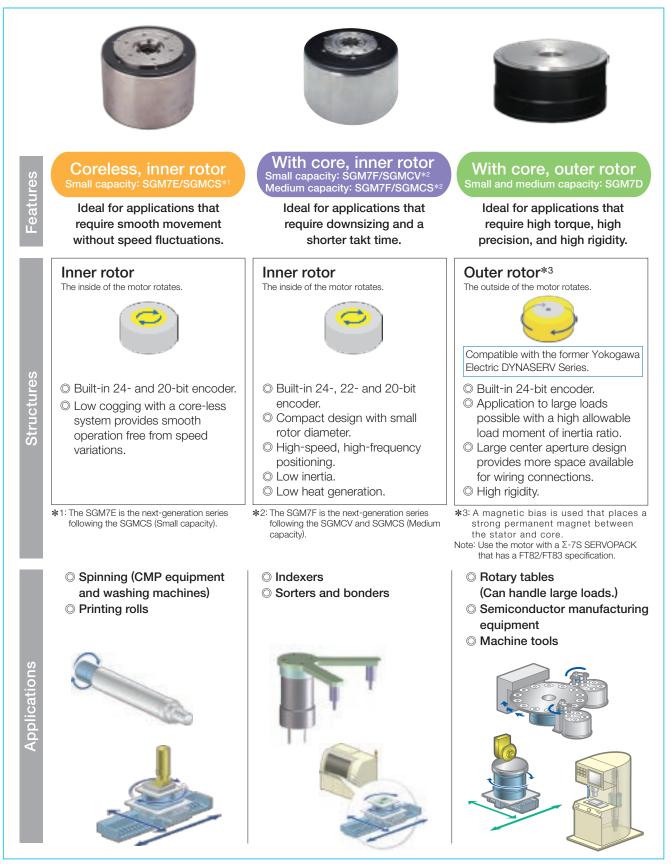


Hold the camera about 10 cm away from the QR code.



Direct Drive Servomotors

Use a direct drive to supply high torque at low speeds, obtain precise positioning at high speeds without any slippage and backlash, and simplify your machine's configuration and maintenance.

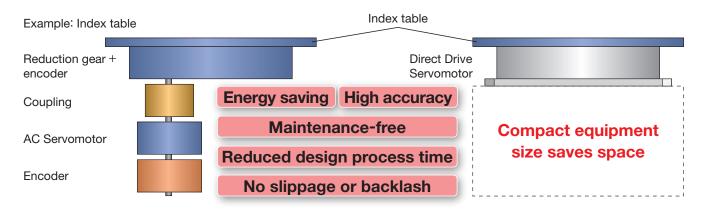


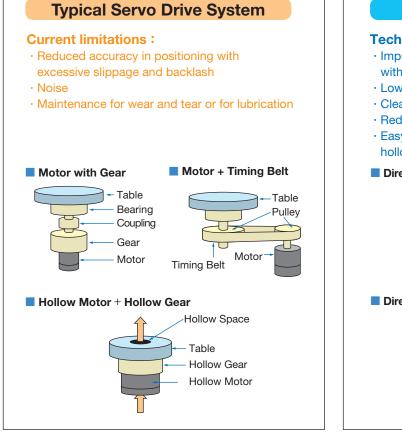


Features of Direct Drive Servomotor

The load is mounted directly to the motor, so the motor accuracy becomes the equipment accuracy, which contributes greatly to increasing the equipment accuracy. Furthermore, there is no drop in efficiency due to the presence of a reduction gear or other parts, which helps to save energy. The motor's compact size also enables reducing the equipment size, which helps to reduce both the design process time and maintenance costs. The desired operation angle and number of divisions can easily be set, simply by changing the command values.



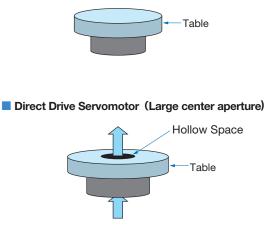




Direct Drive System

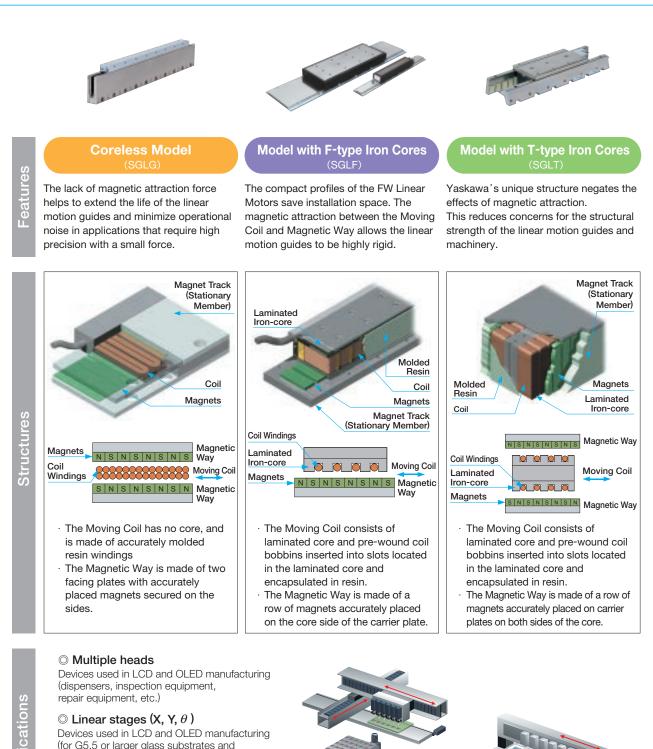
Technical improvements:

- · Improved positioning accuracy
- with direct connection to a load
- · Low noise
- · Clean room use (No gear means no lubrication.)
- · Reduced number of parts
- Easy wiring and piping based on the motor's hollow design
- Direct Drive Servomotor



Linear Servomotors

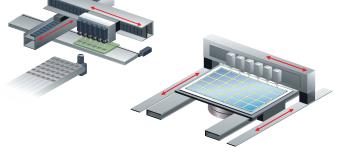
Linear Servo Drives contribute to improved machine functionality and performance with exceptional features such as high speed, fast acceleration, long-stroke compatible, constant speed, stability, clean operation, low noise, and low maintenance.



Devices used in LCD and OLED manufacturing (for G5.5 or larger glass substrates and for long strokes) and semiconductor manufacturing devices (probers, etc.)

○ Gantries

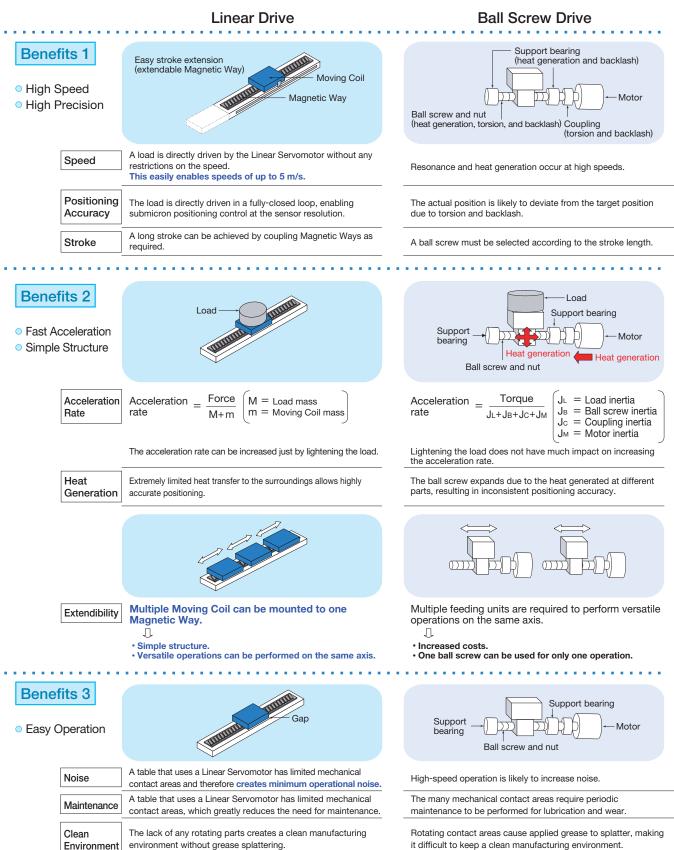
Devices for electronic parts manufacturing (high-speed chip mounters, etc.)



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Benefits of Linear Servomotors



Σ -7-Series SERVOPACKs and Option Modules

SERVOPACKs

MECHATROLINK-III/-II Communications Reference

\bigcirc Real-time communication

A high transmission speed allows real-time transmission of various data required for control.

O Cost savings

Multiple stations can be connected to a single MECHATROLINK transmission line, so wiring costs and time are greatly reduced. Also, only one signal connector is required on the host controller. The all-digital network eliminates the need for a converter to change speed/torque references from digital to analog and for a pulse generator to create position references.

O High-precision motion control

The SERVOPACK when connected to the host controller in the MECHATROLINK-III /-II network provides not only torque, position, and speed control, but also synchronized phase control that requires advanced control technology. The control mode can be changed online so that the machine can move smoothly in complex motions with great efficiency.

Communications protocol	MECHATROLINK-III	MECHATROLINK-II
Physical layer	Ethernet	Same as RS-485
Baud rate	100 Mbps	10 Mbps
Transmission cycle	Σ -7S:125 μ s to 4.0 ms, Σ -7W:250 μ s to 4.0 ms	250 μs to 4.0 ms
Number of transmission bytes	32 or 48 bytes/station	17 or 32 bytes/station
Number of slaves	62 max.	30 max.
Maximum transmission distance	75 m between stations	50 m total (100 m with Repeater)
Minimum distance between stations	20 cm	50 cm

Analog Voltage/Pulse Train Reference

stlov solution of the second s	Reference	Max. input voltage	± 12 V (forward s	speed reference with positive reference)						
e of tage of t		voltage	Factory setting	6 VDC at rated speed (Input gain setting can be changed.)						
Analog voltage Analog voltage Conque Conque Control Control Control Control Control Conque Co		Reference	Max. input voltage	\pm 12 V (forward t	\pm 12 V (forward torque reference with positive reference)					
		voltage	Factory setting	3 VDC at rated to	3 VDC at rated torque (Input gain setting can be changed.)					
e	_	Туре			+ pulse train, CW + CCW pulse train, /o-phase pulse train with 90° phase differential					
enc	itro	Deference	Reference	Form	For line driver, o	pen collector				
Pulse train reference	n cor	o pulse	o pulse			o pulse	pulse Max	Max. input	Line driver	Sign + pulse train, CW + CCW pulse train: 4 Mpps Two-phase pulse train with 90° phase differential: 1 Mpps
se trai	Positic					pulse frequency*	Open Collector	Sign + pulse train, CW + CCW pulse train: 200 kpps Two-phase pulse train with 90° phase differential: 200 kpps		
Clear signal (Position error clear)				For line driver, o	pen collector					



Single-axis MECHATROLINK-III Communications Reference Σ -7S



Two-axis MECHATROLINK-III Communications Reference Σ -7W



Single-axis MECHATROLINK-II Communications Reference Σ -7S



Analog Voltage/ Pulse Train Reference Σ -7S

*: If the maximum reference frequency exceeds 1 Mpps, use a shielded cable for I/O signals and ground both ends of the shield. Connect the shield at the SERVOPACK to the connector shell.

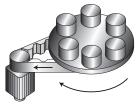
INDEXER Module-Mounted Type

Application Examples

Point-to-point positioning (X-Y Table)



Station positioning (Indexing) (Rotary Table)







Simple

- ◎ Interactive methods for everything from adjustment to programming are available with the setup support tool SigmaWin+ for Windows (Ver.5.72 or later).
- ◎ Simple connection to the host controller can be established with the I/O module.

Smart

- Special languages are not required, because required operation patterns are easily made by simply setting the data for position and speed in program tables.
- ◎ Optimum operation method supports your application.

For positioning, up to 256 steps can be programmed. (Operation) Program tables, Position and speed tables (station positioning), Registration

- (positioning by external signals), Serial communication
- operation, homing, and programmable signal outputs are provided.

Speedy

 \bigcirc Reliable high-speed, high-precision positioning when combined with high-performance Σ -7S SERVOPACKs.

© Motion control is accomplished without using motion controllers. Note: The INDEXER module can be used in combination with the Fully-Closed Module.

DeviceNet Module-Mounted Type

- © Compliant with the communication specifications of the DeviceNet open field network.
- Maintainability improved by the host controller using DeviceNet to monitor the operating conditions of servo drives, alarm status, and other information.
- © Full range of positioning functions featured including simple positioning, homing, continuous speed operation, positioning after continuous speed operation, and programmed operation.
- © Round micro-connectors used for the connectors.
- Modules can be driven by two different power-supply methods: servo control power or external power.

Note: The DeviceNet module can be used in combination with the Fully-Closed Module.

Option Modules

Fully-Closed Module

- Igh-precision and high-response positioning by using feedback from detector (such as an external encoder) installed on the machine.
- \bigcirc High resolution with external encoders (linear scales).

Note: The Fully-Closed Module can be used in combination with the INDEXER module or DeviceNet module.

Safety Module

The Safety Module complies with EN ISO13849-1 (the standards harmonized with EU Machinery Directive 2006/42/EC) and has safety functions equivalent to those stipulated in IEC61800-5-2. By using Σ -7S SERVOPACKs with the safety module, optimum safety designs can be created for mechanical systems to better meet the needs of the industry.

- The first product for AC servo drives in Japan that has safety functions equivalent to the following ones stipulated in the international standard IEC Safe Torque Off (STO), Safe Stop 1 (SS1), Safe Stop 2 (SS2), Safely-Limited Speed (SLS)
- Two safety functions (A and B) are provided and stopping functions can be allocated individually to these safety functions.
- With the attachable Safety Modules for SERVOPACKs, system configurations are simplified and compact.



Specifications				
Function	Specifications			
Stations for Program Table Operation	256			
JOG Speed Setting	16			
ZONE Signal Output	32			
Serial Communication	HR: ASCII; max. axes: 16 MEMOBUS: Binary			
Homing Methods	3			
Equally-dividing and Indexing Positioning (Station Positioning Command)	Rotary machine and tool setting			







Σ -7S SERVOPACKs with FT Specifications



Choose the Best SERVOPACK for the Application

The know-how we have acquired in every market has resulted in the creation of a lineup of SERVOPACKs with FT specifications that have added functions to optimally suit a variety of applications.

					- : Not Possible		
FT Specifications	Applications	Additional Functions	Features	lr A/P	nterfac M-II		
FT19	Tracking	Built-in Less Deviation Control	Little delay in motor operations for position references as a result of built-in less deviation control. Ideal for applications that require reference tracking performance (high position accuracy) during movement.	V	_	V	
FT21	Machining and Cutting	Feed Shaft Supporting	Improved tracking ability and high-accuracy machining operations with the use of clearance (constant distance) control, predictive control, and quadrant projection compensation functions.	_	_	V	
FT40	Press and Injection Molding	Pressure Feedback	Highly accurate pressure control with input of pressure sensor signals directly to the SERVOPACK.	_	-	\checkmark	
FT41	Press and Injection Molding	Pressure Feedback	Highly accurate pressure control by feeding back the signals of the pressure sensors directly to the SERVOPACK through the MECHATROLINK-I/O system.	_	-	V	
FT60	Conveyance	Three-Point Latching	The host controller can detect the orientation of the workpiece or offsets in multiple workpieces based on the information on the three positions input to the SERVOPACK.	_	-	V	
FT62	Conveyance and Alignment	Triggers at Pre-set Positions and Rotational Coordinate System	Addition of pass-through signals for designated points to enable coordinated operations with the use of trigger signals. Turntables can be easily controlled with infinite- length coordinates.	_	_	\checkmark	
FT77	Conveyance	Built-in Torque/Force Assistance	Multiple SERVOPACKs can be used for applications that require more than one axis to easily build a system will increase the torque or force up to five times.	V	_	V	
FT79	Indexing	Built-in INDEXER	Convenient positioning functions (ZONE signal outputs, job speed table, homing, other) added for high-precision and high-speed positioning without a motion controller.	V	_	-	
FT82	For Special Motors	SGM7D Motor Drive	SERVOPACKs with high torque, high precision, and a user-friendly design for SGM7D motors.	V	V	\checkmark	
FT83	For Special Motors	SGM7D Motor Drive	SERVOPACKs with built-in INDEXER for SGM7D motors.	\checkmark	-	-	

 Σ -7-Series SERVOPACKs Σ -7C

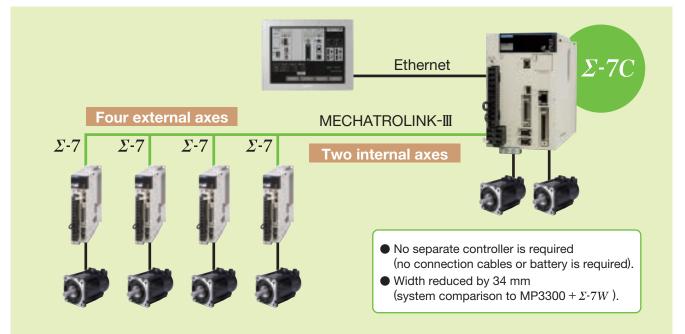




New Two-Axis SERVOPACKs with Built-in Controllers!

Yaskawa's newest two-axis SERVOPACKs with built-in controllers offer the ideal configuration to control small-scale equipment and mechanisms to meet the increasing needs of component downsizing, equipment modularization, and system distribution.

Simple, All-in-One System Configuration



Features

Less system space required

- \odot Configure up to six axes.
- ◎ Build small-scale equipment system without PLC using one SERVOPACK.
- © Expand functionality by mounting an option unit.

Equipment modularization and distributed control system

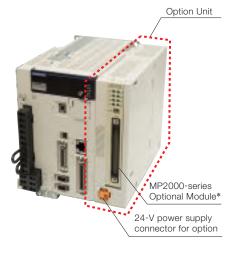
© Reduce burden of designing software when part of the equipment changes.

High-Speed Response

- High-speed response frequency of 3.1 kHz has been achieved.
- ◎ High-speed I/O used for the Controller Function Module.
- The command/response delay is minimized with the two internal axes. These axes can be synchronized with the external axes.

Easier Maintenance

- No battery is required for the Controller Function Module, which reduces the time and cost of periodic replacement.
- Protective functions have been improved for outputs to the Controller Function Module.

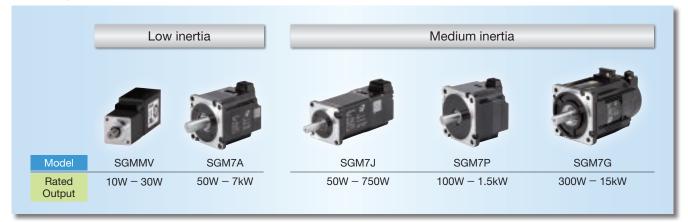


*: Excluding the following Optional Modules: SVA-01, SVB-01, SVC-01, PO-01, MPU-01, 215AIF-01, and EXIOIF.



Servomotors

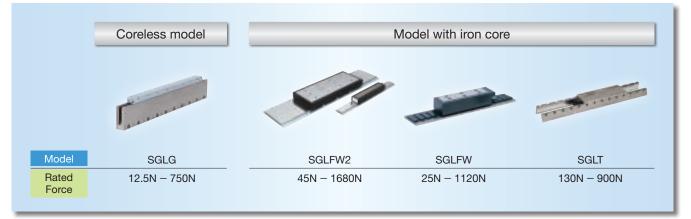
Rotary Servomotors



Direct Drive Servomotors

	With core, outer rotor	With core, inner rotor		Coreless, inner rotor
		0		-
Model	SGM7D	SGM7F/SGMCV (Small Capacity)	SGM7F/SGMCS (Medium capacity)	SGM7E/SGMCS (Small Capacity)
Rated Torque	1.30N·m – 240N·m	2.00N·m – 35.0N·m	45.0N·m – 200N·m	2.00N·m – 35.0N·m

Linear Servomotors



SERVOPACKs

• Σ -7S (Single-axis)





Analog Voltage/Pulse Train Reference SGD7S-DD00A



SGD7S E0A 10

INDEXER Module-Mounted



MECHATROLINK-II Communications Reference SGD7S-DDD10A



DeviceNet Module-Mounted SGD7S EOA 50 SGD7S EE0A 60



MECHATROLINK-III

SGD7S-00020A

Communications

Reference

FT Specifications Refer to page M-26 for the line-up.

• Σ -7W (Two-axis)



Communications Reference SGD7W-DDA20A

• Σ -7C (Two-axis)



 Σ -7C Two-axis SERVOPACKs with Built-in Controllers, **Bus Connection Reference** SGD7C-

Option Modules





Combination of SERVOPACKs and Option Modules

Combination of SERVOPA	CKs and Option Modules		✓ : Possi	ble -: Not Possible
			Option	Module
	SERVOPACK (Model Number)		Fully-Closed Module	Safety Module
			(SGDV-OFA01A)	(SGDV-OSA01A)
Single-axis Analog Voltage/Pulse	Train Reference Type	(SGD7S00A)	✓*1	✓*1
Single-axis MECHATROLINK-II	(SGD7S-00010A)	✓*1	✓*1	
Single-axis MECHATROLINK-II	Communications Reference Type	e (SGD7S-□□□20A)	✓*1	√*1
Two-axis MECHATROLINK-III Co	ommunications Reference Type	(SGD7W- 🗆 🗆 A20A)	-	-
SERVOPACK	SERVOPACK	Command Option Module		
(Model Number of Set)	(Model Number)	(Model Number)		
Single-axis INDEXER Module-Mounted Type (SGD7SE0A10_)	Command Option Attackable Trac	INDEXER (SGDV-OCA03A)	~	_
Single-axis DeviceNet Module-Mounted Type	Command Option Attachable Type (SGD7SE0A)	DeviceNet*2 (SGDV-OCA04A)	\checkmark	_
(SGD7S E0A 50)*2 (SGD7S E0A 60)*3		DeviceNet*3 (SGDV-OCA05A)	~	_

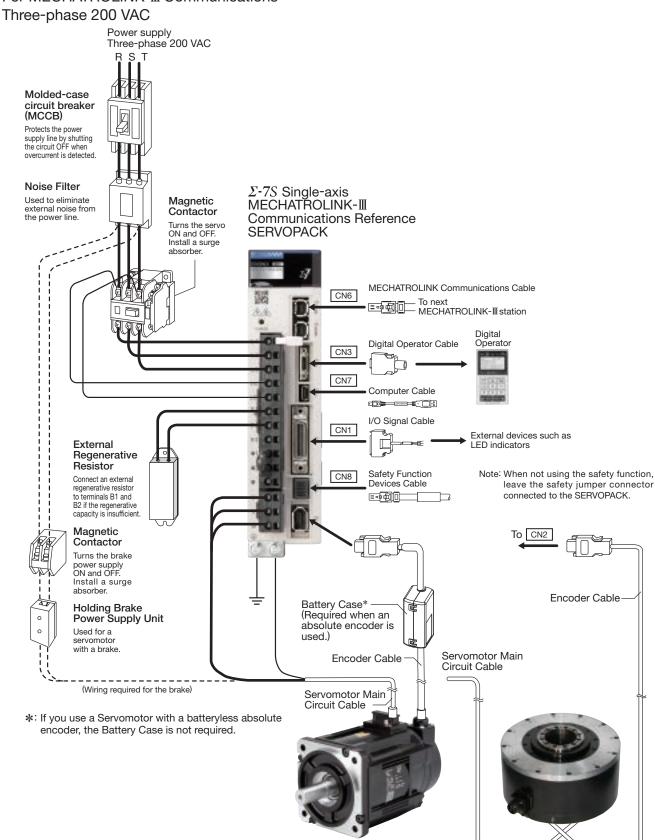
*1. You cannot use a Fully-Closed Module and a Safety Module together.

*2. Driven by control power supply

*3. Driven by external power supply

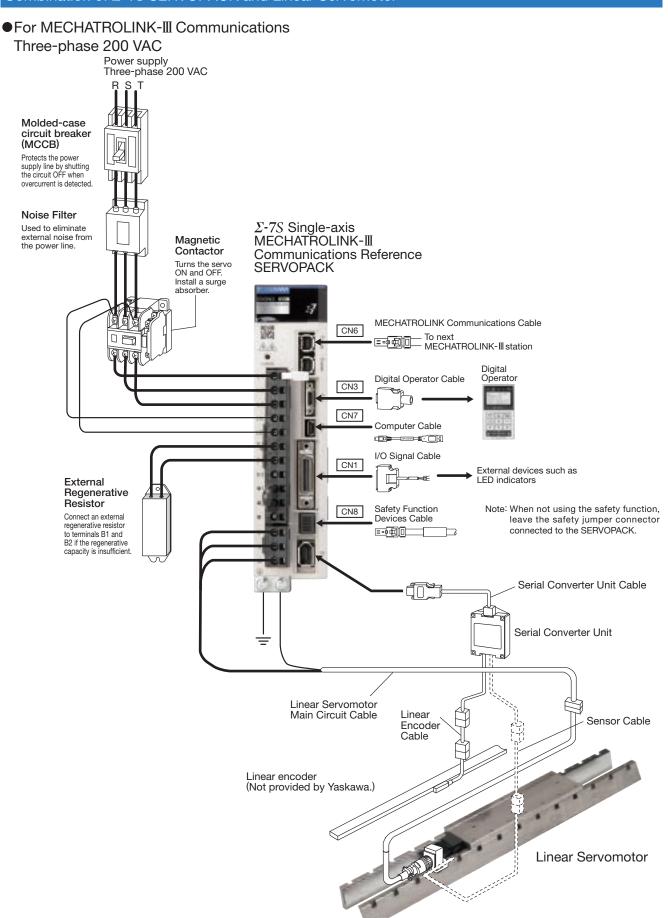






Rotary Servomotor

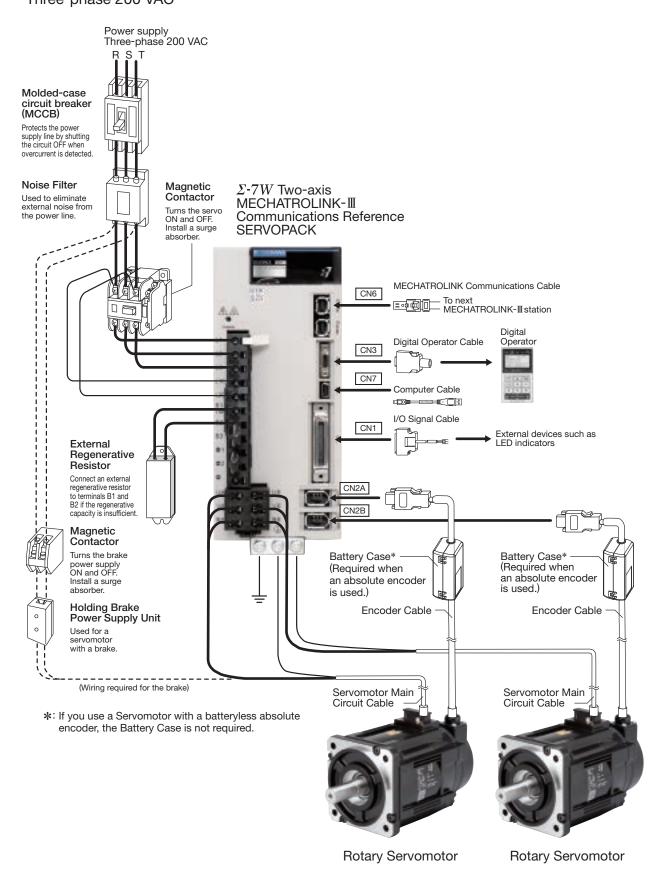
Direct Drive Servomotor



Combination of Σ -7S SERVOPACK and Linear Servomotor

Combination of Σ -7W SERVOPACK and Rotary Servomotor/Direct Drive Servomotor

•For MECHATROLINK-III Communications Three-phase 200 VAC



Σ -7 Series Combination

Combination of Rotary Servomotors and SERVOPACKs

			SERVOP	ACK Model	
Rotary Servomo	tor Model	Rated Output	SGD7S-	SGD7W-DDD SGD7C-DDD	
SGMMV	SGMMV-A1A	10 W			
Low inertia, ultra-small capacity)	SGMMV-A2A	20 W	– R90A, R90F	1R6A*1, 2R8A*1	
6000min ⁻¹	SGMMV-A3A	30 W	1R6A, 2R1F	1R6A, 2R8A*1	
	SGM7J-A5A	50 W	R70A, R70F		
	SGM7J-01A	100 W	R90A, R90F	- 1R6A*1, 2R8A*1	
SGM7J	SGM7J-C2A	150 W	1004 0015	1004 0004*1	
(Medium inertia, high speed)	SGM7J-02A	200 W	— 1R6A, 2R1F	1R6A, 2R8A*1	
3000 min ⁻¹	SGM7J-04A	400 W	2R8A, 2R8F	2R8A, 5R5A*1, 7R6A	
	SGM7J-06A	600 W	CDC A		
	SGM7J-08A	750 W		5R5A, 7R6A	
	SGM7A-A5A	50 W	R70A, R70F	4004*1.0004*1	
	SGM7A-01A	100 W	R90A, R90F	1R6A*1, 2R8A*1	
	SGM7A-C2A	150 W	1004 0015	4004 0004*1	
	SGM7A-02A	200 W	— 1R6A, 2R1F	1R6A, 2R8A*1	
	SGM7A-04A	400 W	2R8A, 2R8F	2R8A, 5R5A*1, 7R6A	
SGM7A	SGM7A-06A	600 W		5R5A, 7R6A	
	SGM7A-08A	750 W			
(Low inertia, high speed)	SGM7A-10A	1.0 kW			
3000 min ⁻¹	SGM7A-15A	1.5 kW	120A		
	SGM7A-20A	2.0 kW	180A	_	
	SGM7A-25A	2.5 kW		-	
	SGM7A-30A	3.0 kW	200A	-	
	SGM7A-40A	4.0 kW			
	SGM7A-50A	5.0 kW	330A		
	SGM7A-70A	7.0 kW	550A	-	
	SGM7P-01A	100 W	R90A, R90F	1R6A*1, 2R8A*1	
SGM7P	SGM7P-02A	200 W	2R8A, 2R1F		
(Medium inertia, flat type)	SGM7P-04A	400 W	2R8A, 2R8F	2R8A, 5R5A*1, 7R6A	
3000 min ⁻¹	SGM7P-08A	750 W	5R5A	5R5A, 7R6A	
	SGM7P-15A	1.5 kW	120A	-	
	SGM7G-03A	300 W			
	SGM7G-05A	450 W		5R5A*1, 7R6A*1	
	SGM7G-09A	850 W	7	R6A	
	SGM7G-13A	1.3 kW	120A		
SGM7G	SGM7G-20A	1.8 kW	180A	-	
(Medium inertia, large torque)	SGM7G-30A	2.9 kW*2		1	
1500 min ⁻¹	SGM7G-44A	4.4 kW	— 330A		
	SGM7G-55A	5.5 kW	470A		
	SGM7G-75A	7.5 kW	550A	-	
	SGM7G-1AA	11 kW	590A	-	
	SGM7G-1EA	15 kW	780A	-	

*1. If you use this combination, performance may not be as good, e.g., the control gain may not increase, in comparison with using a *Σ*-7*S* SERVOPACK. *2. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.



•Combination of Direct Drive Servomotors and SERVOPACKs

		Rated Torque	Instantaneous	SERVOPA	ACK Model
Direct Drive Servomotor Model SGM7D-30F		N·m	Max. Torque	SGD7S-	SGD7W-DDD SGD7C-DDDD
		30.0	N·m 50.0		
	SGM7D-58F	58.0	100		
	SGM7D-90F	90.0	150	120A*1	
	SGM7D-90F	110	200		
	SGM7D-1AP SGM7D-01G	1.30	4.00		-
				2R8A*1, 2R8F*1	
	SGM7D-05G SGM7D-08G	5.00	6.00 15.0		-
	SGM7D-08G SGM7D-18G	18.0	30.0		
				1004*1	
	SGM7D-24G	24.0	45.0	120A*1	
	SGM7D-34G	34.0	60.0 75.0		
	SGM7D-45G	45.0			-
	SGM7D-03H	3.00	4.00	2R8A*1, 2R8F*1	-
	SGM7D-28I	28.0	50.0		
SGM7D	SGM7D-70I	70.0	100		
With core, outer rotor)	SGM7D-1ZI	100	150		-
	SGM7D-1CI	130	200		
	SGM7D-2BI	220	300	100 1*1	
	SGM7D-2DI	240	400	120A*1	
	SGM7D-06J	6.00	8.00		
	SGM7D-09J	9.00	15.0		
	SGM7D-18J	18.0	30.0		
	SGM7D-20J	20.0	45.0		
	SGM7D-38J	38.0	60.0	2R8A*1, 2R8F*1	-
	SGM7D-02K	2.06	5.00		
	SGM7D-06K	6.00	10.0		
	SGM7D-08K	8.00	15.0		
	SGM7D-06L	6.00	10.0		
	SGM7D-12L	12.0	20.0		
	SGM7D-30L	30.0	40.0	120A*1	
	SGM7E-02B	2.00	6.00		
	SGM7E-05B	5.00	15.0	2R8A, 2R1F	
	SGM7E-07B	7.00	21.0		
	SGM7E-04C	4.00	12.0		
SGM7E	SGM7E-10C	10.0	30.0		2R8A
(Coreless, inner rotor)	SGM7E-14C	14.0	42.0	2R8A, 2R8F	
	SGM7E-08D	8.00	24.0		
	SGM7E-17D	17.0	51.0		
	SGM7E-25D	25.0	75.0		
	SGM7E-16E	16.0	48.0	50	R5A
	SGM7E-35E	35.0	105	JF	
	SGM7F-02A	2.00	6.00	2R8A, 2R1F	
	SGM7F-05A	5.00	15.0		2R8A
	SGM7F-07A	7.00	21.0		
	SGM7F-04B	4.00	12.0	2R8A, 2R8F	
	SGM7F-10B	10.0	30.0		
	SGM7F-14B	14.0	42.0	5F	R5A
	SGM7F-08C	8.00	24.0	2R8A, 2R8F	2R8A
SGM7F	SGM7F-17C	17.0	51.0	5F	R5A
	SGM7F-25C	25.0	75.0	7R6A 5R5A	
With core, inner rotor)	SGM7F-16D	16.0	48.0		
	SGM7F-35D	35.0	105	7R6A* ² , 120A	7R6A*2
	SGM7F-45M	45.0	135		R6A
	SGM7F-80M	80.0	240	120A	
	SGM7F-1AM	110	330	180A	1
	SGM7F-80N	80.0	240	120A	1 _
	SGM7F-1EN	150	450		-
	SGM7F-2ZN	200	600	200A	

Direct Drive Servomotor Model		Rated Torque N·m	Instantaneous Max. Torque	SERVOPACK Model	
				SGD7S-□□□□	SGD7W-DDDD
			N∙m		SGD7C-
	SGMCV-04B	4.00	12.0	2R8A, 2R8F	2R8A
	SGMCV-10B	10.0	30.0		
	SGMCV-14B	14.0	42.0	5R5A	
SGMCV (Small capacity, with	SGMCV-08C	8.00	24.0	2R8A, 2R8F	2R8A
core, inner rotor)	SGMCV-17C	17.0	51.0	5R5A	
	SGMCV-25C	25.0	75.0	7R6A	
	SGMCV-16D	16.0	48.0	5R5A	
	SGMCV-35D	35.0	105	7R6A*2, 120A	7R6A*2
	SGMCS-02B	2.00	6.00	2R8A, 2R1F	2R8A
	SGMCS-05B	5.00	15.0		
	SGMCS-07B	7.00	21.0		
	SGMCS-04C	4.00	12.0	2R8A, 2R8F	
SGMCS	SGMCS-10C	10.0	30.0		
(Small capacity, coreless,	SGMCS-14C	14.0	42.0		
inner rotor)	SGMCS-08D	8.00	24.0		
	SGMCS-17D	17.0	51.0		
	SGMCS-25D	25.0	75.0		
	SGMCS-16E	16.0	48.0	5R5A	
	SGMCS-35E	35.0	105		
	SGMCS-45M	45.0	135	7R6A	
201400	SGMCS-80M	80.0	240	120A	_
SGMCS	SGMCS-1AM	110	330	180A	
(Medium capacity, with core. inner rotor)	SGMCS-80N	80.0	240	120A	
	SGMCS-1EN	150	450	200A	
	SGMCS-2ZN	200	600		

Combination of Direct Drive Servomotors and SERVOPACKs

*1 An SGM7D Servomotor is used together with an FT-specification SERVOPACK. The following SERVOPACK models can be used. SGD7S- A A B F82 SGD7S- B OAA F83 SERVOPACK Model SCD7S- SERVOPACK Model SCD7S-

*2 Use the derated values given in the table on the right for the rated output and rated motor speed of this combination.

SERVOPACK Model		SGD7S- 🗆 🗆 🗆	SGD7W-
Rated Output	W	10	00
Rated Motor Speed	d min ⁻¹	2	70

Σ -7 Series Combination

•Combination of Linear Servomotors and SERVOPACKs

Linear Servomotor Model		Rated Force	Max. Force	SERVOPA	CK Model	
		N	N	SGD7S-	SGD7W-DDD SGD7C-DDDD	
	SGLGW-30A050C	12.5	40	R70A, R70F		
SGLG (Coreless model, with standard magnetic way)	SGLGW-30A080C	25	80	R90A, R90F		
	SGLGW-40A140C	47	140		1R6A	
	SGLGW-40A253C	93	280	1R6A, 2R1F		
	SGLGW-40A365C	140	420	2R8A, 2R8F	2R8A	
	SGLGW-60A140C	70	220	1R6A, 2R1F	1R6A	
	SGLGW-60A253C	140	440	2R8A, 2R8F	2R8A	
	SGLGW-60A365C	210	660		15A	
	SGLGW-90A200C	325	1300	120A		
	SGLGW-90A370C	550	2200	180A	_	
	SGLGW-90A535C	750	3000	200A		
	SGLGW-40A140C	57	230	1R6A, 2R1F	1R6A	
	SGLGW-40A1400	114	460	2R8A, 2R8F	2R8A	
SGLG	SGLGW-40A255C	171	690	3R8A	5R5A	
(Coreless model, with	SGLGW-40A303C SGLGW-60A140C	85	360	1R6A, 2R1F	1R6A	
igh-force magnetic way)	SGLGW-60A140C	170	720	3R8A	5R5A	
	SGLGW-60A365C	255	1080		6A	
	SGLGW-80A365C SGLFW-20A090A	255	86	/ H		
	SGLFW-20A090A SGLFW-20A120A	40	125		1064	
				1R6A, 2R1F	1R6A	
	SGLFW-35A120A SGLFW-35A230A	80	220	0004	CDC A	
		160	440	3R8A	5R5A	
	SGLFW-50A200B	280	600	5R 120A	5A	
	SGLFW-50A380B	560	1200			
	SGLFW-1ZA200B					
	SGLFW-1ZA380B	1120	2400	200A		
SGLF	SGLFW2-30A070A	45	135	1R6A, 2R1F	1R6A	
(Model with F-type iron	SGLFW2-30A120A	90	270			
core)	SGLFW2-30A230A	180	540	3R8A	-	
		170	500	2R8A, 2R8F	2R8A	
	SGLFW2-45A200A	280	840		5A	
	SGLFW2-45A380A	560	1680	180A	-	
			1500	120A		
	SGLFW2-90A200A	560	1680			
	SGLFW2-90A380A	1120	3360	200A		
	SGLFW2-90A560A	1680	5040	330A		
	SGLFW2-1DA380A	1680	5040	200A		
	SGLFW2-1DA560A	2520	7560	330A		
	SGLTW-20A170A	130	380	3R8A	5R5A	
	SGLTW-20A320A	250	760	7F	6A	
	SGLTW-20A460A	380	1140	120A	-	
SGLT (Model with T-type iron core)	SGLTW-35A170A	220	660			
	SGLTW-35A170H	300	600	5H	5R5A	
	SGLTW-35A320A	440	1320	1004	_	
	SGLTW-35A320H	600	1200	120A		
	SGLTW-35A460A	670	2000	4004		
	SGLTW-40A400B	670	2600	180A		
	SGLTW-40A600B	1000	4000	330A		
	SGLTW-50A170H	450	900		5A	
	SGLTW-50A320H	900	1800	120A	-	
	SGLTW-80A400B	1300	5000	330A	-	
	SGLTW-80A600B	2000	7500	550A		

Incremental Linear Encoders

✓ : Possible

✓ : Possible

		Linear		Mod	el	Linear	Resolution	Maximum	Support for	Application	Application to
Output Signal	Manufacturer Encode Type		Scale	Sensor Head	Interpolator (Serial Converter Unit)	Encoder Pitch µm	nm	Speed*4 m/s	Polarity Sensor Input	to Linear Motors	Fully-Closed Loop Control
				10	JZDP-H003/-H006*6	20	78.1	5	\checkmark	\checkmark	\checkmark
1 Vp-p	Heidenhain	Heidenhain		JZDP-J003/-J006*6	20	4.9	2	\checkmark	\checkmark	*9	
Analog	Corporation	Exposed	LIF48		JZDP-H003/-H006*6	4	15.6	1	\checkmark	\checkmark	\checkmark
Voltage*1					JZDP-J003/-J006*6		1.0	0.4	\checkmark	*9	*9
voltage	Renishaw plc*5	Exposed	RGS20	RGH22B	JZDP-H005/-H008*6	20	78.1	5	\checkmark	\checkmark	\checkmark
	nemisinaw pic**	Exposed	NG320	NGUZZD	JZDP-J005/-J008*6	20	4.9	2	\checkmark	\checkmark	*9
			SL7⊡0	PI	_101-RY*7	800	97.7	10	-	\checkmark	\checkmark
		Evpood		PL101	MJ620-T13*8	800	97.7	10	\checkmark	\checkmark	*9
Encoder for		Exposed	SQ10	PQ10	MQ10-FLA	400	48.83	3	-	\checkmark	\checkmark
Yaskawa's	Magnescale		3010	FQIU	MQ10-GLA	400	40.03	3	\checkmark	\checkmark	-
Serial	Co., Ltd.		SR75-□□		_	80	9.8	3.33	-	\checkmark	\checkmark
Interface*2		Sealed	SR75-	MF	—	80	78.1	3.33	-	\checkmark	\checkmark
		Sealed	SR85-00		-	80	9.8	3.33	-	\checkmark	\checkmark
			SR85-00	□□□MF	-	80	78.1	3.33	-	\checkmark	\checkmark

Absolute Linear Encoder

Output Signal	Manufacturer	Linear	Model			Linear Encoder	Resolution	Maximum Speed*4	Support for Polarity	Application to	Application to Fully-Closed
Output Signal	Manufacturer	Туре	Scale	Sensor Head	Interpolator (Serial Converter Unit)	Pitch*³ µm	nm	m/s	Sensor Input	Linear Motors	Loop Control
			SR77- 🗆		-	80	9.8	3.33	-	\checkmark	\checkmark
	Magnescale	Sealed	SR77- 🗆	□ □ □ MF	-	80	78.1	3.33	-	\checkmark	\checkmark
	Co., Ltd.	Sealeu	SR87- 🗆		-	80	9.8	3.33	-	\checkmark	\checkmark
			SR87- 🗆		-	80	78.1	3.33	-	\checkmark	\checkmark
			ST78	31A	-	256	500	5	-	\checkmark	\checkmark
			ST78	32A	-	256	500	5	-	\checkmark	\checkmark
Encoder for			ST78	33A	_	51.2	100	5	-	\checkmark	\checkmark
Yaskawa's	Mitutoyo	Exposed	ST78	34A	_	51.2	100	5	-	\checkmark	\checkmark
Serial	Corporation	Lyposed	ST78	38A	-	51.2	100	5	-	\checkmark	\checkmark
Interface*2			ST789	A*10	_	25.6	50	5	-	\checkmark	\checkmark
Interface			ST13	381	_	5.12	10	8	-	\checkmark	\checkmark
			ST13	382	-	0.512	1	3.6*11	-	\checkmark	\checkmark
	Heidenhain	Exposed	LIC4100) series	EIB3391Y*8	20.48	5	10	-	\checkmark	\checkmark
	Corporation	Sealed	LC1	15	EIB33911	40.96	10	3	-	\checkmark	\checkmark
	Renishaw		EL36Y-00	050F 🗆 🗆 🗆	_	12.8	50	100	-	\checkmark	\checkmark
	plc	Exposed	EL36Y-00	100F 🗆 🗆	_	25.6	100	100	-	\checkmark	\checkmark
	pic		EL36Y-00	500F	_	128	500	100	-	\checkmark	\checkmark

* 1. You must also use a Yaskawa Serial Converter Unit. The output signal will be multiplied by 8 bits (256 divisions) or 12 bits (4,096 divisions) in the Serial Converter Unit.

* 2. The multiplier (number of divisions) depends on the Linear Encoder. Also, you must write the motor constant file to the Linear Encoder in advance.

* 3. These are reference values for setting SERVOPACK parameters. Contact the manufacturer for actual linear encoder scale pitches.

4. The maximum speeds given in the above table are the maximum applicable speeds of the encoders when combined with a Yaskawa SERVOPACK. The actual speed will be restricted by either the maximum speed of the Linear Servomotor or the maximum speed of the Linear Encoder (given above). * 5. If you use the origin signals with a Linear Encoder from Renishaw plc, the origin may sometimes be falsely detected. If that occurs, use the BID/DIR signal to output the origin signal only in one direction.

★ 6. Use this model number to purchase the Serial Converter Unit.

* 7. Use this model number to purchase the Sensor Head with Interpolator.

* 8. Use this model number to purchase the Interpolator.

* 9. Contact your Yaskawa representative.

*10. Contact Mitutoyo Corporation for details on the Linear Encoders.

*11.The speed is restricted for some SERVOPACKs.

Note: Confirm detailed specifications, such as the tolerances, dimensions, and operating environment, with the manufacturer of the Encoder before you use it.

Absolute Rotary Encoder

The following Absolute Rotary Encoders are for fully-closed control. Can not use it to control the motor.

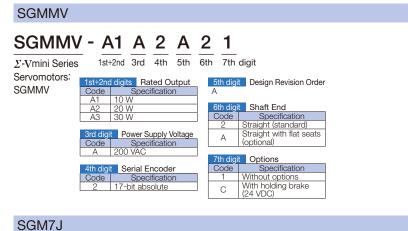
Output Signal	Manufacturer	Linear Encoder	Мс	odel	Relay Device between Fully-Closed Module	Resolution	Maximum
Output Signal	Manufacturer	Туре	Scale	Sensor Head	and Rotary Encoder	Bits	Speed ^{*1} min ⁻¹
	Magnescale	Sealed	RU77-4	096ADF	-	20	2000
	Co., Ltd.	Sealed	RU77-409	96AFFT01	-	22	2000
Encoder for Yaskawa's Serial Interface	Heidenhain	Sealed	RCN2	2310*2		26	3000
Senai mienace			RCN5	510* ²	EIB3391Y	28	800
	Corporation		RCN8310*2			29	400

1. The maximum speeds given in the above table are the maximum applicable speeds of the encoders when combined with a Yaskawa SERVOPACK. The actual speed will be restricted by either the maximum speed of the Linear Servomotor or the maximum speed of the Linear Encoder (given above). * 2. This is a single-turn absolute encoder.

Note: Confirm detailed specifications, such as the tolerances, dimensions, and operating environment, with the manufacturer of the Encoder before you use it.



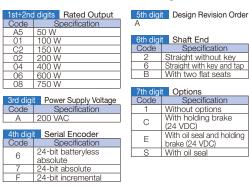
Rotary Servomotors



Without Gears SGM7J - 01 A 7 A 2 1

1st+2nd 3rd 4th 5th 6th 7th digit Σ -7 Series

Servomotors: SGM7J



• With Gears

Servomotors:

SGM7J

SGM7J - 01 A 7 A H 1 2 1 1st+2nd 3rd 4th 5th 6th 7th 8th 9th digit \varSigma -7 Series

 Ist+2nd digits
 Rated Output

 Code
 Specification

 Tst+2norm

 Code
 Spectrum

 A5
 50 W

 01
 100 W

 C2
 150 W

 02
 200 W

 04
 400 W
 600 W 06 08
 3rd digit
 Power Supply Voltage

 Code
 Specification
 Code Sper A 200 VAC
 4th digit
 Serial Encoder

 Code
 Specification

 6
 24-bit batteryless
 24-bit absolute 24-bit incremental 5th digit Design Revision Order

6th digit Gear Type

 Code
 Specification

 H
 HDS planetary

 Iow-backlash gear

7th digi	t Gear Ratio						
Code	Specification						
B	1/11*1						
С	1/21						
1	1/5						
2	1/9*2						
7	1/33						
sup rate *2. This sup with	 *1. This specification is not supported for models with a rated output of 50 W. *2. This specification is supported only for models with a rated output of 50 W. 						
	t Shaft End						
Code	Specification						
0	Flange output						
2	Straight without key						
6	Straight with key and tap						
9th digi	t Options						
Code	Specification						
1	Without options						
	With holding broke						

With holding brake (24 VDC) С

SGM7A

• Without Gears

SGM7A - 01 A 7 A 2 1 1st+2nd 3rd 4th 5th 6th 7th digit Σ -7 Series

	101		our ruraigit
Servomotors:	1st+2nd	digits Rated Output	5th digit Design Revision Order
SGM7A	Code	Specification	A
	A5	50 W	
	01	100 W	6th digit Shaft End
	C2	150 W	Code Specification
	02	200 W	2 Straight without key
	04	400 W	6 Straight with key and tap
	06	600 W	B* With two flat seats
	08	750 W	* Code B is not supported for
	10	1.0 kW	models with a rated output of
	15	1.5 kW	1.5 kW or higher.
	20	2.0 kW	
	25	2.5 kW	7th digit Options
	30	3.0 kW	Code Specification
	40	4.0 kW	1 Without options
	50	5.0 kW	C With holding brake
	70	7.0 kW	(24 VDC)
	3rd dig	t Power Supply Voltage	E With oil seal and holding brake (24 VDC)
	Code	Specification	S With oil seal
	A	200 VAC	Note: SGM7A-70A Servomotors
			with holding brakes are
	4th dig		not available.
	Code	Specification	not available.
	6	24-bit batteryless	
	<u> </u>	absolute	
	<u> </u>	24-bit absolute	
	F	24-bit incremental	

• With Gears

А

Code

н

h digit Gear Type ode Specification

HDS planetary

low-backlash gear

SGM7A - 01 A 7 A H 1 2 1 1st+2nd 3rd 4th 5th 6th 7th 8th 9th digit Σ -7 Series

		our fui our our aigit
Servomotors:	1st+2nd digits Rated Output	7th digit Gear Ratio
SGM7A	Code Specification	Code Specification
	A5 50 W	B 1/11*1
	01 100 W	C 1/21
	C2 150 W	1 1/5
	02 200 W	2 1/9*2
	04 400 W	7 1/33
	06 600 W	
	08 750 W	 This specification is not
	10 1.0 kW	supported for models with a
		rated output of 50 W.
	3rd digit Power Supply Voltage	 This specification is
	Code Specification	supported only for models
	A 200 VAC	with a rated output of 50 W.
		8th digit Shaft End
	4th digit Serial Encoder	Code Specification
	Code Specification	0 Flange output
	6 24-bit batteryless	2 Straight without key
	absolute	6 Straight with key and tap
	7 24-bit absolute	
	F 24-bit incremental	9th digit Options
	Note: Contact your Yaskawa	
	representative for models	
	of 1.5 kW or higher.	With holding brake
		(24 VDC)
	5th digit Design Revision Order	(21,000)

Rotary Servomotors

SGM7P

• Without Gears

SGM7P - 01 A 7 A 2 1 \varSigma -7 Series Servomotors SGM7P

	1st	+2nd 3rd 4th 5th	61	th 7th	digit
:		digits Rated Output		5th dig	
	Code	Specification		Code	Specification
	01	100 W		A	IP65
[02	200 W		E	IP67
[04	400 W			
	08	750 W		6th dig	it Shaft End
1	15	1.5 kW		Code	Specification
		-		2	Straight without key
	3rd digi			6	Straight with key and tap
	Code	Specification			_
	A	200 VAC		7th dig	
				Code	
	4th digi	t Serial Encoder		1	Without options
	Code	Specification		С	With holding brake
	6	24-bit batteryless			(24 VDC)
	0	absolute		E	With oil seal and holding
1	7	24-bit absolute			brake (24 VDC)
	F	24-bit incremental		S	With oil seal

 With Gear 	S							
SGM7P	- 01	Α	7	Α	Η	В	0	1
Σ -7 Series	1st+2n	d 3rd	4th	5th	6th	7th	8th	9th digit
Servomotors:		_					_	
	1st+2nd dig							ar Type
SGM7P	Code	Specit	ficatio	า		Code		pecification
		W 0				н		planetary
		W 0					low-ba	acklash gear
		0 W						D .::
		0 W				'th digi		r Ratio
	15 1.	5 kW				Code		pecification
	3rd digit	Power Su	nnly V	oltago		B C	1/11 1/21	
	Code	Specif			ı H	1	1/21	
		IO VAC	loatio	1	-	7	1/33	
	11 20	0 1/10				1	1/00	
	4th digit	Serial Er	ncode	r	8	th diai	t Sha	ft End
	Code	Specit	ficatio	า		Code	S	pecification
	6 24	-bit batt				0		e output
	b ab	solute	,			2		ht without key
		-bit abso	olute			6	Straigh	t with key and ta
	F 24	-bit incre	ement	al			_	
						Ith digi		
		Design R				Code		pecification
	Code	Specit	ficatio	1		1		ut options
	A IP	55				С	With h	nolding brake

(24 VDC)

SGM7G

SGM7G - 03 A 7 A 2 1

1st+2nd 3rd 4th 5th 6th 7th digit \varSigma -7 Series
 1st+2nd digits
 Rated Output

 Code
 Specification

 03
 300 W

 05
 450 W

 09
 850 W

 13
 1.3 kW

 20
 1.8 kW

 30
 2.9 kW*

 44
 4.4 kW

 56
 5.6 kW

 75
 7.5 kW

 1A
 11 kW

 1E
 15 kW

 *: The rated output is 2.4 kW
 Servomotors:
 4th digit
 Serial Encoder

 Code
 Specification

 6
 24-bit batteryless

 6
 the second secon SGM7G 24-bit absolute 24-bit incremental 5th digit Design Revision Order 6th digit Shaft End
 Code
 Specification

 2
 Straight without key
 6 Straight with key and tap * The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A. 7th digitOptionsCodeSpecification 3rd digitPower Supply VoltageCodeSpecificationA200 VAC With oil seal and holding 1 С F brake (24 VDC) With oil seal

• Direct Drive Servomotors

Note: Direct Drive Servomotors are not available with holding brakes.

SGM7D

SGM7D - 30 F 7 C 4 1

Direct Drive Servomotors: SGM7D

Data di Octavita

1st+2nd	digits Rated Output		
Code	Specification	Code	Specification
01	1.30 N·m	30	30.0 N·m
02	2.06 N·m	34	34.0 N·m
03	3.00 N·m	38	38.0 N·m
05	5.00 N·m	45	45.0 N·m
06	6.00 N·m	58	58.0 N·m
08	8.00 N·m	70	70.0 N·m
09	9.00 N·m	90	90.0 N·m
12	12.0 N·m	1Z	100 N·m
18	18.0 N·m	1A	110 N·m
20	20.0 N·m	1C	130 N·m
24	24.0 N·m	2B	220 N·m
28	28.0 N·m	2D	240 N·m

1st+2nd 3rd 4th 5th 6th 7th digit

S

	t Servomotor Outer Dia	meter	
Code	Specification	Code	Specification
F	264-mm dia.	J	150-mm dia.
G	160-mm dia.	K	107-mm dia.
H	116-mm dia.	L	224 mm × 224 mm
	264-mm dia.		

4th digi	t Serial Encoder
Code	Specification
7	24-bit multi-turn absolute encoder*
F	24-bit incremental encoder*

*: Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters

5th digit Design Revision Order

6th digit Flange ✓ : Applicable models.									
Code Mounting				omotor	Outer	Diame	er Coo	le (3rd	Digit)
Code	IVI	Mounting		G	Н		J	K	L
4	Non-load	with cable on side	\checkmark	~	~	-	-	-	~
5	side	with cable on bottom	\checkmark	√*	-	~	~	\checkmark	-

*: SGM7D-01G and -05G are not available with a cable extending from the bottom.

7th digit Options

Code	Specification			
1	Standard machine precision			
2	High machine precision*			

*: The SGM7D-01G, -05G, and -03H are available only with high mechanical precision.



• Direct Drive Servomotors

Note: Direct Drive Servomotors are not available with holding brakes.

GM7E	- <u>02</u> <u>B</u> <u>7</u> <u>A</u> <u>1</u> <u>1</u>	
ect Drive	1st+2nd 3rd 4th 5th 6th 7th digit	
omotors:	1st+2nd digits Rated Output 4th digit Serial Encoder	
7E	Code Specification Code Specification	
	02 2.00 N·m 7 24-bit multiturn	
	04 4.00 N·m absolute encoder*	
	05 5.00 N·m F 24-bit incremental 07 7.00 N·m F encoder*	
	08 8.00 N·m *Both multiturn absolu	
	10 10.0 N·m encoder and increment	
	14 14.0 N·m encoder can be used a	
	16 16.0 N·m single-turn absolute enco	
	25 25.0 N·m by setting parameters.	
	35 35.0 N·m 5th digit Design Revision Or	der
	A	
	3rd digit Servomotor Outer Diameter Code Specification 6th digit Flange	
	B 135-mm dia. Code Mounting	
	C 175-mm dia. 1 Non-load side	
	D 230-mm dia. 4 Non-load side	
	E 290-mm dia. 4 (with cable on side)	
	7th digit Options	
	Code Specification	
	1 Without options	
	High machine precisi (runout at end of sha	
	2 and runout of shaft	"
	surface: 0.01 mm)	

2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

SGM7F		0.0	^	7	٨		4	4				
SGM7F Direct Drive Servomotors:		st+2nd	3rd	4th	5t	_	6th	Tth	diç	git		
SGM7F	• Small-c			a Out	ραι				• N	ledium	I-capac	itv
	Code		fication	Coc	le	Spe	ecificat	ion	_	ode		-
	02	2.00		14			0 N∙m			45	45.0 N	
	04	4.00		16			0 N∙m			80	1 0.08	
	05	5.00	N·m	17			0 N·m			1A	110 N	
	07	7.00		25			<u>0 N∙m</u> 0 N∙m			1E 2Z	150 N 200 N	
	10	10.0		30		35.	U IN·IT	1		22	200 F	١٠m
				_								
	3rd dig				amete	r			S		ncode	
	Code		Specific				Co				cification	
	A B	100-mm dia. 135-mm dia.							24-bit multiturn absolute encoder		<u>ب</u>	
	C		nm dia			-	-				encoae rement	
	D		nm dia			1	F			oder*	rement	al
	M	280-r			1	* Both multiturn ab:						
	N	000-1	<u>nm dia</u>	L			er	ncod ngle-	er o turr	can b abso	incren e useo olute er neters.	d as
							5th A	digit	D	esign I	Revisior	o Ord
	6th dig	it Fla	inge								cable n	
	Code		Mountii	na	100						Code (3n	
	Out			<u> </u>		A	B		0	D	M	N
	1		oad sid	de		\checkmark	~		1	\checkmark	-	-
	3	Load	oad sid			-			_	_	$\overline{\checkmark}$	✓ ✓
			oad sid				+	-	-		-	
	4		cable c)	\checkmark	~		1	\checkmark	-	-
	7th dig	t Op	tions									
	Code					Sp	ecifica	ation				
	1	Withc	out opti	ons								
	2		machir aft surfi					at er	nd o	f shaf	t and ru	inout

Note: 1. Direct Drive Servomotors are not available with holding brakes.
 This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

SGMCV

- 04 B F A SGMCV 1 4

1st Co

Direct Drive Servomotors: SGMCV

. (J4	D		А			
1s	t+2nd	3rd	4th	5th	6th	7tł	n digit
t+2nc	l digits	Rate	ed Out	put	4th	digi	t Serial Encoder
ode	0	Specifi	cation		Co	de	Specification
)4)8	4.00				E	Ξ	22-bit single-turn absolute encoder
0 4 6	10.0 14.0						22-bit multiturn absolute encoder
6	16.0				L		
	17.0				5th	digi	t Design Revision C
7 25 35	25.0				А	Ű	Ŭ
35	35.0	N∙m					
						ı digi	
d digi	t Serv	omotor	Outer Dia	ameter	Co	de	Specification
ode		Specifi	cation			1	Non-load side
ode B C D		nm di			4	1	Non-load side
С	175-r	mm di	a.			T	(with cable on side)
D	230-r	mm di	a.				
							t Options
					Co	de	Specification
							Without options
							High machine precis

ign Revision Order nge Specification oad side oad side cable on side) it Options Specification Without options High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm) 5

 $m{*}$ Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.

SGMCS

SGMCS - 02 B 3 C 1

1st+2nd 3rd 4th 5th 6th 7th digit

Direct Drive

SGMCS

Servomotors: ______ Rated Output

TOULTIN	Tottend digito Thated Output					
 Small-c 	apacity, Corele		Medium-c	capacity, with Core		
Code	Specification	Code	Specification	on	Code	Specification
02	2.00 N·m	14	14.0 N·m		45	45.0 N·m
04	4.00 N·m	16	16.0 N·m		80	80.0 N·m
05	5.00 N·m	17	17.0 N·m		1A	110 N·m
07	7.00 N·m	25	25.0 N·m		1E	150 N·m
08	8.00 N·m	35	35.0 N·m		2Z	200 N·m
10	10.0 N·m					
3rd digi	3rd digit Servomotor Outer Diameter				Serial Er	ncoder

1

Specification		
135-mm dia.		
175-mm dia.		
230-mm dia.		
290-mm dia.		
280-mm dia.		
360-mm dia.		

4th digi	t Serial Encoder
Code	Specification
3	20-bit single-turn absolute encoder
D	20-bit incremental encoder
	Code 3

5th digit Design Revision Order Code Model with servomotor outer diameter code M or N Model with servomotor outer diameter code E Model with servomotor outer diameter code B, C, or D

6th dig	it Flange					able n			
Code	Mounting	Servomotor Outer Diameter Code (3rd Digit)							
Code	Iviouriurig	В	С	D	E	M	Ň		
-	Non-load side	\checkmark	\checkmark	\checkmark	\checkmark	-	-		
	Load side	-	-	-	-	\checkmark	\checkmark		
3	Non-load side	-	-	-	-	~	\checkmark		
4	Non-load side (with cable on side)	~	~	~	~	-	-		

7th digi	t Options
Code	Specification
1	Without options

* Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.

М	-40
IVI	-40

Linear Servomotors

SGLG (Coreless Models)

• Moving C	Coil		Magnetic Way
SGL	GW-30A05	0 C P 🗌	SGLGM-30108A 🗌
Linear Σ Series		n+8th 9th 10th 11th digit	Linear £ 1st 2nd 3rd+4th 5th+6th+7th 8th 9th digit Series 1st digit Serveromotor Serveromotor Sth+6th+7th digits Length of Magnetic Way
Linear Servomotors	Code Specification Co	Ode Specification A 200 VAC	Linear Servomotors Code Specification G Coreless model 108 108 mm
	Code Specification Code W Moving Coil 0	+7th+8th digits Length of Moving Coil ode Specification 150 50 mm	2nd digit Moving Coll/Magnetic Way 216 216 mm Code Specification 225 225 mm M Magnetic Way 252 252 mm
	3rd+4th digits Magnet Height 1 Code Specification 2 30 30 mm 2 40 40 mm 3 60 60 mm 3	80 mm 40 140 mm 000 199 mm 53 252.5 mm 65 365 mm 70 367 mm	3rd+4th digits Magnet Height 360 360 mm Code Specification 405 405 mm 30 30 mm 432 432 mm 40 40 mm 450 mm 504 60 60 mm 504 504 mm 90 86 mm 504 504 mm
	91	35 535 mm th digit Design Revision Order B · · ·	90 86 mm 8th digit Design Revision Order A, B, C*··· 9th digit Options Code Specification Applicable Models
	10th digit Sensor Specification and O Code Specifications Polarity Sensor Cooling Method	Applicable Models	None Standard-force All models -M High-force SGLGM-40, -60
	C None Air-cooled H Yes Air-cooled	All models SGLGW-40A, -60A, -90A All models	•C = Without mounting holes on the bottom •CT = With mounting holes on the bottom
	11th digit Connector for Servomotor Code Specification	Main Circuit Cable Applicable Models	
	Electronics Japan G.K.	All models SGLGW-30A, -40A, -60A	

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

SGLFW2 (Models with F-type Iron Cores)

Moving C	Coil	Magnetic Way
SGL	F W2 - 30 A 070 A T 🗌	SGL FM2 - 30 270 A
Linear Σ Series Linear Servomotors	1st 2nd 3rd+4th 5th 6th+7th+8th 9th 10th 11th digit 1st digit Servomotor Type Specification Specification Code Specification 0 With 5 With 5 and an an an and an	Linear Σ 1st 2nd 3rd+4th 5th+6th+7th 8th digit Series 1st digit Servomotor Type Linear Code Specification Servomotors F With F-type iron core 2nd digit Moving Coil/Magnetic Way Code Specification M Magnetic Way 3rd+4th digits Magnet Height Code Specification 30 30 mm 45 45 mm 90 90 mm 1D 135 mm
	A 10th digit Sensor Specification Code Specification S With polarity sensor and thermal protector T Without polarity sensor, with thermal protector 11th digit Cooling Method Code Specification None Self-cooled L Water-cooled*	

 $\boldsymbol{\ast}$ Contact your Yaskawa representative for information on water-cooled models.

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.



Linear Servomotors

SGLFW (Nodels with F-type Iron Cores)	
 Moving C 	oil	Magnetic Way
SGL	FW - 20 A 090 A P 🗌	SGL FM - 20324 A 🗌
Linear Σ Series Linear Servomotors	1st 2nd 3rd+4th 5th 6th+7th+8th 9th 10th 11th digit 1st digit Servomotor Type Code Specification Code Specification F With F-type iron core A 200 VAC Code Specification W Moving Coil Gth+7th+8th Length of Moving Coil W Moving Coil 090 91 mm 3rd+4th digits Magnet Height 200 215 mm 20 20 mm 205 mm 205 mm 205 mm	Linear £ 1st 2nd 3rd+4th 5th+6th+7th 8th 9th digit Series 1st digit Servomotor Type Code Specification Code Code Specification Code
	35 36 mm 380 395 mm 50 47.5 mm 91 digit Design Revision Order 1Z 95 mm 91 digit Design Revision Order 10th digit Sensor Specification A, B ··· 380	35 36 mm A, B ··· 50 47.5 mm Image: A red of the second s
	Code Specification P With polarity sensor None Without polarity sensor	Code Specification None Without options C With magnet cover
	Ith digit Connector for Servomotor Main Circuit Cable Code Specification Applicable Models None Connector from Tyco All models	
	D Connector from Interconnectron GmbH SGLFW-35, -50, -1Z□200B	

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

SGLT (Models with T-type Iron Cores)

Marine Oatl

 Moving C 	Coil		Magnetic Way
S G L Linear £ Series Linear Servomotors	1st digit Servomotor Type 3 Code Specification 7 T With T-type iron core 3 2nd digit Moving Coil/Magnetic Way 6 Code Specification 7 W Moving Coil 7 3rd+4th digits Magnet Height 6 Code Specification 20 20 20 mm 35 36 mm 40 40 mm 50 51 mm	70 A P th+8th 9th 10th 11th digit thread 9th 10th 11th digit code Specification 200 VAC th+7th+8th Length of Moving Coil Code Specification 170 170 mm 320 315 mm 400 394.2 mm 460 460 mm 600 574.2 mm 9th digit Design Revision Order A. B State	S G L T M - 20 324 A □ Linear Σ Ist 2nd 3rd+4th 5th+6th+7th 8th 9th digit Series Ist 2nd 3rd+4th 5th+6th+7th 8th 9th digit Linear Ist digit Servomotor Type Ist digit Ist digit Servomotors Ist digit Servomotor Type Ist digit Ist digit Ist digit 2nd digit Moving Coll/Magnetic Way Ist 200 Ist 200 Ist 200 Ist 200 2nd digit Moving Coll/Magnetic Way Ist 200 Ist 200 Ist 200 Ist 200 Ist 200 Ist 200 3rd+4th digits Magnet Height Ist 200 Ist 200
	10th digit Sensor Specification and Specifications Code Specifications Polarity Sensor Cooling Method None None None Valer-cooled Water-cooled H* Yes Ves Self-cooled 11th digit Connector for Servomoto Code Specification Connector from Tyco Electronics Japan G.K. None MS connector Loose lead wires with no connector Note to come to the set of th	Applicable Models All models SGLTW-40, -80 All models	9th digit Options Code Specification Applicable Models None Without options - C With magnet cover All models Y With base and magnet cover SGLTM-20, -35*, -40, -80 * The SGLTM-35 H (high-efficiency models) do not support this specification.

 $m{*}$ Contact your Yaskawa representative for the characteristics, dimensions, and other details on Servomotors with these specifications.

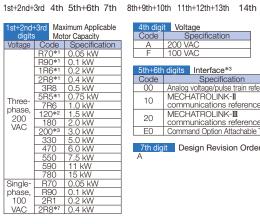
Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

SERVOPACKs

Σ -7S Model

R70 A 20 A SGD7S 001 000 В

 Σ -7 Series Σ -7S Models



	Coue	Specification
	None	Without options
	001	Rack-mounted
		Duct-ventilated
	002	Varnished
erence	008	Single-phase, 200-VAC power si
e	020*6	No dynamic brake
		External dynamic brake resistor
е		
Type*4	11th+12t	h+13th digits FT/EX Specification
	Code	Specification
r	None	Nama
	000	None
	F82*7	Application function option for special motors, SGM7D motor drive
	F83*7	Application function option for special motors, SGM7D motor drive, indexing

+10th digits Hardware Options Specification

Specification

digit

Code



Applicable Models

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model. SGD7S-120A□0A008).
 *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.

- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
 *5. A command option module must be attached to the Command Option Attachable-type SERVOPACK for use. Refer to pages 356 to 381 for details.
- *6. Refer to the following manual for details. Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- #7. Refer to the following manual for details.
 m S-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for SGM7D Motor Product Manual (Manual No.: SIEP S800001 91)
 *8. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. This service is available in Japan only. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Σ -7W Model

1R6 A 20 A 001 SGD7W 000 Β

 Σ -7 Series

digit

 Σ -7W Models

1st+2nd+3rd 4th 5th+6th 7th 8th+9th+10th 11th+12th+13th 14th

Maximum Applicable
 Stream - Store
 Motor Capacity per Axis

 Voltage
 Code
 Specification

 Three
 186*1
 0.2 kW

 phase,
 288*1
 0.4 kW

 200
 585*2
 0.75 kW
 VAC 7R6 1.0 kW

th digit Voltage

200 VAC

Code



7th digit Design Revision Order

8th+9th+10th digits		Hardware Options Specifi	cation
Code		Specification	Applicable Models
None	Without	t options	
001	Rack-mounted		All models
002	Varnished		
020*4		amic brake	SGD7W-1R6A to -2R8A
02014	Externa	I dynamic brake resistor	SGD7W-5R5A to -7R6A
700*5	HWBB option		All models



Specification

- *1. You can use these models with either a single-phase or three-phase power supply input.
 *2. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).
 *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.

- *4. Refer to the following manual for details. Ω Σ-7 Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73) *5. Refer to the following manual for details
- 🛱 Σ-7 Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72) *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. This service is available in Japan only. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Σ -7C Model

SGD7C 1R6 A MA A 001

 Σ -7 Series Σ -7C Models 1st+2nd+3rd 4th 5th+6th 7th 8th+9th+10th digit

1st+2nd-	⊦3rd	Aaximum Applio	able	4th diai	t Volta	ade	8th+9th+1	l Ot
digits	i I	Notor Capacity	per Axis	Code	S	pecification	Code	
Voltage	Cod	e Specific	ation	A	200 V/	AC	None	V
Three-	1R6 ³	^{∗1} 0.2 kW					001	F
phase,	2R8'	^{⊧1} 0.4 kW		5th+6th	ı digits	Interface*3	002	V
200	5R5'	^{⊭2} 0.75 kW		Code		Specification	020*4	Ν
VAC	7R6	3 1.0 kW			Bus co	onnection with		E
				MA	referer	1005	700*5	Ιŀ

8th+9th+	Oth digits Hardware Options Specific	cation
Code	Specification	Applicable Models
None	Without options	
001	Rack-mounted	All models
002	Varnished	
020*4	No dynamic brake	SGD7C-1R6A to -2R8A
02014	External dynamic brake resistor	SGD7C-5R5A to -7R6A
700*5	HWBB option	All models

7th digit Design Revision Order

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input,

derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

- *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors. *4. Refer to the following manual for details. $\square \Sigma$ -7 Series AC Servo Drive Σ -7S/ Σ -7W SERVOPACK with Hardware Option
- Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73) *5. Refer to the following manual for details. $\square \Sigma$ -7 Series AC Servo Drive Σ -7W/ Σ -7C SERVOPACK with Hardware Option
- Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)

Related Documents

The documents that are related to the MP3300 Machine Controllers and Σ -7 series AC Servo Drives are shown in the following table. Refer to these documents as required.

Catalog (Catalog No.)	Manual (Manual No.)	Description of Document
General Catalog Machine Controller and AC Servo Drive Solutions Catalog (KAEP S800001 22)	-	-
MP3300 Catalog Machine Controller MP3300 (KAEP C880725 03)	MP3000-Series Manual MP3300 (SIEP C880725 21)	Describes the functions, specifications, operating methods, maintenance, inspections, and troubleshooting of the MP3000-Series MP3300 Machine Controllers.
Σ -7-Series Catalog AC Servo Drives Σ -7 Series (KAEP S800001 23)	Σ -7-Series SERVOPACK Product Manual Σ -7S SERVOPACK with MECHATROLINK-III Communications References (SIEP S800001 28) Σ -7S SERVOPACK with MECHATROLINK-II Communications References (OUED COOPORT OF)	
	(SIEP S800001 27) Σ -7S SERVOPACK with Analog Voltage/Pulse Train References (SIEP S800001 26) Σ -7S SERVOPACK Command	Provide detailed information on selecting Σ -7-Series SERVOPACKs and information on installing,
	Option Attachable Type with INDEXER Module (SIEP S800001 64) <i>2-7S</i> SERVOPACK Command Option Attachable Type with	connecting, setting, performing trial operation for, tuning, and monitoring the Servo Drives.
	DeviceNet Module (SIEP S800001 70) <i>S</i> -7W SERVOPACK with MECHATROLINK-III Communications References (SIEP S800001 29)	
	Σ -7 C SERVOPACK (SIEP S800002 04)	Provides detailed information on selecting Σ -7-Series Σ -7C SERVOPACKs; installing, connecting, setting, testing in trial operation, and tuning Servo Drives; writing, monitoring, and maintaining programs; and other information.
	Σ -7C SERVOPACK Motion Control User's Manual (SIEP S800002 03)	Provides detailed information on the specifications, system configuration, and application methods of the Motion Control Function Modules (SVD, SVC4, and SVR4) for Σ -7-Series Σ -7C SERVOPACKS.
	Machine Controller MP3000 Series Communications User's Manual (SIEP C880725 12)	Provides detailed information on the specifications, system configuration, and communications connection methods for the Ethernet communications that are used with Σ -7-Series Σ -7C SERVOPACKs.

Catalog (Catalog No.)	Manual (Manual No.)	Description of Document
Σ -7-Series Catalog	\varSigma -7-Series SERVOPACK Product Manual	
AC Servo Drives Σ -7Series (KAEP S800001 23)	Σ -7C SERVOPACK Troubleshooting Manual (SIEP S800002 07)	Provides detailed troubleshooting information for Σ -7-Series Σ -7C SERVOPACKs.
	Σ -7S / Σ -7W SERVOPACK with Hardware Option Specifications Dynamic Brake (SIEP S800001 73)	Provides detailed information on Hardware Options for Σ -7-Series
	Σ -7W / Σ -7C SERVOPACK with Hardware Option Specifications HWBB Function (SIEP S800001 72)	SERVOPACKs.
	Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with Hardware Option Specifications Dynamic Brake (SIEP S800001 91)	Provides detailed information on Options for Σ -7S SERVOPACK with FT/EX Specification.
	Σ -V-Series/ Σ -V-Series for Large- Capacity Models/ Σ -7-Series User's Manual Safety Module (SIEP C720829 06)	Provides details information required for the design and maintenance of a Safety Module.
	\varSigma -7-Series Servomotor Product Manual	
	Rotary Servomotor (SIEP S800001 36)	
	Linear Servomotor (SIEP S800001 37)	Provide detailed information on selecting, installing, and connecting the Σ -7-Series Servomotors.
	Direct Drive Servomotor (SIEP S800001 38)	

Related Documents

Σ-7

Catalog (Catalog No.)	Manual (Manual No.)	Description of Document
Σ -7-Series Catalog	Others	
AC Servo Drives Σ -7Series	Peripheral Device Selection Manual (SIEP S800001 32)	Describes the peripheral devices for a \varSigma -7-Series Servo System.
(KAEP S800001 23)	MECHATROLINK-III Communications Standard Servo Profile Command Manual (SIEP S800001 31)	Provides detailed information on the MECHATROLINK-II communications standard servo profile commands that are used for a Σ -7- Series Servo System.
	MECHATROLINK-I Communications Command Manual (SIEP S800001 30)	Provides detailed information on the MECHATROLINK-II communications commands that are used for a Σ -7-Series Servo System.
	Digital Operator Operating Manual (SIEP S800001 33)	Describes the operating procedures for a Digital Operator for a Σ -7-Series Servo System.
	Engineering Tool SigmaWin+ Operation Manual (SIET S800001 34)	Provides detailed operating procedures for the SigmaWin+ Engineering Tool for a Σ -7-Series Servo System.
	Machine Controller MP2000/MP3000 Series Engineering Tool MPE720 Version 7 User's Manual (SIEP C880761 03)	Describes in detail how to operate MPE720 version 7.
	Machine Controller MP3000 Series Ladder Programming Manual (SIEP C880725 13)	Provides detailed information on the ladder programming specifications and instructions for Σ -7-Series Σ -7C SERVOPACKs.
	Machine Controller MP3000 Series Motion Programming Manual (SIEP C880725 14)	Provides detailed information on the motion programming and sequence programming specifications and instructions for Σ -7-Series Σ -7C SERVOPACKs.

CONTENTS

Σ

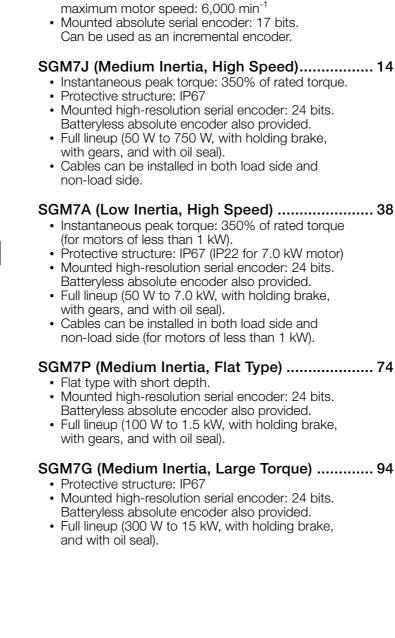
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Rotary Servomotors

Features







SGMMV (Low Inertia, Ultra Small Size)......4

Contributes to machine downsizing

• Ultra small capacity: 10 W to 30 W and

(flange size: $25 \text{ mm} \times 25 \text{ mm}$).



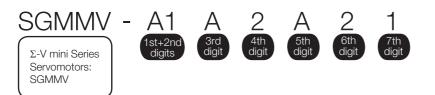






SGMMV

Model Designations



1	1st+2nd digits Rated Output			
	Code	Specification		
	A1	10 W		
	A2	20 W		
	A3	30 W		

3rd dig	t Power Supply Voltage		
Code	Specification		
Α	200 VAC		
4th dig	it Serial Encoder		
Code	Specification		
2	17-bit absolute		
5th digit Design Revision Order			

А

6th dig	it Shaft End
Code	Specification
2	Straight (standard)

2	Straight (standard)
A	Straight with flat seats (optional)



Code	Specification
1	Without options
С	With holding brake (24 VDC)

Specifications and Ratings

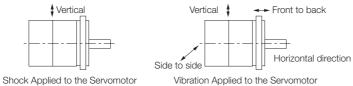
Specifications

	Voltage		200 V		
N	Model SGMMV-		A2A	A3A	
Time Rating			Continuous		
Thermal Class	3		В		
Insulation Res	sistance		500 VDC, 10 M Ω min.		
Withstand Vol	tage		1,500 VAC for 1 minute	Э	
Excitation			Permanent magnet		
Mounting			Flange-mounted		
Drive Method			Direct drive		
Rotation Direc	ction	Counterclockwise (CCW)	for forward reference when	viewed from the load side	
Vibration Clas	s^{*1}		V15		
	Surrounding Air Temperature		0°C to 40°C		
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)			
Environmen- tal Condi- tions	Installation Site	 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. 			
	Storage Environment	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)			
Shock Resistance ^{*2}	Impact Acceleration Rate at Flange	490 m/s ²			
nesistance	Number of Impacts	2 times			
Vibration Resistance ^{*2}	Vibration Acceleration Rate at Flange	49 m/s ²			
Applicable	SGD7S-	R90A,	, R90F	1R6A, 2R1F	
SERVOPACKs	SGD7W- SGD7C-	1R6A*3,	2R8A*3	1R6A, 2R8A ^{*3}	

*1. A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at the rated motor speed.

*2. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.

The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



*3. If you use a Servomotor together with a Σ -7W or Σ -7C SERVOPACK, the control gain may not increase as much as with a Σ -7S SERVOPACK and other performances may be lower than those achieved with a Σ -7S SERVOPACK.

Servomotor Ratings

	Voltage			200 V	
	Model SGMMV-		A1A	A2A	A3A
Rated Output ^{*1}		W	10	20	30
Rated Torque ^{*1, *}	*2	N∙m	0.0318	0.0637	0.0955
Instantaneous N	laximum Torque ^{*1}	N∙m	0.0955	0.191	0.286
Rated Current*1		Arms	0.70	0.66	0.98
Instantaneous N	laximum Current ^{*1}	Arms	2.0	1.9	2.9
Rated Motor Sp	eed ^{*1}	min ⁻¹		3000	
Maximum Motor		min ⁻¹		6000	
Torque Constant	t	N•m/Arms	0.0516	0.107	0.107
Motor Moment of	of Inertia	×10 ⁻⁷ kg•m ²	2.72 (4.07)	4.66 (6.02)	6.68 (8.04)
Rated Power Rate ^{*1}		kW/s	3.72	8.71	13.7
Rated Angular Acceleration Rate ^{*1}		rad/s ²	117000	137000	143000
Heat Sink Size (A	Aluminum) ^{*3}	mm	150×1	150×150×3 250>	
Protective Structure ^{*4}			Totally enclosed, self-cooled, IP55 (except for shaft opening)		
	Rated Voltage	V	24 VDC ^{+10%}		
	Capacity	W	2.0 2.6		.6
	Holding Torque	N•m	0.0318	0.0637	0.0955
Holding Brake	Coil Resistance	Ω (at 20°C)	320	22	1.5
Specifications*5	Rated Current	A (at 20°C)	0.075	0.7	108
	Time Required to Release Brake	ms	40		
	Time Required to Brake	ms		100	
Allowable Load Moment of Inertia (Motor Moment of Inertia Ratio) ^{*6}			30 times		
With External Regenerative		e Resistor	30 times		
	LF	mm		16	
Allowable Shaft Loads ^{*7}	Allowable Radial Load	N	34	4	4
LUdUS	Allowable Thrust Load	Ν		14.5	

Note: The values in parentheses are for Servomotors with Holding Brakes.

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. These are typical values.

*2. The rated torques are the continuous allowable torque values with an aluminum or steel heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*5. Observe the following precautions if you use a Servomotor with a Holding Brake.

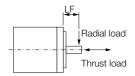
• The holding brake cannot be used to stop the Servomotor.

• The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.

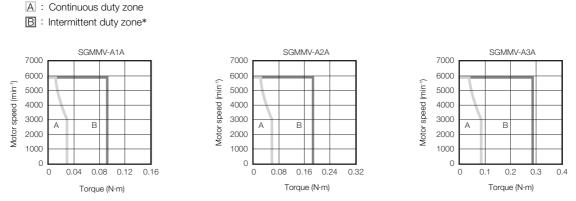
• The 24-VDC power supply is not provided by Yaskawa.

*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

*7. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



Torque-Motor Speed Characteristics



* The characteristics are the same for three-phase 200 V, single-phase 200 V, and single-phase 100 V input.

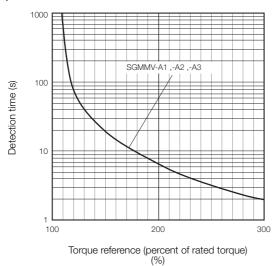
Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

2. The characteristics in the intermittent duty zone depend on the power supply voltage.

- 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* (page 7).

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Servomotor Ratings* (page 6). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- · Reduce the maximum motor speed.

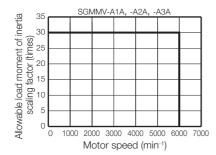
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-R90A, -1R6A, -R90F, and -2R1F

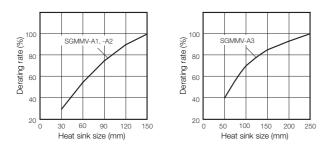
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products. *External Regenerative Resistors* (page 472)

Derating Rates

Servomotor Heat Dissipation Conditions

The Servomotor ratings are the continuous allowable values when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.





The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equipment.

Information

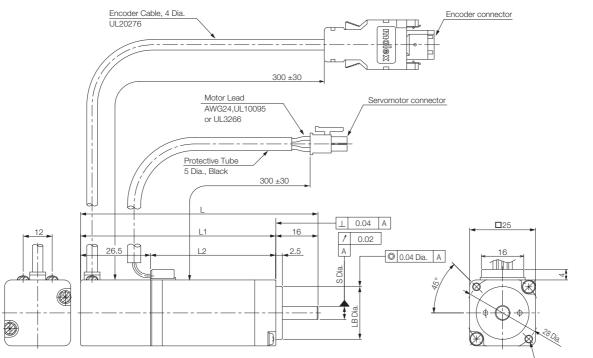
When using Servomotors with derating, change the detection timing of overload warning and overload alarm based on the overload detection level of the motor given in *Servomotor Overload Protection Characteristics* (page 7).

Note: The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your Yaskawa representative.

External Dimensions

Servomotors without Holding Brakes

◆ SGMMV-A1, -A2 and -A3

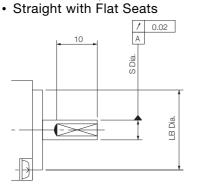


2-M3 Tapped Holes, Depth 7

Model SGMMV-	L	L1	L2		nge nsions	Approx. Mass [kg]
SCIVIIVIV-				S	LB	iviass [kg]
A1A2AD1	70	54	27.5	5 _{-0.008}	20 .0.021	0.13
A2A2AD1	80	64	37.5	5 _0.008	20 _0.021	0.17
A3A2AD1	90	74	47.5	5 -0.008	20 .0.021	0.21

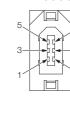
0.5

■ Shaft End Specification



Connector Specifications

Encoder Connector



	1	PG5V	Red
6	2	PG0V	Black
	3*	BAT	Orange
T^{4}	4*	BAT0	Orange/white
\searrow_2	5	PS	Light blue
	6	/PS	Light blue/white
	Connector	FG	Shield
case		(frame ground)	Oneu

* A battery is required only for an absolute

encoder. Model: 55102-0600 Manufacturer: Molex Japan LLC Mating connector: 54280-0609

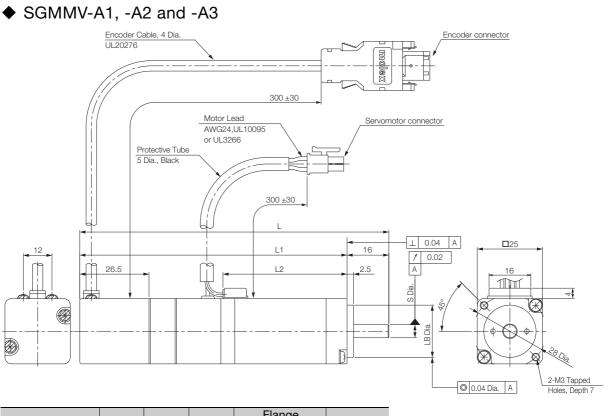
Servomotor Connector

_	
	34

1	Phase U
2	Phase V
3	Phase W
4	FG (frame ground)

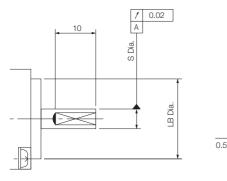
Receptacle: 43025-0400 Manufacturer: Molex Japan LLC

Servomotors with Holding Brakes



Model SGMMV-	L	L1	L2		nge nsions	Approx. Mass [kg]
Scivily -				S	LB	iviass [kg]
A1A2A□C	94.5	78.5	27.5	5 _0.008	20 _0.021	0.215
A2A2A□C	108.5	92.5	37.5	5 -0.008	20 -0.021	0.27
A3A2A□C	118.5	102.5	47.5	5 .0.008	20 _0.021	0.31

Shaft End SpecificationStraight with Flat Seats



Connector Specifications

Encoder Connector

	1	PG5V	Red				
5 6	2	PG0V	Black				
3	3*	BAT	Orange				
	4*	BAT0	Orange/white				
$1 \square 2$	5	PS	Light blue				
	6	/PS	Light blue/white				
	Connector FG Shield						
	case (frame ground)						
 A battery is required only for an absolute encoder. Model: 55102-0600 							
Model. 55102-0000							
	Manufacturer: Molex Japan LLC						
	Mating con	nector: 54280-	0609				

Servomotor Connector

1	Phase U	
2	Phase V	
З	Phase W	
4	FG (frame ground)	
 5	Brake	
6	Brake	

Receptacle: 43025-0600 Manufacturer: Molex Japan LLC

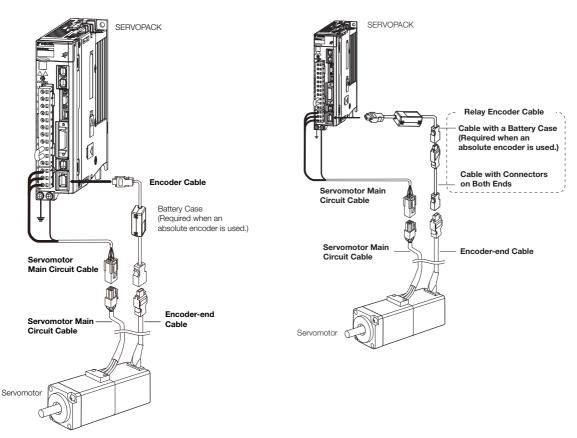
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

- 2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
- 3. Refer to the following manual for the following information.
- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Name	Length	Order N	Number	Appearance
Nume	(L)	Standard Cable	Flexible Cable*	Appearance
	3 m	JZSP-CF2M00-03-E	JZSP-CF2M20-03-E	
	5 m	JZSP-CF2M00-05-E	JZSP-CF2M20-05-E	
	10 m	JZSP-CF2M00-10-E	JZSP-CF2M20-10-E	
For Servomotors with-	15 m	JZSP-CF2M00-15-E	JZSP-CF2M20-15-E	SERVOPACK end Motor end
out Holding Brakes	20 m	JZSP-CF2M00-20-E	JZSP-CF2M20-20-E	
	30 m	JZSP-CF2M00-30-E	JZSP-CF2M20-30-E	© ⊐-i ∕
	40 m	JZSP-CF2M00-40-E	JZSP-CF2M20-40-E	
	50 m	JZSP-CF2M00-50-E	JZSP-CF2M20-50-E	
	3 m	JZSP-CF2M03-03-E	JZSP-CF2M23-03-E	
	5 m	JZSP-CF2M03-05-E	JZSP-CF2M23-05-E	
	10 m	JZSP-CF2M03-10-E	JZSP-CF2M23-10-E	
For Servomotors with	15 m	JZSP-CF2M03-15-E	JZSP-CF2M23-15-E	SERVOPACK end Motor end
Holding Brakes	20 m	JZSP-CF2M03-20-E	JZSP-CF2M23-20-E	
	30 m	JZSP-CF2M03-30-E	JZSP-CF2M23-30-E	
	40 m	JZSP-CF2M03-40-E	JZSP-CF2M23-40-E	
	50 m	JZSP-CF2M03-50-E	JZSP-CF2M23-50-E	

Servomotor Main Circuit Cables

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Encoder Cables of 20 m or Less

Name	Length	Order I	Number	Appearance
Name	(L)	Standard Cable	Flexible Cable*	Appearance
	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
Cables with Connectors	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK end Encoder end
on Both Ends	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
(for incremental encoder)	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	SERVOPACK end Encoder end
Cables with Connectors	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	
on Both Ends (for absolute encoder:	10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
With Battery Case)	15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	Battery Case (battery included)
- /	20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	(Dattery included)

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 68 mm or larger.

Relay Encoder Cables of 30 m to 50 m

Name	Length (L)	Order Number	Appearance
	30 m	JZSP-UCMP00-30-E	SERVOPACK Encoder end
Cables with Connectors on Both Ends (for incremental or absolute encoder)	40 m	JZSP-UCMP00-40-E	
	50 m	JZSP-UCMP00-50-E	
Cable with a Battery Case (Required when an absolute encoder is used.)*	0.3 m	JZSP-CSP12-E	SERVOPACK Encoder end end L Battery Case (battery included)

* This Cable is not required if a battery is connected to the host controller.

SGM7J

Model Designations

	hout Gears	٨	7 0 0	4	
Σ-7	Series vomotors: M7J - 01 1st+2nd digits	3rd	7 A 2 4th 5th 6th digit digit a	7th digit	
1st+2	nd digits Rated Output		ligit Power Supply Voltage		ligit Shaft End
Code	1	Cod		Code	-
A5	50 W		200 VAC	2	Straight without key
01	100 W	4th c	ligit) Serial Encoder	6 B	Straight with key and tap
C2	150 W				With two flat seats
02	200 W	Cod	-	7th d	igit Options
04 06	400 W 600 W	6	24-bit batteryless absolute		
08	750 W	- 7 F	24-bit absolute 24-bit incremental	Code	
00	150 W		24-bit incremental	1	Without options With holding brake (24 V
		5th c	digit Design Revision Order		
				E	With oil seal and holding brake (24 VDC)
		A		S	With oil seal
SGN					
_	and digits Rated Output	5th di	git Design Revision Order		it Shaft End
Code	-	А		Code	Specification
A5	50 W	6th di	git) Gear Type	0	Flange output
01 C2	100 W 150 W	Code		6	Straight without key Straight with key and tap
02	200 W	H	HDS planetary low-backlash gea		
02	400 W		ן וובט pianetary וטיע-שמטמפוד אפני ווביט איז		git Options
04	600 W	7th di	git Gear Ratio		
08	750 W	Code		Code 1	Specification
	1	B	1/11*1		Without options With holding brake (24 VD
rd di	git Power Supply Voltage	C	1/21		I with holding blake (24 VL
Code	-	1	1/5	—	
	Specification			_	
А		2	1/9*2		
A	Specification 200 VAC	2	1/9* ² 1/33	_	
	200 VAC	7	1/33	d for	
th dię	200 VAC	7 *1. Thi			
th dię	200 VAC git Serial Encoder Specification	7 *1. Thi mo *2. Thi	1/33 s specification is not supported dels with a rated output of 50 s specification is supported or	W. nly for	
ith dię Code	200 VAC	7 *1. Thi mo *2. Thi	1/33 s specification is not supported dels with a rated output of 50	W. nly for	

F

24-bit incremental

Specifications and Ratings

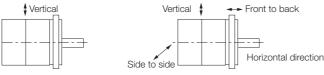
Specifications

	Voltage				200 V						
Ν	Nodel SGM7J-	A5A	01A	C2A	02A	04A	06A	08A			
Time Rating					Continuo						
Thermal Class	3				JL: B, CE						
Insulation Res		500 VDC, 10 MΩ min.									
Withstand Vol	tage			1,500	VAC for	1 minute					
Excitation					nanent m	0					
Mounting					nge-mou						
Drive Method					Direct dri						
Rotation Direc	stion	Counter	clockwise ((CCW) for fo	orward refe side	rence when v	viewed from	the load			
Vibration Clas	s*1				V15						
	Surrounding Air Temperature	0°C to 40°C (With derating, usage is possible between 40°C and 60°C.)*3									
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)									
Environmen- tal Condi- tions	Installation Site	 Must k Must f Must h is poss 	pe well-ve acilitate in nave an alf	ntilated a spection titude of ⁻ reen 1,00	nd free o and clea 1,000 m d 0 m and	or less. (Wi 2,000 m.) [*]	moisture. th derating				
	Storage Environment	Storage	Temperati	ure: -20°C	to 60°C	store it with the p (with no fre umidity (with	ezing)				
Shock	Impact Acceleration Rate at Flange				490 m/s	2					
Resistance ^{*2}	Number of Impacts				2 times	;					
Vibration Resistance ^{*2}	Vibration Acceleration Rate at Flange				49 m/s	2					
Applicable	SGD7S-	R70A, R70F	R90A, R90F	1R6A	, 2R1F	2R8A, 2R8F	5R5A				
SERVO- PACKs	SGD7W- SGD7C-	1R6A ^{*4} ,	, 2R8A ^{*4}	1R6A,	2R8A ^{*4}	2R8A, 5R5A ^{*4} , 7R6A ^{*4}	5R5A,	, 7R6A			

*1. A vibration class of V15 indicates a vibration amplitude of 15 µm maximum on the Servomotor without a load at the rated motor speed.

*2. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.

The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



Shock Applied to the Servomotor

Vibration Applied to the Servomotor

*3. Refer to the following section for the derating rates.

Derating Rates (page 22)

*4. If you use a Servomotor together with a Σ -7W or Σ -7C SERVOPACK, the control gain may not increase as much as with a Σ -7S SERVOPACK and other performances may be lower than those achieved with a Σ -7S SERVOPACK.

Ratings of Servomotors without Gears

	Voltage					200 V			
	Model SGM7J-		A5A	01A	C2A	02A	04A	06A	08A
Rated C	Dutput ^{*1}	W	50	100	150	200	400	600	750
	orque ^{*1, *2}	N∙m	0.159	0.318	0.477	0.637	1.27	1.91	2.39
Instanta	aneous Maximum Torque ^{*1}	N∙m	0.557	1.11	1.67	2.23	4.46	6.69	8.36
Rated C	Current ^{*1}	Arms	0.55	0.85	1.6	1.6	2.5	4.2	4.4
Instanta	aneous Maximum Current*1	Arms	2.0	3.1	5.7	5.8	9.3	15.3	16.9
Rated N	Notor Speed ^{*1}	min⁻¹				3000			
Maximu	Im Motor Speed ^{*1}	min⁻¹				6000			
Torque	Constant	N•m/Arms	0.316	0.413	0.321	0.444	0.544	0.493	0.584
Motor N	Noment of Inertia		0.0395	0.0659	0.0915	0.263	0.486	0.800	1.59
	With holding brake	×10 ⁻⁴ kg⋅m ²	0.0475	0.0739	0.0995	0.333	0.556	0.870	1.77
	With batteryless absolute encoder		0.0410	0.0674	0.0930	0.264	0.487	0.801	1.59
Rated F	Power Rate ^{*1}	kW/s	6.40	15.3	24.8	15.4	33.1	45.6	35.9
	With holding brake	1.00/5	5.32	13.6	22.8	12.1	29.0	41.9	32.2
Rated A	Angular Acceleration Rate ^{*1}	rad/s ²	40200	48200	52100	24200	26100	23800	15000
	With holding brake		33400	43000	47900	19100	22800	21900	13500
Derating	Rate for Servomotor with Oil Seal	%	80		90			95	
-	nk Size (Aluminum)*3	mm	200×2	200×6			0 × 250 :		
Protect	ive Structure ^{*4}			Totally enclosed, self-cooled, IP67					
S	Rated Voltage	V			24	VDC±10		P	
lke Js,	Capacity	W		5.5	P	6	-		.5
Holding Brake Specifications ^{*5}	Holding Torque	N∙m	0.159	0.318	0.477	0.637	1.27	1.91	2.39
ng fice	Coil Resistance	Ω (at 20°C)	1	04.8±10	%	96±			±10%
oldi	Rated Current	A (at 20°C)		0.23		0.2	25	0.	
S H	Time Required to Release Brake	ms			60			8	0
	Time Required to Brake	ms				100		I	
	ble Load Moment of Inertia Moment of Inertia Ratio) ^{*6}			35 times	i	15 times	10 times	20 times	12 times
	With External Regenerative F External Dynamic Brake Res			35 times		25 ti	mes	20 times	15 times
ble *3	LF	mm	20				25		35
Allowable Shaft Loads ^{*3}	Allowable Radial Load	Ν	78					392	
Allo S Lo	Allowable Thrust Load	Ν	54					147	

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*5. Observe the following precautions if you use a Servomotor with a Holding Brake.

The holding brake cannot be used to stop the Servomotor.
The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.

The 24-VDC power supply is not provided by Yaskawa.

*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

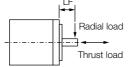
*7. To externally connect a dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect a dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70

• SGD7W-1R6A20A020 to -2R8A20A020

• SGD7C-1R6AMAA020 to -2R8AMAA020

*8. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



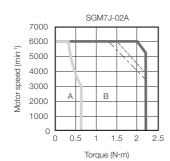
Torque-Motor Speed Characteristics

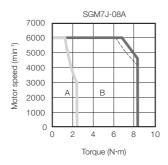
A : Continuous duty zone

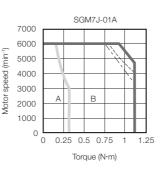
B: Intermittent duty zone

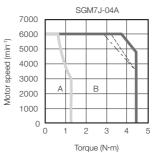
(solid lines): With three-phase 200-V or single-phase 230-V input (dotted lines): With single-phase 200-V input (dashed-dotted lines): With single-phase 100-V input

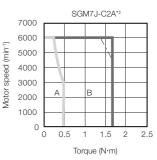
SGM7J-A5A*I 7000 6000 Motor speed (min⁻¹) 5000 4000 3000 2000 1000 0 0 0.15 0.3 0.45 0.6 0.75 Torque (N·m)

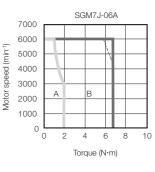












*1. The characteristics are the same for single-phase 200 V and single-phase 100 V input.

*2. The characteristics are the same for three-phase 200 V and single-phase 200 V input.

Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Ratings of Servomotors with Gears

			Gear N	lechanisr	n			Structure		Motion [a	rc-min]
All Models		Pla	netary ge	ear mech	anism			self-cooled, IP naft opening)	255	3 max.	
				Servomoto	or			(Gear Output		
Servomotor Model SGM7J-	Out	ted tput N]	Rated Motor Speed [min ⁻¹]	Maxi- mum Motor Speed [min ⁻¹]	Rated Torque [N⋅m]	Instanta- neous Maxi- mum Torque [N·m]	Gear Ratio	Rated Torque/ Efficiency*1 [N·m/%]	Instanta- neous Maxi- mum Torque [N·m]	Rated Motor Speed [min ⁻¹]	Maxi- mum Motor Speed [min ⁻¹]
A5ADAH1D							1/5	0.433/64*2	2.37	600	1200
A5ADAH2D			0000	0000	0.150	0.557	1/9	1.12/78	3.78 ^{*3}	333	667
	5	50	3000	6000	0.159	0.557	1/21	2.84/85	10.6	143	286
A5ADAH7D	1						1/33	3.68/70	15.8	91	182
01A D AH1 D							1/5	1.06/78*2	4.96	600	1200
		~~	0000	0000	0.318		1/11	2.52/72	10.7	273	545
		00	3000	6000		1.11	1/21	5.35/80	20.8	143	286
01A D AH7 D							1/33	7.35/70	32.7	91	182
C2ADAH1D							1/5	1.68/83*2	7.80	600	1200
	1		3000	6000	0.477	1.67	1/11	3.53/79*2	16.9	273	545
	1	50	3000			1.67	1/21	6.30/70 ^{*2}	31.0	143	286
							1/33	11.2/79*2	49.7	91	182
02A□AH1□							1/5	2.39/75	9.80	600	1200
						+	1/11	5.74/82	22.1	273	545
	20	00	3000	6000	0.637	2.23	1/21	10.2/76	42.1	143	286
02A D AH7 D							1/33	17.0/81	67.6	91	182
04A D AH1 D							1/5	5.35/84	20.1	600	1200
		00	3000	6000	1.27	4.46	1/11	11.5/82	45.1	273	545
	40	00	3000	0000	1.27	4.40	1/21	23.0/86	87.0	143	286
04A D AH7 D	1						1/33	34.0/81	135	91	182
06A D AH1 D							1/5	7.54/79	30.5	600	1200
	60	00	3000	6000	1.91	6.69	1/11	18.1/86	68.6	273	545
	600 3000	0000	1.31	0.03	1/21	32.1/80	129	143	286		
06A D AH7 D							1/33	53.6/85	206	91	182
08A D AH1 D							1/5	10.0/84	38.4	600	1200
	7!	750 3000	6000	2.39	8.36	1/11	23.1/88	86.4	273	545	
				0000	2.00	0.00	1/21	42.1/84	163	143	286
08ADAH7D							1/33	69.3/88	259	91	182

*1. The gear output torque is expressed by the following formula.

Gear output torque = Servomotor output torque $\times \frac{1}{\text{Gear ratio}} \times \text{Efficiency}$

The gear efficiency depends on operating conditions such as the output torque, motor speed, and temperature. The values in the table are typical values for the rated torque, rated motor speed, and a surrounding air temperature of 25°C. They are reference values only.

*2. When using an SGM7J-A5A, SGM7J-01A, or SGM7J-C2A Servomotor with a gear ratio of 1/5 or an SGM7J-C2A Servomotor with a gear ratio of 1/11, maintain an 85% maximum effective load ratio. For an SGM7J-C2A Servomotor with a gear ratio of 1/21 or 1/33, maintain a 90% maximum effective load ratio. The values in the table take the effective load ratio into consideration.

*3. The instantaneous maximum torque is 300% of the rated torque.

- Note: 1. The gears that are mounted to Yaskawa Servomotors have not been broken in. Break in the Servomotor if necessary. First, operate the Servomotor at low speed with no load. If no problems
 - occur, gradually increase the speed and load. 2. The no-load torque for a Servomotor with a Gear is high immediately after the Servomotor starts, and it then decreases and becomes stable after a few minutes.

This is a common phenomenon caused by grease circulation in the gears and it does not indicate faulty gears. 3. Other specifications are the same as those for Servomotors without Gears.



The SERVOPACK speed control range is 1:5,000. If you use Servomotors at extremely low speeds (0.02 min⁻¹ or lower at the gear output shaft), if you use Servomotors with a one-pulse feed reference for extended periods, or under some other operating conditions, the gear bearing lubrication may be insufficient. That may cause deterioration of the bearing or increase the load ratio. Contact your Yaskawa representative if you use a Servomotor under these conditions.

			tia [×10⁻⁴ kg·			/ith Gears		
Servomotor Model SGM7J-	Shaft O Motor* + Gear	utput Gear	Flange C Motor* + Gear	Gear	Allowable Radial Load [N]	Allowable Thrust Load [N]	LF [mm]	Reference Diagram
A5ADAH1D	0.0455	0.006	0.0445	0.005	95	431	37	
A5ADAH2D	0.0425	0.003	0.0425	0.003	113	514	37	
	0.0435	0.004	0.0435	0.004	146	663	37	
A5ADAH7D	0.0845	0.045	0.0845	0.045	267	1246	53	
01A D AH1 D	0.0719	0.006	0.0709	0.005	95	431	37	
	0.126	0.060	0.125	0.059	192	895	53	
	0.116	0.050	0.116	0.050	233	1087	53	
01A D AH7 D	0.131	0.065	0.130	0.064	605	2581	75	
C2ADAH1D	0.0975	0.006	0.0965	0.005	95	431	37	Shaft Output
C2ADAHBD	0.152	0.060	0.151	0.059	192	895	53	∗⊡•
C2ADAHCD	0.202	0.110	0.200	0.108	528	2254	75	Radial load
C2ADAH7D	0.157	0.065	0.156	0.064	605	2581	75	┶╌─╌┤╠╧╷╾╸
02A D AH1 D	0.470	0.207	0.464	0.201	152	707	53	Thrust load
	0.456	0.193	0.455	0.192	192	895	53	
	0.753	0.490	0.751	0.488	528	2254	75	Flange Output
02A D AH7 D	0.713	0.450	0.712	0.449	605	2581	75	Flange Output
04A D AH1 D	0.693	0.207	0.687	0.201	152	707	53	
	1.06	0.570	1.05	0.560	435	1856	75	
	0.976	0.490	0.974	0.488	528	2254	75	Radial load
04ADAH7D	1.11	0.620	1.10	0.610	951	4992	128	Thrust load
06A D AH1 D	1.50	0.700	1.46	0.660	343	1465	75	
	1.37	0.570	1.36	0.560	435	1856	75	
	1.64	0.840	1.62	0.820	830	4359	128	
06A D AH7 D	1.42	0.620	1.41	0.610	951	4992	128	
08A D AH1 D	2.29	0.700	2.25	0.660	343	1465	75	
	2.19	0.600	2.18	0.590	435	1856	75	
	4.59	3.00	4.57	2.98	830	4359	128	
08A D AH7 D	4.39	2.80	4.37	2.78	951	4992	128	

* The moment of inertia for the Servomotor and gear is the value without a holding brake. You can calculate the moment of inertia for a Servomotor with a Gear and Holding Brake with the following formula.

Motor moment of inertia for a Servomotor with a Holding Brake from Ratings of Servomotors without Gears (page 16) + Moment of inertia for the gear from the above table.

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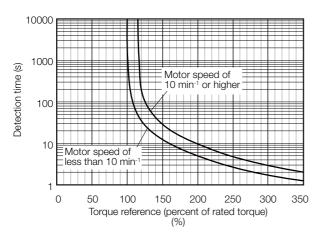
During operation, the gear generates the loss at the gear mechanism and oil seal. The loss depends on the torque and motor speed conditions. The temperature rise depends on the loss and heat dissipation conditions. For the heat dissipation conditions, always refer to the following table and check the gear and motor Important temperatures with the actual equipment. If the temperature is too high, implement the following measures.

- · Decrease the load ratio. • Change the heat dissipation conditions.
- Use forced-air cooling for the motor with a cooling fan or other means.

Model		Heat Sink Size	e	
Woder	1/5	1/9 or 1/11	1/21	1/33
SGM7J-A5		А		
SGM7J-01				
SGM7J-C2		В		
SGM7J-02				
SGM7J-04				
SGM7J-06		C		
SGM7J-08		0		
• B: 300 mm ×	$300 \text{ mm} \times$	6 mm, aluminum plate 12 mm, aluminum plate 12 mm, aluminum plate		

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 17.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings of Servomotors without Gears* (page 16). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

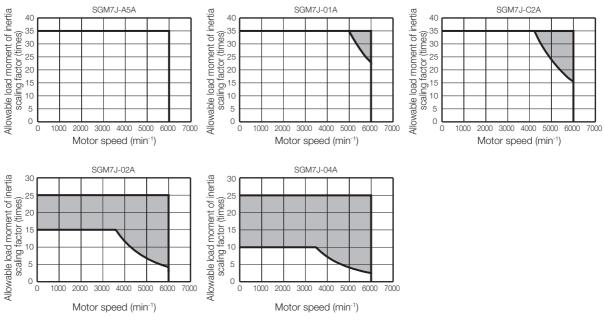
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

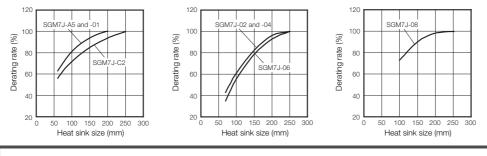
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

Derating Rates

Servomotor Heat Dissipation Conditions

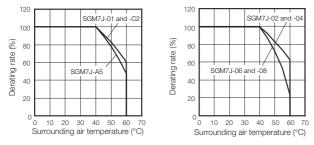
The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.



The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equipment. Important

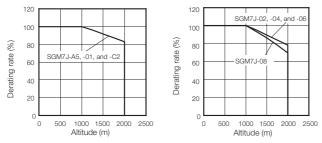
Applications Where the Surrounding Air Temperature Exceeds 40°C

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a Servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs.



Applications Where the Altitude Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs.

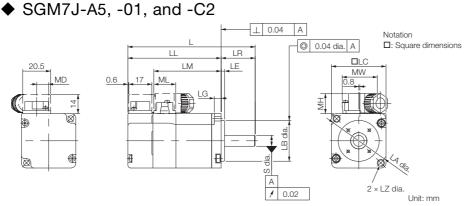


When using Servomotors with derating, change the detection timing of overload warning and Information overload alarm based on the overload detection level of the motor given in Servomotor Overload Protection Characteristics (page 20).

- Note: 1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.
 - 2. The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your Yaskawa representative.

External Dimensions

Servomotors without Gears



Model	*	LL*	LL*	LL*	LL*	LM		F	lange	e Dim	nensi	ons		S	МП	MW	мш	N/1	Approx.
SGM7J-	L.			LR	LE	LG	LC	LA	LB	LΖ	3		101.0.0			Approx. Mass [kg]			
	81.5 (122)	56.5 (97)	37.9	25	2.5	5	40	46	30 .0.021	4.3	8 -0.009	8.8	25.8	14.7	16.1	0.3 (0.6)			
01ADA2D	93.5 (134)	68.5 (109)	49.9	25	2.5	5	40	46	30 .0.021	4.3	8 -0.009	8.8	25.8	14.7	16.1	0.4 (0.7)			
	105.5 (153.5)	80.5 (128.5)	61.9	25	2.5	5	40	46	30 .0.021	4.3	8 -0.009	8.8	25.8	14.7	16.1	0.5 (0.8)			

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

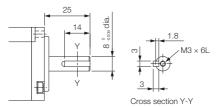
Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

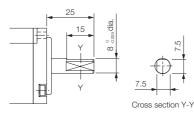
2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

• Straight with Key and Tap



• With Two Flat Seats



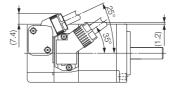
Specifications of Options

Oil Seal

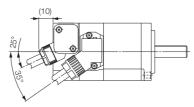


Connector Mounting Dimensions

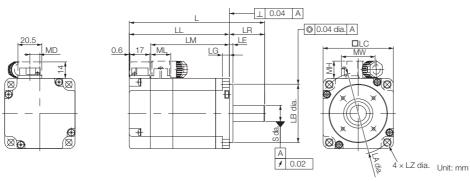
Cable Installed on Load Side



• Cable Installed on Non-load Side



◆ SGM7J-02, -04, and -06



Model	*		_L* LM -		F	lange	e Dim	nensi	ons		S	MD	MW	МН	ML	Approx.
SGM7J-				LR	LE	LG	LC	LA	LB	LZ	0		10100			Mass [kg]
	99.5 (140)	69.5 (110)	51.2	30	3	6	60	70	50 .0.025	5.5	14 ⁰ -0.011	8.5	28.7	14.7	17.1	0.8 (1.4)
04ADA2D	115.5 (156)	85.5 (126)	67.2	30	3	6	60	70	50 .0.025	5.5	14 ⁰ -0.011	8.5	28.7	14.7	17.1	1.1 (1.7)
06A□A2□	137.5 (191.5)	107.5 (161.5)		30	3	6	60	70	50 0 -0.025	5.5	14 ⁰ _{-0.011}	8.5	28.7	14.7	17.1	1.6 (2.2)

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

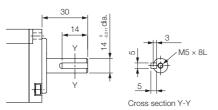
Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

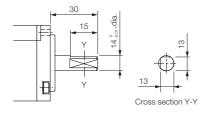
2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

• Straight with Key and Tap

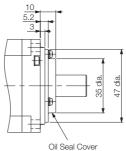


• With Two Flat Seats



Specifications of Options

Oil Seal

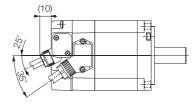


Connector Mounting Dimensions

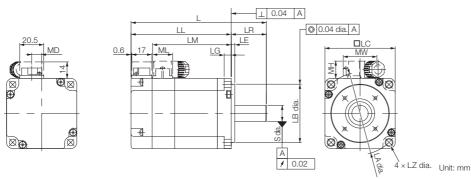
Cable Installed on Load Side



Cable Installed on Non-load Side



SGM7J-08



Model SGM7J-					F	lange	e Dim	nensi	ons							Approx.
	L*	LL*	LM	LR	LE	LG	LC	LA	LB	LZ	S	MD	MW	MH	ML	Mass* [kg]
08ADA2D	137 (184)	97 (144)	78.5	40	3	8	80	90	70 .030	7	19 ⁰ -0.013	13.6	38	14.7	19.3	2.2 (2.8)

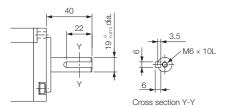
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.
 Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

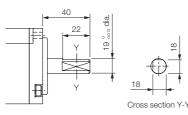
 The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

• Straight with Key and Tap

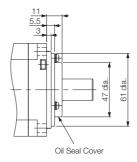


• With Two Flat Seats



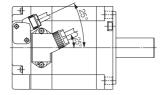
Specifications of Options

Oil Seal

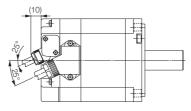


Connector Mounting Dimensions

• Cable Installed on Load Side

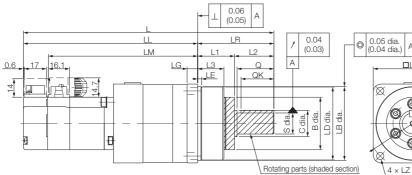


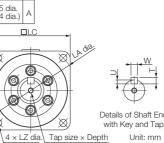
• Cable Installed on Non-load Side



Servomotors with Gears

◆ SGM7J-A5, -01, and -C2





Details of Shaft End

Model SGM7J-	Gear Ratio	L*	LL*	*	LM	1	Flange Dimensions									
				-			LR	LE	LG	В	LD	LE	3	LC	LA	LZ
	1/5	138	9		77.4	٨		2.2	5	29	39.5	40 -0.025			46	3.4
A5ADAH2DD	1/9	(178.5) (136	(136.5)			42)	40		
	1/21	147 (187.5	10) (145		86.4	4							J.U25	10	10	
	1/33	178.5 (219)		120.5 (161)		.9	58	2.5	8	40	55.5	56.)).030	60	70	5.5
	1/5	150 (190.5		108 (148.5)		4	42	2.2	5	29	39.5	40 .)).025	40	46	3.4
	1/11	190.5	132	132.5 (173)		.9	58	2.5	8	40	55.5	56 .0.030)	60	70	5.5
	1/21	(231)	(17			.9	9 50						0.030			
	1/33	215 (255.5	13) (175	-	116	.4	80	7.5	10	59	84	85 .	85 ⁰ _{-0.035} 9		105	9
C2ADAH1DD	1/5	162 (210)		120 (168)		101.4		2.2	5	29	39.5	40 _0.025		40	46	3.4
	1/11	202.5 (250.5		144.5 (192.5)		125.9		2.5	8	40	55.5	56 0 -0.030		60	70	5.5
C2ADAHCDD	1/21	227	14	147		٨	80	7.5	10	59	84	85 .0.035)	90	105	9
C2ADAH7DD	1/33	(275)	(19	95)	128.4							OU -0.035		90	105	9
	Fland	e Dimen	sions					Tap Size ×		Key Dimensions Approx.						
Model SGM7J-	L1	L2	L3	Q	С		S	Depth		QK	U			Mass		
	22	20	14.6			10 .0.015									0.6	
				_	_		0	M3 ×	< 6L	15	2.5	4	4		(0.9)	
							-0.015			-		-	-		0.7	

(1.0)1.3 28 30 20 28 20 16 .0.018 $M4 \times 8L$ 25 З 5 5 A5ADAH7DD (1.6)0.7 01ADAH1DD 22 20 14.6 10 -0.015 $M3 \times 6L$ 15 2.5 4 4 _ _ (1.0)1.4 28 30 20 28 20 16 .0.018 $M4 \times 8L$ 25 З 5 5 (1.7)2.8 (3.1) 01ADAH7DD 36 44 26 42 32 25 .0.021 $M6 \times 12L$ 36 4 8 7 0.8 C2ADAH1DD 22 20 14.6 10 .0.015 $M3 \times 6L$ 15 2.5 4 4 _ _ (1.1)1.5 С2АПАНВПП 28 30 20 28 20 16 .0.018 $M4 \times 8L$ 25 З 5 5 (1.8)C2ADAHCDD 2.9 7 36 44 26 42 36 8 32 25 .0.021 $M6 \times 12L$ 4 (3.2)C2ADAH7DD

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

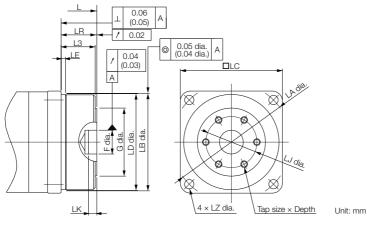
Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the Σ , Σ -II, and Σ -III Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

Flange Output Face



Note: The geometric tolerance in parentheses is the value for LC = 40.

Model SGM7J-	Gear Ratio	L*	LR	LJ	F	G	LK	No. of Taps \times Tap Size \times Depth	Approx. Mass [kg]
A5ADAH10D	1/5	111							
A5ADAH20D	1/9	(151.5)	15	18	5 +0.012	24	3	$3 \times M4 \times 61$	0.6
A5ADAHC0D	1/21	120 (160.5)	10	10	0.	27	0		(0.9)
	1/33	141.5 (182)	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	1.2 (1.5)
01A D AH10D	1/5	123 (163.5)	15	18	5 +0.012	24	3	$3 \times M4 \times 6L$	0.7 (1.0)
	1/11	153.5	21	30	14 ^{+0.018}	40		$3 \times M4 \times 7L$	1.3
	1/21	(194)	21	30	14 0	40	5	5 X 1V14 X 7 L	(1.6)
01ADAH70D	1/33	162 (202.5)	27	45	24 0+0.021	59	0	$6 \times M6 \times 10L$	2.4 (2.7)
C2ADAH10D	1/5	135 (183)	15	18	5 +0.012	24	3	$3 \times M4 \times 6L$	0.8 (1.1)
C2ADAHB0D	1/11	165.5 (213.5)	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	1.4 (1.7)
C2ADAHC0D	1/21	174	27	45	24 +0.021	59	5	$6 \times M6 \times 10L$	2.5
C2ADAH70D	1/33	(222)	21	40	Z4 0	59	5		(2.8)

* For models that have a batteryless absolute encoder, L is 8 mm greater than the given value. Refer to the following section for the values for individual models.

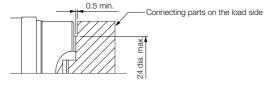
Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

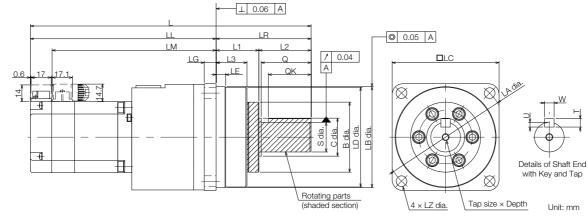
2. Dimensions not found in the above table are the same as those in the table on the previous page.



For a Servomotor with a flange output that has square gear flange dimensions (\square LC) of 40 mm, we recommend that you design the Servomotor with the dimensions shown in the following figure in order to secure a gap between the gear oil seal and the connecting parts on the load side.



♦ SGM7J-02, -04, and -06



Model SGM7J-	Gear	L*	LL*	LM				Flar	nge Din	nensions			
	Ratio	E.			LR	LE	LG	В	LD	LB	LC	LA	LZ
	1/5	191.5	133.5	115.2	58	2.5	8	40	55.5	56 ⁰ -0.030	60	70	5.5
	1/11	(232)	(174)	110.2	50	2.0	0	40	00.0	50 -0.030	00	10	0.0
	1/21	220.5	140.5	122.2	80	7.5	10	59	84	85 .0.035	90	105	9
	1/33	(261)	(181)	122.2	00	7.5	10	59	04	00 _{-0.035}	90	105	9
	1/5	207.5 (248)	149.5 (190)	131.2	58	2.5	8	40	55.5	56 -0.030	60	70	5.5
	1/11	236.5	156.5	138.2	80	7.5	10	59	84	85 .0.035	90	105	9
	1/21	(277)	(197)	130.2	00	1.5	10	29	04	00 _{-0.035}	90	105	9
	1/33	322.5 (363)	189.5 (230)	171.2	133	12.5	13	84	114	115 ⁰ -0.035	120	135	11
	1/5	258.5	178.5	160.2	80	7.5	10	59	84	85 ⁰ -0.035	90	105	9
	1/11	(312.5)	(232.5)	100.2	00	1.5	10	29	04	00 _{-0.035}	90	105	9
	1/21	344.5	211.5	193.2	133	12.5	13	84	114	115 ⁰ -0.035	120	135	11
	1/33	(398.5)	(265.5)	190.2	100	12.0	10	04	114	110 -0.035	120	130	11

Model SGM7J-	Flan	ge Dimens	sions	Q	С	S	Tap Size \times	K	ey Dim	nensio	ns	Approx.	
Wodel SGIW73-	L1	L2	L3	Q		3	Depth	QK	U	W	Т	Mass [kg]	
												1.8	
	28	30	20	28	20	16 ⁰ -0.018	$M4 \times 8L$	25	3	5	5	(2.4)	
	20	50	20	20	20	10 -0.018		20	0	5	5	1.9	
												(2.5)	
	36	44	26	42	32	25 ⁰ -0.021	M6 × 12L	36	4	8	7	3.7	
	30	44	20	42	32	25 -0.021	IVIO X IZL	30	4	0	1	(4.3)	
	28	30	20	28	20	16 ⁰ -0.018	$M4 \times 8L$	25	3	5	5	2.1	
	20	20	30	20	20	20	10 -0.018		20	0	5	5	(2.7)
	36	44	26	42	32	25 ⁰ -0.021	M6 × 12L	36	4	8	7	4.0	
	30	44	20	42	32	25 -0.021	IVIO X TZL	30	4	0	1	(4.6)	
	48	85	33	82	44	40 _0.025	M10 × 20L	70	5	12	8	8.6	
	40	00	- 33	02	44	40 -0.025	WITU X ZUL	70	5	12	0	(9.2)	
												4.3	
	36	44	26	42	32	25 ⁰ -0.021	M6 x 12L	36	4	8	7	(4.9)	
	50		20	72	02	∠∪ -0.021	IVIO A TZL	00	4	0	1	4.5	
												(5.1)	
	48	85	33	82	44	40 _0.025	M10 × 20L	70	5	12	8	9.1	
	40	00	55	02	44	40 _{-0.025}	IVITO X ZUL	10	5	12	0	(9.7)	

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

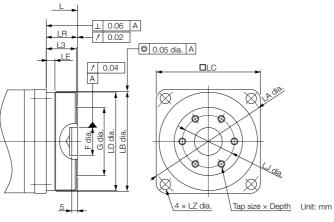
Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the $\Sigma,$ $\Sigma\text{-II},$ and $\Sigma\text{-III}$ Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

■ Flange Output Face



Model SGM7J-	Gear Ratio	L*	LR	LJ	F	G	No. of Taps × Tap Size × Depth	Approx. Mass [kg]
02ADAH10D	1/5	154.5	21	30	14 +0.018	40	$6 \times M4 \times 7L$	1.7 (2.3)
	1/11	(195)	21	50	14 0	40	0 × 1014 × 7 E	1.8 (2.4)
02AOAHC0O	1/21	167.5	27	45	24 +0.021	59	$6 \times M6 \times 10L$	3.3
02A□AH70□	1/33	(208)	21	43	24 0	59		(3.9)
04ADAH10D	1/5	170.5 (211)	21	30	14 ^{+0.018}	40	$6 \times M4 \times 7L$	2.0 (2.6)
04AOAHB0O	1/11	183.5	27	45	24 +0.021	59	$6 \times M6 \times 10L$	3.6
04AOAHCOO	1/21	(224)	21	40	Z4 0	55		(4.2)
04ADAH70D	1/33	224.5 (265)	35	60	32 +0.025 0	84	$6 \times M8 \times 12L$	7.2 (7.8)
06A□AH10□	1/5	205.5	27	45	24 ^{+0.021}	59	6 × M6 × 10∟	3.9 (4.5)
	1/11	(259.5)	21	40	∠4 ₀	29		4.1 (4.7)
	1/21	246.5	35	60	32 +0.025	84	6 × M8 × 12L	7.7
06A□AH70□	1/33	(300.5)	- 55	00	32 0	04	U X IVIO X TZL	(8.3)

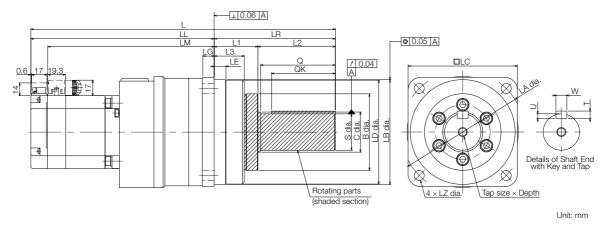
* For models that have a batteryless absolute encoder, L is 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 32)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Dimensions not found in the above table are the same as those in the table on the previous page.

◆ SGM7J-08



Model SGM7J-	Gear	L*	LL*	LM	Flange Dimensions								
	Ratio	L	LL			LE	LG	В	LD	LB	LC	LA	LZ
	1/5	255	175	156.5	80	7.5	10	59	84	85 ⁰ -0.035	90	105	9
	1/11	(302)	(222)	100.0	00	1.0	10	00	04	00 -0.035	30	100	3
	1/21	334	201	182.5	133	12.5	13	84	114	⁰	120	135	11
	1/33	(381)	(248)	102.5	100	12.0	10	04	114	115 ⁰ -0.035	120	100	

Model SGM7 I-	Model SGM7J-		sions	Q C S		9	Tap Size \times	Key Dimensions				Approx.
	L1	L2	L3	Q		5	Depth	QK	U	W	Т	Mass* [kg]
	36	44	26	42	32	25 °	M6 × 12L	36	4	8	7	5.1 (5.7)
	00	44	20	42	02	20 _{-0.021}	WOX 12L	00	4	0	1	5.3 (5.9)
	48	85	33	82	44	40 0 -0.025	M10 × 20L	70	5	12	8	10 (10.6)

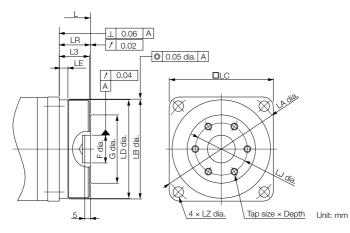
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the $\Sigma,$ $\Sigma\text{-II},$ and $\Sigma\text{-III}$ Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

■ Flange Output Face



Model SGM7J-	Gear Ratio	L*	LR	LJ	F	G	No. of Taps \times Tap Size \times Depth	Approx. Mass* [kg]
08A D AH101	1/5	202	27	45	24 ^{+0.021}	59	$6 \times M6 \times 10L$	4.7 (5.3)
08ADAHB01	1/11	(249)	21	-10	24 0	00		4.9 (5.5)
08ADAHC01	1/21	236	35	60	32 +0.025	84	6 × M8 × 12L	8.6
08ADAH701	1/33	(283)	- 55	00	32 0	04	0 × 100 × 12L	(9.2)

* For models that have a batteryless absolute encoder, L is 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Dimensions not found in the above table are the same as those in the table on the previous page.

Dimensions of Servomotors with Batteryless Absolute Encoders

		iour dea	13
Model SGM7J-	L	LL	Approx. Mass [kg]
A5A6A2ロ	89.5	64.5	0.3
	(130)	(105)	(0.6)
01A6A2ロ	101.5	76.5	0.4
	(142)	(117)	(0.7)
C2A6A2□	113.5	88.5	0.5
	(161.5)	(136.5)	(0.8)
02A6A2□	107.5	77.5	0.8
	(148)	(118)	(1.4)
04A6A2□	123.5	93.5	1.1
	(164)	(134)	(1.7)
06A6A2ロ	145.5	115.5	1.6
	(198.5)	(169.5)	(2.2)
08A6A2ロ	145	105	2.3
	(192)	(152)	(2.9)

Servomotors without Gears

Note: The values in parentheses are for Servomotors with Holding Brakes.

Servomotors with Gears

Shaft End Specification: Straight

Shaft End Specification: Flange Output

ASA6AH100 146 104 0.6 ASA6AH200 119 ASA6AH200 (186.5) 0.6 ASA6AH200 (195.5) (133.5) (1.7) ASA6AH200 (159.5) 0.6 ASA6AH700 186.5 128.5 1.3 0.7 ASA6AH700 149.5 1.2 ASA6AH100 158 116 0.7 ASA6AH700 149.5 1.2 O1A6AH100 158.5 165.5 (1.0) 01A6AH100 131 0.7 O1A6AH200 (239) (181) (1.7) 01A6AH00 161.5 1.3 O1A6AH700 223 143 2.8 01A6AH700 170 2.4 O1A6AH700 210.5 152.5 1.5 C2A6AH100 143.5 0.8 C2A6AH100 210.5 152.5 1.5 C2A6AH100 143.5 0.8 C2A6AH100 210.5 152.5 1.5 C2A6AH100 143.5 0.8 C2A6AH100 210.5 128.5 128.5 1.4	Model SGM7J-	L	LL	Approx. Mass [kg]	Model SGM7J-	L	Approx. Mass [kg]
	A5A6AH1DD	146	104	0.6	A5A6AH10□	119	
A5A6AHCCID 105.5 115.5 1.7 A5A6AHCCID 168.5 1.2 A5A6AH7DD 186.5 128.5 1.3 A5A6AH7DD 149.5 1.2 01A6AH1DD 158.5 169 (1.6) 01A6AH10D 131 0.7 01A6AHBDD 198.5 140.5 1.4 01A6AHB0D 161.5 1.3 01A6AH7DD 223 143 2.8 01A6AH70D 170 2.4 01A6AH7DD (218) (176) (1.1) 01A6AH70D 170 2.4 01A6AH7DD (218) (176) (1.1) 01A6AH70D (210.5) (2.7) C2A6AH1DD 170 152.5 1.5 C2A6AHC0D 210.5 2.5 (2283) (203) (3.2) C2A6AHC0D 210.5 2.5 C2A6AHC0D 210.5 2.5 02A6AH1DD 191.5 141.5 (2.4) 02A6AH10D 162.5 (2.8) 02A6AH2DD 228.5 148.5 3.7 02A6AHB0D (25.5	A5A6AH2DD	(186.5)	(144.5)	(0.9)	A5A6AH20ロ	(159.5)	
ASAGAH7UL (227) (169) (1.6) ASAGAH7UL (190) (1.5) 01A6AH10 158 116 0.7 01A6AH10 (131) 0.7 01A6AHB0 198.5 (156.5) (1.0) 01A6AHB0 161.5 1.3 01A6AH70 (239) (181) (1.7) 01A6AHC0 (202) (1.6) 01A6AH70 (263.5) (183.5) (3.1) 01A6AH70 (202) (1.6) 01A6AH10 170 224 (2.7) (2.4) (1.7) 2.4 01A6AH70 (210.5) (1.7) (2.8) (1.7) (2.1) (1.1) C2A6AH10 170 128 0.8 C2A6AH00 (21.5) (1.7) C2A6AH70 (283) (203) (3.2) C2A6AH100 (13.5) 1.4 C2A6AH10 191.5 141.5 (2.4) 02A6AH100 (258.5) (2.8) 02A6AH10 191.5 148.5 3.7 02A6AH00 175.5 3.3				(1.7)	A5A6AHC0ロ		. ,
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	A5A6AH7ロロ				A5A6AH70ロ		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	01A6AH1ロロ			÷	01A6AH10ロ		÷
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	01A6AHBDD		140.5	1.4	01A6AHB0ロ	161.5	1.3
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		(239)		(1.7)	01A6AHC0ロ	· · ·	(1.6)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	01A6AH7ロロ				01A6AH70ロ		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	C2A6AH1DD				C2A6AH10D		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	С2А6АНВПП				C2A6AHB0□		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C2A6AHCDD			-	C2A6AHC0□		2.5
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C2A6AH7DD	(283)	(203)	(3.2)	C2A6AH70ロ	(258.5)	(2.8)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	02A6AH1ロロ			(2.4)	02A6AH10ロ		(2.3)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		(232)	(182.5)	-	02A6AHB0ロ	(203)	-
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		228.5	148.5	3.7	02A6AHC0ロ	175.5	3.3
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	02A6AH7ロロ	(269)	(189)	(4.3)	02A6AH70ロ	(216)	(3.9)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	04A6AH1ロロ				04A6AH10ロ		-
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					04A6AHB0ロ		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		(285)		(4.6)	04A6AHC0ロ	(232)	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	04A6AH7ロロ				04A6AH70ロ		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	06A6AH1ロロ	266.5	186.5		06A6AH10ロ	213.5	
O6A6AH7□□ (406.5) (273.5) (9.7) O6A6AH70□ (308.5) (8.3) 08A6AH1□□ 263 183 5.2 08A6AH10□ 210 4.8 (5.4) 08A6AHB□□ (310) (230) 5.4 08A6AHB0□ (257) 5.0 (5.6) 08A6AHC□□ 342 209 10.1 08A6AHC0□ 244 8.7		(320.5)	(240.5)	-	06A6AHB0ロ	(267.5)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				-	06A6AHC0ロ		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	06A6AH7ロロ	(406.5)	(273.5)	(9.7)	06A6AH70ロ	(308.5)	(8.3)
08A6AHBDD Constraint 08A6AHBDD <	08A6AH1ロロ			(5.8)	08A6AH10ロ		(5.4)
		(310)	(230)	÷	08A6AHB0ロ	(257)	
08A6AH7□□ (389) (256) (10.7) 08A6AH70□ (291) (9.3)				-	08A6AHC0D		-
	08A6AH7ロロ	(389)	(256)	(10.7)	08A6AH70ロ	(291)	(9.3)

Note: The values in parentheses are for Servomotors with Holding Brakes.

SGM7J

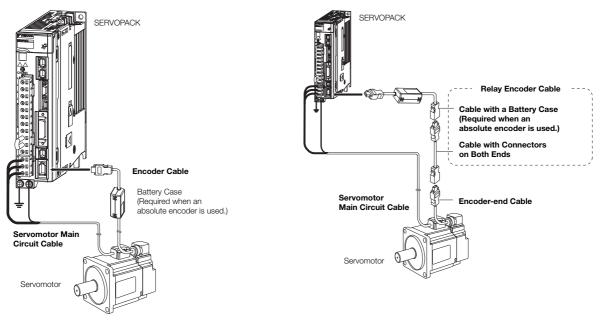
Selecting Cables

◆ Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

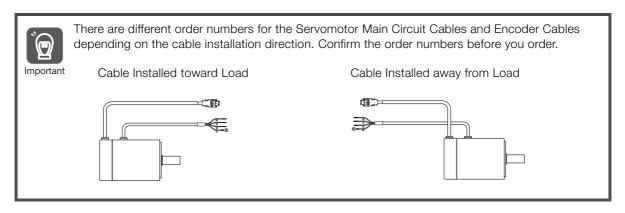
Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

- 2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
- 3. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
 - Order numbers and specifications for wiring materials
 - Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)



Servomotor Main Circuit Cables

Servomotor	Name	Length	Order 1	Number	Appograpoo
Model	Name	(L)	Standard Cable	Flexible Cable*	Appearance
		3 m	JZSP-C7M10F-03-E	JZSP-C7M12F-03-E	
		5 m	JZSP-C7M10F-05-E	JZSP-C7M12F-05-E	
00171451 00		10 m	JZSP-C7M10F-10-E	JZSP-C7M12F-10-E	
SGM7J-A5 to -C2		15 m	JZSP-C7M10F-15-E	JZSP-C7M12F-15-E	
50 W to 150 W		20 m	JZSP-C7M10F-20-E	JZSP-C7M12F-20-E	
00 W 10 100 W		30 m	JZSP-C7M10F-30-E	JZSP-C7M12F-30-E	
		40 m	JZSP-C7M10F-40-E	JZSP-C7M12F-40-E	
		50 m	JZSP-C7M10F-50-E	JZSP-C7M12F-50-E	
		3 m	JZSP-C7M20F-03-E	JZSP-C7M22F-03-E	
	For Servo- motors with-	5 m	JZSP-C7M20F-05-E	JZSP-C7M22F-05-E	
	out Holding	10 m	JZSP-C7M20F-10-E	JZSP-C7M22F-10-E	SERVOPACK end Motor end
SGM7J-02 to -06	Brakes	15 m	JZSP-C7M20F-15-E	JZSP-C7M22F-15-E	
200 W to 600 W		20 m	JZSP-C7M20F-20-E	JZSP-C7M22F-20-E	
200 10 000 10	Cable	30 m	JZSP-C7M20F-30-E	JZSP-C7M22F-30-E	
	installed	40 m	JZSP-C7M20F-40-E	JZSP-C7M22F-40-E	
	toward load	50 m	JZSP-C7M20F-50-E	JZSP-C7M22F-50-E	
		3 m	JZSP-C7M30F-03-E	JZSP-C7M32F-03-E	
		5 m	JZSP-C7M30F-05-E	JZSP-C7M32F-05-E	
		10 m	JZSP-C7M30F-10-E	JZSP-C7M32F-10-E	
SGM7J-08		15 m	JZSP-C7M30F-15-E	JZSP-C7M32F-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M30F-20-E	JZSP-C7M32F-20-E	
750 W, 1.0 KW		30 m	JZSP-C7M30F-30-E	JZSP-C7M32F-30-E	
		40 m	JZSP-C7M30F-40-E	JZSP-C7M32F-40-E	
		50 m	JZSP-C7M30F-50-E	JZSP-C7M32F-50-E	
		3 m	JZSP-C7M10G-03-E	JZSP-C7M12G-03-E	
		5 m	JZSP-C7M10G-05-E	JZSP-C7M12G-05-E	
		10 m	JZSP-C7M10G-10-E	JZSP-C7M12G-10-E	
SGM7J-A5 to -C2		15 m	JZSP-C7M10G-15-E	JZSP-C7M12G-15-E	
50 W to 150 W		20 m	JZSP-C7M10G-20-E	JZSP-C7M12G-20-E	
50 W 10 150 W		30 m	JZSP-C7M10G-30-E	JZSP-C7M12G-30-E	
		40 m	JZSP-C7M10G-40-E	JZSP-C7M12G-40-E	-
		50 m	JZSP-C7M10G-50-E	JZSP-C7M12G-50-E	-
	For Servo-	3 m	JZSP-C7M20G-03-E	JZSP-C7M22G-03-E	-
	motors with-	5 m	JZSP-C7M20G-05-E	JZSP-C7M22G-05-E	-
	out Holding	10 m	JZSP-C7M20G-10-E	JZSP-C7M22G-10-E	SERVOPACK end Motor end
SGM7J-02 to -06	Brakes	15 m	JZSP-C7M20G-15-E	JZSP-C7M22G-15-E	
200 W/ to 600 W/	Cabla	20 m	JZSP-C7M20G-20-E	JZSP-C7M22G-20-E	
200 W to 600 W	Cable installed	30 m	JZSP-C7M20G-30-E	JZSP-C7M22G-30-E	
	away from	40 m	JZSP-C7M20G-40-E	JZSP-C7M22G-40-E	
	load	50 m	JZSP-C7M20G-50-E	JZSP-C7M22G-50-E	-
		3 m	JZSP-C7M30G-03-E	JZSP-C7M32G-03-E	-
		5 m	JZSP-C7M30G-05-E	JZSP-C7M32G-05-E	-
		10 m	JZSP-C7M30G-10-E	JZSP-C7M32G-10-E	
SGM7J-08		15 m	JZSP-C7M30G-15-E	JZSP-C7M32G-15-E	
750 14/ 4 0 114/		20 m	JZSP-C7M30G-20-E	JZSP-C7M32G-20-E	1
750 W, 1.0 kW		30 m	JZSP-C7M30G-30-E	JZSP-C7M32G-30-E	
		40 m	JZSP-C7M30G-40-E	JZSP-C7M32G-40-E	
		50 m	JZSP-C7M30G-50-E	JZSP-C7M32G-50-E	1
		50 111			

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Servomotor	Norse	Length	Order N	Number	Annonion
Model	Name	(L)	Standard Cable	Flexible Cable*	Appearance
		3 m	JZSP-C7M13F-03-E	JZSP-C7M14F-03-E	
		5 m	JZSP-C7M13F-05-E	JZSP-C7M14F-05-E	
		10 m	JZSP-C7M13F-10-E	JZSP-C7M14F-10-E	
SGM7J-A5 to -C2		15 m	JZSP-C7M13F-15-E	JZSP-C7M14F-15-E	
50 W to 150 W		20 m	JZSP-C7M13F-20-E	JZSP-C7M14F-20-E	
00 11 10 100 10		30 m	JZSP-C7M13F-30-E	JZSP-C7M14F-30-E	
		40 m	JZSP-C7M13F-40-E	JZSP-C7M14F-40-E	
		50 m	JZSP-C7M13F-50-E	JZSP-C7M14F-50-E	
	For Servo-	3 m	JZSP-C7M23F-03-E	JZSP-C7M24F-03-E	
	motors with	5 m	JZSP-C7M23F-05-E	JZSP-C7M24F-05-E	
00117100100	Holding	10 m	JZSP-C7M23F-10-E	JZSP-C7M24F-10-E	SERVOPACK end Motor end
SGM7J-02 to -06	Brakes	15 m	JZSP-C7M23F-15-E	JZSP-C7M24F-15-E	
200 W to 600 W		20 m	JZSP-C7M23F-20-E	JZSP-C7M24F-20-E	
200 11 10 000 11	Cable	30 m	JZSP-C7M23F-30-E	JZSP-C7M24F-30-E	
	installed toward load	40 m	JZSP-C7M23F-40-E	JZSP-C7M24F-40-E	
	toward load	50 m	JZSP-C7M23F-50-E	JZSP-C7M24F-50-E	
		3 m	JZSP-C7M33F-03-E	JZSP-C7M34F-03-E	
		5 m	JZSP-C7M33F-05-E	JZSP-C7M34F-05-E	
00147100		10 m	JZSP-C7M33F-10-E	JZSP-C7M34F-10-E	
SGM7J-08		15 m	JZSP-C7M33F-15-E	JZSP-C7M34F-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M33F-20-E	JZSP-C7M34F-20-E	
		30 m	JZSP-C7M33F-30-E	JZSP-C7M34F-30-E	
		40 m	JZSP-C7M33F-40-E	JZSP-C7M34F-40-E	
		50 m	JZSP-C7M33F-50-E	JZSP-C7M34F-50-E	
		3 m	JZSP-C7M13G-03-E	JZSP-C7M14G-03-E	
		5 m	JZSP-C7M13G-05-E	JZSP-C7M14G-05-E	
SGM7J-A5 to -C2		10 m	JZSP-C7M13G-10-E	JZSP-C7M14G-10-E	
3GIWI7 J-A3 10 -02		15 m	JZSP-C7M13G-15-E	JZSP-C7M14G-15-E	
50 W to 150 W		20 m	JZSP-C7M13G-20-E	JZSP-C7M14G-20-E	
		30 m	JZSP-C7M13G-30-E	JZSP-C7M14G-30-E	
		40 m	JZSP-C7M13G-40-E	JZSP-C7M14G-40-E	
		50 m	JZSP-C7M13G-50-E	JZSP-C7M14G-50-E	
	For Servo-	3 m	JZSP-C7M23G-03-E	JZSP-C7M24G-03-E	
	motors with	5 m	JZSP-C7M23G-05-E	JZSP-C7M24G-05-E	
SGM7J-02 to -06	Holding Brakes	10 m	JZSP-C7M23G-10-E	JZSP-C7M24G-10-E	SERVOPACK end Motor end
3GIWI7 J-02 10 -00	DIAKES	15 m	JZSP-C7M23G-15-E	JZSP-C7M24G-15-E	
200 W to 600 W	Cable	20 m	JZSP-C7M23G-20-E	JZSP-C7M24G-20-E	
	installed	30 m	JZSP-C7M23G-30-E	JZSP-C7M24G-30-E	
	away from	40 m	JZSP-C7M23G-40-E	JZSP-C7M24G-40-E	
	load	50 m	JZSP-C7M23G-50-E	JZSP-C7M24G-50-E	
		3 m	JZSP-C7M33G-03-E	JZSP-C7M34G-03-E	
		5 m	JZSP-C7M33G-05-E	JZSP-C7M34G-05-E	
SGM7 1-09		10 m	JZSP-C7M33G-10-E	JZSP-C7M34G-10-E	
SGM7J-08		15 m	JZSP-C7M33G-15-E	JZSP-C7M34G-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M33G-20-E	JZSP-C7M34G-20-E	
, -		30 m	JZSP-C7M33G-30-E	JZSP-C7M34G-30-E	
		40 m	JZSP-C7M33G-40-E	JZSP-C7M34G-40-E	
		50 m	JZSP-C7M33G-50-E	JZSP-C7M34G-50-E	

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Encoder Cables of 20 m or Less

Servomo-	Nierze	Length	Order N	Number	A
tor Model	Name	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
	For incremental encoder,	3 m	JZSP-C7PI0D-03-E	JZSP-C7PI2D-03-E	
	or batteryless absolute	5 m	JZSP-C7PI0D-05-E	JZSP-C7PI2D-05-E	SERVOPACK Encoder end
	encoder	10 m	JZSP-C7PI0D-10-E	JZSP-C7PI2D-10-E	
	Cable installed toward	15 m	JZSP-C7PI0D-15-E	JZSP-C7PI2D-15-E	
	load	20 m	JZSP-C7PI0D-20-E	JZSP-C7PI2D-20-E	
	For incremental encoder,	3 m	JZSP-C7PI0E-03-E	JZSP-C7PI2E-03-E	
	or batteryless absolute encoder	5 m	JZSP-C7PI0E-05-E	JZSP-C7PI2E-05-E	SERVOPACK Encoder end end L
	encoder	10 m	JZSP-C7PI0E-10-E	JZSP-C7PI2E-10-E	
	Cable installed away	15 m	JZSP-C7PI0E-15-E	JZSP-C7PI2E-15-E	
All SGM7J	from load	20 m	JZSP-C7PI0E-20-E	JZSP-C7PI2E-20-E	
models	For absolute encoder:	3 m	JZSP-C7PA0D-03-E	JZSP-C7PA2D-03-E	SERVOPACK Encoder end
	With Battery Case ^{*2}	5 m	JZSP-C7PA0D-05-E	JZSP-C7PA2D-05-E	end L
	,	10 m	JZSP-C7PA0D-10-E	JZSP-C7PA2D-10-E	
	Cable installed toward	15 m	JZSP-C7PA0D-15-E	JZSP-C7PA2D-15-E	Battery Case (battery included)
	load	20 m	JZSP-C7PA0D-20-E	JZSP-C7PA2D-20-E	(Dattery included)
	For absolute encoder:	3 m	JZSP-C7PA0E-03-E	JZSP-C7PA2E-03-E	SERVOPACK Encoder end
	With Battery Case ^{*2}	5 m	JZSP-C7PA0E-05-E	JZSP-C7PA2E-05-E	end L
		10 m	JZSP-C7PA0E-10-E	JZSP-C7PA2E-10-E	
	Cable installed away	15 m	JZSP-C7PA0E-15-E	JZSP-C7PA2E-15-E	Battery Case (battery included)
1	from load	20 m	JZSP-C7PA0E-20-E	JZSP-C7PA2E-20-E	(battery included)

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. If a battery is connected to the host controller, the Battery Case is not required. If so, use a cable for incremental encoders.

◆ Relay Encoder Cable of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number	Appearance
All SGM7J	Encoder-end Cable (for all types of encoders) Cable installed toward load	0.3 m	JZSP-C7PRCD-E	SERVOPACK end Encoder end
	Encoder-end Cable (for all types of encoders) Cable installed away from load	0.3 m	JZSP-C7PRCE-E	SERVOPACK end Encoder end
	Cables with Connectors on Both Ends (for all types of encoders)	30 m	JZSP-UCMP00-30-E	SERVOPACK end Encoder end
models		40 m	JZSP-UCMP00-40-E	
		50 m	JZSP-UCMP00-50-E	
	Cable with a Battery Case (Required when an absolute encoder is used.*)	0.3 m	JZSP-CSP12-E	SERVOPACK end Encoder end

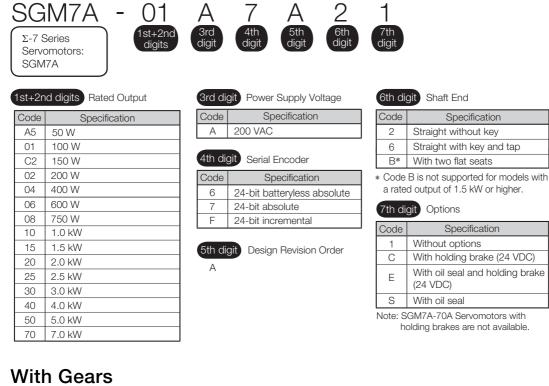
* This Cable is not required if you use a Servomotor with a Batteryless Absolute Encoder, and you connect a battery to the host controller.

MEMO

SGM7A

Model Designations

Without Gears



SGM7A	-	01	ŀ
Σ-7 Series Servomotors: SGM7A		1st+2nd digits	3 di

	А	(А	Н	7	2
t+2nd	3rd	4th	5th	6th	7th	8th
digits	digit	digit	digit	digit	digit	dig

1.1

1st+2nd digits Rated Output		
Code	Specification	
A5	50 W	
01	100 W	
C2	150 W	
02	200 W	
04	400 W	
06	600 W	
08	750 W	
10	1.0 kW	

3rd digit Power Supply Voltage Code Specification 200 VAC А

h dig	it s	Serial	Encode

Code	Specification
6	24-bit batteryless absolute
7	24-bit absolute
F	24-bit incremental
Note: Contact your Yaskawa representative for models of 1.5 kW or higher.	



6th digit Gear Type

_	-
Code	Specification
Н	HDS planetary low-backlash gear

ťh	diait	Gear Ratio
uı	uigit	

Specification

Specification

Code	Specification
В	1/11*1
С	1/21
1	1/5
2	1/9*2
7	1/33

*1. This specification is not supported for models with a rated output of 50 W.

*2. This specification is supported only for models with a rated output of 50 W.

8th digit Shaft E

Code	Specification
0	Flange output
2	Straight without key
6	Straight with key and tap

9th digit Options

Code	Specification
1	Without options
С	With holding brake (24 VDC)

Specifications and Ratings

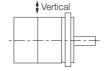
Specifications

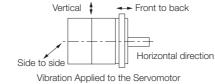
	Volta	ge						200 V					
M	odel SC	GM7A-	A5A	01A	C2A, 02A	04A	06A, 08A	10A	15A	20A	25A, 30A	40A, 50A	70A
	Rating						Со	ntinuous	3			1	
	nal Class				UL: B,	CE: B				l	il: f, Ce	E: F	
		sistance					500 VDC						
	tand Vo	Itage				1	,500 VA						
Excita								nent ma	•				
Mount	0						0	e-moun					
	Method							ect drive					
	on Dire		Cou	ntercloc	kwise (C	CCW) for	forward		ce wher	n viewe	d from t	he load s	side
Vibrati	ion Clas							V15					
	Temp	unding Air erature	0°	°C to 40	°C (Witł	n deratin	g, usage	e is poss	ible bet	ween 4	0°C and	d 60°C.)*	3
SU	Surro Humio	unding Air dity		:	20% to	80% rel	ative hu	midity (v	vith no	conde	nsation)		
Environmental Conditions	Install	ation Site	 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. (With derating, usage is p between 1,000 m and 2,000 m.)^{*3} Must be free of strong magnetic fields. 								possible	¢	
Enviro		onment	disconn Storage	ected. Tempe Humidi	rature: - ity: 20%	20°C to	owing er 60°C (w relative	ith no fre	ezing)	u store	it with th	ne power	cable
Shock Resistance ^{*2}	ation Flange						49	90 m/s ²					
St Resis	Numb Impac		2 times										
Vibration Resistance*2		ion Accel- n Rate at e			·	odels 15	A to 504	A: 24.5 r	n/s² fro	ont to b	ack)		14.7 m/s ²
Applics	ahle	SGD7S-	R70A, R70F	R90A, R90F	1R6A, 2R1F	2R8A, 2R8F	5R5A	120	AC	180A	200A	330A	550A
Applicable SERVOPACKs SGD7W- SGD7C- 1R6A ^{*4} , 2					1R6A, 2R8A ^{*4}	2R8A, 5R5A ^{*4} , 7R6A ^{*4}	5R5A, 7R6A				_		

*1. A vibration class of V15 indicates a vibration amplitude of $15 \,\mu$ m maximum on the Servomotor without a load at the rated motor speed.

*2. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.

The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.





Shock Applied to the Servomotor V

*3. Refer to the following section for the derating rates.

*4. If you use a Servomotor together with a Σ -7W or Σ -7C SERVOPACK, the control gain may not increase as much as with a Σ -7S SERVOPACK and other performances may be lower than those achieved with a Σ -7S SERVOPACK.

Ratings of Servomotors without Gears

Model SGM7A-A5ARated Output*1W50Rated Torque*1.*2N·m0.159Instantaneous Maximum Torque*1N·m0.557Rated Current*1Arms0.57Instantaneous Maximum Current*1Arms2.1	01A 100 0.318 1.11 0.89	C2A 150 0.477 1.67	02A 200 0.637	04A 400	06A 600	08A	10A
Rated Torque*1,*2N·m0.159Instantaneous Maximum Torque*1N·m0.557Rated Current*1Arms0.57	0.318 1.11	0.477		400	600		
Rated Torque*1,*2N·m0.159Instantaneous Maximum Torque*1N·m0.557Rated Current*1Arms0.57	1.11		0.637		000	750	1000
Instantaneous Maximum Torque*1N⋅m0.557Rated Current*1Arms0.57		1.67		1.27	1.91	2.39	3.18
	0.89		2.23	4.46	6.69	8.36	11.1
Instantaneous Maximum Current ^{*1} Arms 2.1		1.5	1.5	2.4	4.5	4.4	6.4
	3.2	5.6	5.9	9.3	16.9	16.8	23.2
Rated Motor Speed ^{*1} min ⁻¹			30	00			
Maximum Motor Speed ^{*1} min ⁻¹			60	00			
Torque Constant N·m/Arms 0.304	0.384	0.332	0.458	0.576	0.456	0.584	0.541
Motor Moment of Inertia 0.0217	0.0337	0.0458	0.139	0.216	0.315	0.775	0.971
With holding brake ×10 ⁻⁴ kg·m ² 0.0297	0.0417	0.0538	0.209	0.286	0.385	0.955	1.15
With batteryless absolute encoder 0.0232	0.0352	0.0473	0.140	0.217	0.316	0.776	0.972
Rated Power Rate ^{*1} kW/s 11.7	30.0	49.7	29.2	74.7	115	73.7	104
With holding brake 8.51	24.2	42.2	19.4	56.3	94.7	59.8	87.9
rod/of	94300	104000	45800	58700	60600	30800	32700
With holding brake 53500	76200	88600	30400	44400	49600	25000	27600
Derating Rate for Servomotor with Oil Seal % 80		90			9	5	
Heat Sink Size (Aluminum) ^{*3} mm 200 × 2	200 × 6	250) × 250	× 6	300 × 300 × 12 ^{*9}	250 × 250 × 6	300 × 300 × 12
Protective Structure ^{*4}	То	tally end	closed,	self-co	oled, IP	67	
Rated Voltage V			24 VD0	C±10%			
Provide V Quart Capacity W Holding Torque N·m O.159 Coil Resistance Ω (at 20°C) Rated Current A (at 20°C) Time Required to Release Brake Ms Time Required to Release Brake	5.5		6			6.5	
Holding Torque N·m 0.159	0.318	0.477	0.637	1.27	1.91	2.39	3.18
Ω (at 20°C) 10)4.8±10	%	96±		8	8.6±109	%
등 등 Rated Current A (at 20°C)	0.23		0.2	25		0.27	
우 资 Time Required to Release Brake ms		60				80	
Time Required to Brake ms			1(00			
Allowable Load Moment of Inertia (Motor Moment of Inertia Ratio) ^{*6}	10 times	8	30 times	20 ti	mes	20 ti	imes
External Dynamic Brake Resistor	40 times		30 times	20 ti	mes	30 ti	imes
est [∞] LF mm	20			25		3	5
Bit Stress LF mm Image: Stress Allowable Radial Load N Image: Stress Allowable Thrust Load N	78			245		392	
end the second	54			74		14	17

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature wind-ing is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

Servomotor Heat Dissipation Conditions (page 48)

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*5. Observe the following precautions if you use a Servomotor with a Holding Brake. The holding brake cannot be used to stop the Servomotor.

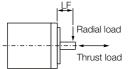
- The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.
- The 24-VDC power supply is not provided by Yaskawa.

*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

*7. To externally connect a dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect a dynamic brake resistor if you use the following SERVOPACKs (maximum applica-

SGD7S-R70□□□A020 to -2R8□□□A020
 SGD7W-1R6A20A020 to -2R8A20A020
 SGD7C-1R6AMAA020 to -2R8AMAA020

*8. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



*9. If the heat sink is 250 mm × 250 mm × 6 mm, the rated output is 550 W and the rated torque is 1.75 N·m. Refer to the following section for details.

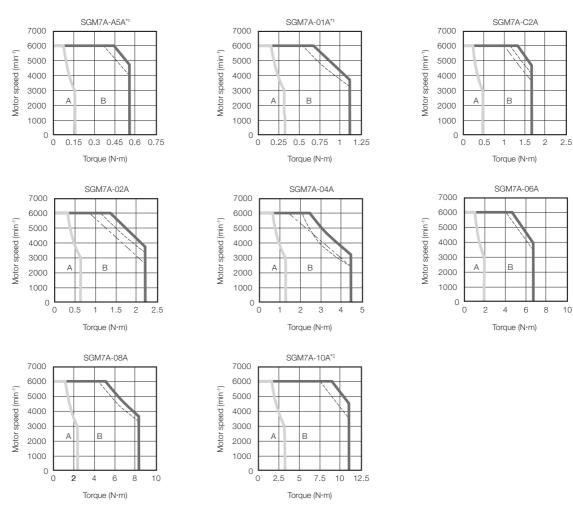
Servomotor Heat Dissipation Conditions (page 48)

Torque-Motor Speed Characteristics

A : Continuous duty zone

B : Intermittent duty zone

(solid lines): With three-phase 200-V or single-phase 230-V input
 (dotted lines): With single-phase 200-V input
 (dashed-dotted lines): With single-phase 100-V input



*1. The characteristics are the same for single-phase 200 V and single-phase 100 V input.

*2. A single-phase power input can be used in combination with the SGD7S-120ADDA008.

Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

2. The characteristics in the intermittent duty zone depend on the power supply voltage.

3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.

4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Ratings of Servomotors without Gears

Model SGM7A- *1 *1,*2 Maximum Torque*1 t*1 Maximum Current*1 Speed*1 tor Speed*1 tor Speed*1 ant nt of Inertia ding brake yless absolute encoder Rate*1	kW N·m Arms Arms min ⁻¹ min ⁻¹ \times 10 ⁻⁴ kg·m ²	15A 1.5 4.90 14.7 9.3 28 0.590	20A 2.0 6.36 19.1 12.1 42	25A 2.5 7.96 23.9 15.6 51	30A 3.0 9.80 29.4 17.9 56	40A 4.0 12.6 37.8 25.4 77	50A 5.0 15.8 47.6 27.6 84	70A 7.0 22.3 54.0 38.3
*1, *2 Maximum Torque ^{*1} t ^{*1} Maximum Current ^{*1} Speed ^{*1} tor Speed ^{*1} ant nt of Inertia Jing brake yless absolute encoder	N·m N·m Arms Arms min ⁻¹ N·m/Arms	4.90 14.7 9.3 28 0.590	6.36 19.1 12.1	7.96 23.9 15.6	9.80 29.4 17.9 56	12.6 37.8 25.4	15.8 47.6 27.6	22.3 54.0
*1, *2 Maximum Torque ^{*1} t ^{*1} Maximum Current ^{*1} Speed ^{*1} tor Speed ^{*1} ant nt of Inertia Jing brake yless absolute encoder	N·m Arms Arms min ⁻¹ min ⁻¹ N·m/Arms	14.7 9.3 28 0.590	19.1 12.1	23.9 15.6	29.4 17.9 56	37.8 25.4	47.6 27.6	54.0
t ^{*1} Maximum Current ^{*1} Speed ^{*1} tor Speed ^{*1} ant nt of Inertia ling brake yless absolute encoder	Arms Arms min ⁻¹ min ⁻¹ N·m/Arms	9.3 28 0.590	12.1	15.6	17.9 56	25.4	27.6	
t ^{*1} Maximum Current ^{*1} Speed ^{*1} tor Speed ^{*1} ant nt of Inertia ling brake yless absolute encoder	Arms min ⁻¹ min ⁻¹ N·m/Arms	28 0.590			56			38.3
Speed ^{*1} tor Speed ^{*1} ant nt of Inertia ding brake yless absolute encoder	min ⁻¹ min ⁻¹ N•m/Arms	0.590	42	51		77	8/	
tor Speed ^{*1} ant nt of Inertia ling brake yless absolute encoder	min ⁻¹ N•m/Arms		l				04	105
ant nt of Inertia ling brake yless absolute encoder	N•m/Arms				3000	C		-
nt of Inertia Jing brake yless absolute encoder					6000	*9		
ling brake yless absolute encoder	$\times 10^{-4} \mathrm{ka} \cdot \mathrm{m}^2$		0.561	0.538	0.582	0.519	0.604	0.604
yless absolute encoder	$\times 10^{-4} \mathrm{ka} \cdot \mathrm{m}^2$	2.00	2.47	3.19	7.00	9.60	12.3	12.3
•	- 0	2.25	2.72	3.44	9.20	11.8	14.5	-
Rate ^{*1}		2.00	2.47	3.19	7.00	9.60	12.3	12.3
	kW/s	120	164	199	137	165	203	404
ling brake	100/3	106	148	184	104	134	172	-
r Acceleration Rate ^{*1}	rad/s ²	24500	25700	24900	14000	13100	12800	18100
ling brake	140/5	21700	23300	23100	10600	10600	10800	-
e (Aluminum) ^{*3}	mm	30	$00 \times 300 \times 10^{-1}$	12		400	$\times 400 \times 2$	0
ucture ^{*4}			Totally	enclosed,	self-cooled	I, IP67		Totally enclosed, separately cooled (with fan), IP22
d Voltage	V			24 VE	0C ^{+10%}			
acity	W		12			10		-
ing Torque	N∙m	7.	84	10		20		-
Resistance	Ω (at 20°C)		48			59		_
d Current	A (at 20°C)		0.5			0.41		
e Required to ase Brake	ms		170			100		
Required to Brake	ms			8	0			
ad Moment of Inertia nt of Inertia Ratio) ^{*6}			10 times			Ę	5 times	
			20 times			1	5 times	
	mm		45		63			
	1		686		980 1		117	'6
	N	686			392			
as R ad	lequired to Brake I Moment of Inertia t of Inertia Ratio) ^{*6} nal Regenerative Re namic Brake Resis	ee Brake ms lequired to Brake ms Moment of Inertia t of Inertia Ratio) *6 hal Regenerative Resistor and mamic Brake Resistor*7 mm	se Brake ITTS tequired to Brake ms I Moment of Inertia tof Inertia Ratio) *6 nal Regenerative Resistor and mm mm ble Radial Load N	se Brake ITIS 170 lequired to Brake ms 10 times I Moment of Inertia t of Inertia Ratio) *6 10 times nal Regenerative Resistor and namic Brake Resistor*7 20 times mm 45 ble Radial Load N 686	See Brake ITIS ITTO Idequired to Brake ms 8 I Moment of Inertia t of Inertia Ratio) *6 10 times nal Regenerative Resistor and namic Brake Resistor*7 20 times mm 45 ble Radial Load N 686	See Brake Ins Ins lequired to Brake ms 80 I Moment of Inertia t of Inertia Ratio) *6 10 times nal Regenerative Resistor and mm 20 times Image: Non-Sectional Control 10 times Image: Non-Sectional Control 10 times Image: Non-Sectional Control 10 times	See Brake ITIS ITTO ITO Idequired to Brake ms 80 I Moment of Inertia t of Inertia Ratio) *6 10 times 8 nal Regenerative Resistor and mm 20 times 1 Image: Brake Resistor *7 20 times 1 Image: Brake Resistor *7 45 Image: Brake Resistor 980	se Brake ITIS ITO ITO lequired to Brake ms 80 I Moment of Inertia t of Inertia Ratio) *6 10 times 5 times nal Regenerative Resistor and mm 20 times 15 times km 45 63 ble Radial Load N 686 980 117

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

Servomotor Heat Dissipation Conditions (page 48)

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used. *5. Observe the following precautions if you use a Servomotor with a Holding Brake.

• The holding brake cannot be used to stop the Servomotor.

• The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment. • The 24-VDC power supply is not provided by Yaskawa.

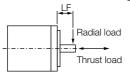
*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

*7. To externally connect a dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. How-ever, you cannot externally connect a dynamic brake resistor if you use the following SERVOPACKs (maximum applica-ble motor capacity: 400 W).

• SGD7S-R70000A020 to -2R8000A020

• SGD7W-1R6A20A020 to -2R8A20A020

- SGD7C-1R6AMAA020 to -2R8AMAA020
- *8. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



*9. For the SGM7A-25A or SGM7A-50A, the maximum motor speed for the continuous duty zone is 5,000 min⁻¹. Use the Servomotor within the continuous duty zone for the average motor speed and effective torque.

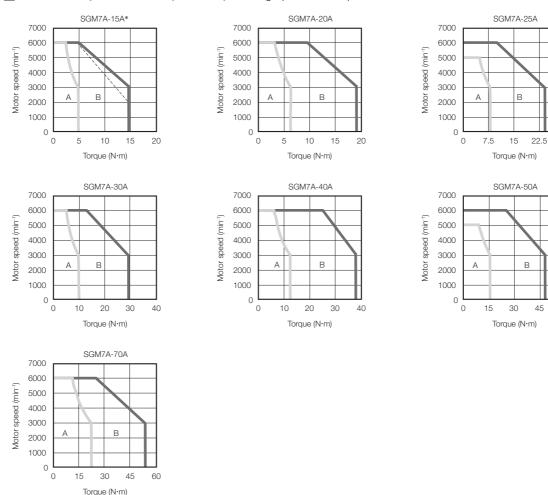
30

60

Torque-Motor Speed Characteristics

A : Continuous duty zoneB : Intermittent duty zone

(solid lines): With three-phase 200-V or single-phase 230-V input (dotted lines): With single-phase 200-V input



* A single-phase power input can be used in combination with the SGD7S-120ADDA008.

- Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.
 - 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 - 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
 - 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Ratings of Servomotors with Gears

			Gear N	lechanisr	n			Structure		Motion [a	arc-min]
All Model	S	Plar	netary ge	ear mech	anism			elf-cooled, IP: aft opening)	55	3 max.	
				Servomoto	r			(Gear Output		
Servomotor Model SGM7A-	Rat Outpu		Rated Motor Speed [min ⁻¹]	Maximum Motor Speed [min ⁻¹]	Rated Torque [N⋅m]	Instanta- neous Maxi- mum Torque [N·m]	Gear Ratio	Rated Torque/ Efficiency ^{*1} [N·m/%]	Instantaneous Maximum Torque [N·m]	Rated Motor Speed [min ⁻¹]	Maximum Motor Speed [min ⁻¹]
A5A□AH1□							1/5	0.433/64*2	2.37	600	1200
A5ADAH2D	50	0	3000	6000	0.159	0.557	1/9	1.12/78	3.78 ^{*3}	333	667
A5ADAHCD	0	0	3000	0000	0.159	0.337	1/21	2.84/85	10.6	143	286
A5A□AH7□	1						1/33	3.68/70	15.8	91	182
01A D AH1 D							1/5	1.06/78*2	4.96	600	1200
	10	0	2000	6000	0.210	1.11	1/11	2.52/72	10.7	273	545
		0	3000	6000	0.318	1.11	1/21	5.35/80	20.8	143	286
01A D AH7 D	1						1/33	7.35/70	32.7	91	182
C2ADAH1D							1/5	1.68/83*2	7.80	600	1200
C2ADAHBD	4.5		0000	0000	0.477	1.67	1/11	3.53/79*2	16.9	273	545
C2ADAHCD	15	0	3000	6000			1/21	6.30/70 ^{*2}	31.0	143	286
C2ADAH7D	1						1/33	11.2/79 ^{*2}	49.7	91	182
02A D AH1 D							1/5	2.39/75	9.80	600	1200
	0.0		0000	0000	0.007	0.00	1/11	5.74/82	22.1	273	545
	20	00	3000	6000	0.637	2.23	1/21	10.2/76	42.1	143	286
02A D AH7 D	1						1/33	17.0/81	67.6	91	182
04A D AH1 D							1/5	5.35/84	20.1	600	1200
	10	0	0000	0000	1 07	4.40	1/11	11.5/82	45.1	273	545
	40	0	3000	6000	1.27	4.46	1/21	23.0/86	87.0	143	286
04A D AH7 D	1						1/33	34.0/81	135	91	182
06A D AH1 D							1/5	7.54/79	30.5	600	1200
	0.0		0000	0000	1.01	0.00	1/11	18.1/86	68.6	273	545
	60	00	3000	6000	1.91	6.69	1/21	32.1/80	129	143	286
06A D AH7 D	1						1/33	53.6/85	206	91	182
08A D AH1 D							1/5	10.0/84	38.4	600	1200
			0000	0000	0.00	0.00	1/11	23.1/88	86.4	273	545
	75	bU	3000	6000	2.39	8.36	1/21	42.1/84	163	143	286
08A D AH7 D	1						1/33	69.3/88	259	91	182
10A D AH1 D							1/5	13.7/86	52.5	600	1200
							1/11	29.1/83	111	273	545
	10	00	3000	6000	3.18	11.1	1/21	58.2/87	215	143	286
	1						1/33	94.5/90	296*3	91	182

*1. The gear output torque is expressed by the following formula.

Gear output torque = Servomotor output torque $\times \frac{1}{\text{Gear ratio}} \times \text{Efficiency}$

The gear efficiency depends on operating conditions such as the output torque, motor speed, and temperature. The values in the table are typical values for the rated torque, rated motor speed, and a surrounding air temperature of 25°C. They are reference values only.

*2. When using an SGM7A-A5A, SGM7A-01A, or SGM7A-C2A Servomotor with a gear ratio of 1/5 or an SGM7A-C2A Servomotor with a gear ratio of 1/11, maintain an 85% maximum effective load ratio. For an SGM7A-C2A Servomotor with a gear ratio of 1/21 or 1/33, maintain a 90% maximum effective load ratio. The values in the table take the effective load ratio into consideration.

*3. The instantaneous maximum torque is 300% of the rated torque.

Note: 1. The gears that are mounted to Yaskawa Servomotors have not been broken in.

Break in the Servomotor if necessary. First, operate the Servomotor at low speed with no load. If no problems occur, gradually increase the speed and load.

The no-load torque for a Servomotor with a Gear is high immediately after the Servomotor starts, and it then decreases and becomes stable after a few minutes. This is a common phenomenon caused by grease circulation in the gears and it does not indicate faulty gears.

3. Contact your Yaskawa representative for information on Servomotor with Gears with a rated output of 1.5 kW or higher. 4. Other specifications are the same as those for Servomotors without Gears.



The SERVOPACK speed control range is 1:5,000. If you use Servomotors at extremely low speeds (0.02 min⁻¹ or lower at the gear output shaft), if you use Servomotors with a one-pulse feed reference for extended periods, or under some other operating conditions, the gear bearing lubrication may be insufficient. That may cause deterioration of the bearing or increase the load ratio. Contact your Yaskawa representative if you use a Servomotor under these conditions.

				27				
		ment of Iner			Allowable	With Gears		
Servomotor Model SGM7A-	Motor* + Gear	Output Gear	Motor* + Gear	Output Gear	Allowable Radial Load [N]	Allowable Thrust Load [N]	LF [mm]	Reference Diagram
A5ADAH1D	0.0277	0.006	0.0267	0.005	95	431	37	
A5ADAH2D	0.0247	0.003	0.0247	0.003	113	514	37	
A5ADAHCD	0.0257	0.004	0.0257	0.004	146	663	37	
A5ADAH7D	0.0667	0.045	0.0667	0.045	267	1246	53	
01A D AH1 D	0.0397	0.006	0.0387	0.005	95	431	37	
	0.0937	0.060	0.0927	0.059	192	895	53	
	0.0837	0.050	0.0837	0.050	233	1087	53	
01A D AH7 D	0.0987	0.065	0.0977	0.064	605	2581	75	
C2ADAH1D	0.0518	0.006	0.0508	0.005	95	431	37	
C2ADAHBD	0.106	0.060	0.105	0.059	192	895	53	Shaft Output
C2ADAHCD	0.156	0.110	0.154	0.108	528	2254	75	│ │ <mark>→└[─]→</mark> │
C2ADAH7D	0.111	0.065	0.110	0.064	605	2581	75	Radial load
02A□AH1□	0.346	0.207	0.340	0.201	152	707	53	
	0.332	0.193	0.331	0.192	192	895	53	Thrust load
02ADAHCD	0.629	0.490	0.627	0.488	528	2254	75	
02A D AH7 D	0.589	0.450	0.588	0.449	605	2581	75	
04A D AH1 D	0.423	0.207	0.417	0.201	152	707	53	
	0.786	0.570	0.776	0.560	435	1856	75	Flange Output
	0.706	0.490	0.704	0.488	528	2254	75	
04A D AH7 D	0.836	0.620	0.826	0.610	951	4992	128	
06A□AH1□	1.02	0.700	0.975	0.660	343	1465	75	Radial load
	0.885	0.570	0.875	0.560	435	1856	75	│ -┤ ├ ╫╫ ┫┴- ++
	1.16	0.840	1.14	0.820	830	4359	128	Thrust load
06A D AH7 D	0.935	0.620	0.925	0.610	951	4992	128	
08A D AH1 D	1.48	0.700	1.44	0.660	343	1465	75	
	1.38	0.600	1.37	0.590	435	1856	75	
	3.78	3.00	3.76	2.98	830	4359	128	
	3.58	2.80	3.57	2.79	951	4992	128	
	1.67	0.700	1.63	0.660	343	1465	75]
	4.37	3.40	4.31	3.34	684	3590	128	
	3.97	3.00	3.95	2.98	830	4359	128]
10A D AH7 D	3.77	2.80	3.76	2.79	951	4992	128	

* The moment of inertia for the Servomotor and gear is the value without a holding brake. You can calculate the moment of inertia for a Servomotor with a Gear and Holding Brake with the following formula.

Motor moment of inertia for a Servomotor with a Holding Brake from Ratings of Servomotors without Gears (page 40) + Moment of inertia for the gear from the above table.



During operation, the gear generates the loss at the gear mechanism and oil seal. The loss depends on the torque and motor speed conditions. The temperature rise depends on the loss and heat dissipation conditions. For the heat dissipation conditions, always refer to the following table and check the gear and motor Important temperatures with the actual equipment. If the temperature is too high, implement the following measures. · Decrease the load ratio.

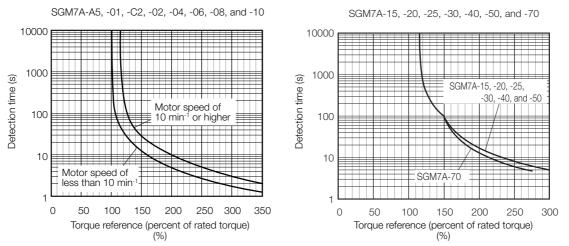
- Change the heat dissipation conditions.
- Use forced-air cooling for the motor with a cooling fan or other means.

Model		Heat Sink Siz	е	
Widdei	1/5	1/9 or 1/11	1/21	1/33
SGM7A-A5		А		
SGM7A-01			Ţ	
SGM7A-C2		В		
SGM7A-02				
SGM7A-04		Ţ		
SGM7A-06				
SGM7A-08		С		
SGM7A-10A				
• A: 250 mm ×	250 mm ×	6 mm, aluminum plate		
• B: 300 mm ×	$300 \text{ mm} \times$	12 mm, aluminum plate	Э	
• C: 250 mm v	250 mm v	10 mm aluminum plat	2	

• C: 350 mm × 350 mm × 12 mm, aluminum plate

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 41 or page 43.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings of Servomotors without Gears* (pages 40 and 42). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

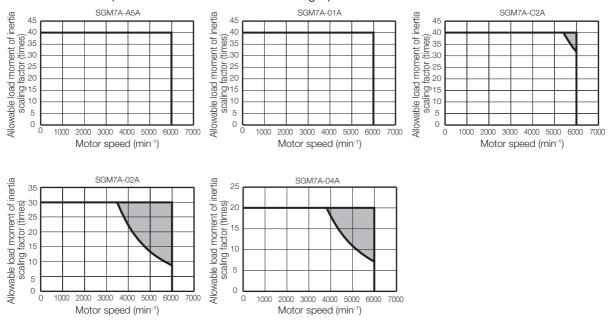
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

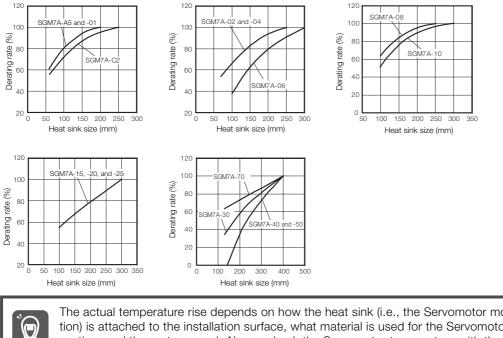
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

Derating Rates

Servomotor Heat Dissipation Conditions

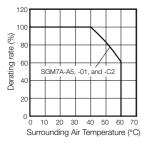
The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.

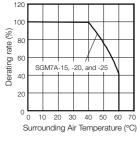


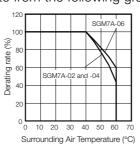
The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equip-Important ment.

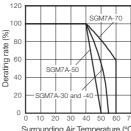
Applications Where the Surrounding Air Temperature Exceeds 40°C

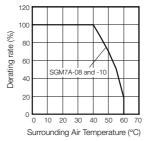
The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a Servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs.





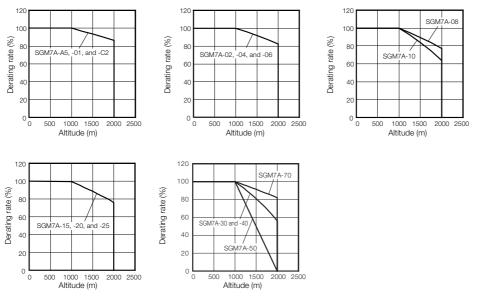






Applications Where the Altitude Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs.



Information

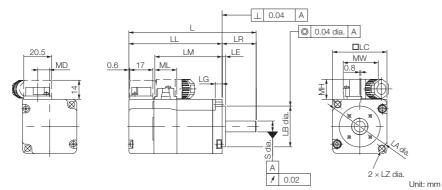
When using Servomotors with derating, change the detection timing of overload warning and overload alarm based on the overload detection level of the motor given in Servomotor Overload Protection Characteristics (page 46).

- Note: 1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.
 - The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your Yaskawa representative.

External Dimensions

Servomotors without Gears

◆ SGM7A-A5, -01, and -C2



Model	*	LL*	LM		F	lang	e Din	nensi	ons		S	MD	MW	МН	MI	Approx. Mass [kg]
SGM7A-				LR	LE	LG	LC	LA	LB	LZ	5	IVID	10100			Mass [kg]
	81.5 (122)	56.5 (97)	37.9	25	2.5	5	40	46	30 .0.021	4.3	8 -0.009	8.8	25.8	14.7	16.1	0.3 (0.6)
	93.5 (134)	68.5 (109)	49.9	25	2.5	5	40	46	30 .0.021	4.3	8 -0.009	8.8	25.8	14.7	16.1	0.4 (0.7)
	105.5 (153.5)	80.5 (128.5)	61.9	25	2.5	5	40	46	30 .0.021	4.3	8 -0.009	8.8	25.8	14.7	16.1	0.5 (0.8)

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

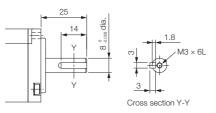
Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

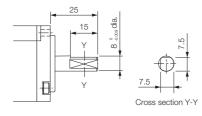
The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

• Straight with Key and Tap

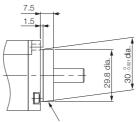


• With Two Flat Seats



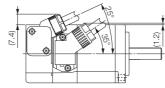
Specifications of Options



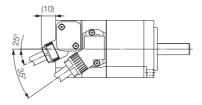


Oil Seal Cover

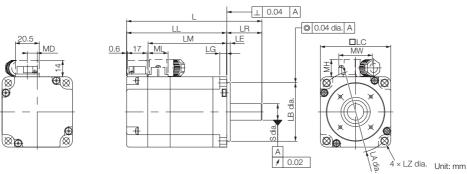
Connector Mounting Dimensions
Cable Installed on Load Side



Cable Installed on Non-load Side



◆ SGM7A-02, -04, and -06



Model					F	lang	e Din	nensi	ons							Approx.
SGM7A-	L*	LL*	LM	LR	LE	LG	LC	LA	LB	LZ	S	MD	MW	MH	ML	Mass [kg]
02A D A2D	99.5 (140)	69.5 (110)	51.2	30	3	6	60	70	50 ⁰ -0.025	5.5	14 ⁰ -0.011	8.5	28.7	14.7	17.1	0.8 (1.4)
04A D A2D	115.5 (156)	85.5 (126)	67.2	30	3	6	60	70	50 ⁰ -0.025	5.5	14 ⁰ -0.011	8.5	28.7	14.7	17.1	1.2 (1.8)
06A□A2□	137.5 (191.5)	107.5 (161.5)	89.2	30	3	6	60	70	50 _{-0.025}	5.5	14 ⁰ -0.011	8.5	28.7	14.7	17.1	1.6 (2.2)

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

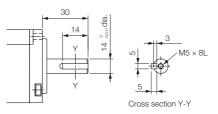
 $\fbox{3}$ Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

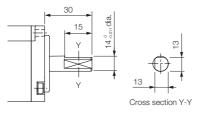
2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

• Straight with Key and Tap

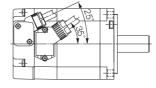


• With Two Flat Seats

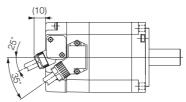


Specifications of Options

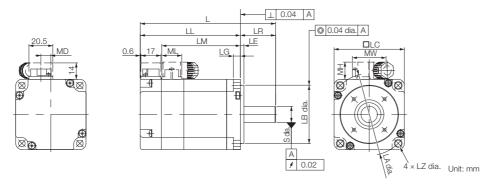
- Oil Seal
 - Oil Seal Cover
- Connector Mounting Dimensions
- Cable Installed on Load Side



Cable Installed on Non-load Side



◆ SGM7A-08 and -10



Model					F	lang	e Din	nensi	ons							Approx.
SGM7A-	L*	LL*	LM	LR	LE	LG	LC	LA	LB	LZ	S	MD	MW	MH	ML	Mass* [kg]
	137 (184)	97 (144)	78.5	40	3	8	80	90	70 .0.030	7	19 _{-0.013}	13.6	38	14.7	19.3	2.3 (2.9)
10A□A2□	162 (209)	122 (169)	103.5	40	3	8	80	90	70 .0.030	7	19 ⁰ -0.013	13.6	38	14.7	19.3	3.1 (3.7)

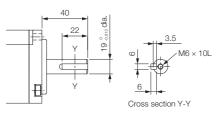
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.
 Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

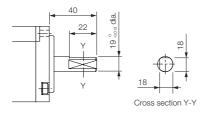
2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

• Straight with Key and Tap



• With Two Flat Seats



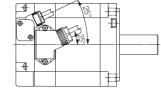
Specifications of Options

• Oil Seal

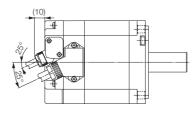
Oil Seal Cover

Connector Mounting Dimensions

Cable Installed on Load Side

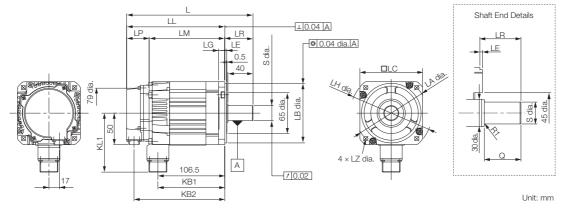


Cable Installed on Non-load Side



Servomotors without Gears and without Holding Brakes

◆ SGM7A-15, -20, and -25



Model SGM7A-	L*	LL*	LM	LP*	LR	KB1	KB2*	KL1
15A D A21	202	157	121	36	45	107	145	94
20A D A21	218	173	137	36	45	123	161	94
25A D A21	241	196	160	36	45	146	184	94

Model SGM7A-		F	lange	Dimens	sions			Shaft End Di	mensions	Approx.
	LA	LB	LC	LE	LG	LH	LZ	S	Q	Mass [kg]
15A D A21	115	95 .0.035	100	3	10	130	7	24 .0.013	40	4.6
20A□A21	115	95 .0.035	100	3	10	130	7	24 ⁰ _{-0.013}	40	5.4
25A D A21	115	95 ⁰ -0.035	100	3	10	130	7	24 ⁰ _{-0.013}	40	6.8

* For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

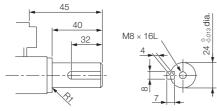
Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

Straight with Key and Tap



Connector Specifications

• Encoder Connector (24-bit Encoder)

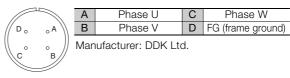
		•		
	1	PS	6*	BAT(+)
A 3 0 3 Y	2	/PS	7	-
$H^{7\circ} \circ \circ \circ 4$	3	-	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute encoder.

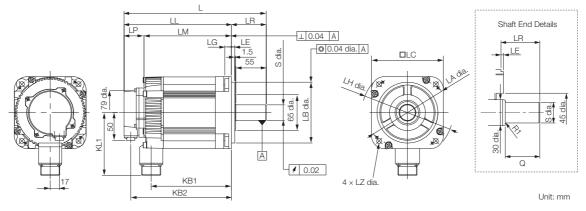
Receptacle: CM10-R10P-D Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-**D**-D for Right-angle Plug

CM10-SP10S-□-D for Straight Plug (□ depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotor Connector



◆ SGM7A-30, -40, and -50



Model SGM7A-	L*	LL*	LM	LP*	LR	KB1	KB2*	KL1
30A□A21	257	194	158	36	63	145	182	114
40A D A21	296	233	197	36	63	184	221	114
50A D A21	336	273	237	36	63	224	261	114

Model SGM7A-			Flange	Dimens	Shaft End Di	Approx.				
	LA	LB	LC	LE	LG	LH	LZ	S	Q	Mass [kg]
30A□A21	145	110 -0.035	130	6	12	165	9	28 .0.013	55	10.5
40A D A21	145	110 ⁰ -0.035	130	6	12	165	9	28 .0.013	55	13.5
50A D A21	145	110 -0.035	130	6	12	165	9	28 .0.013	55	16.5

* For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

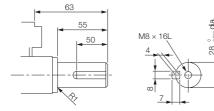
Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

· Straight with Key and Tap



Connector Specifications

• Encoder Connector (24-bit Encoder)

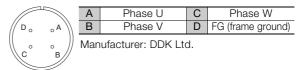
	1	PS	6*	BAT(+)
\$ 3 0 0 1	2	/PS	7	-
70004	3	_	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute

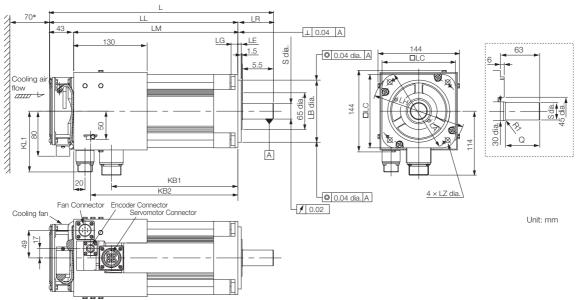
encoder. Receptacle: CM10-R10P-D

Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-□-D for Right-angle Plug CM10-SP10S-□-D for Straight Plug (□ depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotor Connector



◆ SGM7A-70



* Leave a minimum space of 70 mm around the Servomotor from walls and other equipment to allow for a sufficient amount of cooling air.

	Model SGM7A-	L	LL	LM	LR	KB1	KB2*	KL1		Flange Dimensions						Shaft I Dimens		IVIGOO
	OCIVITA-								LA	LB	LC	LE	LG	LH	LΖ	S	Q	[kg]
-	70A□A21	397	334	291	63	224	261	108	145	110 -0.035	130	6	12	165	9	28 .0.013	55	18.5

* For models that have a batteryless absolute encoder, KB is 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Cooling Fan Specifications

Single-phase, 220 V 50/60 Hz 17/15 W 0.11/0.09 A

Specifications of Fan Operation Error Detector

Contact Capacity

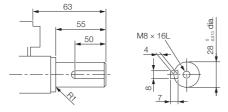
Maximum allowable voltage: 350 V (AC/DC) Maximum allowable current: 120 mA (AC/ DC) Maximum controllable power: 360 mW

Alarm Contacts

ON for normal fan rotation. OFF at 1,680 \pm 100 min⁻¹ max. OFF for 3 seconds at startup.

Shaft End Specifications

Straight with Key and Tap



Connector Specifications

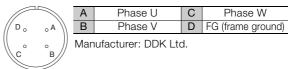
• Encoder Connector (24-bit Encoder)

	1	PS	6*	BAT(+)
A 31	2	/PS	7	-
$H(7\circ\circ\circ\circ4)$	3	-	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute encoder. Receptacle: CM10-R10P-D

Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-□-D for Right-angle Plug CM10-SP10S-□-D for Straight Plug (□ depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotor Connector

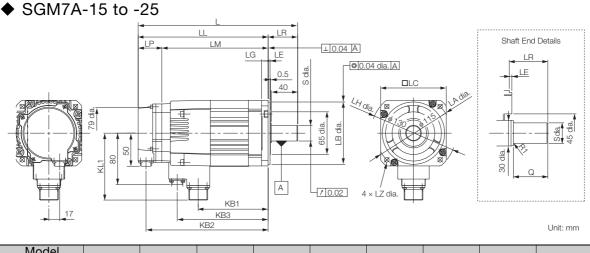


Fan Connector

_												
		Α	Fan motor	D	Alarm pin							
F . A	°∘в∭	В	Fan motor	Е	Alarm pin							
) C – F FG (frame ground											
ĽĎ	c	App Con Plug	eptacle: MS3102A licable Plug (Availa trols Co., Ltd.) g: MS3108B14S-63 le Clamp: MS3057	able t S	from Yaskawa							

Note: The Servomotor Connector (receptacle) is RoHS compliant. Contact the connector manufacturer for RoHS-compliant cable-side connectors (not provided by Yaskawa).

Servomotors without Gears and with Holding Brakes



Model SGM7A-	L*	LL*	LM	LP*	LR	KB1	KB2*	КВЗ	KL1
15A□A2C	243	198	162	36	45	107	186	139	102
20ADA2C	259	214	178	36	45	123	202	155	102
25A□A2C	292	247	211	36	45	156	235	188	102

Model		FI	ange D	imensi		Shaft End Di	mensions	Approx.		
SGM7A-	LA	LB	LC	LE	LG	LH	LZ	S	Q	Mass [kg]
15A D A2C	115	95 0 -0.035	100	3	10	130	7	24 _0.013	40	6.0
20ADA2C	115	95 0 -0.035	100	3	10	130	7	24 _{-0.013}	40	6.8
25ADA2C	115	95 0 -0.035	100	3	10	130	7	24 _{-0.013}	40	8.7

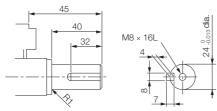
* For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

G Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

· Straight with Key and Tap



Connector Specifications

Encoder Connector (24-bit Encoder)

	1	PS	6*	BAT(+)
3 . 1	2	/PS	7	-
(70 0 0 04)	3	_	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute encoder.
 Receptacle: CM10-R10P-D
 Applicable plug: Not provided by Yaskawa.
 Plug: CM10-AP10S-□-D for Right-angle Plug
 CM10-SP10S-□-D for Straight Plug

(depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotor Connector

\square	\sim	Α	Phase U	С	Phase W
/ D 。	₀ A	В	Phase V	D	FG (frame ground)
(\c°	∘в∥	Man	ufacturer: DDK Lto	d.	

Brake Connector



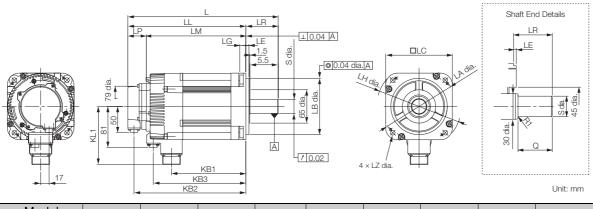
2 Brake terminal Note: There is no voltage polarity for the brake terminals.

Brake terminal

Receptacle: CM10-R10P-D Applicable plug: Not provided by Yaskawa. Plug: CM10-AP2S-□-D for Right-angle Plug CM10-SP2S-□-D for Straight Plug

(D depends on the applicable cable size.) Manufacturer: DDK Ltd.

SGM7A-30 to -50



Model SGM7A-	L*	LL*	LM	LP*	LR	KB1	KB2*	KB3	KL1	
30A□A2C	293	232	196	36	63	145	220	181	119	
40A□A2C	332	269	233	36	63	184	257	220	119	
50ADA2C	372	309	273	36	63	224	297	260	119	

Model		FI	ange D	imensi	ons			Shaft End Di	Approx.		
SGM7A-	LA	LB	LC	LE	LG	LH	LZ	S	Q	Mass [kg]	
30A□A2C	145	110 ⁰ -0.035	130	6	12	165	9	28 .0.013	55	13	
40A0A2C	145	110 ⁰ -0.035	130	6	12	165	9	28 -0.013	55	16	
50A0A2C	145	110 ⁰ -0.035	130	6	12	165	9	28 0 -0.013	55	19	

* For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

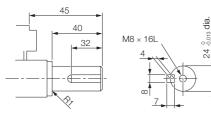
Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

Straight with Key and Tap



Connector Specifications

• Encoder Connector (24-bit Encoder)

	1	PS	6*	BAT(+)
3.01	2	/PS	7	-
	3	-	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute

encoder. Receptacle: CM10-R10P-D Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-□-D for Right-angle Plug CM10-SP10S-□-D for Straight Plug (□ depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotor Connector

		Α	Phase U	С	Phase W
D _o	₀ A)\	В	Phase V	D	FG (frame ground)
∖c°	∘в	Mar	ufacturer: DDK Lto	d.	

Brake Connector



 1
 Brake terminal

 2
 Brake terminal

 Note: There is no voltage polarity for the brake terminals.
 Brake terminals.

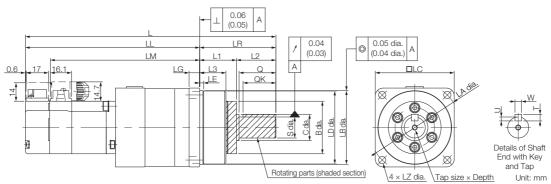
 Receptacle: CM10-R10P-D
 Applicable plug: Not provided by Yaskawa.

 Plug: CM10-AP2S-□-D for Right-angle Plug
 CM10-SP2S-□-D for Straight Plug

CM10-SP2S-D-D for Straight Plug (D depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotors with Gears

◆ SGM7A-A5, -01, and -C2



Model SGM7A-	Gear	*		LL	*	LM				Fla	nge D	imen	sions			
	Ratio	L		LL	- '		LR	LE	LG	В	LD		LB	LC	LA	LZ
	1/5	138 (178.5		9) (136		77.4										
A5ADAH2DD	1/9	147	5)	10			42	2.2	5	29	39.5	5 40) _{-0.025}	40	46	3.4
	1/21	(187.5	·	(145		86.4										
	1/33	178.5 (219)		120 (16		101.9	58	2.5	8	40	55.5	5 56	5 _{-0.030}	60	70	5.5
	1/5	150 (190.5		10 (148		89.4	42	2.2	5	29	39.5	5 40) _{-0.025}	40	46	3.4
	1/11	190.5		132		113.9	58	2.5	8	40	55.5	5 56	5 _{-0.030}	60	70	5.5
	1/21	(231)	·	(17		110.0	00	2.0	0	10	00.0		-0.030	00	10	0.0
	1/33	215 (255.5		13 (175		116.4	80	7.5	10	59	84	85	5 ⁰ -0.035	90	105	9
	1/5	162 (210)		12 (16		101.4	42	2.2	5	29	39.5	5 40) -0.025	40	46	3.4
	1/11	202.5 (250.5		144 (192		125.9	58	2.5	8	40	55.5	5 56	5 _{-0.030}	60	70	5.5
	1/21	227		14		128.4	80	7.5	10	59	84	0.	D -0.035	90	105	9
C2ADAH7DD	1/33	(275))	(19	95)	120.4	80	7.5	7.5 10		04	0	J -0.035	90	105	9
Model SGM7A-	Flange	e Dimen	nsio	ons	Q	С	S	Tap Size ×		е×	Key Dimensio			ons	Арр	orox.
	L1	L2		L3	3	U	3		Depth		QK	QK U W		Т	Mass [kg]	
															0.	
A5AOAH2OO	22	20	1	4.6	_	-	10 -0.0	15	M3 × 6I		15	2.5 4		4	(0.9)	
															0. (1.	
	28	30	2	20	28	20	16 -0.0	18	M4 × 8	3L	25	3	5	5		.3 .6)
	22	20	1	4.6	-	-	10 -0.0	15	M3 × (6L	15	2.5	4	4	0. (1.	
	28	30		20	28	20	16 .0.0	18	$M4 \times 8$	3L	25	3	5	5		.4
															2.	.7)
	36	44		26	42	32	25 -0.0	21	И6 × 1	2L	36	4	8	7	(3.	.1)
	22	20	1	4.6	_	-	10 -0.0	15	M3 × (3L	15	2.5	4	4	0. (1.	
С2АПАНВПП		00		20	28	20	16 .0.0		$M4 \times 8$	31	25	3	5	5		.5
	28	30		20	20	20	IO -0.0	18		-	20	0	-	Ŭ	(1.	.8)

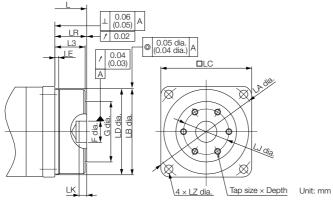
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

- 2. Gear dimensions are different from those of the Σ , Σ -II, and Σ -III Series.
- 3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.





Note: The geometric tolerance in parentheses is the value for LC = 40.

Model SGM7A-	Gear Ratio	L*	LR	LJ	F	G	LK	No. of Taps \times Tap Size \times Depth	Approx. Mass [kg]
A5ADAH10D	1/5	111							
A5ADAH20D	1/9	(151.5)	15	18	5 +0.012	24	3	$3 \times M4 \times 6L$	0.6
	1/21	120 (160.5)	10	10	0.0	27	0		(0.9)
	1/33	141.5 (182)	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	1.2 (1.5)
01A□AH10□	1/5	123 (163.5)	15	18	5 +0.012	24	3	$3 \times M4 \times 6L$	0.7 (1.0)
	1/11	153.5	21	30	14 ^{+0.018}	40		$3 \times M4 \times 7L$	1.3
	1/21	(194)	21	00	14 0	40	5	5 × 1014 × 7 L	(1.6)
01A□AH70□	1/33	162 (202.5)	27	45	24 +0.021	59	0	$6 \times M6 \times 10L$	2.4 (2.7)
C2ADAH10D	1/5	135 (183)	15	18	5 +0.012	24	3	$3 \times M4 \times 6L$	0.8 (1.1)
С2АПАНВОП	1/11	165.5 (213.5)	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	1.4 (1.7)
C2ADAHC0D	1/21	174	27	45	24 ^{+0.021}	59	5	$6 \times M6 \times 10L$	2.5
C2ADAH70D	1/33	(222)	21	40	∠4 ₀	09	5		(2.8)

* For models that have a batteryless absolute encoder, L is 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

24 dia. max.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

0.5 min

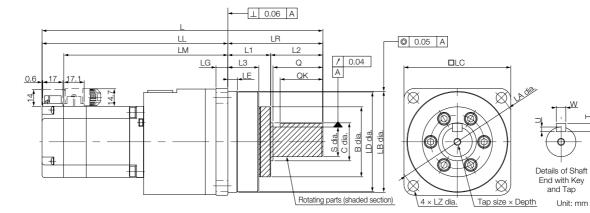
2. Dimensions not found in the above table are the same as those in the table on the previous page.



For a Servomotor with a flange output that has square gear flange dimensions (\Box LC) of 40 mm, we recommend that you design the Servomotor with the dimensions shown in the following figure in order to secure a gap between the gear oil seal and the connecting parts on the load side.

- Connecting parts on the load side

◆ SGM7A-02, -04, and -06



Model SGM7A-	Gear	*	11*	LL* LM		Flange Dimensions										
Model SGM/A-	Ratio	Ľ.	LL.	LIVI	LR	LE	LG	В	LD	LB	LC	LA	LZ			
	1/5	191.5	133.5	115.2	58	2.5	8	40	55.5	56 ⁰ -0.030	60	70	5.5			
	1/11	(232)	(174)	110.2	50	2.0	0	40	00.0	50 -0.030	00	10	0.0			
	1/21	220.5	140.5	122.2	80	7.5	10	59	84	85 .0.035	90	105	9			
	1/33	(261)	(181)	122.2	00	7.5	10	29	04	00 -0.035	90	105	9			
	1/5	207.5 (248)	149.5 (190)	131.2	58	2.5	8	40	55.5	56 .0.030	60	70	5.5			
	1/11	236.5	156.5	138.2	80	7.5	10	59	84	85 -0.035	90	105	9			
	1/21	(277)	(197)	130.2	00	7.5	10	59	04	80 -0.035	90	105	9			
	1/33	322.5 (363)	189.5 (230)	171.2	133	12.5	13	84	114	115 -0.035	120	135	11			
06A D AH1 DD	1/5	258.5	178.5	160.2	80	7.5	10	59	84	85 -0.035	90	105	9			
	1/11	(312.5)	(232.5)	100.2	00	7.5	10	39	04	OO -0.035	90	105	9			
	1/21	344.5	211.5	193.2	133	12.5	13	84	114	115 ⁰ -0.035	120	135	11			
	1/33	(398.5)	(265.5)	190.2	100	12.0	13	04	114	110 -0.035	120	130	11			

Model SGM7A-	Flang	e Dimer	nsions	Q	С	S	Tap Size \times	K	ey Din	nensior	าร	Approx.	
Model SGMTA-	L1	L2	L3	Q	U	5	Depth	QK	U	W	Т	Mass [kg]	
	28	30	20	28	20	16 ⁰ -0.018	$M4 \times 8L$	25	3	5	5	1.8 (2.4)	
	20	00	20	20	20	10 -0.018	WHY X OL	20	0	0	0	1.9 (2.5)	
	36	44	26	42	32	25 ⁰ _{-0.021}	M6 × 12L	36	4	8	7	3.7 (4.3)	
	28	30	20	28	20	16 ⁰ -0.018	$M4 \times 8L$	25	3	5	5	2.1 (2.7)	
	36	44	26	42	32	25 ⁰ -0.021	M6 × 12L	36	4	8	7	4.0 (4.6)	
	48	85	33	82	44	40 -0.025	M10 × 20L	70	5	12	8	8.6 (9.2)	
	36	44	26	42	32	25 ⁰ -0.021	M6 × 12L	36	4	8	7	4.3 (4.9)	
	00	TT	20	72	02	o.021 د ک	WOX TZE	00	-	0	,	4.5 (5.1)	
	48	85	33	82	44	40 -0.025	$M10 \times 20L$	70	5	12	8	9.1 (9.7)	

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater than the given value. Refer to the following section for the values for individual models.

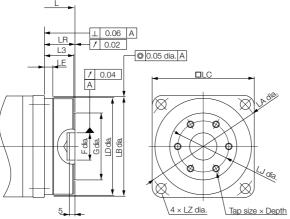
Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the $\Sigma,$ $\Sigma\text{-II},$ and $\Sigma\text{-III}$ Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

■ Flange Output Face



Model SGM7A-	Gear Ratio	L*	LR	LJ	F	G	No. of Taps \times Tap Size \times Depth	Approx. Mass [kg]
02A□AH10□	1/5	154.5	21	30	14 ^{+0.018}	40	$6 \times M4 \times 7L$	1.7 (2.3)
02A□AB20□	1/11	(195)	21	30	14 0	40	0 × 1014 × 7 L	1.8 (2.4)
02AOAHCOO	1/21	167.5	27	45	24 +0.021	59	$6 \times M6 \times 10L$	3.3
02A□AH70□	1/33	(208)	21	40	24 0	- 59	O X IVIO X TUL	(3.9)
04A□AH10□	1/5	170.5 (211)	21	30	14 ^{+0.018}	40	$6 \times M4 \times 7L$	2.0 (2.6)
	1/11	183.5	27	45	24 ^{+0.021}	59	$6 \times M6 \times 10L$	3.6
04AOAHC0O	1/21	(224)	21	40	24 0	- 59	O X IVIO X TUL	(4.2)
04A¤AH70¤	1/33	224.5 (265)	35	60	32 +0.025 0	84	6 × M8 × 12L	7.2 (7.8)
06A□AH10□	1/5	205.5	27	45	24 ^{+0.021}	59	6 × M6 × 10L	3.9 (4.5)
	1/11	(259.5)	21	40	Z4 0	39	U A IVIO A TUL	4.1 (4.7)
06AOAHC0O	1/21	246.5	35	60	32 +0.025	84	6 × M8 × 12L	7.7
06A□AH70□	1/33	(300.5)		00	32 0	04	U X IVIO X TZL	(8.3)

Unit: mm

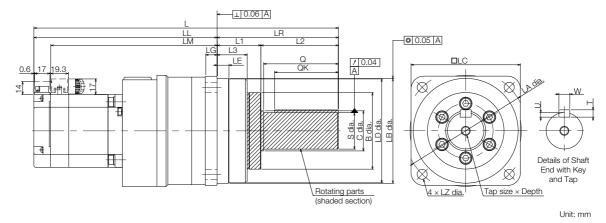
* For models that have a batteryless absolute encoder, L is 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Dimensions not found in the above table are the same as those in the table on the previous page.

◆ SGM7A-08 and -10



Model SGM7A-	Gear	*	LL*				Flange Dimensions												
Wodel Sawn A-	Ratio	E.				LR	LE	LG	В	LD		LB	LC	LA	LZ				
	1/5	255	175	156	3.5	80	7.5	10 59		84	85 .0.035		90	105	9				
	1/11	(302)	(222)	150	5.5	00	1.5	10	10 59		0	OO -0.035		100	9				
	1/21	334	201	101	2 5	133	12.5	13	84	114		5 ⁰ -0.035	120	135	11				
	1/33	(381)	(248)	102	182.5		12.0	10	04	114		O -0.035	120	100	11				
	1/5	280 (327)	200 (247)	18-	1.5	80	7.5	10	59	84	8	5 _{-0.035}	90	105	9				
	1/11	050	000																
	1/21	359 (406)	226 (273)	207	207.5 133		12.5	13 84		114	11	115 -0.035		135	11				
	1/33	(100)	(210)																
	Flange	Dimon	aiana							Ka		nensior	20	A					
	Flange	e Dimen	sions	_	-	c s		l lap S	IZE X	ne	;y Dili	lensior	15	ADDr	OX.				
Model SGM7A-	L1	L2	L3	Q	С		S	Tap S Dep	L	QK	U	W	T	Appr Mass*					
Model SGM7A-	L1	L2	L3			21	-	Dep	oth	QK	U	W	Т	• •	' [kg] 9				
				Q 42	С 32	25	S 5 -0.021		oth		,	· · · · · ·		Mass*	* [kg] 9 8) 1				
08A□AH1□□	- 36	L2 44	L3 26	42	32		D ⁰ _{-0.021}	Der M6 ×	oth 12L	QК 36	U 4	W 8	т 7	Mass* 4.9 (5.8	* [kg] 9 8) 1 0)				
	L1	L2	L3				-	Dep	oth 12L	QK	U	W	Т	Mass* 4.9 (5.8 5. (6.0	* [kg] 9 8) 1 0) 8				
08A□AH1□□ 08A□AHB□□ 08A□AHC□□	- 36	L2 44	L3 26	42	32	40	D ⁰ _{-0.021}	Der M6 ×	12L 20L	QК 36	U 4	W 8	т 7	Mass* 4.9 (5.8 5.7 (6.0 9.8	f [kg] 9 8) 1 0) 8 .7) 0				
08A□AH1□□ 08A□AHB□□ 08A□AHC□□ 08A□AHC□□	- 36 - 48	L2 44 85	L3 26 33	42 82	32	40	5 ⁰ -0.021 0 ⁰ -0.025	M6 ×	12L 20L	QК 36 70	U 4 5	W 8 12	т 7 8	Mass* 4.9 (5.8 (6.0 (10.0 (6.0 (6.0	* [kg] 9 3) 1 0) 8 7) 0 6)				
08A□AH1□□ 08A□AHB□□ 08A□AHC□□ 08A□AH7□□ 10A□AH1□□	- 36 - 48	L2 44 85	L3 26 33	42 82	32	40	5 ⁰ -0.021 0 ⁰ -0.025	M6 ×	oth 12L < 20L 12L	QК 36 70	U 4 5	W 8 12	т 7 8	Mass* 4.9 (5.8 5.7 (6.0 9.8 (10) 6.0	* [kg] 9 8) 1 0) 8 7) 8 7) 0 6) 9				

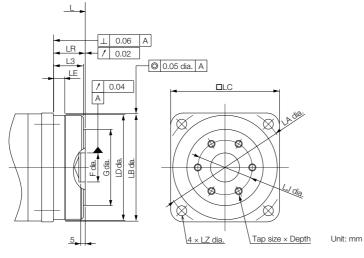
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the Σ , Σ -II, and Σ -III Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

■ Flange Output Face



Model SGM7A-	Gear Ratio	L*	LR	LJ	F	G	No. of Taps \times Tap Size \times Depth	Approx. Mass* [kg]	
08A□AH10□	1/5	202	27	45	04 +0.021	59	$6 \times M6 \times 10L$	4.7 (5.3)	
	1/11	(249)	21	45	24 +0.021	59	6 × M6 × 10L	4.9 (5.5)	
	1/21	236	35	60	32 ^{+0.025}	84	6 × M8 × 12L	8.6	
08AOAH70O	1/33	(283)	(283)	00	00	32 0	04	U X IVIO X TZL	(9.2)
10A□AH10□	1/5	227 (274)	27	45	24 0+0.021	59	6 × M6 × 10L	5.6 (6.3)	
	1/11	001						0.5	
10ADAHC0D	1/21	261 (308)	35	60	32 +0.025	84	$6 \times M8 \times 12L$	9.5 (10.1)	
10A D AH70 D	1/33	(000)						(10.1)	

* For models that have a batteryless absolute encoder, L is 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models. *Dimensions of Servomotors with Batteryless Absolute Encoders* (page 64)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Dimensions not found in the above table are the same as those in the table on the previous page.

Dimensions of Servomotors with Batteryless Absolute Encoders

Model SGM7A-	L	LL	LP	KB2	Approx. Mass [kg]
A5A6A2ロ	89.5 (130)	64.5 (105)	-	-	0.3 (0.6)
01A6A2ロ	101.5 (142)	76.5 (117)	-	-	0.4 (0.7)
C2A6A2□	113.5 (161.5)	88.5 (136.5)	-	-	0.5 (0.8)
02A6A2ロ	107.5 (148)	77.5 (118)	-	-	0.8 (1.4)
04A6A2ロ	123.5 (164)	93.5 (134)	-	-	1.2 (1.8)
06A6A2ロ	145.5 (198.5)	115.5 (169.5)	_	_	1.6 (2.2)
08A6A2ロ	145 (192)	105 (152)	_	_	2.4 (3.0)
10A6A2ロ	170 (217)	130 (177)	_	_	3.2 (3.8)
15A6A2ロ	210 (251)	165 (206)	44 (44)	153 (194)	4.6 (6.0)
20A6A2ロ	226 (267)	181 (222)	44 (44)	169 (210)	5.4 (6.8)
25A6A2ロ	249 (300)	204 (255)	44 (44)	192 (243)	6.8 (8.7)
30A6A2ロ	265 (301)	202 (240)	44 (44)	190 (228)	10.5 (13)
40A6A2ロ	304 (340)	241 (277)	44 (44)	229 (265)	13.5 (16)
50A6A2ロ	344 (380)	281 (317)	44 (44)	269 (305)	16.5 (19)
70A6A2ロ	397	334	-	269	18.5

♦ Servomotors without Gears

Note: The values in parentheses are for Servomotors with Holding Brakes.

♦ Servomotors with Gears

Shaft End Specification: Straight

Shaft End Specification: Flange Output

			-			
Model SGM7A-	L	LL	Approx. Mass [kg]	Model SGM7A-	L	Approx. Mass [kg]
A5A6AH1DD	146	104	0.6	A5A6AH10口	119	
A5A6AH2DD	(186.5)	(144.5)	(0.9)	A5A6AH20口	(159.5)	0.6
	155 (195.5)	113 (153.5)	0.7 (1.7)	A5A6AHC0D	128 (168.5)	(0.9)
A5A6AH7ロロ	186.5 (227)	128.5 (169)	1.3 (1.6)	A5A6AH70ロ	149.5 (190)	1.2 (1.5)
01A6AH1ロロ	158 (198.5)	116 (156.5)	0.7 (1.0)	01A6AH10ロ	131 (171.5)	0.7 (1.0)
01A6AHBDD	198.5	140.5	1.4	01A6AHB0口	161.5	1.3
01A6AHCDD	(239)	(181)	(1.7)	01A6AHC0D	(202)	(1.6)
01A6AH7ロロ	223 (263.5)	143 (183.5)	2.8 (3.1)	01A6AH70ロ	170 (210.5)	2.4 (2.7)
C2A6AH1DD	170 (218)	128 (176)	0.8 (1.1)	C2A6AH10□	143 (191)	0.8 (1.1)
С2А6АНВПП	210.5 (258.5)	152.5 (200.5)	1.5 (1.8)	C2A6AHB0D	173.5 (221.5)	1.4 (1.7)
C2A6AHCDD	235	155	2.9	C2A6AHC0□	210.5	2.5
C2A6AH7DD	(283)	(203)	(3.2)	C2A6AH70D	(258.5)	(2.8)
02A6AH1ロロ	191.5	141.5	1.8 (2.4)	02A6AH10ロ	162.5	1.7 (2.3)
02A6AHBロロ	(232)	(182.5)	1.9 (2.5)	02A6AHB0ロ	(203)	1.8 (2.4)
02A6AHCDD	228.5	148.5	3.7	02A6AHC0口	175.5	3.3
02A6AH7ロロ	(269)	(189)	(4.3)	02A6AH70ロ	(216)	(3.9)
04A6AH1ロロ	207.5 (248)	149.5 (198)	2.1 (2.7)	04A6AH10ロ	178.5 (219)	2.0 (2.6)
04A6AHBDD	236.5	184.5	4.0	04A6AHB0ロ	191.5	3.6
04A6AHCDD	(285)	(205)	(4.6)	04A6AHC0ロ	(232)	(4.2)
04A6AH7ロロ	330.5 (371)	197.5 (238)	8.6 (9.2)	04A6AH70ロ	232.5 (273)	7.2 (7.8)
06A6AH1ロロ	266.5	186.5	4.3 (4.9)	06A6AH10ロ	213.5	3.9 (4.5)
06A6AHBロロ	(320.5)	(240.5)	4.5 (5.1)	06A6AHB0ロ	(267.5)	4.1 (4.7)
06A6AHCDD	352.5	219.5	9.1	06A6AHC0ロ	254.5	7.7
06A6AH7ロロ	(406.5)	(273.5)	(9.7)	06A6AH70ロ	(308.5)	(8.3)
08A6AH1ロロ	263	183	5.0 (5.9)	08A6AH10ロ	210	4.8 (5.4)
08A6AHBロロ	(310)	(230)	5.2 (6.1)	08A6AHB0ロ	(257)	5.0 (5.6)
08A6AHCDD	342	209	9.9	08A6AHC0口	244	8.7
08A6AH7ロロ	(389)	(256)	(10.8)	08A6AH70ロ	(291)	(9.3)
10A6AH1ロロ	288 (335)	208 (255)	6.1 (6.7)	10A6AH10ロ	235 (282)	5.7 (6.4)
10A6AHBロロ 10A6AHCロロ 10A6AH7ロロ	367 (414)	234 (281)	11.0 (11.6)	10A6AHB0□ 10A6AHC0□ 10A6AH70□	269 (316)	9.6 (10.2)

Note: The values in parentheses are for Servomotors with Holding Brakes.

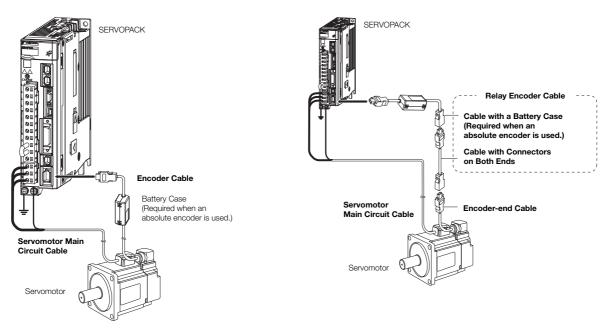
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



- Note: 1. Cables with connectors on both ends that are compliant with an IP67 protective structure and European Safety Standards are not available from Yaskawa for the SGM7A-15A to SGM7A-70A Servomotors. You must make such a cable yourself. Use the Connectors specified by Yaskawa for these Servomotors. (These Connectors are compliant with the standards.) Yaskawa does not specify what wiring materials to use.
 - 2. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.
 - 3. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
 - 4. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
 - Order numbers and specifications for wiring materials
 - Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

 For the SGM7A-A5 to -10, there are different order numbers for the Servomotor Main Circuit Cables and Encoder Cables depending on the cable installation direction. Confirm the order numbers before you order.

 Cable Installed toward Load
 Cable Installed away from Load

 Important
 Important

◆ Servomotor Main Circuit Cables

Servomotor	Name	Length	Order I	Number	Appearance
Model	Name	(L)	Standard Cable	Flexible Cable*	Appearance
		3 m	JZSP-C7M10F-03-E	JZSP-C7M12F-03-E	
		5 m	JZSP-C7M10F-05-E	JZSP-C7M12F-05-E	
		10 m	JZSP-C7M10F-10-E	JZSP-C7M12F-10-E	
SGM7A-A5 to -C2		15 m	JZSP-C7M10F-15-E	JZSP-C7M12F-15-E	
50 W to 150 W		20 m	JZSP-C7M10F-20-E	JZSP-C7M12F-20-E	
		30 m	JZSP-C7M10F-30-E	JZSP-C7M12F-30-E	
		40 m	JZSP-C7M10F-40-E	JZSP-C7M12F-40-E	
		50 m	JZSP-C7M10F-50-E	JZSP-C7M12F-50-E	
	For Servo-	3 m	JZSP-C7M20F-03-E	JZSP-C7M22F-03-E	
	motors with-	5 m	JZSP-C7M20F-05-E	JZSP-C7M22F-05-E	
	out Holding	10 m	JZSP-C7M20F-10-E	JZSP-C7M22F-10-E	SERVOPACK end Motor en
SGM7A-02 to -06	Brakes	15 m	JZSP-C7M20F-15-E	JZSP-C7M22F-15-E	
200 W to 600 W		20 m	JZSP-C7M20F-20-E	JZSP-C7M22F-20-E	
200 11 10 000 11	Cable	30 m	JZSP-C7M20F-30-E	JZSP-C7M22F-30-E	
	installed toward load	40 m	JZSP-C7M20F-40-E	JZSP-C7M22F-40-E	
	loward load	50 m	JZSP-C7M20F-50-E	JZSP-C7M22F-50-E	
		3 m	JZSP-C7M30F-03-E	JZSP-C7M32F-03-E	
		5 m	JZSP-C7M30F-05-E	JZSP-C7M32F-05-E	
001174 00 1 10		10 m	JZSP-C7M30F-10-E	JZSP-C7M32F-10-E	
SGM7A-08 and -10		15 m	JZSP-C7M30F-15-E	JZSP-C7M32F-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M30F-20-E	JZSP-C7M32F-20-E	
100 11, 1.0 111		30 m	JZSP-C7M30F-30-E	JZSP-C7M32F-30-E	
		40 m	JZSP-C7M30F-40-E	JZSP-C7M32F-40-E	
		50 m	JZSP-C7M30F-50-E	JZSP-C7M32F-50-E	
		3 m	JZSP-C7M10G-03-E	JZSP-C7M12G-03-E	
		5 m	JZSP-C7M10G-05-E	JZSP-C7M12G-05-E	
001474 45 1 00		10 m	JZSP-C7M10G-10-E	JZSP-C7M12G-10-E	
SGM7A-A5 to -C2		15 m	JZSP-C7M10G-15-E	JZSP-C7M12G-15-E	
50 W to 150 W		20 m	JZSP-C7M10G-20-E	JZSP-C7M12G-20-E	
		30 m	JZSP-C7M10G-30-E	JZSP-C7M12G-30-E	
		40 m	JZSP-C7M10G-40-E	JZSP-C7M12G-40-E	
		50 m	JZSP-C7M10G-50-E	JZSP-C7M12G-50-E	
	For Servo-	3 m	JZSP-C7M20G-03-E	JZSP-C7M22G-03-E	
	motors with-	5 m	JZSP-C7M20G-05-E	JZSP-C7M22G-05-E	
001474 00 +- 00	out Holding	10 m	JZSP-C7M20G-10-E	JZSP-C7M22G-10-E	SERVOPACK end Motor en
SGM7A-02 to -06	Brakes	15 m	JZSP-C7M20G-15-E	JZSP-C7M22G-15-E	
200 W to 600 W	Cable	20 m	JZSP-C7M20G-20-E	JZSP-C7M22G-20-E	
	installed	30 m	JZSP-C7M20G-30-E	JZSP-C7M22G-30-E	
	away from	40 m	JZSP-C7M20G-40-E	JZSP-C7M22G-40-E	
	load	50 m	JZSP-C7M20G-50-E	JZSP-C7M22G-50-E	
	1	3 m	JZSP-C7M30G-03-E	JZSP-C7M32G-03-E	
		5 m	JZSP-C7M30G-05-E	JZSP-C7M32G-05-E	
001474 00 1 10		10 m	JZSP-C7M30G-10-E	JZSP-C7M32G-10-E	
SGM7A-08 and -10		15 m	JZSP-C7M30G-15-E	JZSP-C7M32G-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M30G-20-E	JZSP-C7M32G-20-E	
100 11, 1.0 (11)		30 m	JZSP-C7M30G-30-E	JZSP-C7M32G-30-E	
		40 m	JZSP-C7M30G-40-E	JZSP-C7M32G-40-E	
		50 m	JZSP-C7M30G-50-E	JZSP-C7M32G-50-E	1

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Servomotor	Name	Length	Order N	Number	Appearance
Model	Name	(L)	Standard Cable	Flexible Cable*	Appearance
		3 m	JZSP-C7M13F-03-E	JZSP-C7M14F-03-E	
		5 m	JZSP-C7M13F-05-E	JZSP-C7M14F-05-E	
		10 m	JZSP-C7M13F-10-E	JZSP-C7M14F-10-E	
SGM7A-A5 to -C2		15 m	JZSP-C7M13F-15-E	JZSP-C7M14F-15-E	
50 W to 150 W		20 m	JZSP-C7M13F-20-E	JZSP-C7M14F-20-E	
00 11 10 100 11		30 m	JZSP-C7M13F-30-E	JZSP-C7M14F-30-E	
		40 m	JZSP-C7M13F-40-E	JZSP-C7M14F-40-E	
		50 m	JZSP-C7M13F-50-E	JZSP-C7M14F-50-E	
	For Servo-	3 m	JZSP-C7M23F-03-E	JZSP-C7M24F-03-E	
	motors with	5 m	JZSP-C7M23F-05-E	JZSP-C7M24F-05-E	
	Holding	10 m	JZSP-C7M23F-10-E	JZSP-C7M24F-10-E	SERVOPACK end Motor end
SGM7A-02 to -06	Brakes	15 m	JZSP-C7M23F-15-E	JZSP-C7M24F-15-E	
200 W to 600 W		20 m	JZSP-C7M23F-20-E	JZSP-C7M24F-20-E	
200 11 10 000 11	Cable	30 m	JZSP-C7M23F-30-E	JZSP-C7M24F-30-E	
	installed toward load	40 m	JZSP-C7M23F-40-E	JZSP-C7M24F-40-E	
	loward load	50 m	JZSP-C7M23F-50-E	JZSP-C7M24F-50-E	
		3 m	JZSP-C7M33F-03-E	JZSP-C7M34F-03-E	
		5 m	JZSP-C7M33F-05-E	JZSP-C7M34F-05-E	
		10 m	JZSP-C7M33F-10-E	JZSP-C7M34F-10-E	
SGM7A-08 and -10		15 m	JZSP-C7M33F-15-E	JZSP-C7M34F-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M33F-20-E	JZSP-C7M34F-20-E	
100 10, 1.0 100		30 m	JZSP-C7M33F-30-E	JZSP-C7M34F-30-E	
		40 m	JZSP-C7M33F-40-E	JZSP-C7M34F-40-E	
		50 m	JZSP-C7M33F-50-E	JZSP-C7M34F-50-E	
		3 m	JZSP-C7M13G-03-E	JZSP-C7M14G-03-E	
		5 m	JZSP-C7M13G-05-E	JZSP-C7M14G-05-E	
001474 451 00		10 m	JZSP-C7M13G-10-E	JZSP-C7M14G-10-E	
SGM7A-A5 to -C2		15 m	JZSP-C7M13G-15-E	JZSP-C7M14G-15-E	
50 W to 150 W		20 m	JZSP-C7M13G-20-E	JZSP-C7M14G-20-E	
		30 m	JZSP-C7M13G-30-E	JZSP-C7M14G-30-E	
		40 m	JZSP-C7M13G-40-E	JZSP-C7M14G-40-E	
		50 m	JZSP-C7M13G-50-E	JZSP-C7M14G-50-E	
	For Servo-	3 m	JZSP-C7M23G-03-E	JZSP-C7M24G-03-E	
	motors with	5 m	JZSP-C7M23G-05-E	JZSP-C7M24G-05-E	
001174 00 1 00	Holding	10 m	JZSP-C7M23G-10-E	JZSP-C7M24G-10-E	SERVOPACK end Motor end
SGM7A-02 to -06	Brakes	15 m	JZSP-C7M23G-15-E	JZSP-C7M24G-15-E	
200 W to 600 W	Cable	20 m	JZSP-C7M23G-20-E	JZSP-C7M24G-20-E	
200 11 10 000 11	installed	30 m	JZSP-C7M23G-30-E	JZSP-C7M24G-30-E	
	away from	40 m	JZSP-C7M23G-40-E	JZSP-C7M24G-40-E	
	load	50 m	JZSP-C7M23G-50-E	JZSP-C7M24G-50-E	
		3 m	JZSP-C7M33G-03-E	JZSP-C7M34G-03-E	
		5 m	JZSP-C7M33G-05-E	JZSP-C7M34G-05-E	
001474 00 1 10		10 m	JZSP-C7M33G-10-E	JZSP-C7M34G-10-E	
SGM7A-08 and -10		15 m	JZSP-C7M33G-15-E	JZSP-C7M34G-15-E	
750 W, 1.0 kW		20 m	JZSP-C7M33G-20-E	JZSP-C7M34G-20-E	
100 W, 1.0 KW		30 m	JZSP-C7M33G-30-E	JZSP-C7M34G-30-E	
		40 m	JZSP-C7M33G-40-E	JZSP-C7M34G-40-E	
		50 m	JZSP-C7M33G-50-E	JZSP-C7M34G-50-E	1

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Servo-		Connec-	1	Order I	Number	
motor Model	Name	tor Spec- ifications	Length (L)	Standard Cable	Flexible Cable ^{*1}	Appearance
Woder		moutions	3 m	JZSP-UVA101-03-E	JZSP-UVA121-03-E	
			5 m	JZSP-UVA101-05-E	JZSP-UVA121-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA101-10-E	JZSP-UVA121-10-E	
			15 m	JZSP-UVA101-15-E	JZSP-UVA121-15-E	
	For Servomotors		20 m	JZSP-UVA101-20-E	JZSP-UVA121-20-E	
	without Holding Brakes		3 m	JZSP-UVA102-03-E	JZSP-UVA122-03-E	
			5 m	JZSP-UVA102-05-E	JZSP-UVA122-05-E	SERVOPACK Motor end
		Right-angle	10 m	JZSP-UVA102-10-E	JZSP-UVA122-10-E	
			15 m	JZSP-UVA102-15-E	JZSP-UVA122-15-E	
SGM7A-		20 m	JZSP-UVA102-20-E	JZSP-UVA122-20-E		
15			3 m	JZSP-UVA131-03-E	JZSP-UVA141-03-E	SERVOPACK end Motor end
1.5 kW			5 m	JZSP-UVA131-05-E	JZSP-UVA141-05-E	
		Straight	10 m	JZSP-UVA131-10-E	JZSP-UVA141-10-E	
	For Servomotors		15 m	JZSP-UVA131-15-E	JZSP-UVA141-15-E	SERVOPACK end Brake end
	with Holding		20 m	JZSP-UVA131-20-E	JZSP-UVA141-20-E	
	Brakes		3 m	JZSP-UVA132-03-E	JZSP-UVA142-03-E	SERVOPACK end Motor end
	(Set of Two		5 m	JZSP-UVA132-05-E	JZSP-UVA142-05-E	
	Cables ^{*2})	Right-angle	10 m	JZSP-UVA132-10-E	JZSP-UVA142-10-E	
		nigint-angle	15 m	JZSP-UVA132-15-E	JZSP-UVA142-15-E	Brake end Motor end
			20 m	JZSP-UVA132-20-E	JZSP-UVA142-20-E	
			3 m	JZSP-UVA301-03-E	JZSP-UVA321-03-E	<u>D</u>
			5 m	JZSP-UVA301-05-E	JZSP-UVA321-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA301-10-E	JZSP-UVA321-10-E	
			15 m	JZSP-UVA301-15-E	JZSP-UVA321-15-E	
	For Servomotors without Holding		20 m	JZSP-UVA301-20-E	JZSP-UVA321-20-E	
	Brakes		3 m	JZSP-UVA302-03-E	JZSP-UVA322-03-E	
			5 m	JZSP-UVA302-05-E	JZSP-UVA322-05-E	SERVOPACK Motor end
		Right-angle	10 m	JZSP-UVA302-10-E	JZSP-UVA322-10-E	
			15 m	JZSP-UVA302-15-E	JZSP-UVA322-15-E	
SGM7A- 20			20 m	JZSP-UVA302-20-E	JZSP-UVA322-20-E	
20			3 m	JZSP-UVA331-03-E	JZSP-UVA341-03-E	SERVOPACK end Motor end
2.0 kW			5 m	JZSP-UVA331-05-E	JZSP-UVA341-05-E	
		Straight	10 m	JZSP-UVA331-10-E	JZSP-UVA341-10-E	SERVOPACK end Brake end
	For Servomotors		15 m	JZSP-UVA331-15-E	JZSP-UVA341-15-E	L J
	with Holding Brakes		20 m	JZSP-UVA331-20-E	JZSP-UVA341-20-E	
			3 m	JZSP-UVA332-03-E	JZSP-UVA342-03-E	SERVOPACK end Motor end
	(Set of Two		5 m	JZSP-UVA332-05-E	JZSP-UVA342-05-E	
	Cables ^{*2})	Right-angle	10 m 15 m	JZSP-UVA332-10-E JZSP-UVA332-15-E	JZSP-UVA342-10-E JZSP-UVA342-15-E	
		J 5	10 (1)	JLOF-UVA002-10-E	JLOF-UVA042-10-E	Brake end Motor end L
			20 m	JZSP-UVA332-20-E	JZSP-UVA342-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable). When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables. • Cable with Straight Plug: JZSP-U7B23-DD-E

Servo-		Connec-	Length	Order I	Number	
motor Model	Name	tor Spec- ifications	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
			3 m	JZSP-UVA501-03-E	JZSP-UVA521-03-E	
			5 m	JZSP-UVA501-05-E	JZSP-UVA521-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA501-10-E	JZSP-UVA521-10-E	
	For Servomotors without Holding		15 m	JZSP-UVA501-15-E	JZSP-UVA521-15-E	
			20 m	JZSP-UVA501-20-E	JZSP-UVA521-20-E	
	Brakes		3 m	JZSP-UVA502-03-E	JZSP-UVA522-03-E	
			5 m	JZSP-UVA502-05-E	JZSP-UVA522-05-E	SERVOPACK Motor end
		Right-angle	10 m	JZSP-UVA502-10-E	JZSP-UVA522-10-E	
			15 m	JZSP-UVA502-15-E	JZSP-UVA522-15-E	
SGM7A-			20 m	JZSP-UVA502-20-E	JZSP-UVA522-20-E	
25			3 m	JZSP-U7A551-03-E	JZSP-U7A561-03-E	SERVOPACK end Motor end
2.5 kW			5 m	JZSP-U7A551-05-E	JZSP-U7A561-05-E	
2.0 KW		Straight	10 m	JZSP-U7A551-10-E	JZSP-U7A561-10-E	SERVOPACK end Brake end
	For Servomotors		15 m	JZSP-U7A551-15-E	JZSP-U7A561-15-E	L L J
	with Holding		20 m	JZSP-U7A551-20-E	JZSP-U7A561-20-E	
	Brakes		3 m	JZSP-U7A552-03-E	JZSP-U7A562-03-E	SERVOPACK end Motor end
	(Set of Two		5 m	JZSP-U7A552-05-E	JZSP-U7A562-05-E	
	Cables ^{*2})	Right-angle	10 m	JZSP-U7A552-10-E	JZSP-U7A562-10-E	Brake end Motor end
			15 m	JZSP-U7A552-15-E	JZSP-U7A562-15-E	
			20 m	JZSP-U7A552-20-E	JZSP-U7A562-20-E	
			3 m	JZSP-UVA601-03-E	JZSP-UVA621-03-E	
			5 m	JZSP-UVA601-05-E	JZSP-UVA621-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA601-10-E	JZSP-UVA621-10-E	
	For Servomotors		15 m	JZSP-UVA601-15-E	JZSP-UVA621-15-E	
	without Holding		20 m	JZSP-UVA601-20-E	JZSP-UVA621-20-E	
	Brakes		3 m	JZSP-UVA602-03-E	JZSP-UVA622-03-E	SERVOPACK Motor end
			5 m	JZSP-UVA602-05-E	JZSP-UVA622-05-E	
		Right-angle	10 m	JZSP-UVA602-10-E	JZSP-UVA622-10-E	
			15 m	JZSP-UVA602-15-E	JZSP-UVA622-15-E	
SGM7A-			20 m	JZSP-UVA602-20-E	JZSP-UVA622-20-E	
30			3 m	JZSP-UVA631-03-E	JZSP-UVA641-03-E	SERVOPACK end Motor end
3.0 kW			5 m	JZSP-UVA631-05-E	JZSP-UVA641-05-E	
0.0 KW		Straight	10 m	JZSP-UVA631-10-E	JZSP-UVA641-10-E	
	For Servomotors		15 m	JZSP-UVA631-15-E	JZSP-UVA641-15-E	SERVOPACK end Brake end
	with Holding Brakes		20 m	JZSP-UVA631-20-E	JZSP-UVA641-20-E	
			3 m	JZSP-UVA632-03-E	JZSP-UVA642-03-E	SERVOPACK end Motor end
	(Set of Two Cables ^{*2})		5 m	JZSP-UVA632-05-E	JZSP-UVA642-05-E	
	,	Right-angle	10 m	JZSP-UVA632-10-E	JZSP-UVA642-10-E	Brake end Motor end
			15 m	JZSP-UVA632-15-E	JZSP-UVA642-15-E	
			20 m	JZSP-UVA632-20-E	JZSP-UVA642-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable). When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables. • Cable with Straight Plug: JZSP-U7B23-DD-E

Cable with Right-angle Plug: JZSP-U7B24-□□-E

Servo-		Connec-	Length	Order N	Number	
motor Model	Name	tor Spec- ifications	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
			3 m	JZSP-UVA701-03-E	JZSP-UVA721-03-E	
			5 m	JZSP-UVA701-05-E	JZSP-UVA721-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA701-10-E	JZSP-UVA721-10-E	
			15 m	JZSP-UVA701-15-E	JZSP-UVA721-15-E	
	For Servomotors without Holding		20 m	JZSP-UVA701-20-E	JZSP-UVA721-20-E	
	Brakes		3 m	JZSP-UVA702-03-E	JZSP-UVA722-03-E	
			5 m	JZSP-UVA702-05-E	JZSP-UVA722-05-E	SERVOPACK Motor end
		Right-angle	10 m	JZSP-UVA702-10-E	JZSP-UVA722-10-E	
SGM7A-			15 m	JZSP-UVA702-15-E	JZSP-UVA722-15-E	
40 and			20 m	JZSP-UVA702-20-E	JZSP-UVA722-20-E	
-50			3 m	JZSP-UVA731-03-E	JZSP-UVA741-03-E	SERVOPACK end Motor end
4.0 kW,			5 m	JZSP-UVA731-05-E	JZSP-UVA741-05-E	
5.0 kW		Straight	10 m	JZSP-UVA731-10-E	JZSP-UVA741-10-E	
	For Servomotors		15 m	JZSP-UVA731-15-E	JZSP-UVA741-15-E	SERVOPACK end Brake end
	with Holding Brakes		20 m	JZSP-UVA731-20-E	JZSP-UVA741-20-E	
	DIAKES		3 m	JZSP-UVA732-03-E	JZSP-UVA742-03-E	SERVOPACK end Motor end
	(Set of Two		5 m	JZSP-UVA732-05-E	JZSP-UVA742-05-E	
	Cables ^{*2})	Right-angle	10 m	JZSP-UVA732-10-E	JZSP-UVA742-10-E	
			15 m	JZSP-UVA732-15-E	JZSP-UVA742-15-E	Brake end Motor end
			20 m	JZSP-UVA732-20-E	JZSP-UVA742-20-E	
			3 m	JZSP-UVA901-03-E	JZSP-UVA921-03-E	
			5 m	JZSP-UVA901-05-E	JZSP-UVA921-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA901-10-E	JZSP-UVA921-10-E	
SGM7A-			15 m	JZSP-UVA901-15-E	JZSP-UVA921-15-E	
70*3	For Servomotors		20 m	JZSP-UVA901-20-E	JZSP-UVA921-20-E	
	Brakes		3 m	JZSP-UVA902-03-E	JZSP-UVA922-03-E	
7.0 kW			5 m	JZSP-UVA902-05-E	JZSP-UVA922-05-E	SERVOPACK Motor end
		Right-angle	10 m	JZSP-UVA902-10-E	JZSP-UVA922-10-E	
			15 m	JZSP-UVA902-15-E	JZSP-UVA922-15-E	
			20 m	JZSP-UVA902-20-E	JZSP-UVA922-20-E	_

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable). When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables.

Cable with Straight Plug: JZSP-U7B23-□□-E

Cable with Right-angle Plug: JZSP-U7B24-□□-E

*3. A cooling fan is built into the SGM7A-70 Servomotor. There is no specified cable to connect to the built-in cooling fan connector. Use appropriate wiring materials for the built-in cooling fan connector specifications. The cable is available from Yaskawa Controls Co., Ltd.

Refer to the following manual for the built-in cooling fan connector specifications that are required to select the cable.

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Encoder Cables of 20 m or Less

Model Name (L) Standard Cable Fiexble Cable** Appearance For incremental or batteryless abolite ended* 3 m JZSP-C7P00-05E JZSP-C7P02-05E Standard Cable S	Servomotor	NI-	Length	Order N	Number	
SCM7A-45 to -10 3m JZSP-C7P100-05-E JZSP-C7P12-05-E SEM0PACK Encoder and Distribution SGM7A-45 to -10 3m JZSP-C7P100-16-E JZSP-C7P12-05-E JZSP-C7P12-05-E SEM0PACK Encoder and Distribution SGM7A-45 to -10 3m JZSP-C7P100-05-E JZSP-C7P12-05-E JZSP-C7P12-05-E SEM0PACK Encoder and Distribution SGM7A-45 to -10 3m JZSP-C7P10E-10-E JZSP-C7P12E-10-E JZSP-C7P12E-10-E SEM0PACK Encoder and Distribution Encoder and Distribution SGM7A-45 to -10 Autoryless 3m JZSP-C7P10E-10-E JZSP-C7P12E-10-E SEM0PACK Encoder and Distribution SGM7A-45 to -10 For absolute encoder: With Battery Case ¹² 3m JZSP-C7P100-10-E JZSP-C7P12E-10-E SEM0PACK Encoder and Distribution Gabie installed toward load 10m JZSP-C7P100-10-E JZSP-C7P12D-10-E SEM0PACK Encoder and Distribution Gabie installed toward load 10m JZSP-C7P100-10-E JZSP-C7P12D-10-E SEM0PACK Encoder and Distribution Gabie installed toward load 10m JZSP-C7P100-10-E JZSP-		Name		Standard Cable	Flexible Cable ^{*1}	Appearance
SGM7A-85 to -10 50 W to 1.0 kW 5 m JZSP-C7P10D-10-E JZSP-C7P12D-10-E SSPCPACK Encoder and product of the state of the state of the			3 m	JZSP-C7PI0D-03-E	JZSP-C7PI2D-03-E	
SGM7A-45 to -10 50 W to 1.0 kW absolute encoder or battoryloss absolute encoder 10 m (2SP-C7PI0E-03E) (20 m) (2SP-C7PI0E-03E) (2SP-C7PI2E-03E) (20 m) (2SP-C7PI0E-03E) (2SP-C7PI2E-03E) (2S			5 m	JZSP-C7PI0D-05-E	JZSP-C7PI2D-05-E	
SGM7A-A5 to -10 Cable installed noward load 3 m JZSP-C7P10D-20-E JZSP-C7P12E-03-E SERVOPACK Encoder end SGM7A-A5 to -10 Cable installed away from load 3 m JZSP-C7P10E-03-E JZSP-C7P12E-03-E SERVOPACK Encoder end SGM7A-A5 to -10 Cable installed away from load 3 m JZSP-C7P10E-10-E JZSP-C7P12E-03-E SERVOPACK Encoder end SGM7A-A5 to -10 Cable installed away from load 3 m JZSP-C7P10E-10-E JZSP-C7P12E-10-E SERVOPACK Encoder end SGM7A-A5 to -10 For absolute encoder: With Battery Case ⁻¹² 3 m JZSP-C7PA0D-03-E JZSP-C7PA2D-03-E SERVOPACK Encoder end Gable installed toward load 15 m JZSP-C7PA0D-03-E JZSP-C7PA2E-03-E SERVOPACK Encoder end Gable installed away from load 3 m JZSP-C7PA0E-03-E JZSP-C7PA2E-03-E SERVOPACK Encoder end SM JZSP-C7PA0E-03-E JZSP-C7PA2E-03-E SERVOPACK Encoder end Gable installed away from load 3 m JZSP-C7PA0E-03-E JZSP-C7PA2E-03-E SERVOPACK Encoder end			10 m	JZSP-C7PI0D-10-E	JZSP-C7PI2D-10-E	
toward load 20m JZSP-C7PI0D-20-E JZSP-C7PI2D-20-E For incremental encoder, or batteryless absolute encoder 3m JZSP-C7PI0E-03-E JZSP-C7PI2E-03-E JZSP-C7PI2E-03-E Gamma 10m JZSP-C7PI0E-10-E JZSP-C7PI2E-10-E JZSP-C7PI2E-10-E JZSP-C7PI2E-10-E Gabin stalled away from load 10m JZSP-C7PI0E-10-E JZSP-C7PI2E-10-E JZSP-C7PI2E-10-E SOW to 1.0 kW For absolute encoder: With Battery Case*2 3m JZSP-C7PADD-03-E JZSP-C7PADD-03-E JZSP-C7PADD-04-E For absolute encoder: With Battery Case*2 3m JZSP-C7PADD-04-E JZSP-C7PADD-04-E JZSP-C7PADD-04-E For absolute encoder: With Battery Case*2 10m JZSP-C7PADE-04-E JZSP-C7PADE-04-E JZSP-C7PADE-04-E Cable installed away from load 15m JZSP-C7PADE-04-E JZSP-C7PADE-04-E JZSP-C7PADE-04-E Cable installed away from load 15m JZSP-C7PADE-04-E JZSP-C7PADE-04-E JZSP-C7PADE-04-E Tor incremental encoder, or hitropriest absolute encoder 15m JZSP-C7PADE-04-E JZSP-C7PADE-04-E JZSP-C7PADE-04-E Tor incremental encoder, With Battery Case*			15 m	JZSP-C7PI0D-15-E	JZSP-C7PI2D-15-E	
SGM7A.45 to -10 50 W to 1.0 kW -0 m JZSP-C7PI0E-05-E JZSP-C7PI2E-05-E SEPVOPACK Encoder and balace needed SGM7A.45 to -10 50 W to 1.0 kW -0 m JZSP-C7PI0E-10-E JZSP-C7PI2E-10-E JZSP-C7PADD-03-E JZSP-C7PADD-03-E JZSP-C7PADD-03-E JZSP-C7PADD-01-E JZSP-C7PADD-01-E JZSP-C7PADD-01-E JZSP-C7PADD-01-E JZSP-C7PADD-01-E JZSP-C7PADD-01-E JZSP-C7PADD-01-E JZSP-C7PADD-02-E JZSP-C7PADE-02-E EFVOPACK Encoder and For absolute encoder.Whh Battery Case*2 -0 m JZSP-C7PADE-02-E JZSP-C7PADE-03-E EFVOPACK Encoder and 10 m JZSP-C7PADD-02-E JZSP-C7PADE-03-E JZSP-C7PADE-03-E EFVOPACK Encoder and 10 m JZSP-C7PADE-10-E JZSP-C7PADE-10-E JZSP-C7PADE-10-E JZSP-C7PADE-10-E JZSP-C7PADE-10-E JZSP-C7PADE-10-E JZSP-C7PADE-10-E JZSP-CVP11-03-E Encoder and ID ID ID			20 m	JZSP-C7PI0D-20-E	JZSP-C7PI2D-20-E	
SGM7A-A5 to -10 50 W to 1.0 kW 0 m JZSP-C7P0E-10-E JZSP-C7P12E-10-E JZSP-C7P12E-20-E JZSP-C7P12E-20-E<			3 m	JZSP-C7PI0E-03-E	JZSP-C7PI2E-03-E	
SGM7A-A5 to -10 50 W to 1.0 kW absolute encoder Cable installed away from load 10 m JZSP-C7PI0E-10-E 20 m JZSP-C7PI2E-10-E JZSP-C7PI2E-10-E 20 m JZSP-C7PI2E-10-E JZSP-C7PI2E-00-E 50 W to 1.0 kW For absolute encoder: With Battery Case*2 3 m JZSP-C7PAD0-03-E JZSP-C7PA2D-03-E SETVOPACK Encoder end encoder: With Battery Case*2 Cable installed toward load 3 m JZSP-C7PA0D-03-E JZSP-C7PA2D-03-E SETVOPACK Encoder end encoder: With Battery Case*2 For absolute encoder: With Battery Case*2 3 m JZSP-C7PA0E-03-E JZSP-C7PA2E-03-E SETVOPACK Encoder end encoder: With Battery Case*2 Cable installed away from load 3 m JZSP-C7PA0E-03-E JZSP-C7PA2E-10-E JZSP-C7PA2E-10-E SETVOPACK Encoder end encoder: With Battery Case*2 For incremental encoder, or batteryJess absolute encoder 15 m JZSP-CVP01-03-E JZSP-CVP11-05-E SETVOPACK Encoder end end 15 m JZSP-CVP01-03-E JZSP-CVP11-05-E JZSP-CVP11-05-E JZSP-CVP12-02-E SETVOPACK Encoder end end 15 m JZSP-CVP01-20-E JZSP-CVP12-02-E JZSP-CVP12-02-E SETVOPACK Encoder end end SetVOP0-05-E			5 m	JZSP-C7PI0E-05-E	JZSP-C7PI2E-05-E	
SGM7A-A5 to -10 50 W to 1.0 kW Cable installed encoder: With Battery Case ⁻² 3 m JZSP-C7PI0E-20-E JZSP-C7PA2D-03-E SERVOPACK Encoder end encoder: With Battery Case ⁻² Cable installed toward load 15 m JZSP-C7PA0D-05-E JZSP-C7PA2D-03-E SERVOPACK Encoder end encoder: With Battery Case ⁻² To absolute encoder: With Battery Case ⁻² 3 m JZSP-C7PA0D-10-E JZSP-C7PA2D-03-E SERVOPACK Encoder end encoder: With Battery Case ⁻² To absolute encoder: With Battery Case ⁻² 3 m JZSP-C7PA0E-05-E JZSP-C7PA2E-03-E SERVOPACK Encoder end encoder: With Battery Case ⁻² To m JZSP-C7PA0E-05-E JZSP-C7PA2E-10-E JZSP-C7PA2E-10-E JZSP-C7PA2E-10-E SERVOPACK Encoder end encoder: With Battery Case ⁻² To incremental encoder: With or battryless absolute encoder m JZSP-CVP10-10-E JZSP-CVP11-02-E SERVOPACK Encoder end encoder: With Battery Case ⁻² To incremental encoder: With Battery Case ⁻² m JZSP-CVP01-05-E JZSP-CVP11-02-E SERVOPACK Encoder end encoder: With Battery Case ⁻² m JZSP-CVP02-05-E ⁻¹ JZSP-CVP12-05-E SERVOPACK Encoder end encoder: With Battery Case ⁻² m JZSP-CVP02-05-E ⁻¹ JZSP-CVP12-05-E SERVOPACK Enc			10 m	JZSP-C7PI0E-10-E	JZSP-C7PI2E-10-E	
SGM7A + A5 to -10 50 W to 1.0 kW away from load 20 m JZSP-C7PI0E-20-E JZSP-C7PA0D-03-E JZSP-C7PA0D-03-E For absolute encoder: With Battery Case*2 3 m JZSP-C7PA0D-05-E JZSP-C7PA0D-05-E JZSP-C7PA0D-07E JZSP-C7PA0E-07E JZSP-C7PA0E-07E JZSP-C7PA0E-07E JZSP-C7PA0E-07E JZSP-C7PA2E-07E JZSP-C7PA2E-07E <td< td=""><td></td><td>Oshla izatalla d</td><td>15 m</td><td>JZSP-C7PI0E-15-E</td><td>JZSP-C7PI2E-15-E</td><td></td></td<>		Oshla izatalla d	15 m	JZSP-C7PI0E-15-E	JZSP-C7PI2E-15-E	
50 W to 1.0 kW For absolute encoder: With Battery Case ⁻² 3 m J2SP-C7PA0D-03-E JZSP-C7PA2D-03-E SERVOPACK Encoder end Cable installed toward load 10 m JZSP-C7PA0D-05-E JZSP-C7PA2D-10-E JZSP-C7PA2D-05-E JZSP-C7PA2E-05-E JZSP-C7PA2E-05-E <t< td=""><td>SGM7A-A5 to -10</td><td></td><td>20 m</td><td>JZSP-C7PI0E-20-E</td><td>JZSP-C7PI2E-20-E</td><td></td></t<>	SGM7A-A5 to -10		20 m	JZSP-C7PI0E-20-E	JZSP-C7PI2E-20-E	
Servoract Servoract Encoder end 0 m JZSP-C7PA0D-05-E JZSP-C7PA2D-05-E SERVORACK Encoder end 10 m JZSP-C7PA0D-10-E JZSP-C7PA2D-10-E Image: Comparison of the service of the ser	50 W to 1.0 kW	-	3 m	JZSP-C7PA0D-03-E	JZSP-C7PA2D-03-E	
SGM7A-15 to -70 Image: Construction of the construlin of the construction of the construline of the constr		encoder: With	5 m	JZSP-C7PA0D-05-E	JZSP-C7PA2D-05-E	
Cable installed toward load 15 m JZSP-C7PA0D-15-E JZSP-C7PA2D-15-E Battery Case (battery included) For absolute encoder: With Battery Case*2 3 m JZSP-C7PA0E-03-E JZSP-C7PA2E-03-E EFVOPACK Encoder end Cable installed away from load 3 m JZSP-C7PA0E-05-E JZSP-C7PA2E-05-E EVENOPACK Encoder end 10 m JZSP-C7PA0E-10-E JZSP-C7PA2E-10-E JZSP-C7PA2E-10-E EVENOPACK Encoder end 20 m JZSP-C7PA0E-10-E JZSP-C7PA2E-20-E JZSP-C7PA2E-20-E EVENOPACK Encoder end 3 m JZSP-C7PA0E-10-E JZSP-C7PA0E-10-E JZSP-CVP11-03-E SERVOPACK Encoder end 3 m JZSP-C7PA0E-20-E JZSP-CVP11-05-E JZSP-CVP11-15-E JZSP-CVP11-15-E Image: ServOPACK Encoder end 10 m JZSP-CVP02-03-E ⁻¹ JZSP-CVP12-05-E Image: ServOPACK Encoder end 10 m JZSP-CVP02-03-E ⁻¹ JZSP-CVP12-05-E Image: ServOPACK Encoder end 10 m JZSP-CVP02-03-E ⁻¹ JZSP-CVP12-05-E Image: ServOPACK Encoder end 10 m JZSP-CVP02-		Battery Case ^{*2}	10 m	JZSP-C7PA0D-10-E	JZSP-C7PA2D-10-E	
SGM7A-15 to -70 12SP-CVP01-02-E JZSP-CVP01-02-E JZSP-CVP01-02-E JZSP-CVP01-02-E JZSP-CVP042E-03-E SGM7A-15 to -70 1.5 kW to 7.0 kW 7 M JZSP-CVP01-02-E JZSP-CVP11-02-E JZSP-CVP11-02-E JZSP-CVP11-02-E JZSP-CVP01-02-E JZSP-CVP02-02-E JZSP-C		Cable installed	15 m	JZSP-C7PA0D-15-E	JZSP-C7PA2D-15-E	Battery Case
10 du30due 5 m JZSP-C7PA0E-05-E JZSP-C7PA2E-05-E JZSP-C7PA12E-05-E JZSP-C7PA12E-05-E JZSP-C7PA12E-05-E JZSP-C7PA11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P11-05-E JZSP-C7P12-05-E JZSP-C7P12-05-E JZSP-C7P2-05-E		toward load	20 m	JZSP-C7PA0D-20-E	JZSP-C7PA2D-20-E	(battery molddod)
encoder: With Battery Case*25 mJZSP-C7PA0E-05-EJZSP-C7PA2E-05-ESERVOPACKEncoder endCable installed away from load10 mJZSP-C7PA0E-10-EJZSP-C7PA2E-10-EImage: Case of the second secon		For absolute	3 m	JZSP-C7PA0E-03-E	JZSP-C7PA2E-03-E	
SGM7A-15 to -70 1.5 kW to 7.0 kW For absolute encoder: With Battery Case ¹ 3 m JZSP-CVPA0E-10-E JZSP-C7PA0E-20-E JZSP-C7PA2E-10-E JZSP-C7PA2E-20-E Image: Comparison of the startery case (battery included) SGM7A-15 to -70 1.5 kW to 7.0 kW For absolute encoder: With Battery Case ² 3 m JZSP-CVP01-03-E 5 m JZSP-CVP01-05-E JZSP-CVP01-05-E JZSP-CVP11-05-E JZSP-CVP11-10-E E SERVOPACK encoder end encoder, or batteryless absolute encoder Encoder end encoder, or batteryless absolute encoder Image: Comparison of the startery and JZSP-CVP02-03-E ³ JZSP-CVP02-03-E ³ JZSP-CVP02-05-E ³ JZSP-CVP12-10-E ³ JZSP-CVP12-10-E ³ JZSP-CVP12-10-E ³ JZSP-CVP12-10-E ³ JZSP-CVP12-10-E ³ JZSP-CVP12-10-E ³ JZSP-CVP26-03-E SERVOPACK encoder end encoder Encoder end encoder SGM7A-15 to -70 1.5 kW to 7.0 kW TSP-CVP02-10-E ³ Sm JZSP-CVP02-03-E ³ JZSP-CVP02-03-E ³ SERVOPACK end encoder ErvOPACK encoder end encoder			5 m	JZSP-C7PA0E-05-E	JZSP-C7PA2E-05-E	
Cable installed away from load15 mJZSP-C7PA0E-15-EJZSP-C7PA2E-15-EBattery Case (battery included)20 mJZSP-CVPA0E-20-EJZSP-C7PA2E-20-EJZSP-CVP11-03-EJZSP-CVP11-03-E3 mJZSP-CVP01-03-EJZSP-CVP11-05-EJZSP-CVP11-05-EJZSP-CVP11-05-E10 mJZSP-CVP01-10-EJZSP-CVP11-10-EJZSP-CVP11-10-E15 mJZSP-CVP01-20-EJZSP-CVP11-10-EJZSP-CVP11-20-E20 mJZSP-CVP02-03-E* ³ JZSP-CVP12-03-E3 mJZSP-CVP02-03-E* ³ JZSP-CVP12-03-E3 mJZSP-CVP02-05-E* ³ JZSP-CVP12-05-E10 mJZSP-CVP02-05-E* ³ JZSP-CVP12-05-E10 mJZSP-CVP02-15-E* ³ JZSP-CVP12-10-E15 mJZSP-CVP02-05-E* ³ JZSP-CVP12-10-E15 mJZSP-CVP02-05-E* ³ JZSP-CVP12-10-E15 mJZSP-CVP06-03-EJZSP-CVP12-10-E15 mJZSP-CVP06-03-EJZSP-CVP26-03-E5 mJZSP-CVP06-03-EJZSP-CVP26-05-E10 mJZSP-CVP06-03-EJZSP-CVP26-05-E10 mJZSP-CVP06-05-EJZSP-CVP26-05-E10 mJZSP-CVP06-15-EJZSP-CVP26-05-E10 mJZSP-CVP06-15-EJZSP-CVP26-05-E10 mJZSP-CVP07-03-E*JZSP-CVP27-05-E10 mJZSP-CVP07-03-E*JZSP-CVP27-05-E10 mJZSP-CVP07-03-E*JZSP-CVP27-05-E10 mJZSP-CVP07-05-E*JZSP-CVP27-05-E10 mJZSP-CVP07-05-E*JZSP-CVP27-05-E10 mJZSP-CVP07-05-E*JZSP-CVP27-05-E10 mJZ		Battery Case ^{*2}	10 m	JZSP-C7PA0E-10-E	JZSP-C7PA2E-10-E	
away from load20 mJZSP-C7PA0E-20-EJZSP-C7PA2E-20-E3 mJZSP-CVP01-03-EJZSP-CVP11-03-EJZSP-CVP11-03-E5 mJZSP-CVP01-05-EJZSP-CVP11-05-EISSP-CVP11-05-E10 mJZSP-CVP01-10-EJZSP-CVP11-10-E15 mJZSP-CVP01-10-EJZSP-CVP11-10-E20 mJZSP-CVP01-20-EJZSP-CVP12-03-E3 mJZSP-CVP02-03-E*3JZSP-CVP12-03-E3 mJZSP-CVP02-05-E*3JZSP-CVP12-03-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP06-03-EJZSP-CVP26-03-E5 mJZSP-CVP06-03-EJZSP-CVP26-03-E10 mJZSP-CVP06-10-EJZSP-CVP26-03-E10 mJZSP-CVP06-10-EJZSP-CVP26-10-E10 mJZSP-CVP06-10-EJZSP-CVP26-10-E10 mJZSP-CVP06-10-EJZSP-CVP26-10-E10 mJZSP-CVP07-03-E*iJZSP-CVP27-03-E3 mJZSP-CVP07-03-E*iJZSP-CVP27-03-E10 mJZSP-CVP07-03-E*iJZSP-CVP27-05-E10 mJZSP-CVP07-03-E*iJZSP-CVP27-05-E11 mJZSP-CVP07-10-E*iJZSP-CVP27-10-E11 mJZSP-CVP07-10-E*iJZSP-CVP27-10-E11 mJZSP-CVP07-10-E*iJZSP-CVP27-10-E11 mJZSP-CVP07-10-E*iJZSP		Cable installed	15 m	JZSP-C7PA0E-15-E	JZSP-C7PA2E-15-E	Battery Case
SGM7A-15 to -70 1.5 kW to 7.0 kW 3 m JZSP-CVP01-05-E JZSP-CVP12-05-E SERVOPACK Encoder end 5 m JZSP-CVP01-10-E JZSP-CVP11-10-E JZSP-CVP11-10-E IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		away from load	20 m	JZSP-C7PA0E-20-E	JZSP-C7PA2E-20-E	(battery moldody)
SGM7A-15 to -70 10 m JZSP-CVP01-10-E JZSP-CVP11-10-E end 10 m JZSP-CVP01-20-E JZSP-CVP11-10-E Image: Comparison of the state sta			3 m	JZSP-CVP01-03-E	JZSP-CVP11-03-E	
SGM7A-15 to -70 10 m JZSP-CVP01-10-E JZSP-CVP11-10-E JZSP-CVP11-10-E SGM7A-15 to -70 15 m JZSP-CVP02-03-E*3 JZSP-CVP12-03-E Image: SERVOPACK inclusion of the server of the			5 m	JZSP-CVP01-05-E	JZSP-CVP11-05-E	
For incremental encoder, or batteryless absolute encoder 3 m JZSP-CVP01-20-E JZSP-CVP12-03-E 3 m JZSP-CVP02-03-E*3 JZSP-CVP12-03-E JZSP-CVP12-03-E 10 m JZSP-CVP02-10-E*3 JZSP-CVP12-10-E Image: Server and the			10 m			
SGM7A-15 to -7020 mJZSP-CVP02-03-E*3JZSP-CVP12-03-E1.5 kW to 7.0 kW20 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E1.5 kW to 7.0 kW3 mJZSP-CVP02-20-E*3JZSP-CVP12-10-E1.5 kW to 7.0 kW3 mJZSP-CVP06-03-EJZSP-CVP12-20-E1.5 kW to 7.0 kW3 mJZSP-CVP06-03-EJZSP-CVP26-03-E5 mJZSP-CVP06-03-EJZSP-CVP26-03-ESERVOPACK1.5 kW to 7.0 kW3 mJZSP-CVP06-03-EJZSP-CVP26-03-E5 mJZSP-CVP06-10-EJZSP-CVP26-10-ESERVOPACK10 mJZSP-CVP06-15-EJZSP-CVP26-10-EEncoder end10 mJZSP-CVP06-15-EJZSP-CVP26-10-ESERVOPACK10 mJZSP-CVP06-10-EJZSP-CVP26-10-EEncoder end10 mJZSP-CVP06-10-EJZSP-CVP26-10-ESERVOPACK10 mJZSP-CVP07-03-E*JZSP-CVP27-03-ESERVOPACK10 mJZSP-CVP07-03-E*3JZSP-CVP27-03-ESERVOPACK10 mJZSP-CVP07-05-E*3JZSP-CVP27-03-ESERVOPACK10 mJZSP-CVP07-05-E*3JZSP-CVP27-10-ESERVOPACK10 mJZSP-CVP07-10-E*3JZSP-CVP27-10-ESERVOPACK10 mJZSP-CVP07-16-E*3JZSP-CVP27-10-ESERVOPACK10 mJZSP-CVP07-16-E*3JZSP-CVP27-10-ESERVOPACK10 mJZSP-CVP07-16-E*3JZSP-CVP27-10-ESERVOPACK10 mJZSP-CVP07-16-E*3JZSP-CVP27-10-EServoPACK10 mJZSP-CVP07-16-E*3JZSP-CVP27-10-EServoPACK10 mJZSP-CVP07-16-E*3		For incromontal	15 m			
SGM7A-15 to -703 mJZSP-CVP02-03-E*3JZSP-CVP12-03-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E10 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E15 mJZSP-CVP02-20-E*3JZSP-CVP12-15-E20 mJZSP-CVP02-20-E*3JZSP-CVP12-20-E1.5 kW to 7.0 kW3 mJZSP-CVP06-03-EJZSP-CVP26-03-E5 mJZSP-CVP06-03-EJZSP-CVP26-03-ESERVOPACK10 mJZSP-CVP06-10-EJZSP-CVP26-03-EEncoder end10 mJZSP-CVP06-10-EJZSP-CVP26-10-EIn m10 mJZSP-CVP06-10-EJZSP-CVP26-10-EEncoder end10 mJZSP-CVP06-10-EJZSP-CVP26-10-EEncoder end10 mJZSP-CVP06-20-EJZSP-CVP26-10-EEncoder end10 mJZSP-CVP06-20-EJZSP-CVP26-10-EEncoder end10 mJZSP-CVP07-03-E*3JZSP-CVP27-03-EEncoder end3 mJZSP-CVP07-03-E*3JZSP-CVP27-03-EEncoder end10 mJZSP-CVP07-10-E*3JZSP-CVP27-03-EEncoder end10 mJZSP-CVP07-10-E*3JZSP-CVP27-10-EEncoder end11 mJZSP-CVP07-10-E*3JZSP-CVP27-10-EEncoder end11 mJZSP-CVP07-10-E*3JZSP-CVP27-10-EEncoder end11 mJZSP-CVP07-10-E*3JZSP-CVP27-10-EEncoder end11 mJZSP-CVP07-10-E*3JZSP-CVP27-10-EEncoder end11 mJZSP-CVP07-10-E*3JZSP-CVP27-10-EEncoder (battery included)			20 m	JZSP-CVP01-20-E	JZSP-CVP11-20-E	
SGM7A-15 to -7010 mJZSP-CVP02-10-E*3JZSP-CVP12-10-E15 mJZSP-CVP02-20-E*3JZSP-CVP12-15-E20 mJZSP-CVP02-20-E*3JZSP-CVP12-20-E3 mJZSP-CVP06-03-EJZSP-CVP26-03-E5 mJZSP-CVP06-10-EJZSP-CVP26-05-E10 mJZSP-CVP06-10-EJZSP-CVP26-10-E15 mJZSP-CVP06-10-EJZSP-CVP26-10-E15 mJZSP-CVP06-10-EJZSP-CVP26-10-E15 mJZSP-CVP06-20-EJZSP-CVP26-10-E15 mJZSP-CVP06-20-EJZSP-CVP26-10-E15 mJZSP-CVP06-20-EJZSP-CVP26-10-E15 mJZSP-CVP07-03-E*3JZSP-CVP26-10-E10 mJZSP-CVP07-03-E*3JZSP-CVP27-05-E10 mJZSP-CVP07-03-E*3JZSP-CVP27-05-E10 mJZSP-CVP07-10-E*3JZSP-CVP27-05-E10 mJZSP-CVP07-10-E*3JZSP-CVP27-10-E15 mJZSP-CVP07-10-E*3JZSP-CVP27-10-E15 mJZSP-CVP07-10-E*3JZSP-CVP27-10-E			3 m	JZSP-CVP02-03-E*3	JZSP-CVP12-03-E	
SGM7A-15 to -70 10 m JZSP-CVP02-10-E*3 JZSP-CVP12-10-E 15 m JZSP-CVP02-20-E*3 JZSP-CVP12-15-E Image: Comparison of the state of th		absolute encoder	5 m	JZSP-CVP02-05-E*3	JZSP-CVP12-05-E	
SGM7A-15 to -70 1.5 kW to 7.0 kWJZSP-CVP02-20-E*3 3 mJZSP-CVP02-20-E*3 JZSP-CVP06-03-E JZSP-CVP06-03-E JZSP-CVP06-03-E JZSP-CVP26-05-E JZSP-CVP26-10-E 15 m JZSP-CVP06-15-E 20 m JZSP-CVP06-15-ESERVOPACK encoder end Encoder end Battery Case*2Encoder end encoderFor absolute encoder: With Battery Case*23 m JZSP-CVP06-15-E 20 m JZSP-CVP06-15-EJZSP-CVP26-10-E JZSP-CVP26-15-E JZSP-CVP26-15-ESERVOPACK end Encoder end end UTEncoder end end Encoder end Battery Case (battery included)For absolute encoder: With Battery Case*23 m JZSP-CVP07-05-E*3 5 m JZSP-CVP07-05-E*3 I 0 m JZSP-CVP07-15-E*3 JZSP-CVP27-15-ESERVOPACK end end Encoder end Encoder end end Encoder end Encoder end 			10 m	JZSP-CVP02-10-E*3	JZSP-CVP12-10-E	
1.5 kW to 7.0 kW 3 m JZSP-CVP06-03-E JZSP-CVP26-03-E SERVOPACK Encoder end 5 m JZSP-CVP06-10-E JZSP-CVP26-10-E Image: Servopack (battery included) Encoder end 10 m JZSP-CVP06-15-E JZSP-CVP26-10-E Image: Servopack (battery included) Encoder end 10 m JZSP-CVP06-15-E JZSP-CVP26-15-E Image: Servopack (battery included) Encoder end 10 m JZSP-CVP06-20-E JZSP-CVP26-20-E Image: Servopack (battery included) Encoder end 3 m JZSP-CVP07-03-E*3 JZSP-CVP27-03-E Image: Servopack (battery included) Encoder end 10 m JZSP-CVP07-05-E*3 JZSP-CVP27-05-E Image: Servopack (battery included) Encoder end 11 m JZSP-CVP07-15-E*3 JZSP-CVP27-10-E Image: Servopack (battery included) Encoder end			15 m	JZSP-CVP02-15-E*3	JZSP-CVP12-15-E	
1.5 kW to 7.0 kW 3 m JZSP-CVP06-03-E JZSP-CVP26-03-E SERVOPACK Encoder end 5 m JZSP-CVP06-10-E JZSP-CVP26-10-E Image: Case to the second se	SGM7A-15 to -70		20 m	JZSP-CVP02-20-E*3	JZSP-CVP12-20-E	
For absolute encoder: With Battery Case*25 mJZSP-CVP06-10-E 15 mJZSP-CVP06-10-E JZSP-CVP06-15-EJZSP-CVP26-10-E JZSP-CVP26-15-Eend Image: Case Battery Case (battery included)5 mJZSP-CVP06-15-E 20 mJZSP-CVP07-03-E*3 JZSP-CVP07-03-E*3JZSP-CVP27-03-E JZSP-CVP27-05-ESERVOPACK end Image: Case (battery included)10 mJZSP-CVP07-05-E*3 Image: JZSP-CVP27-05-EJZSP-CVP27-05-E Image: JZSP-CVP27-10-ESERVOPACK Battery Case (battery included)			3 m	JZSP-CVP06-03-E	JZSP-CVP26-03-E	
For absolute encoder: With Battery Case*2 15 m JZSP-CVP06-15-E JZSP-CVP26-15-E Battery Case*3 JZSP-CVP26-20-E 15 m JZSP-CVP07-03-E*3 JZSP-CVP27-03-E SERVOPACK Encoder end 10 m JZSP-CVP07-10-E*3 JZSP-CVP27-10-E Battery Case Servopack Encoder end 15 m JZSP-CVP07-15-E*3 JZSP-CVP27-15-E SERVOPACK Encoder end			5 m	JZSP-CVP06-05-E	JZSP-CVP26-05-E	
For absolute encoder: With Battery Case*215 mJZSP-CVP06-15-EJZSP-CVP26-15-E (battery included)Battery Case (battery included)3 mJZSP-CVP07-03-E*3JZSP-CVP27-03-E5 mJZSP-CVP07-05-E*3JZSP-CVP27-05-E10 mJZSP-CVP07-10-E*3JZSP-CVP27-10-E15 mJZSP-CVP07-15-E*3JZSP-CVP27-15-E			10 m	JZSP-CVP06-10-E	JZSP-CVP26-10-E	
For absolute encoder: With Battery Case*220 mJZSP-CVP06-20-EJZSP-CVP26-20-E3 mJZSP-CVP07-03-E*3JZSP-CVP27-03-E5 mJZSP-CVP07-05-E*3JZSP-CVP27-05-E10 mJZSP-CVP07-10-E*3JZSP-CVP27-10-E15 mJZSP-CVP07-15-E*3JZSP-CVP27-15-E			15 m	JZSP-CVP06-15-E	JZSP-CVP26-15-E	Battery Case
encoder: With Battery Case ^{*2} 3 m JZSP-CVP07-03-E ^{*3} JZSP-CVP27-03-E 5 m JZSP-CVP07-05-E ^{*3} JZSP-CVP27-05-E 10 m JZSP-CVP07-10-E ^{*3} JZSP-CVP27-10-E 15 m JZSP-CVP07-15-E ^{*3} JZSP-CVP27-15-E		For absolute				(battery included)
5 m JZSP-CVP07-05-E JZSP-CVP27-05-E 10 m JZSP-CVP07-10-E*3 JZSP-CVP27-10-E 15 m JZSP-CVP07-15-E*3 JZSP-CVP27-15-E						
10 mJZSP-CVP07-10-E*3JZSP-CVP27-10-E15 mJZSP-CVP07-15-E*3JZSP-CVP27-15-E		Battery Case ⁻²	5 m	JZSP-CVP07-05-E*3	JZSP-CVP27-05-E	end la
15 m JZSP-CVP07-15-E ^{*3} JZSP-CVP27-15-E (battery included)			10 m	JZSP-CVP07-10-E*3	JZSP-CVP27-10-E	
20 m JZSP-CVP07-20-E*3 JZSP-CVP27-20-E			15 m	JZSP-CVP07-15-E*3	JZSP-CVP27-15-E	Dallery Gase
			20 m	JZSP-CVP07-20-E*3	JZSP-CVP27-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. If a battery is connected to the host controller, the Battery Case is not required. If so, use a cable for incremental encoders.

*3. You cannot use a right-angle connector for the encoder of a SGM7A-70A (7.0 kW) Servomotor. Use a straight connector.

Servomotor Model	Name	Length (L)	Order Number	Appearance
	Encoder-end Cable (for all types of encoders) Cable installed toward load	0.3 m	JZSP-C7PRCD-E	SERVOPACK end Encoder end
	Encoder-end Cable (for all types of encoders) Cable installed away from load	0.3 m	JZSP-C7PRCE-E	SERVOPACK end Encoder end
SGM7A-A5 to -10 50 W to 1.0 kW	Cables with Connectors on	30 m	JZSP-UCMP00-30-E	SERVOPACK end Encoder end
0 W 10 1.0 KW	Both Ends (for all types of	40 m	JZSP-UCMP00-40-E	
	encoders)	50 m	JZSP-UCMP00-50-E	
	Cable with a Battery Case (Required when an absolute encoder is used. ^{*2})	0.3 m	JZSP-CSP12-E	SERVOPACK end Encoder end
	Encoder-end Cable	0.3 m	JZSP-CVP01-E	SERVOPACK end Encoder end
	(for all types of encoders)	0.5 11	JZSP-CVP02-E*1	SERVOPACK end Encoder end
SGM7A-15 to -70 1.5 kW to 7.0 kW	Cables with Connectors on	30 m	JZSP-UCMP00-30-E	SERVOPACK end L Encoder end
	Both Ends (for all types of	40 m	JZSP-UCMP00-40-E	
	encoders)	50 m	JZSP-UCMP00-50-E	
	Cable with a Battery Case (Required when an absolute encoder is used. ^{*2})	0.3 m	JZSP-CSP12-E	SERVOPACK end Encoder enc Battery Case (battery included)

◆ Relay Encoder Cable of 30 m to 50 m

*1. You cannot use a right-angle connector for the encoder of a SGM7A-70A (7.0 kW) Servomotor. Use a straight connector.

*2. This Cable is not required if you use a Servomotor with a Batteryless Absolute Encoder, and you connect a battery to the host controller.

SGM7P

Model Designations

Without Gears			
SGM7P - 01	A 7 A 2 1		
Σ-7 Series Servomotors: SGM7P	3rd 4th 5th 6th 7th digit digit digit		
st+2nd digits Rated Output	4th digit Serial Encoder	6th di	git Shaft End
Code Specification	Code Specification	Code	Specification
01 100 W	6 24-bit batteryless absolute	2	Straight without key
02 200 W	7 24-bit absolute	6	Straight with key and tap
04 400 W	F 24-bit incremental		
08 750 W		7th dig	git Options
15 1.5 kW	5th digit Design Revision Order	Code	Specification
	Code Specification	1	Without options
rd digit Power Supply Voltage	A IP65	С	With holding brake (24 VDC)
Code Specification A 200 VAC	E IP67	E	With oil seal and holding brake (24 VDC)
		S	With oil seal
SGM7P - 01	A 7 A H B 3rd 4th 5th 6th 7th	0 8th	1 9th
SGM7P - 01			9th digit
SGM7P - 01 2-7 Series Servomotors: SGM7P		8th	digit
SGM7P - 01 Σ-7 Series Servomotors: SGM7P st+2nd digits Rated Output	3rd digit 4th digit 5th digit 6th digit 7th digit digit	8th digit	digit
SGM7P - 01 Σ-7 Series Servomotors: SGM7P st+2nd digits Rated Output	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order	8th digit 8th dig	digit it Shaft End Specification
SGM7P - 01 2-7 Series Servomotors: SGM7P Ist+2nd digits Rated Output Code Specification	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55	8th digit 8th dig Code	digit it Shaft End
SGM7P - 01 2-7 Series Servomotors: SGM7P Ist+2nd digits Rated Output Code Specification 01 100 W	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification	8th digit 8th dig Code 0	digit Shaft End Specification Flange output
SGM7P - 01 Σ-7 Series Servomotors: SGM7P SGM7P SGM7P Servomotors: Servomotors: SGM7P Servomotors:	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55	8th digit 8th dig Code 0 2	tigit Shaft End Specification Flange output Straight without key
SGM7P - 01 Σ-7 Series 1st+2nd Servomotors: SGM7P 1st+2nd digits Rated Output Code Specification 01 100 W 02 200 W 04 400 W	3rd digit4th digit5th digit6th digit7th digit5th digitDesign Revision OrderCodeSpecification AAIP556th digitGear Type	8th digit 8th dig Code 0 2 6	digit Shaft End Specification Flange output Straight without key Straight with key and tap
SGM7P - 01 Σ-7 Series Servomotors: SGM7P 1st+2nd cligits 1st+2nd digits Rated Output Code Specification 01 100 W 02 200 W 04 400 W 08 750 W 15 1.5 kW	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear	8th digit 8th dig Code 0 2 6	digit Shaft End Specification Flange output Straight without key
SGM7P - 01 Σ-7 Series Servomotors: SGM7P 1st+2nd digits Ist+2nd digits Rated Output Ist+2nd digits Rated Output Code Specification 01 100 W 02 200 W 04 400 W 08 750 W 15 1.5 kW	3rd digit4th digit5th digit6th digit7th digit5th digitDesign Revision Order5th digitDesign Revision OrderCodeSpecificationAIP556th digitGear TypeCodeSpecification	8th digit 8th dig Code 0 2 6	cigit Shaft End Specification Flange output Straight without key Straight with key and tap
SGM7P - 01 2-7 Series Servomotors: SGM7P SGM7P Servomotors: SGM7P Servomotors: SGM7P Servomotors: SGM7P Rated Output Servomotors SGM7P Servomotors: SGM7P Rated Output Servomotors SGM7P Servomotors: Servomotors: Servomot	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification Without options
SGM7P - 01 Σ-7 Series Servomotors: SGM7P 1st+2nd digits Rated Output 1st+2nd digits Rated Output Code Specification 01 100 W 02 200 W 04 400 W 08 750 W 15 1.5 kW Brd digit Power Supply Voltage	3rd digit4th digit5th digit6th digit7th digit5th digitDesign Revision OrderCodeSpecification AAIP556th digitGear TypeCodeSpecification hHHDS planetary low-backlash gear7th digitGear Ratio	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification
SGM7P - 01 Σ-7 Series Servomotors: SGM7P S	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear 7th digit Gear Ratio Code Specification	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification Without options
SGM7P - 01 2-7 Series Servomotors: SGM7P SGM7P Servomotors: SGM7P Servomotors: SGM7P Servomotors: SGM7P Servomotors: SGM7P Rated Output Servomotors: SGM7P Servomotors: Servomotors	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear 7th digit Gear Ratio Code Specification H HDS planetary low-backlash gear	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification Without options
SGM7P - 01 2-7 Series Servomotors: SGM7P Ist+2nd digits Rated Output Code Specification 01 100 W 02 200 W 04 400 W 08 750 W 15 1.5 kW Brd digit Power Supply Voltage Code Specification A 200 VAC	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear 7th digit Gear Ratio Code Specification H 1/11 C 1/21	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification Without options
SGM7P - 01 Σ-7 Series Servomotors: SGM7P 1st+2nd digits 1st+2nd digits Rated Output 1st+2nd digits Rated Output 1st+2nd digits Rated Output 1st+2nd digits Rated Output 01 100 W 02 200 W 04 400 W 08 750 W 15 1.5 kW 3rd digit Power Supply Voltage Code Specification A 200 VAC 4th digit Serial Encoder	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear 7th digit Gear Ratio Code Specification H 111 C 1/21 1 1/5	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification Without options
Servemotors: SGM7P digits 1st+2nd digits Rated Output Code Specification 01 100 W 02 200 W 04 400 W 08 750 W 15 1.5 kW 3rd digit Power Supply Voltage Code Specification A 200 VAC 4th digit Serial Encoder Code Specification	3rd digit 4th digit 5th digit 6th digit 7th digit 5th digit Design Revision Order Code Specification A IP55 6th digit Gear Type Code Specification H HDS planetary low-backlash gear 7th digit Gear Ratio Code Specification H 111 C 1/21 1 1/5	8th digit 8th digit Code 0 2 6 9th dig Code 1	digit Shaft End Specification Flange output Straight without key Straight with key and tap it Options Specification Without options

Specifications and Ratings

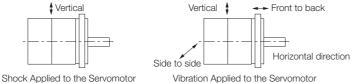
Specifications

	Voltage			200 V			
	Model SGM7P-	01A	02A	04A	08A	15A	
Time Rating				Continuous			
Thermal Class				UL: B, CE: E	}		
Insulation Resis	stance	500 VDC, 10 M Ω min.					
Withstand Volta	age		1,500) VAC for 1 n	ninute		
Excitation			Pei	rmanent mag	jnet		
Mounting			FI	ange-mounte	ed		
Drive Method				Direct drive			
Rotation Directi	on	Counterclockw	vise (CCW) for fo	rward reference	when viewed fro	m the load side	
Vibration Class	*1			V15			
	Surrounding Air Temperature			0°C to 40°C			
		(With derati	ing, usage is	possible bet	ween 40°C a	and 60°C.) ^{*3}	
	Surrounding Air Humidity	20% to	80% relative	e humidity (w	ith no conde	ensation)	
Environmental Conditions	Installation Site	 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. (With derating, usage is possible between 1,000 m and 2,000 m.)*³ Must be free of strong magnetic fields. 				oisture.	
	Storage Environment	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)				ezing)	
Shock	Impact Acceleration Rate at Flange			490 m/s ²			
Resistance ^{*2}	Number of Impacts			2 times			
Vibration Resistance ^{*2}	Vibration Acceleration Rate at Flange			49 m/s ²			
Applicable	SGD7S-	R90A, R90F	2R8A, 2R1F	2R8A, 2R8F	5R5A	120A	
SERVOPACKs	SGD7W- SGD7C-	1R6A ^{*4} , 2R8A ^{*4}	2R8A, 5R5	A ^{*4} , 7R6A ^{*4}	5R5A, 7R6A	-	

*1. A vibration class of V15 indicates a vibration amplitude of 15 µm maximum on the Servomotor without a load at the rated motor speed.

*2. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.

The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



Shock Applied to the Scholhotol

*3. Refer to the following section for the derating rates.

Derating Rates (page 82)

*4. If you use a Servomotor together with a Σ -7W or Σ -7C SERVOPACK, the control gain may not increase as much as with a Σ -7S SERVOPACK and other performances may be lower than those achieved with a Σ -7S SERVOPACK.

Ratings of Servomotors without Gears

	Voltage				200 V				
	Model SGM7P-		01A	02A	04A	08A	15A		
Rated	Output ^{*1}	W	100	200	400	750	1500		
	Torque ^{*1,*2}	N∙m	0.318	0.637	1.27	2.39	4.77		
Instant	aneous Maximum Torque ^{*1}	N∙m	0.955	1.91	3.82	7.16	14.3		
Rated	Current ^{*1}	Arms	0.86	2.0	2.6	5.4	9.2		
Instant	aneous Maximum Current ^{*1}	Arms	2.8	6.4	8.4	16.5	28.0		
Rated	Motor Speed ^{*1}	min ⁻¹		I	3000	I	L		
Maxim	um Motor Speed ^{*1}	min ⁻¹			6000				
Torque	Constant	N•m/Arms	0.401	0.355	0.524	0.476	0.559		
Motor	Moment of Inertia		0.0592	0.263	0.409	2.10	4.02		
	With holding brake	×10 ⁻⁴ kg·m ²	0.0892	0.415	0.561	2.98	4.90		
	With batteryless absolute encoder		0.0607	0.264	0.410	2.10	4.02		
Rated	Power Rate ^{*1}	kW/s	17.1	15.4	39.6	27.2	56.6		
	With holding brake	KVV/5	11.3	9.7	28.8	19.1	46.4		
Rated	Angular Acceleration Rate ^{*1}	rad/s ²	53700	24200	31100	11400	11900		
	With holding brake	rau/s	35600	15300	22600	8020	9730		
Derating	Rate for Servomotor with Oil Seal	%	g	0		95			
Heat S	ink Size ^{*3}	mm	2	50 × 250 × 6 300 × 300 × 12					
Protect	tive Structure ^{*4}			Totally encl	ooled, IP65				
	Rated Voltage	V		2	4 VDC ±109	%			
s, ée	Capacity	W	6	7	.4	7	.5		
Holding Brake Specifications ^{*5}	Holding Torque	N∙m	0.318	0.637	1.27	2.39	4.77		
ng l fica:	Coil Resistance	Ω (at 20°C)	96	84	.5	76	5.8		
eci	Rated Current	A (at 20°C)	0.25	0.	31	0.	31		
Sp H	Time Required to Release Brake	ms			80				
	Time Required to Brake	ms			100				
Allowat	ble Load Moment of Inertia								
(Motor	Moment of Inertia Ratio)*6		25 times	15 times	10 times	5 ti	mes		
	With External Regenerative Res		20 111165	10 111165	TO times	5 11	1163		
	External Dynamic Brake Resist	or ^{*7}							
* <u>e</u>	LF	mm	20 25		5	3	5		
Allowable Shaft Loads*8	Allowable Radial Load	Ν	78 245		15	392 490			
Allo	Allowable Thrust Load	Ν	49	6	8	147			

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

Servomotor Heat Dissipation Conditions (page 82)

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*5. Observe the following precautions if you use a Servomotor with a Holding Brake.

• The holding brake cannot be used to stop the Servomotor.

• The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.

The 24-VDC power supply is not provided by Yaskawa.

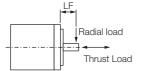
*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

*7. To externally connect a dynamic brake resistor, select hardware option specification 020 for the SERVOPACK.

However, you cannot externally connect a dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70000A020 to -2R8000A020

- SGD7W-1R6A20A020 to -2R8A20A020
- SGD7C-1R6AMAA020 to -2R8AMAA020
- *8. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.

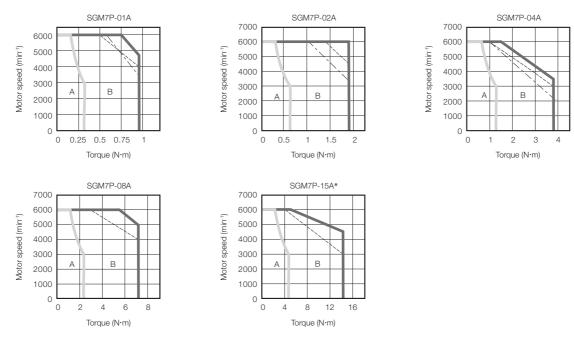


Torque-Motor Speed Characteristics

(solid lines): With three-phase 200-V or single-phase 230-V input

A : Continuous duty zone B : Intermittent duty zone

----- (dotted lines): With single-phase 200-V input (dashed-dotted lines): With single-phase 100-V input



* A single-phase power input can be used in combination with the SGD7S-120ADA008.

- Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
 - 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 - 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
 - 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Ratings of Servomotors with Gears

	G	Gear Me	chanism	I	Protec	tive Str	ructure	Lost Motion [arc-min]			
All Models	Plane	tary gea	ır mecha	nism	,	,	elf-cooled, aft opening)	3	max.		
			Servom	otor			G	ear Output			
Servomotor Model SGM7P-	Rated Output [W]	Rated Motor Speed [min ⁻¹]	Maxi- mum Motor Speed [min ⁻¹]	mum Rated In Motor Torque Speed [N·m]		Gear Ratio	Rated Torque/ Efficiency ^{*1} [N·m/%]	Instanta- neous Maxi- mum Torque [N·m]	Rated Motor Speed [min ⁻¹]	Maxi- mum Motor Speed [min ⁻¹]	
01A D AH1 D						1/5	1.05/78 ^{*2}	4.30	600	1200	
	100	3000	6000	0.318	0.955	1/11	2.52/72	9.30	273	545	
	100	0000	0000	0.010	0.000	1/21	5.34/80	18.2	143	286	
01A D AH7 D						1/33	6.82/65	27.0	91	182	
02A0AH10						1/5	2.39/75	8.60	600	1200	
	200	3000	6000	0.637	1.91	1/11	5.74/82	19.4	273	545	
	200	3000		0.037	1.91	1/21	10.2/76	35.9	143	286	
02A0AH70						1/33	17.0/81	57.3	91	182	
04A D AH1 D						1/5	5.33/84	17.8	600	1200	
	400	3000	6000	1.27	3.82	1/11	11.5/82	38.3	273	545	
	400	0000	0000	1.21	0.02	1/21	22.9/86	74.4	143	286	
04A D AH7 D						1/33	34.0/81	114.6	91	182	
08A D AH1 D						1/5	10.0/84	32.8	600	1200	
	750	3000	6000	2.39	7.16	1/11	23.1/88	73.6	273	545	
	730	3000	0000	2.09	7.10	1/21	42.1/84	138.0	143	286	
08A D AH7 D						1/33	69.3/88	220	91	182	
15A D AH1 D						1/5	19.1/80	64.8	600	1200	
	1500 2000 6000	4 77	14.0	1/11	45.6/87	146	273	545			
	1500	1500 3000 6000 4		4.77	14.3	1/21	87.1/87	278	143	214 ^{*3}	
15A D AH7 D						1/33	142/90	443	91	136 ^{*3}	

*1. The gear output torque is expressed by the following formula.

Gear output torque = Servomotor output torque × $\frac{1}{\text{Gear ratio}}$ × Efficiency

The gear efficiency depends on operating conditions such as the output torque, motor speed, and temperature. The values in the table are typical values for the rated torque, rated motor speed, and a surrounding air temperature of 25°C. They are reference values only.

*2. Use the Servomotor at an effective load ratio of 85% or less. The values in the table take the effective load ratio into consideration.

*3. The maximum motor speed calculated at the motor shaft is 4,500 min⁻¹ max.

- Note: 1. The gears that are mounted to Yaskawa Servomotors have not been broken in. Break in the Servomotor if necessary. First, operate the Servomotor at low speed with no load. If no problems occur, gradually increase the speed and load.
 - 2. The no-load torque for a Servomotor with a Gear is high immediately after the Servomotor starts, and it then decreases and becomes stable after a few minutes. This is a common phenomenon caused by grease circulation in the gears and it does not indicate faulty gears.
 - 3. Other specifications are the same as those for Servomotors without Gears.



The SERVOPACK speed control range is 1:5,000. If you use Servomotors at extremely low speeds (0.02 min⁻¹ or lower at the gear output shaft), if you use Servomotors with a one-pulse feed reference for extended periods, or under some other operating conditions, the gear bearing lubrication may be insufficient. That may cause deterioration of the bearing or increase the load ratio. Contact your Yaskawa representative if you use a Servomotor under these conditions.

	Momen	t of Iner	tia [×10 ⁻⁴	kg∙m²]	With Low-	Backlash	Gears	
Servomotor	Shaft (Dutput	Flange	Output	Allow- able	Allow-		
Model SGM7P-	Motor* + Gear	Gear	Motor* + Gear	Gear	Radial Load [N]	able Thrust Load [N]	LF [mm]	Reference Diagram
	0.0642	0.005	0.0632	0.004	95	431	37	
	0.119	0.060	0.118	0.059	192	895	53	
	0.109	0.050	0.109	0.050	233	1087	53	
01A D AH7 D	0.509	0.450	0.508	0.449	605	2581	75	
02A0AH10	0.470	0.207	0.464	0.201	152	707	53	Shaft Output
	0.456	0.193	0.455	0.192	192	895	53	LF I < • I
	0.753	0.490	0.751	0.488	528	2254	75	Radial load
02A0AH70	0.713	0.450	0.712	0.449	605	2581	75	
04ADAH1D	0.616	0.207	0.610	0.201	152	707	53	Thrust load
	0.979	0.570	0.969	0.560	435	1856	75	
	0.899	0.490	0.897	0.488	528	2254	75	Flange Output
04ADAH7D	1.03	0.620	1.01	0.610	951	4992	128	
08A D AH1 D	3.20	1.10	3.16	1.06	343	1465	75	
	2.70	0.600	2.69	0.590	435	1856	75	Radial load
	5.10	3.00	5.08	2.98	830	4359	128	│ _ - * - *
08A0AH70	4.90	2.80	4.89	2.79	951	4992	128	Thrust load
15AOAH1O	7.82	3.80	7.55 3.53		540	2834	128	
15ADAHBD	7.42	3.40	7.36	3.34	684	3590	128	
	9.82	5.80	9.72	5.70	2042	8840	151	
15A D AH7 D	8.82	4.80	8.79	4.77	2338	10120	151	

* The moment of inertia for the Servomotor and gear is the value without a holding brake. You can calculate the moment of inertia for a Servomotor with a Gear and Holding Brake with the following formula.

Motor moment of inertia for a Servomotor with a Holding Brake from *Ratings of Servomotors without Gears* (page 76) + Moment of inertia for the gear from the above table.

Important

During operation, the gear generates the loss at the gear mechanism and oil seal. The loss depends on the torque and motor speed conditions. The temperature rise depends on the loss and heat dissipation conditions. For the heat dissipation conditions, always refer to the following table and check the gear and motor temperatures with the actual equipment. If the temperature is too high, implement the following measures.

- Decrease the load ratio.
- Change the heat dissipation conditions.
- Use forced-air cooling for the motor with a cooling fan or other means.

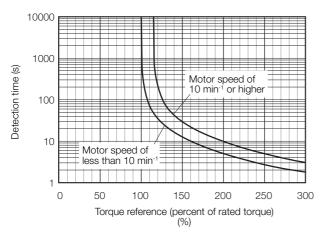
Model		Heat Sink Size										
WOder	1/5	1/11	1/21	1/33								
SGM7P-01			ŀ	4								
SGM7P-02												
SGM7P-04			В									
SGM7P-08		С										
SGM7P-15												
• A: 250 mm ×		6 mm, aluminum plate										

• B: $300 \text{ mm} \times 300 \text{ mm} \times 12 \text{ mm}$, aluminum plate

• C: 350 mm × 350 mm × 12 mm, aluminum plate

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40° C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* (page 77).

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings of Servomotors without Gears* (page 76). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

• Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

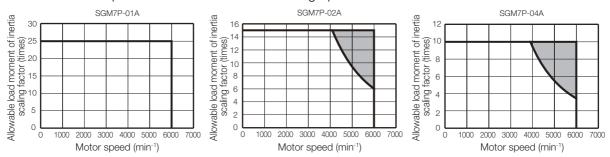
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

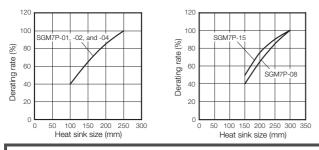
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

Derating Rates

Servomotor Heat Dissipation Conditions

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.

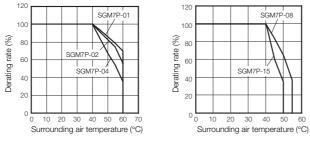




The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equipment.

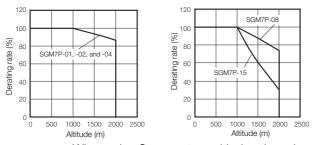
◆ Applications Where the Surrounding Air Temperature Exceeds 40°C

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a Servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs.



Applications Where the Altitude Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs.



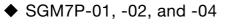
Information

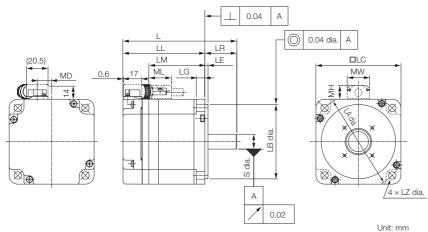
When using Servomotors with derating, change the detection timing of overload warning and overload alarm based on the overload detection level of the motor given in *Servomotor Overload Protection Characteristics* (page 80).

- Note: 1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.
 - 2. The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your Yaskawa representative.

External Dimensions

Servomotors without Gears





Model			1.1.4	Flange Dimensions							-					Approx.
SGM7P-	L*	LL*	LM	LR	LE	LG	LC	LA	LB	LΖ	S	MD	MW	MH	ML	Mass* [kg]
01A D A2D	85 (115)	60 (90)	36	25	3	6	60	70	50 ⁰ -0.025	5.5	8 -0.009	8.5	19	12	20	0.5 (0.9)
02A□A2□	97 (128.5)	67 (98.5)	43	30	3	8	80	90	70 .0.030	7	1 4 ⁰ -0.011	13.6	21	13	21	1.1 (1.9)
04A□A2□	107 (138.5)	77 (108.5)	53	30	3	8	80	90	70 .0.030	7	14 ⁰ -0.011	13.6	21	13	21	1.4 (2.2)

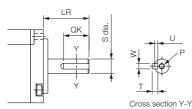
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.
 Dimensions of Servomotors with Batteryless Absolute Encoders (page 89)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

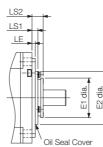
• Straight with Key and Tap



Model SGM7P-	LR	QK	S	W	Т	U	Р
01ADA6D	25	14	8 .0.009	3	3	1.8	M3×6L
02A□A6□	30	14	14 -0.011	5	5	3	M5×8L
04ADA6D	30	14	14 -0.011	5	5	3	M5×8L

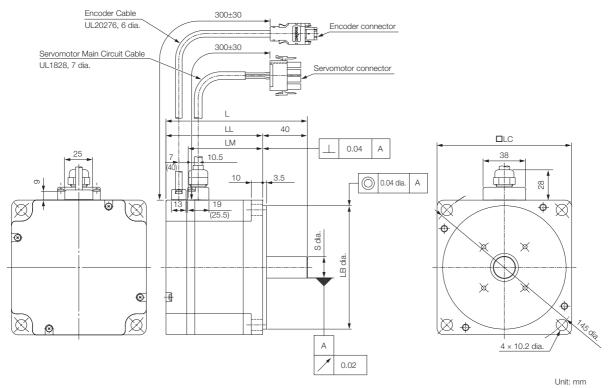
Specifications of Options

Oil Seal



Model		Dimensi	ions with	Oil Seal							
SGM7P-	E1	21 22 201 202 2									
01ADA2D	22	38	3.5	7	3						
02ADA2D	35	47	5.2	10	3						
04ADA2D	00	47	0.2	10	5						

◆ SGM7P-08 and -15



Model SGM7P-	L*	LL*	LM	LB	LC	S	Approx. Mass* [kg]
08A □ A2 □	126.5 (160)	86.5 (120)	67.6	110 _{-0.035}	120	19 .0.013	4.2 (5.9)
15A D A2 D	154.5 (187.5)	114.5 (147.5)	95.6	110 ⁰ -0.035	120	19 .0.013	6.6 (8.2)

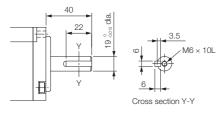
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.
 Dimensions of Servomotors with Batteryless Absolute Encoders (page 89)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

 The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

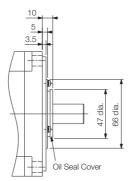
Shaft End Specifications

• Straight with Key and Tap

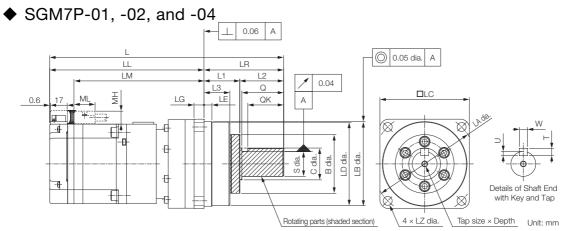


Specifications of Options

Oil Seal



Servomotors with Gears



Model	Gear	*		LL* LM					Fla	nge D	imens	ions			
SGM7P-	Ratio	L.		Γ.		LF	۲ LE	LG	В	LD	L	B	LC	LA	LZ
	1/5	141.8 (171.8		9.5 9.5)	75.5	42	2 2.2	5	29	39.	5 40)_00.025	40	46	3.4
	1/11	182		24	100	58	3 2.5	8	40	55.	5 56	b _{-0.030}	60	70	5.5
	1/21	(212)) (1	54)	100	00	, 2.0	0		00.	5 00	-0.030	00	10	0.0
	1/33	211 (241)		31 61)	107	80) 7.5	10	59	84	85	0 -0.035	90	105	9
	1/5	190		32	108	58	3 2.5	8	40	55.	5 56	0 -0.030	60	70	5.5
	1/11	(221.8	5) (16	3.5)	100	00	2.0	0	40	00.	5 50	0-0.030	00	10	0.0
	1/21	225		45	121	80) 7.5	10	59	84	95	0 0-0.035	90	105	9
	1/33	(256.8	5) (17	6.5)	121	00	1.0	10	59	04	00	-0.035	90	100	3
	1/5	200 (231.5		42 3.5)	118	58	3 2.5	8	40	55.	5 56	3 ⁰ -0.030	60	70	5.5
	1/11	235	1	55	131	80) 7.5	10	59	84	0.5	0	90	105	9
	1/21	(266.5	5) (18	6.5)	131	00	1.5	10	09	04	80	0 -0.035	90	105	9
	1/33	314 (345.		81 2.5)	157	13	3 12.5	5 13	84	114	11	5 _{-0.035}	120	135	11
Model	Flange	Dimer	sions			С	S	Tap S	ize ×	K	ey Din	nensio	ons	Appro	x. Mass*
SGM7P-	L1	L2	L3		2	C	3	Dep	oth	QK	U	W	Т		[kg]
	22	20	14.6	-	-	_	10.015	M3 >	< 6L	15	2.5	4	4	0.9	(1.3)
	28	30	20	2	0	20	16 ^{.0}	M4 >	2 OI	25	3	5	5	16	6 (2.0)
	20	30	20	2	0	20	I O-0.018	1014 2	(OL	20	3	5	5	1.0	0 (2.0)
	36	44	26	4	2	32	25.0.021	$M6 \times$	12L	36	4	8	7	3.4	(3.8)
	28	30	20	2	0	20	16 ^{.0}	M4 >	/ QI	25	3	5	5	2.3	8 (2.9)
	20	30	20	2	0	20	10-0.018	1014 /	V OL	20	0	5	5	2.4	(3.0)
	36	44	26	4	2	32	25 ⁰ -0.021	$M6 \times$	101	36	4	8	7	10	2 (5.0)
	00	44	20	-	2	02	20-0.021		IZL	00	4		'	4.2	. (0.0)
	28	30	20	2	8	20	16.0.018	M4 >	< 8L	25	3	5	5	2.6	6 (3.2)
	36	44	26	4	2	32	25 ⁰ -0.021	$M6 \times$	121	36	4	8	7	ЛБ	5 (5.3)
	00	44	20	4	۷	02	∠J _{-0.021}		ILL	00	4	0	1	4.0	(0.0)
	48	85	33	8	2	44	40_0.025	M10 >	< 20L	70	5	12	8	9.2	(10.0)

* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.

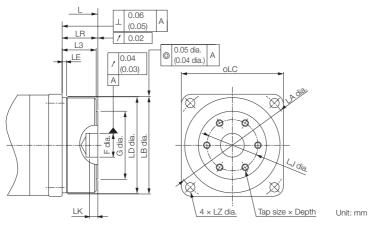
Dimensions of Servomotors with Batteryless Absolute Encoders (page 89)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the $\Sigma,$ $\Sigma\text{-II},$ and $\Sigma\text{-III}$ Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

Flange Output Face



Note: The geometric tolerance in parentheses is the value for LC = 40.

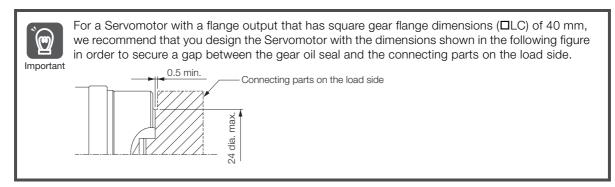
Model SGM7P-	Gear Ratio	L*	LR	LJ	F	G	LK	No. of Taps × Tap Size × Depth	Approx. Mass* [kg]
01AOAH10O	1/5	114.5 (144.5)	15	18	5+0.012	24	3	$3 \times M4 \times 6L$	0.8 (1.2)
	1/11	145	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	15(10)
01ADAHC0D	1/21	(175)	21	30	14 0	40	5	0 X 1V14 X 7 L	1.5 (1.9)
01ADAH70D	1/33	158 (188)	27	45	24+0.021	59	5	$6 \times M6 \times 10L$	3.0 (3.4)
02AOAH10O	1/5	153	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	2.2 (2.8)
	1/11	(184.5)	21	30	14 0	40	5	0 X 1014 X 7 L	2.3 (2.9)
02AOAHC0O	1/21	172	27	45	24 ^{+0.021}	59	5	$6 \times M6 \times 10L$	3.8 (4.6)
02AOAH70O	1/33	(203.5)	21	40	24 0	59	5	0 X IVIO X TUL	3.8 (4.0)
04ADAH10D	1/5	163 (194.5)	21	30	14 ^{+0.018}	40	5	$6 \times M4 \times 7L$	2.5 (3.1)
	1/11	182	27	45	24 ^{+0.021}	59	5	$6 \times M6 \times 10L$	4 1 (4 0)
04ADAHC0D	1/21	(213.5)	21	40	∠4 ₀	- 39	5	U A IVIU A TUL	4.1 (4.9)
04ADAH70D	1/33	216 (247.5)	35	60	32+0.025	84	5	6 × M8 × 12L	7.8 (8.6)

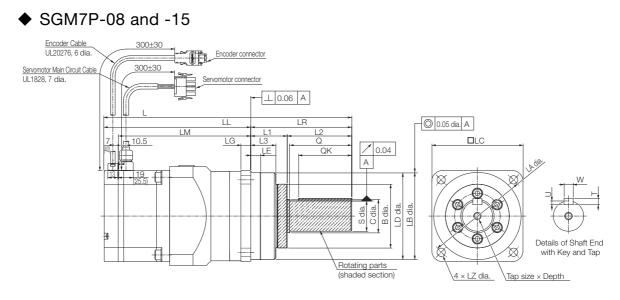
* For models that have a batteryless absolute encoder, L is 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 89)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Dimensions not found in the above table are the same as those in the table on the previous page.





Unit: mm

Model SGM7P-	Gear	L*	*	_L* LM -		Flange Dimensions											
	Ratio	L .			LR	LE	LG	В	LD	LB	LC	LA	LZ				
	1/5	253.5	173.5	154.6	80	7.5	10	59	84	85 ⁰ -0.035	90	105	9				
	1/11	(287)	(207)	134.0	00	1.5	10	09	04	00-0.035	30	105	9				
	1/21	326.5	193.5	174.6	133	12.5	13	84	114	115.0	120	135	11				
	1/33	(360)	(227)	174.0	100	12.0	10	04	114	113 _{-0.035}	120	100	11				
	1/5	354.5	221.5	202.6	133	12.5	13	84	114	115.0	120	135	11				
	1/11	(387.5)	(254.5)	202.0	100	12.0	10	04	114	113 _{-0.035}	120	100	11				
	1/21	393.5	237.5	218.6	156	12	16	122	163	165.0	170	190	14				
15AOAH7OO	1/33	(426.5)	(270.5)	210.0	150	12	10	122	103	100-0.063	170	190	14				
Model SGM7P-	Flange I	Dimensions	- 0	с	s		Size >	<		imensio	าร	Арр					

Model SGM7P-	Flange Dimensions		sions	Q	С	S	Tap Size ×	Ke	ey Dim	nensio	ns	Approx.
	L1	L2	L3	G		0	Depth	QK	U	W	Т	Mass* [kg]
	36	44	26	42	32	25 _{-0.021}	$M6 \times 12L$	36	4	8	7	6.9 (8.6)
	00	44	20	42	02	20-0.021	IVIO A 12L	00	4	0	1	7.1 (8.8)
	48	85	33	82	44	40.0	M10 × 20L	70	5	12	8	12 (13.7)
	40	00	00	02	44	40-0.025	WITU X ZUL	10	5	12	0	12 (13.7)
15AOAH1OO	48	85	33	82	44	40.00	M10 × 20L	70	5	12	8	13.9 (15.5)
	40	00	00	02	44	40-0.025	WITU X ZUL	10	5	12	0	14.4 (16.0)
	70	86	51	82	56	50 ⁰ -0.025	M10 × 20L	70	5.5	14	9	25.7 (27.3)
15AOAH7OO	70	86	51	02	50	00-0.025	WITO X ZUL	10	0.0	14	9	20.1 (21.0)

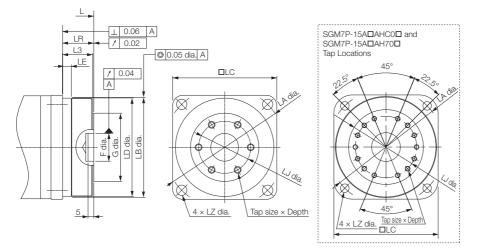
* For models that have a batteryless absolute encoder, L and LL are 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Gear dimensions are different from those of the Σ , Σ -II, and Σ -III Series.

3. The values for the shaft end are for a straight shaft with key and tap. If a key and tap are not necessary, specify shaft end code 2 for the 8th digit.

■ Flange Output Face



Model SGM7P-	Gear Ratio	L*	LR	LJ	F	G	LK	No. of Taps × Tap Size × Depth	Approx. Mass* [kg]		
08AOAH10O	1/5	200.5	27	45	24+0.021	59	5	$6 \times M6 \times 10L$	6.5 (8.2)		
	1/11	(234)	21	40	Z4 0	09	5		6.7 (8.4)		
08ADAHC0D	1/21	228.5	228.5	228.5	35	60	32+0.025	84	5	$6 \times M8 \times 12L$	10.6 (12.3)
08AOAH70O	1/33	(262)	00	00	JZ 0	04	0	0 × 100 × 12L	10.0 (12.3)		
15AOAH10O	1/5	256.5	35	60	32+0.025	84	5	$6 \times M8 \times 12L$	12.5 (14.1)		
15ADAHB0D	1/11	(289.5)	30	60	32 0	04	Э	U X IVIO X IZL	13 (14.6)		
15ADAHC0D	1/21	290.5	53	100	47+0.025	122	7	$14 \times M8 \times 12L$	22.7 (24.3)		
15ADAH70D	1/33	(323.5)	00	55 100	41 0	122	1	14 × 100 × 12L	22.7 (24.3)		

Unit: mm

* For models that have a batteryless absolute encoder, L is 8 mm greater and the approximate mass is 0.1 kg greater than the given value. Refer to the following section for the values for individual models.
 Dimensions of Servomotors with Batteryless Absolute Encoders (page 89)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. Dimensions not found in the above table are the same as those in the table on the previous page.

Dimensions of Servomotors with Batteryless Absolute Encoders

Model SGM7P-	L	LL	Approx. Mass [kg]
01A6A2ロ	93	68	0.5
	(123)	(98)	(0.9)
02A6A2ロ	105	75	1.2
	(136.5)	(106.5)	(2.0)
04A6A2ロ	115	85	1.5
	(146.5)	(116.5)	(2.3)
08A6A2ロ	134.5	94.5	4.3
	(168)	(128)	(6.0)
15A6A2ロ	162.5	122.5	6.7
	(195.5)	(155.5)	(8.3)

Servomotors without Gears

Note: The values in parentheses are for Servomotors with Holding Brakes.

Servomotors with Gears

· Shaft End Specification: Straight

Model SGM7P-Model SGM7P-Approx. Approx. Т LL L Mass [kg] Mass [kg] 122.5 (152.5) 149.5 107.5 0.9 0.8 01A6AH100 01A6AH10□ (179.5) (1.3) (1.2) (179.5)01A6AHBDD 01A6AHB0D 190 132 1.6 153 1.5 (220)(162)(2.0)(183)(1.9)01A6AHCDD 01A6AHC0□ 139 3.4 3.0 219 166 01A6AH7DD 01A6AH70ロ (249) (169) (3.8)(196)(3.4)2.4 2.3 02A6AH100 02A6AH10ロ (3.0) (2.9)198 140 161 (229.5)(171.5)(192.5) 2.5 24 02A6AHBDD 02A6AHB0ロ (3.1)(3.0)02A6AHCDD 02A6AHC0□ 233 153 4.3 180 3.9 (264.5)(184.5)(5.1) (211.5)(4.7)02A6AH7DD 02A6AH70ロ 208 150 2.7 171 2.6 04A6AH1DD 04A6AH10ロ (239.5)(181.5)(3.3)(202.5)(3.2)04A6AHBDD 04A6AHB0□ 243 163 4.6 190 4.2 (5.0)(274.5)(194.5)(5.4)(221.5)04A6AHCDD 04A6AHC0□ 191 224 322 9.3 7.9 04A6AH7DD 04A6AH70ロ (220.5) (255.5) (8.7) (354.5) (10.1) 7.0 6.6 08A6AH1ロロ 08A6AH10□ (8.7)261.5 181.5 208.5 (8.3)(295) (215)(242)7.2 6.8 08A6AHBDD 08A6AHB0D (8.9) (8.5)08A6AHCDD 08A6AHC0□ 334.5 201.5 12.1 236.5 10.7 (368) (235) (13.8) (270) (12.4) 08A6AH7ロロ 08A6AH70ロ 14.0 12.6 15A6AH1DD 15A6AH10ロ 362.5 229.5 (15.6)264.5 (14.2)(395.5)(262.5)14.5 (297.5)13.1 15A6AHBDD 15A6AHB0□ (16.1)(14.7)15A6AHCDD 15A6AHC0D 401.5 245.5 25.8 298.5 22.8 (24.4)(434.5)(278.5)(27.4)(331.5)15A6AH700 15A6AH70ロ

Note: The values in parentheses are for Servomotors with Holding Brakes.

Shaft End Specification: Flange Output

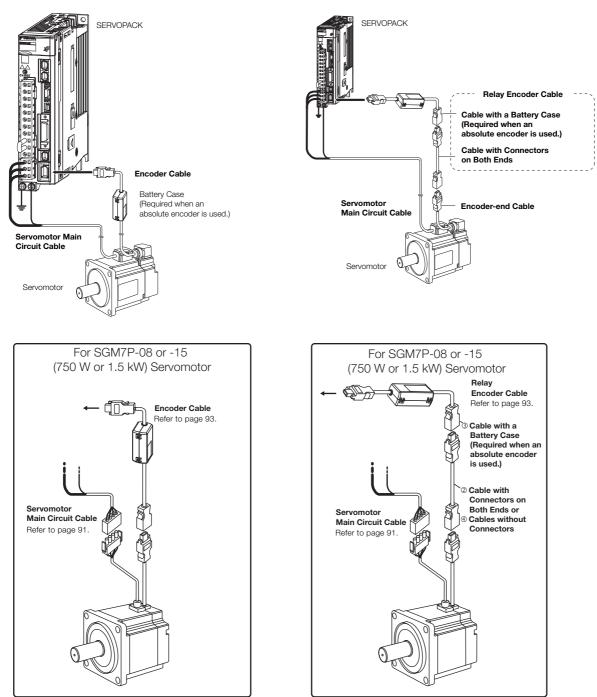
Selecting Cables

◆ Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

- 2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
- 3. Refer to the following manual for the following information.
- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor	Name	Length	Order 1	Number	Appearance			
Model	Name	(L)	Standard Cable	Flexible Cable*	Appearance			
		3 m	JZSP-CSM01-03-E	JZSP-CSM21-03-E				
SGM7P-01		5 m	JZSP-CSM01-05-E	JZSP-CSM21-05-E				
		10 m	JZSP-CSM01-10-E	JZSP-CSM21-10-E				
SGM/P-01		15 m	JZSP-CSM01-15-E	JZSP-CSM21-15-E				
100 W		20 m	JZSP-CSM01-20-E	JZSP-CSM21-20-E				
		30 m	JZSP-CSM01-30-E	JZSP-CSM21-30-E				
		40 m	JZSP-CSM01-40-E	JZSP-CSM21-40-E	SERVOPACK Motor end			
		50 m	JZSP-CSM01-50-E	JZSP-CSM21-50-E				
		3 m	JZSP-CSM02-03-E	JZSP-CSM22-03-E				
		5 m	JZSP-CSM02-05-E	JZSP-CSM22-05-E				
SGM7P-02 and	For Servo- motors	10 m	JZSP-CSM02-10-E	JZSP-CSM22-10-E				
-04		15 m	JZSP-CSM02-15-E	JZSP-CSM22-15-E				
		20 m	JZSP-CSM02-20-E	JZSP-CSM22-20-E				
200 W, 400 W		30 m	JZSP-CSM02-30-E	JZSP-CSM22-30-E				
	without	40 m	JZSP-CSM02-40-E	JZSP-CSM22-40-E				
	Holding	50 m	JZSP-CSM02-50-E	JZSP-CSM22-50-E				
	Brakes	3 m	JZSP-CMM00-03-E	JZSP-CMM01-03-E				
		5 m	JZSP-CMM00-05-E	JZSP-CMM01-05-E				
SGM7P-08		10 m	JZSP-CMM00-10-E	JZSP-CMM01-10-E				
SGIM/P-08		15 m	JZSP-CMM00-15-E	JZSP-CMM01-15-E				
750 W		20 m	JZSP-CMM00-20-E	JZSP-CMM01-20-E				
		30 m	JZSP-CMM00-30-E	JZSP-CMM01-30-E	SERVOPACK Motor end			
		40 m	JZSP-CMM00-40-E	JZSP-CMM01-40-E				
		50 m	JZSP-CMM00-50-E	JZSP-CMM01-50-E				
		3 m	JZSP-CMM20-03-E	_				
SGM7P-15		5 m	JZSP-CMM20-05-E	_				
		10 m	JZSP-CMM20-10-E	_				
1.5 kW		15 m	JZSP-CMM20-15-E	_				
		20 m	JZSP-CMM20-20-E	-				

♦ Servomotor Main Circuit Cables

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Servomotor	Name	Length	Order I	Number	Appearance
Model	Name	(L)	Standard Cable	Flexible Cable*	Appearance
		3 m	JZSP-CSM11-03-E	JZSP-CSM31-03-E	
		5 m	JZSP-CSM11-05-E	JZSP-CSM31-05-E	
		10 m	JZSP-CSM11-10-E	JZSP-CSM31-10-E	
SGM7P-01		15 m	JZSP-CSM11-15-E	JZSP-CSM31-15-E	
100 W		20 m	JZSP-CSM11-20-E	JZSP-CSM31-20-E	
		30 m	JZSP-CSM11-30-E	JZSP-CSM31-30-E	
		40 m	JZSP-CSM11-40-E	JZSP-CSM31-40-E	SERVOPACK Motor end
		50 m	JZSP-CSM11-50-E	JZSP-CSM31-50-E	
		3 m	JZSP-CSM12-03-E	JZSP-CSM32-03-E	
		5 m	JZSP-CSM12-05-E	JZSP-CSM32-05-E	
SGM7P-02 and		10 m	JZSP-CSM12-10-E	JZSP-CSM32-10-E	
-04	For Servo- motors	15 m	JZSP-CSM12-15-E	JZSP-CSM32-15-E	
		20 m	JZSP-CSM12-20-E	JZSP-CSM32-20-E	
200 W, 400 W		30 m	JZSP-CSM12-30-E	JZSP-CSM32-30-E	
	with	40 m	JZSP-CSM12-40-E	JZSP-CSM32-40-E	
	Holding	50 m	JZSP-CSM12-50-E	JZSP-CSM32-50-E	
	Brakes	3 m	JZSP-CMM10-03-E	JZSP-CMM11-03-E	
		5 m	JZSP-CMM10-05-E	JZSP-CMM11-05-E	
		10 m	JZSP-CMM10-10-E	JZSP-CMM11-10-E	
SGM7P-08		15 m	JZSP-CMM10-15-E	JZSP-CMM11-15-E	
750 W		20 m	JZSP-CMM10-20-E	JZSP-CMM11-20-E	SERVOPACK Motor end
		30 m	JZSP-CMM10-30-E	JZSP-CMM11-30-E	end L
		40 m	JZSP-CMM10-40-E	JZSP-CMM11-40-E	
		50 m	JZSP-CMM10-50-E	JZSP-CMM11-50-E	
		3 m	JZSP-CMM30-03-E	-	б— U
SGM7P-15		5 m	JZSP-CMM30-05-E	_	
		10 m	JZSP-CMM30-10-E	_	
1.5 kW		15 m	JZSP-CMM30-15-E	_	
		20 m	JZSP-CMM30-20-E	_	

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Servomotor	Name	Length	Order N	Number	Apportopos		
Model	Name	(L)	Standard Cable Flexible Cable ^{*1}		Appearance		
		3 m	JZSP-C7PI0D-03-E	JZSP-C7PI2D-03-E			
SGM7P-01, -02		5 m	JZSP-C7PI0D-05-E	JZSP-C7PI2D-05-E	SERVOPACK Encoder end		
and -04 100 W, 200 W,	For incremental	10 m	JZSP-C7PI0D-10-E	JZSP-C7PI2D-10-E			
400 W	encoder,	15 m	JZSP-C7PI0D-15-E	JZSP-C7PI2D-15-E			
	or batteryless absolute encoder	20 m	JZSP-C7PI0D-20-E	JZSP-C7PI2D-20-E			
	absolute encoder	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E			
SGM7P-08	Cable installed toward load	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end		
and -15		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E			
750 W, 1500 W		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E			
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E			
		3 m	JZSP-C7PA0D-03-E	JZSP-C7PA2D-03-E			
SGM7P-01, -02		5 m	JZSP-C7PA0D-05-E	JZSP-C7PA2D-05-E	SERVOPACK Encoder end		
and -04 100 W, 200 W,	For absolute	10 m	JZSP-C7PA0D-10-E	JZSP-C7PA2D-10-E			
400 W	encoder: With	15 m	JZSP-C7PA0D-15-E	JZSP-C7PA2D-15-E	Battery Case (battery included)		
	Battery Case ^{*2}	20 m	JZSP-C7PA0D-20-E	JZSP-C7PA2D-20-E			
	Cable installed	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E			
SGM7P-08	toward load	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	SERVOPACK Encoder end		
and -15		10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E			
750 W, 1500 W		15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	Battery Case (battery included)		
		20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	(Dattery Inciuded)		

Encoder Cables of 20 m or Less

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. If a battery is connected to the host controller, the Battery Case is not required. If so, use a cable for incremental encoders.

♦ Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L) Order Numbe		Appearance
	Encoder-end Cable (for all types of encoders) Cable installed toward load	0.3 m	JZSP-C7PRCD-E	
	Cables with Connectors on	30 m	JZSP-UCMP00-30-E	SERVOPACK end Encoder end
	Both Ends	40 m	JZSP-UCMP00-40-E	
All SGM7P models	(for all types of encoders)	50 m	JZSP-UCMP00-50-E	
	Cable with a Battery Case (Required when an absolute encoder is used.*)	0.3 m	JZSP-CSP12-E	SERVOPACK end Encoder end

* This Cable is not required if you use a Servomotor with a Batteryless Absolute Encoder, and you connect a battery to the host controller.

SGM7G

Model Designations





* The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.

1	3rd dig	t Power Supply Voltage			
	Code	Specification			
	A 200 VAC				
	4th dig	it Serial Encoder			

Code	Specification
6	24-bit batteryless absolute
7	24-bit absolute
F	24-bit incremental

5th digit Design Revision Order

А

Code	Specification
2	Straight without key
6	Straight with key and tap
Zthe all a	Onting

6th digit Shaft End

1	7th digit Options							
	Code	Specification						
	1	Without options						
	С	With holding brake (24 VDC)						
	E	With oil seal and holding brake (24 VDC)						
	S	With oil seal						

Specifications and Ratings

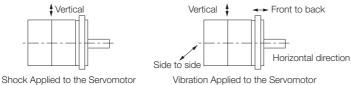
Specifications

	200 V									
M	odel SGM7G-	03A 05A	09A	13A	20A	30A 44A	55A	75A	1AA	1EA
Time Rating					Cor	ntinuous				
Thermal Class	i				UL:	F, CE: F				
Insulation Res	istance			50	DO VDC	, 10 M Ω m	in.			
Withstand Vol	tage			1,	500 VA	C for 1 min	ute			
Excitation					Permar	nent magne	t			
Mounting					Flange	e-mounted				
Drive Method					Dire	ect drive				
Rotation Direc	tion	Counterclock	wise (C	CW) for	forward	reference wh	en view	ed from	n the loa	id side
Vibration Clas					V15					
	Surrounding Air Temperature	0°C to 40°C (60°C max.)*3								
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)								
Environmen- tal Condi- tions	Installation Site	 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. (With derating, usage is possible between 1,000 m and 2,000 m.)*³ Must be free of strong magnetic fields. 								
	Storage Environment	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)								
Shock Resistance ^{*2}	Impact Acceleration Rate at Flange				49	0 m/s ²				
Resistance -	Number of Impacts				2	times				
Vibration Resistance ^{*2}	Vibration Acceleration Rate at Flange	49 m/s ² (24.5 m/s ² front to back) 24.5 m/s ²								
Annlinghia	SGD7S-	3R8A	7R6A	120A	180A	330A	470A	550A	590A	780A
Applicable SERVOPACKs	SGD7W- SGD7C-	5R5A ^{*4} , 7R6A ^{*4} 7A6A –								

*1. A vibration class of V15 indicates a vibration amplitude of 15 µm maximum on the Servomotor without a load at the rated motor speed.

*2. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.

The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



Shock Applied to the Servorhotor Vi

*3. Refer to the following section for the derating rates.

Derating Rates (page 102)

*4. If you use a Servomotor together with a Σ -7W or Σ -7C SERVOPACK, the control gain may not increase as much as with a Σ -7S SERVOPACK and other performances may be lower than those achieved with a Σ -7S SERVOPACK.

Servomotor Ratings

	Voltage								
	Model SGM7G-		03A	05A	09A				
Rated C	Dutput ^{*1}	kW	0.3	0.45	0.85	1.3	1.8		
Rated T	orque ^{*1, *2}	N∙m	1.96	2.86	5.39	8.34	11.5		
Instanta	aneous Maximum Torque ^{*1}	N∙m	5.88	8.92	14.2	23.3	28.7		
Rated C	Current ^{*1}	Arms	2.8	3.8	6.9	10.7	16.7		
Instanta	aneous Maximum Current ^{*1}	Arms	8.0	11	17	28	42		
Rated N	Notor Speed ^{*1}	min ⁻¹			1500				
Maximu	Im Motor Speed ^{*1}	min ⁻¹			3000				
Torque	Constant	N•m/Arms	0.776	0.854	0.859	0.891	0.748		
Motor N	Noment of Inertia	×10 ⁻⁴ kg·m ²	2.48 (2.73)	3.33 (3.58)	13.9 (16.0)	19.9 (22.0)	26.0 (28.1)		
Rated F	Power Rate ^{*1}	kW/s	15.5 (14.1)	24.6 (22.8)			50.9 (47.1)		
Rated A	Angular Acceleration Rate ^{*1}	rad/s ²	7900 (7180)	8590 (7990)	3880 4190 4420 (3370) (3790) (4090)				
Heat Si	nk Size ^{*3}	mm	250 × 250 × 6 400 × 400 × 20 (aluminum) (steel)			20			
Protecti	ve Structure ^{*4}			Totally encl	osed, self-c	ooled, IP67			
	Rated Voltage	V	24 VDC ^{+10%} ₀						
\$ \$	Capacity	W	10						
rake ons [*]	Holding Torque	N•m	4	.5	12.7	19	9.6		
ig B cati	Coil Resistance	Ω (at 20°C)	5	6		59			
Holding Brake Specifications ^{*5}	Rated Current	A (at 20°C)	0.	43		0.41			
Ъд	Time Required to Release Brake	ms			100				
	Time Required to Brake	ms		80					
	le Load Moment of Inertia Moment of Inertia Ratio) ^{*6}		15 t	imes		5 times			
	With External Regenerative F External Dynamic Brake Res	15 times		10 times					
s, 10	LF	mm	4	0		58			
Allowable Shaft Loads*7	Allowable Radial Load	Ν		490		686	980		
Allo S Lo	Allowable Thrust Load	Ν		98		343	392		

Note: The values in parentheses are for Servomotors with Holding Brakes.

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values with an aluminum or steel heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*5. Observe the following precautions if you use a Servomotor with a Holding Brake.

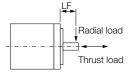
• The holding brake cannot be used to stop the Servomotor.

• The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.

The 24-VDC power supply is not provided by Yaskawa.

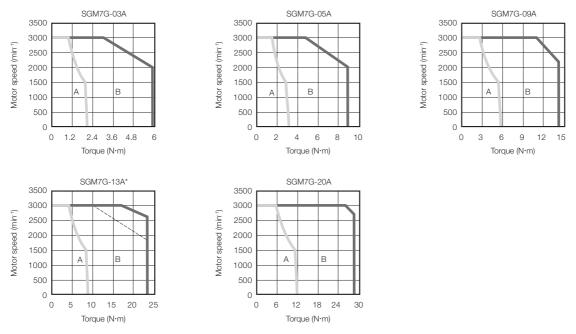
*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

*7. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



Torque-Motor Speed Characteristics

A : Continuous duty zone B : Intermittent duty zone (solid lines): With three-phase 200-V or single-phase 230-V input (dotted lines): With single-phase 200-V input



* A single-phase power input can be used in combination with the SGD7S-120ADDA008.

Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Ratings

Voltage			200 V						
Model SGM7G-			30A	30A*6	44A	55A	75A	1AA	1EA
Rated Output ^{*1}		kW	2.9	2.4	4.4	5.5	7.5	11	15
Rated Torque ^{*1,*2}		N∙m	18.6	15.1	28.4	35.0	48.0	70.0	95.4
Instantaneous Maximum Torque ^{*1}		N∙m	54.0	45.1	71.6	102	119	175	224
Rated Current ^{*1}		Arms	23.8	19.6	32.8	37.2	54.7	58.6	78.0
Instantaneous Maximum Current*1		Arms	70	56	84	110	130	140	170
Rated Motor Speed ^{*1}		min⁻¹	1500	1500	1500	1500	1500	1500	1500
Maximum Motor Speed ^{*1}		min ⁻¹	3000	3000	3000	3000	3000	2000	2000
Torque Constant		N•m/Arms	0.848	0.848	0.934	1.00	0.957	1.38	1.44
Motor Moment of Inertia		×10 ⁻⁴ kg·m ²	46.0 (53.9)	46.0 (53.9)	67.5 (75.4)	89.0 (96.9)	125 (133)	242 (261)	303 (341)
Rated Power Rate ^{*1}		kW/s	75.2 (64.2)	49.5 (42.2)	119 (107)	138 (126)	184 (173)	202 (188)	300 (267)
Rated Angular Acceleration Rate*1		rad/s ²	4040 (3450)	3280 (2800)	4210 (3770)	3930 (3610)	3840 (3610)	2890 (2680)	3150 (2800)
Heat Sink Size*3		mm	550 × 550 × 30 (steel) (s					650×6 (ste	
Protective Structure ^{*4}			Totally enclosed, self-cooled, IP67						
Holding Brake Specifications ^{*5}	Rated Voltage	V	24 VDC ^{+10%}						
	Capacity	W		18.5 25		5	32	35	
	Holding Torque	N∙m		43.1		72.6		84.3	114.6
	Coil Resistance	Ω (at 20°C)	31		23		18	17	
	Rated Current	A (at 20°C)	0.77		1.0	05	1.33	1.46	
	Time Required to Release Brake	ms	170 250						
	Time Required to Brake	ms	100			80			
Allowable Load Moment of Inertia (Motor Moment of Inertia Ratio) ^{*6}		5 times	3 times		5 times				
With External Regenerative Resistor and External Dynamic Brake Resistor			10 times	7 times		10 times			
Allowable Shaft Loads*7	LF	mm	79					16	
	Allowable Radial Load	Ν	1470			1764		4998	
	Allowable Thrust Load	Ν	490			588			2156

Note: The values in parentheses are for Servomotors with Holding Brakes.

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values with an aluminum or steel heat sink of the dimensions given in the table.

*3. Refer to the following section for the relation between the heat sinks and derating rate.

*4. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*5. Observe the following precautions if you use a Servomotor with a Holding Brake.

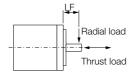
• The holding brake cannot be used to stop the Servomotor.

• The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.

The 24-VDC power supply is not provided by Yaskawa.

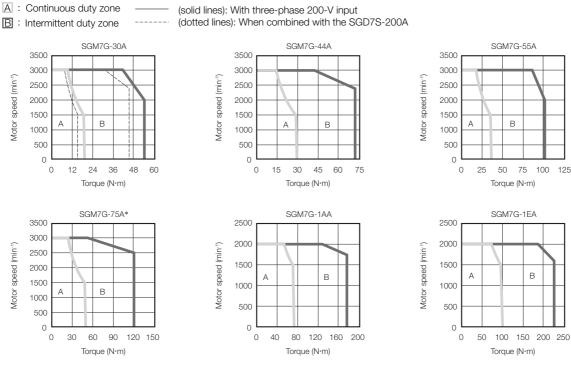
*6. The motor moment of inertia scaling factor is the value for a standard Servomotor without a Holding Brake.

*7. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



*8. This is the value if you combine the SGM7G-30A with the SGD7S-200A.

Torque-Motor Speed Characteristics



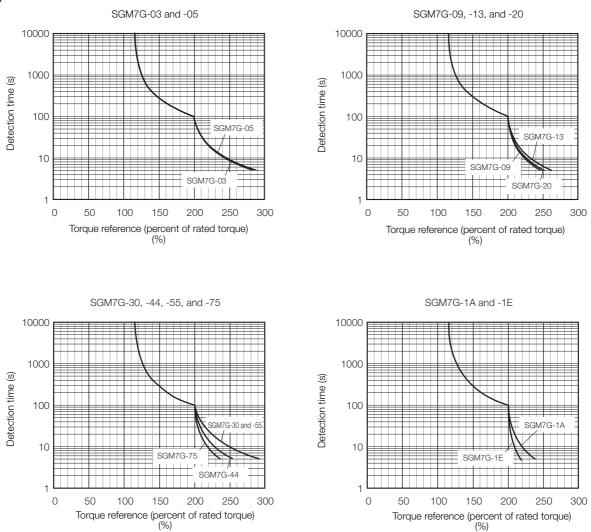
* Use an SGM7G-75A Servomotor with a Holding Brake with an output torque of 14.4 N·m (30% of the rated torque) or lower when using the Servomotor in continuous operation at the maximum motor speed of 3,000 min⁻¹.

Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 99.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Servomotor Ratings* (pages 96 and 98). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

When an External Regenerative Resistor Is Required

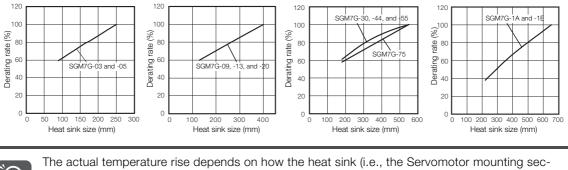
Install the External Regenerative Resistor. Refer to the following section for the recommended products.

 \bigcirc

Derating Rates

Servomotor Heat Dissipation Conditions

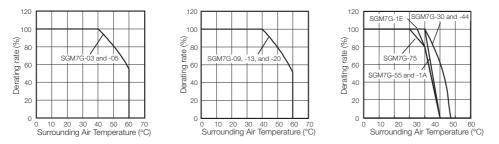
The Servomotor ratings are the continuous allowable values when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.



tion) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equip-Important ment.

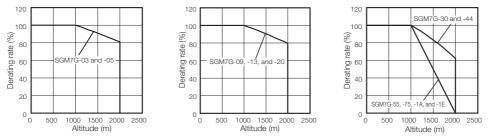
Servomotor Derating Rates for Surrounding Air Temperatures

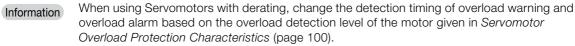
Apply a suitable derating rate from the following graphs according to the surrounding air temperature of the Servomotor (60°C max.).



Applications Where the Altitude Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs.



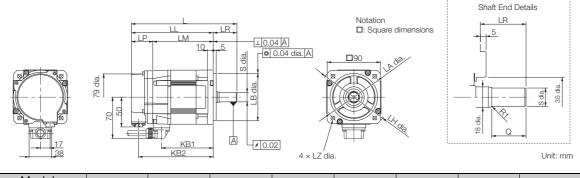


- Note: 1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.
 - 2. The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your Yaskawa representative.

External Dimensions

Servomotors without Holding Brakes

SGM7G-03 and -05



Model SGM7G-	L^{*1}	LL^{*1}	LM	LP^{*1}	LR	KB1	KB2 ^{*1}	KL1
03ADA21	166 ^{*2}	126	90	36	40 ^{*2}	75	114	70
05ADA21	179	139	103	36	40	88	127	70

Model			Flang	e Dimen		Shaft End Di	Approx.			
SGM7G-	LA	LB	LC	LE	LG	LH	LZ	S	Q	Mass [kg]
03A D A21	100	80 .0.030	90	5	10	120	6.6	16 .0.011 *2	30 ^{*2}	2.6
05A D A21	100	80 .0.030	90	5	10	120	6.6	16 _{-0.011}	30	3.2

*1. For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

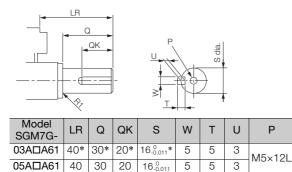
Dimensions of Servomotors with Batteryless Absolute Encoders (page 109)

*2. The L, LR, S, and Q dimensions of these Servomotors are different from those of the Σ -V-series SGMGV Servomotors.

Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

- 2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.
- Shaft End Specifications
- · Straight with Key and Tap



* The shaft end dimensions of these Servomotors are different from those of the Σ -V-series SGMGV Servomotors.

Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Connector Specifications

Encoder Connector (24-bit Encoder)

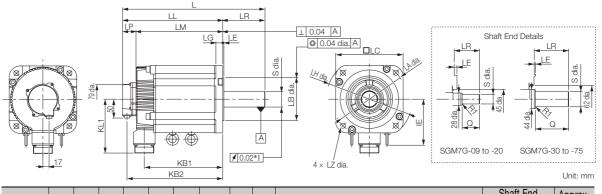
	1	PS	6*	BAT(+)
A 3 0 1	2	/PS	7	-
$H(7\circ\circ\circ\circ4)$	3	_	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

- * A battery is required only for an absolute encoder.
- Receptacle: CM10-R10P-D
- Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-□-D for Right-angle Plug CM10-SP10S-□-D for Straight Plug
- (
 depends on the applicable cable size.)
 Manufacturer: DDK Ltd.

Servomotor Connector

PE	FG (frame ground)	3	Phase U
5	_	2	Phase V
4	_	1	Phase W
	ufacturer: Japan Av stry, Ltd.	viatic	n Electronics

♦ SGM7G-09 to -75



Model SGM7G-	L*2	LL*2	LM	LP^{*2}	LR	KB1	KB2*2	IE	KL1		Flange Dimensions						Shaft End Dimensions		
Sum u-										LA	LB	LC	LE	LG	LH	LZ	S	Q	[kg]
09A□A21	195	137	101	36	58	83	125	-	104	145	110 _{-0.035}	130	6	12	165	9	24 _{-0.013} ^{° *3}	40	5.5
13A□A21	211	153	117	36	58	99	141	-	104	145	110 _{-0.035}	130	6	12	165	9	24 -0.013 *3	40	7.1
20A□A21	229	171	135	36	58	117	159	I	104	145	110 _{-0.035}	130	6	12	165	9	24 ⁰ -0.013	40	8.6
30A□A21	239	160	124	36	79	108	148	I	134	200	114.3 [0.025	180	3.2	18	230	13.5	35 +0.01	76	13.5
44A□A21	263	184	148	36	79	132	172	-	134	200	114.3 [0.025	180	3.2	18	230	13.5	35 ° ^{+0.01}	76	17.5
55A0A21	334	221	185	36	113	163	209	123	144	200	114.3 _{-0.025}	180	3.2	18	230	13.5	42 -0.016	110	21.5
75A0A21	380	267	231	36	113	209	255	123	144	200	114.3 ⁰ -0.025	180	3.2	18	230	13.5	42 -0.016	110	29.5

*1. This is 0.04 for the SGM7G-55 or SGM7G-75.

*2. For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

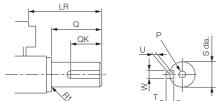
Dimensions of Servomotors with Batteryless Absolute Encoders (page 109)

*3. The S dimensions of these Servomotors are different from those of the Σ-V-series SGMGV Servomotors. Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

- Shaft End Specifications
- Straight with Key and Tap



Model SGM7G-	LR	Q	QK	S	W	т	U	Р
09A□A61	58	40	25	24 _{-0.013} *	8*	7*	4*	
13A□A61	58	40	25	24 _{-0.013} *	8*	7*	4*	M5×12L
20A□A61	58	40	25	24.0.013	8	7	4	
30A□A61	79	76	60	35+0.01	10	8	5	M12×25L
44ADA61	79	76	60	35+0.01	10	8	5	WITZAZUL
55ADA61	113	110	90	42.0.016	12	8	5	M16×32L
75ADA61	113	110	90	42.0.016	12	8	5	WITUNUZL

* The shaft end dimensions of these Servomotors are different from those of the Σ-V-series SGMGV Servomotors. Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Connector Specifications

• Encoder Connector (24-bit Encoder)

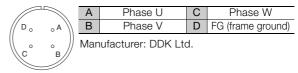
	1	PS	6*	BAT(+)
A 3 0 1 M	2	/PS	7	-
	3	-	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute encoder.

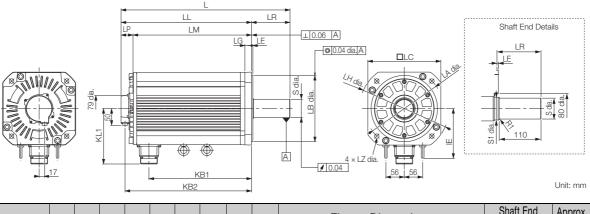
Receptacle: CM10-R10P-D

- Applicable plug: Not provided by Yaskawa.
- Plug: CM10-AP10S-D-D for Right-angle Plug
- CM10-SP10S-D-D for Straight Plug (D depends on the applicable cable size.)
- Manufacturer: DDK Ltd.

Servomotor Connector



♦ SGM7G-1A and -1E



Model SGM7G-	L*	LL*	LM	LP*	LR	KB1	KB2*	IE	KL1		Flange Dimensions						Shaft End Dimensions		Approx. Mass	
Salvir G-										LA	LB	LC	LE	LG	LH	LZ	S	S1	[kg]	
1AADA21	447	331	295	36	116	247	319	150	168	235	200 -0.046	220	4	20	270	13.5	42 -0.016	50	57	
1EADA21	509	393	357	36	116	309	381	150	168	235	200 -0.046	220	4	20	270	13.5	55 +0.030 +0.011	60	67	

* For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

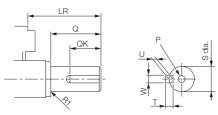
Dimensions of Servomotors with Batteryless Absolute Encoders (page 109)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

· Straight with Key and Tap



Model SGM7G-	LR	Q	QK	S	W	Т	U	Р
1AADA61	116	110	90	42.0.016	12	8	5	M16×32L
1EADA61	116	110	90	55 ^{+0.030} _{+0.011}	16	10	6	M20×40L

Connector Specifications

Encoder Connector (24-bit Encoder)

		· ·		,
	1	PS	6*	BAT(+)
	2	/PS	7	-
	3	-	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

A battery is required only for an absolute encoder. Receptacle: CM10-R10P-D

Applicable plug: Not provided by Yaskawa.

- Plug: CM10-AP10S-□-D for Right-angle Plug
- CM10-SP10S-□-D for Straight Plug
- (
 depends on the applicable cable size.)
 Manufacturer: DDK Ltd.

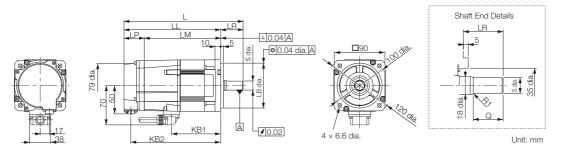
Servomotor Connector



А	Phase U	С	Phase W						
В	Phase V	D	FG (frame ground)						
Manufacturer: DDK Ltd.									

Servomotors with Holding Brakes

♦ SGM7G-03 and -05



Model SGM7G-	L*1	LL^{*1}	LM	LP^{*1}	LR	KB1	KB2 ^{*1}	KL1
03ADA2C	199 ^{*2}	159	123	36	40 ^{*2}	75	147	70
05ADA2C	212	172	136	36	40	88	160	70

Model SGM7G-	Flange Dimensions Shaft End Dimen- sions										
3GIVI7 G-	LA	LB	LC	LE	LG	LH	LZ	S	Q	[kg]	
03ADA2C	100	80 .0.030	90	5	10	120	6.6	16 .0.011*2	30 ^{*2}	3.6	
05ADA2C	100	80 .0.030	90	5	10	120	6.6	16 .0.011	30	4.2	

*1. For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 109)

*2. The L, LR, S, and Q dimensions of these Servomotors are different from those of the Σ-V-series SGMGV Servomotors.

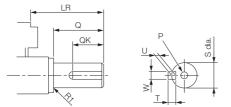
Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

Straight with Key and Tap



Model SGM7G-	LR	Q	QK	S	W	Т	U	Р
03A□A6C	40*	30*	20*	16.0.011*	5	5	3	M5×12L
05A□A6C	40	30	20	16.0.011	5	5	3	NIO A 12L

* The shaft end dimensions of these Servomotors are different from those of the Σ -V-series SGMGV Servomotors.

Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Connector Specifications

Encoder Connector (24-bit Encoder)



	1	P5	6*	BAI(+)
• • ¹)	2	/PS	7	-
° °4)	3	-	8	-
8//	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)

* A battery is required only for an absolute encoder.

Receptacle: CM10-R10P-D

FG (frame ground)

- Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-□-D for Right-angle Plug
- CM10-SP10S-□-D for Straight Plug (□ depends on the applicable cable size.)
- Manufacturer: DDK Ltd.

3

Phase U

Servomotor Connector

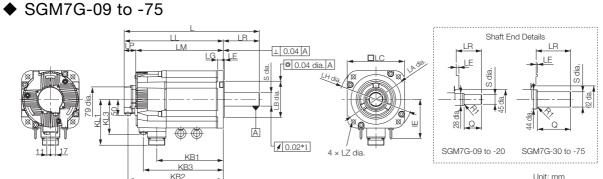
PE
5 4
Ma Indi

 5
 2
 Phase V

 4
 1
 Phase W

 Manufacturer: Japan Aviation Electronics

Nanufacturer: Japan Aviation Electronics ndustry, Ltd.



																				Unit. I	11111
Model SGM7G-	L*2	LL ^{*2}	LM	LP*2	LR	KB1	KB2*2	KB3	IE	KL1	KL3		Flan	ge D	imen	sior	IS		Shaft E Dimensi		Approx. Mass [kg]
50IVI7 0-												LA	LB	LC	LE	LG	LH	LZ	S	Q	ividos [ny]
09ADA2C	231	173	137	36	58	83	161	115	-	104	80	145	110 _{-0.035}	130	6	12	165	9	24 ⁰ -0.013 ^{*3}	40	7.5
13A0A2C	247	189	153	36	58	99	177	131	-	104	80	145	110 _{-0.035}	130	6	12	165	9	24 .0.013*3	40	9.0
20ADA2C	265	207	171	36	58	117	195	149	-	104	80	145	110 _{-0.035}	130	6	12	165	9	24 -0.013	40	11.0
30A□A2C	287	208	172	36	79	108	196	148	-	134	110	200	114.3 ⁰ -0.025	180	3.2	18	230	13.5	35 +0.01	76	19.5
44ADA2C	311	232	196	36	79	132	220	172	-	134	110	200	114.3 ⁰ -0.025	180	3.2	18	230	13.5	35 +0.01	76	23.5
55ADA2C	378	265	229	36	113	163	253	205	123	144	110	200	114.3 ⁰ -0.025	180	3.2	18	230	13.5	42 -0.016	110	27.5
75A□A2C	424	311	275	36	113	209	299	251	123	144	110	200	114.3 ° -0.025	180	3.2	18	230	13.5	42 .0.016	110	35.0

*1. This is 0.04 for the SGM7G-55 or SGM7G-75.

*2. For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

Dimensions of Servomotors with Batteryless Absolute Encoders (page 109)
 *3. The S dimensions of these Servomotors are different from those of the Σ-V-series SGMGV Servomotors.

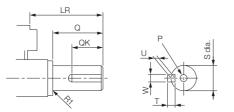
Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

Shaft End Specifications

· Straight with Key and Tap



Model SGM7G-	LR	Q	QK	S	W	т	U	Р
09A□A6C	58	40	25	24 _{-0.013} *	8*	7*	4*	
13A□A6C	58	40	25	24 _{-0.013} *	8*	7*	4*	M5×12L
20ADA6C	58	40	25	24 _{-0.013}	8	7	4	
30A□A6C	79	76	60	35 ^{+0.01}	10	8	5	M12×25L
44A□A6C	79	76	60	35+0.01	10	8	5	
55A□A6C	113	110	90	42.0.016	12	8	5	M16×32L
75A□A6C	113	110	90	42.0.016	12	8	5	WITUXJZL

 The shaft end dimensions of these Servomotors are different from those of the Σ-V-series SGMGV Servomotors.

Models that have the same installation dimensions as the SGMGV Servomotors are also available. Contact your Yaskawa representative for details.

Connector Specifications

Encoder Connector (24-bit Encoder)

		``		,							
	1	PS	6*	BAT(+)							
31	2	/PS	7	-							
0 0 0 04	3	_	8	-							
10 ° 8	4	PG5V	9	PG0V							
	5*	BAT(-)	FG (frame ground)								
	* A betten (in required only for an abaclute										

* A battery is required only for an absolute encoder. Receptacle: CM10-R10P-D

Applicable plug: Not provided by Yaskawa. Plug: CM10-AP10S-D-D for Right-angle Plug CM10-SP10S-D-D for Straight Plug (D depends on the applicable cable size.) Manufacturer: DDK Ltd.

Servomotor Connector

	-				
\square		Α	Phase U	С	Phase W
D _o	₀ A)\	В	Phase V	D	FG (frame ground)
ို	в	Man	ufacturer: DDK Lto		

Brake Connector



 1
 Brake terminal

 2
 Brake terminal

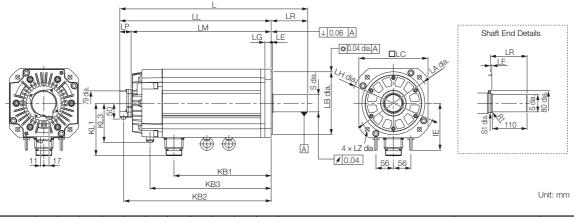
 Note: There is no voltage polarity for the brake terminals.
 Brake terminals.

 Receptacle: CM10-R10P-D
 Applicable plug: Not provided by Yaskawa.

 Plug: CM10-AP2S-□-D for Right-angle Plug CM10-SP2S-□-D for Straight Plug (□ depends on the applicable cable size.)

 Manufacturer: DDK Ltd.

♦ SGM7G-1A, 1E



Model	*	LL*	тм	LP*	IR	KB1	KB2*	KB3	IE	KL1 KL3			Flange Dimensions						Shaft End Di	Approx.		
SGM7G-						NDT	NDZ	ND0	1	NL I	NL0	LA	LB	LC	LE	LG	LH	LZ	S	S1	Mass [kg]	
1AADA2C	498	382	346	36	116	247	370	315	150	168	125	235	200 -0.046	220	4	20	270	13.5	42 -0.016	50	65	
1EADA2C	598	482	446	36	116	309	470	385	150	168	125	235	200 .0.046	220	4	20	270	13.5	55 +0.030 +0.011	60	85	

* For models that have a batteryless absolute encoder, L, LL, LP, and KB2 are 8 mm greater than the given value. Refer to the following section for the values for individual models.

I ☐ Dimensions of Servomotors with Batteryless Absolute Encoders (page 109)

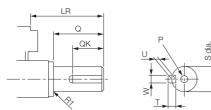
Note: 1. The values in parentheses are for Servomotors with Holding Brakes.

2. The values for a straight, without key specification are given. Refer to the information given below for other shaft end specifications and option specifications.

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Shaft End Specifications

· Straight with Key and Tap



Model SGM7G-	LR	Q	QK	S	W	Т	U	Р
1AA□A6C	116	110	90	42_0.016	12	8	5	M16×32L
1EA□A6C	116	110	90	55+0.030	16	10	6	M20×40L

Connector Specifications

• Encoder Connector (24-bit Encoder)

	1	PS	6*	BAT(+)
3 1	2	/PS	7	-
70 0 0 04	3	_	8	-
10 8	4	PG5V	9	PG0V
	5*	BAT(-)	10	FG (frame ground)
	2 3 4 5*	/PS _	7 8 9	

* A battery is required only for an absolute encoder.
Receptacle: CM10-R10P-D
Applicable plug: Not provided by Yaskawa.
Plug: CM10-AP10S-□-D for Right-angle Plug CM10-SP10S-□-D for Straight Plug (□ depends on the applicable cable size.)
Manufacturer: DDK Ltd.

Servomotor Connector



Α	Phase U	С	Phase W							
В	Phase V	D	FG (frame ground)							
Manufacturer: DDK Ltd.										

Brake Connector



 1
 Brake terminal

 2
 Brake terminal

 Note: There is no voltage polarity for the brake terminals.
 Brake terminals.

 Receptacle: CM10-R10P-D
 Applicable plug: Not provided by Yaskawa.

 Plug: CM10-AP2S-□-D for Right-angle Plug CM10-SP2S-□-D for Straight Plug (□ depends on the applicable cable size.)
 Manufacturer: DDK Ltd.

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Dimensions of Servomotors with Batteryless Absolute Encoders

Model SGM7G-	L	LL	LP	KB2	Approx. Mass [kg]			
03A6A21	174	134	44	122	2.6			
05A6A21	187	147	44	135	3.2			
09A6A21	203	145	44	133	5.5			
13A6A21	219	161	44	149	7.1			
20A6A21	237	179	44	167	8.6			
30A6A21	247	168	44	156	13.5			
44A6A21	271	192	44	180	17.5			
55A6A21	342	229	44	217	21.5			
75A6A21	388	275	44	263	29.5			
1AA6A21	455	339	44	327	57			
1EA6A21	514	401	44	389	67			

Servomotors without Holding Brakes

Servomotors with Holding Brakes

Model SGM7G-	L	LL	LP	KB2	Approx. Mass [kg]
03A6A2C	207	167	44	155	3.6
05A6A2C	220	180	44	168	4.2
09A6A2C	239	181	44	169	7.5
13A6A2C	255	197	44	185	9.0
20A6A2C	273	215	44	203	11
30A6A2C	295	216	44	204	19.5
44A6A2C	319	240	44	228	23.5
55A6A2C	386	273	44	261	27.5
75A6A2C	432	319	44	307	35.0
1AA6A2C	506	390	44	378	65
1EA6A2C	606	490	44	478	85

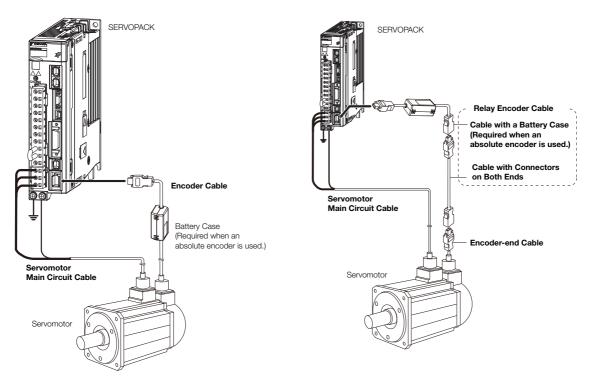
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



- Note: 1. Cables with connectors on both ends that are compliant with an IP67 protective structure and European Safety Standards are not available from Yaskawa for the SGM7G Servomotors. You must make such a cable yourself. Use the Connectors specified by Yaskawa for these Servomotors. (These Connectors are compliant with the standards.) Yaskawa does not specify what wiring materials to use.
 - 2. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.
 - 3. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
 - 4. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
 - Order numbers and specifications for wiring materials
 - L Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Name	Length (L)	Order Number*	Appearance
		3 m	JZSP-CVM21-03-E	
		5 m	JZSP-CVM21-05-E	
		10 m	JZSP-CVM21-10-E	SERVOPACK end Motor end
	For Servomotors without Holding	15 m	JZSP-CVM21-15-E	
	Brakes	20 m	JZSP-CVM21-20-E	
		30 m	JZSP-CVM21-30-E	
SGM7G-03		40 m	JZSP-CVM21-40-E	
and -05		50 m	JZSP-CVM21-50-E	
300 W.		3 m	JZSP-CVM41-03-E	
450 W		5 m	JZSP-CVM41-05-E	
		10 m	JZSP-CVM41-10-E	SERVOPACK end Motor end
	For Servomotors	15 m	JZSP-CVM41-15-E	
	with Holding Brakes	20 m	JZSP-CVM41-20-E	
		30 m	JZSP-CVM41-30-E	
		40 m	JZSP-CVM41-40-E	
		50 m	JZSP-CVM41-50-E	

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Servo-		Connec-	Length	Order N	Number	
motor Model	Name	tor Spec- ifications	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
			3 m	JZSP-UVA101-03-E	JZSP-UVA121-03-E	
			5 m	JZSP-UVA101-05-E	JZSP-UVA121-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA101-10-E	JZSP-UVA121-10-E	
			15 m	JZSP-UVA101-15-E	JZSP-UVA121-15-E	
	For Servomotors		20 m	JZSP-UVA101-20-E	JZSP-UVA121-20-E	
	without Holding Brakes		3 m	JZSP-UVA102-03-E	JZSP-UVA122-03-E	
			5 m	JZSP-UVA102-05-E	JZSP-UVA122-05-E	SERVOPACK Motor end
	SGM7G-	Right-angle	10 m	JZSP-UVA102-10-E	JZSP-UVA122-10-E	
SGM7G-			15 m	JZSP-UVA102-15-E	JZSP-UVA122-15-E	
09 and			20 m	JZSP-UVA102-20-E	JZSP-UVA122-20-E	
-13			3 m	JZSP-UVA131-03-E	JZSP-UVA141-03-E	SERVOPACK end Motor end
850 W,		Straight	5 m	JZSP-UVA131-05-E	JZSP-UVA141-05-E	
1.3 kW			10 m	JZSP-UVA131-10-E	JZSP-UVA141-10-E	C
	For Servomotors		15 m	JZSP-UVA131-15-E	JZSP-UVA141-15-E	SERVOPACK end Brake end
	with Holding		20 m	JZSP-UVA131-20-E	JZSP-UVA141-20-E	
	Brakes (Set of Two Cables ^{*2})		3 m	JZSP-UVA132-03-E	JZSP-UVA142-03-E	SERVOPACK Motor end
			5 m	JZSP-UVA132-05-E	JZSP-UVA142-05-E	
		Right-angle	10 m	JZSP-UVA132-10-E	JZSP-UVA142-10-E	
			15 m	JZSP-UVA132-15-E	JZSP-UVA142-15-E	Brake end Motor end
			20 m	JZSP-UVA132-20-E	JZSP-UVA142-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable).

When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables.

• Cable with Straight Plug: JZSP-U7B23-

Cable with Right-angle Plug: JZSP-U7B24-□□-E

Servo-		Connec-	Longth	Order I	Number	
motor Model	Name	tor Spec- ifications	Length (L) Standard Cable Flexible Cable ^{*1}		Appearance	
			3 m	JZSP-UVA301-03-E	JZSP-UVA321-03-E	
		5 m	JZSP-UVA301-05-E	JZSP-UVA321-05-E	SERVOPACK Motor end	
		Straight	10 m	JZSP-UVA301-10-E	JZSP-UVA321-10-E	
			15 m	JZSP-UVA301-15-E	JZSP-UVA321-15-E	
	For Servomotors without Holding		20 m	JZSP-UVA301-20-E	JZSP-UVA321-20-E	
	Brakes		3 m	JZSP-UVA302-03-E	JZSP-UVA322-03-E	
	Diditio		5 m	JZSP-UVA302-05-E	JZSP-UVA322-05-E	SERVOPACK Motor end
		Right-angle	10 m	JZSP-UVA302-10-E	JZSP-UVA322-10-E	
			15 m	JZSP-UVA302-15-E	JZSP-UVA322-15-E	
SGM7G-			20 m	JZSP-UVA302-20-E	JZSP-UVA322-20-E	
20			3 m	JZSP-UVA331-03-E	JZSP-UVA341-03-E	SERVOPACK end Motor end
1.8 kW			5 m	JZSP-UVA331-05-E	JZSP-UVA341-05-E	
1.0 KVV		Straight	10 m	JZSP-UVA331-10-E	JZSP-UVA341-10-E	
	For Servomotors		15 m	JZSP-UVA331-15-E	JZSP-UVA341-15-E	SERVOPACK end Brake end
	with Holding		20 m	JZSP-UVA331-20-E	JZSP-UVA341-20-E	
	Brakes		3 m	JZSP-UVA332-03-E	JZSP-UVA342-03-E	SERVOPACK Motor end
	(Set of Two		5 m	JZSP-UVA332-05-E	JZSP-UVA342-05-E	
	Cables ^{*2})	Right-angle	10 m	JZSP-UVA332-10-E	JZSP-UVA342-10-E	Brake end Motor end
			15 m	JZSP-UVA332-15-E	JZSP-UVA342-15-E	
			20 m	JZSP-UVA332-20-E	JZSP-UVA342-20-E	
			3 m	JZSP-UVA601-03-E	JZSP-UVA621-03-E	
			5 m	JZSP-UVA601-05-E	JZSP-UVA621-05-E	SERVOPACK end Motor end
		Straight	10 m	JZSP-UVA601-10-E	JZSP-UVA621-10-E	
	For Servomo-		15 m	JZSP-UVA601-15-E	JZSP-UVA621-15-E	
	tors without		20 m	JZSP-UVA601-20-E	JZSP-UVA621-20-E	
	Holding		3 m	JZSP-UVA602-03-E	JZSP-UVA622-03-E	
SGM7G-	Brakes	Right-	5 m	JZSP-UVA602-05-E	JZSP-UVA622-05-E	SERVOPACK end Motor end
30		angle	10 m	JZSP-UVA602-10-E	JZSP-UVA622-10-E	
		angro	15 m	JZSP-UVA602-15-E	JZSP-UVA622-15-E	
2.4 kW			20 m	JZSP-UVA602-20-E	JZSP-UVA622-20-E	
(When using an			3 m	JZSP-UVA631-03-E	JZSP-UVA641-03-E	SERVOPACK end Motor end
SGD7S-			5 m	JZSP-UVA631-05-E	JZSP-UVA641-05-E	
200A		Straight	10 m	JZSP-UVA631-10-E	JZSP-UVA641-10-E	
SERVO-	For Servomotors		15 m	JZSP-UVA631-15-E	JZSP-UVA641-15-E	SERVOPACK end Brake end
PACK.)	with Holding Brakes		20 m	JZSP-UVA631-20-E	JZSP-UVA641-20-E	
			3 m	JZSP-UVA632-03-E	JZSP-UVA642-03-E	SERVOPACK end Motor end
	(Set of Two Cables ^{*2})		5 m	JZSP-UVA632-05-E	JZSP-UVA642-05-E	
	Janes)	Right-angle	10 m	JZSP-UVA632-10-E	JZSP-UVA642-10-E	Brake end Motor end
			15 m	JZSP-UVA632-15-E	JZSP-UVA642-15-E	
			20 m	JZSP-UVA632-20-E	JZSP-UVA642-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable).

When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables. • Cable with Straight Plug: JZSP-U7B23-DD-E

Cable with Right-angle Plug: JZSP-U7B24-□□-E

Note: If you need a Cable with a length of 20 m to 50 m, consider the operating conditions and specify a suitable length.

Servo-		Connec-	Length	Order I	Number	
motor Model	Name	tor Spec- ifications	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
			3 m	JZSP-UVA701-03-E	JZSP-UVA721-03-E	
			5 m	JZSP-UVA701-05-E	JZSP-UVA721-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVA701-10-E	JZSP-UVA721-10-E	
	For Servomo-		15 m	JZSP-UVA701-15-E	JZSP-UVA721-15-E	
	tors without		20 m	JZSP-UVA701-20-E	JZSP-UVA721-20-E	
	Holding		3 m	JZSP-UVA702-03-E	JZSP-UVA722-03-E	
	Brakes	Diabt	5 m	JZSP-UVA702-05-E	JZSP-UVA722-05-E	SERVOPACK Motor end
		Right- angle	10 m	JZSP-UVA702-10-E	JZSP-UVA722-10-E	
SGM7G-		en igre	15 m	JZSP-UVA702-15-E	JZSP-UVA722-15-E	
30 and			20 m	JZSP-UVA702-20-E	JZSP-UVA722-20-E	
-44			3 m	JZSP-UVA731-03-E	JZSP-UVA741-03-E	SERVOPACK Motor end
2.9 kW,			5 m	JZSP-UVA731-05-E	JZSP-UVA741-05-E	
4.4 kW		Straight	10 m	JZSP-UVA731-10-E	JZSP-UVA741-10-E	
	For Servomotors		15 m	JZSP-UVA731-15-E	JZSP-UVA741-15-E	SERVOPACK Brake end
	with Holding		20 m	JZSP-UVA731-20-E	JZSP-UVA741-20-E	
	Brakes		3 m	JZSP-UVA732-03-E	JZSP-UVA742-03-E	SERVOPACK Motor end
	(Set of Two		5 m	JZSP-UVA732-05-E	JZSP-UVA742-05-E	
	Cables ^{*2})	Right-angle	10 m	JZSP-UVA732-10-E	JZSP-UVA742-10-E	
			15 m	JZSP-UVA732-15-E	JZSP-UVA742-15-E	Brake end Motor end
			20 m	JZSP-UVA732-20-E	JZSP-UVA742-20-E	
			3 m	JZSP-UVAA01-03-E	JZSP-UVAA21-03-E	
			5 m	JZSP-UVAA01-05-E	JZSP-UVAA21-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVAA01-10-E	JZSP-UVAA21-10-E	
	For Servomo-		15 m	JZSP-UVAA01-15-E	JZSP-UVAA21-15-E	
	tors without		20 m	JZSP-UVAA01-20-E	JZSP-UVAA21-20-E	
	Holding		3 m	JZSP-UVAA02-03-E	JZSP-UVAA22-03-E	
	Brakes		5 m	JZSP-UVAA02-05-E	JZSP-UVAA22-05-E	SERVOPACK Motor end
		Right- angle	10 m	JZSP-UVAA02-10-E	JZSP-UVAA22-10-E	
SGM7G-		angle	15 m	JZSP-UVAA02-15-E	JZSP-UVAA22-15-E	
55 and			20 m	JZSP-UVAA02-20-E	JZSP-UVAA22-20-E	
-75			3 m	JZSP-UVAA31-03-E	JZSP-UVAA41-03-E	SERVOPACK Motor end
5.5 kW,			5 m	JZSP-UVAA31-05-E	JZSP-UVAA41-05-E	
7.5 kW		Straight	10 m	JZSP-UVAA31-10-E	JZSP-UVAA41-10-E	
	For Servomotors		15 m	JZSP-UVAA31-15-E	JZSP-UVAA41-15-E	SERVOPACK Brake end end L
	with Holding		20 m	JZSP-UVAA31-20-E	JZSP-UVAA41-20-E	
	Brakes		3 m	JZSP-UVAA32-03-E	JZSP-UVAA42-03-E	SERVOPACK Motor end
	(Set of Two		5 m	JZSP-UVAA32-05-E	JZSP-UVAA42-05-E	
	Cables ^{*2})	Right-angle	10 m	JZSP-UVAA32-10-E	JZSP-UVAA42-10-E	Brake end Motor end
			15 m	JZSP-UVAA32-15-E	JZSP-UVAA42-15-E	L
			20 m	JZSP-UVAA32-20-E	JZSP-UVAA42-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable). When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables. • Cable with Straight Plug: JZSP-U7B23-DD-E

• Cable with Right-angle Plug: JZSP-U7B24-□□-E

Note: If you need a Cable with a length of 20 m to 50 m, consider the operating conditions and specify a suitable length.

Servo-		Connec-		Order I	Number	_
motor Model			Length (L)	Standard Cable	Flexible Cable ^{*1}	Appearance
			3 m	JZSP-UVAB01-03-E	JZSP-UVAB21-03-E	
			5 m	JZSP-UVAB01-05-E	JZSP-UVAB21-05-E	SERVOPACK Motor end
		Straight	10 m	JZSP-UVAB01-10-E	JZSP-UVAB21-10-E	
	For Servomo-		15 m	JZSP-UVAB01-15-E	JZSP-UVAB21-15-E	
	tors without		20 m	JZSP-UVAB01-20-E	JZSP-UVAB21-20-E	
	Holding		3 m	JZSP-UVAB02-03-E	JZSP-UVAB22-03-E	
	Brakes	Distat	5 m	JZSP-UVAB02-05-E	JZSP-UVAB22-05-E	SERVOPACK Motor end
	GM7G-	Right- angle	10 m	JZSP-UVAB02-10-E	JZSP-UVAB22-10-E	
SGM7G-			15 m	JZSP-UVAB02-15-E	JZSP-UVAB22-15-E	
1A and			20 m	JZSP-UVAB02-20-E	JZSP-UVAB22-20-E	
-1E			3 m	JZSP-UVAB31-03-E	JZSP-UVAB41-03-E	SERVOPACK Motor end
11 kW,			5 m	JZSP-UVAB31-05-E	JZSP-UVAB41-05-E	
15 kW		Straight	10 m	JZSP-UVAB31-10-E	JZSP-UVAB41-10-E	
	For Servomotors		15 m	JZSP-UVAB31-15-E	JZSP-UVAB41-15-E	SERVOPACK Brake end
	with Holding		20 m	JZSP-UVAB31-20-E	JZSP-UVAB41-20-E	
	Brakes		3 m	JZSP-UVAB32-03-E	JZSP-UVAB42-03-E	SERVOPACK Motor end
	(Set of Two Cables ^{*2})		5 m	JZSP-UVAB32-05-E	JZSP-UVAB42-05-E	
		Right-angle	10 m	JZSP-UVAB32-10-E	JZSP-UVAB42-10-E	
			15 m	JZSP-UVAB32-15-E	JZSP-UVAB42-15-E	Brake end Motor end
			20 m	JZSP-UVAB32-20-E	JZSP-UVAB42-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. This order number is for a set of two cables (Main Power Supply Cable and Holding Brake Cable). When you purchase them separately, the order numbers for Main Power Supply Cables are the same as for a Servomotor without a Holding Brake.

The following order numbers are for a Holding Brake Cable. These Standard Cables are Flexible Cables.

Cable with Straight Plug: JZSP-U7B23-□□-E
Cable with Right-angle Plug: JZSP-U7B24-□□-E

Note: If you need a Cable with a length of 20 m to 50 m, consider the operating conditions and specify a suitable length.

Encoder Cables of 20 m or Less

Servomotor	Nerree	Length	Order I	Number	A = = = = = = = = =
Model	Name			Flexible Cable ^{*1}	Appearance
		3 m	JZSP-CVP01-03-E	JZSP-CVP11-03-E	
		5 m	JZSP-CVP01-05-E	JZSP-CVP11-05-E	SERVOPACK Encoder end
		10 m	JZSP-CVP01-10-E	JZSP-CVP11-10-E	
	For incremen-	15 m	JZSP-CVP01-15-E	JZSP-CVP11-15-E	
	tal encoder, or batteryless	20 m	JZSP-CVP01-20-E	JZSP-CVP11-20-E	*
	absolute	3 m	JZSP-CVP02-03-E	JZSP-CVP12-03-E	
	encoder	5 m	JZSP-CVP02-05-E	JZSP-CVP12-05-E	SERVOPACK Encoder end
		10 m	JZSP-CVP02-10-E	JZSP-CVP12-10-E	
		15 m	JZSP-CVP02-15-E	JZSP-CVP12-15-E	
All SGM7G models		20 m	JZSP-CVP02-20-E	JZSP-CVP12-20-E	•
All SGIVITG MODELS		3 m	JZSP-CVP06-03-E	JZSP-CVP26-03-E	
		5 m	JZSP-CVP06-05-E	JZSP-CVP26-05-E	SERVOPACK Encoder end
		10 m	JZSP-CVP06-10-E	JZSP-CVP26-10-E	
		15 m	JZSP-CVP06-15-E	JZSP-CVP26-15-E	Battery Case (battery included)
	For absolute encoder: With	20 m	JZSP-CVP06-20-E	JZSP-CVP26-20-E	
	Battery Case ^{*2}	3 m	JZSP-CVP07-03-E	JZSP-CVP27-03-E	
	Buttory Oude	5 m	JZSP-CVP07-05-E	JZSP-CVP27-05-E	
		10 m	JZSP-CVP07-10-E	JZSP-CVP27-10-E	
		15 m	JZSP-CVP07-15-E	JZSP-CVP27-15-E	Battery Case (battery included)
		20 m	JZSP-CVP07-20-E	JZSP-CVP27-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. If a battery is connected to the host controller, the Battery Case is not required. If so, use a cable for incremental encoders.

♦ Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number for Standard Cable	Appearance	
	Encoder-end Cable (for	0.3 m	JZSP-CVP01-E	SERVOPACK end Encoder end	
	all types of encoders)	0.3 m -	JZSP-CVP02-E	SERVOPACK end Encoder end	
All SGM7G models	Cables with Connec- tors on Both Ends (for all types of encoders)	30 m	JZSP-UCMP00-30-E	SERVOPACK Encoder end	
		40 m	JZSP-UCMP00-40-E		
		50 m	JZSP-UCMP00-50-E		
	Cable with a Battery Case (Required when an absolute encoder is used.)*	0.3 m	JZSP-CSP12-E	SERVOPACK Encoder end end Battery Case (battery included)	

* This Cable is not required if you use a Servomotor with a Batteryless Absolute Encoder, and you connect a battery to the host controller.

MEMO

Direct Drive Servomotors

Features



- SGM7D (With Core, Outer Rotor) 118 · Ideal for applications that require high torque, high precision, and high rigidity. Application to large loads possible with a high allowable load moment of inertia ratio. · Highly accurate indexing can be achieved with a high-resolution 24-bit encoder. • High rigidity. • Large center aperture design to save wiring space. SGM7E (Coreless, Inner Rotor)144 · Ideal for applications that require smooth movement without speed fluctuations. · Low cogging with a core-less system provides smooth operation free from speed variations. Highly accurate indexing can be achieved with a high-resolution 24-bit encoder. · High machine precision for runout at end of shaft and runout of shaft surface (0.01 mm). SGM7F (With Core, Inner Rotor) 160 · Ideal for applications that require downsizing and a shorter takt time. • High-speed, high-frequency positioning. Low heat generation. · Highly accurate indexing can be achieved with a high-resolution 24-bit encoder. High machine precision for runout at end of shaft and runout of shaft surface (0.01 mm). SGMCV (Small Capacity, with Core, Inner Rotor) 182 Compact design with small rotor diameter.

 - Low inertia, low heat generation.
 - High-speed, high-frequency positioning.
 - · High machine precision for runout at end of shaft
 - and runout of shaft surface (0.01 mm).
 - Built-in 22-bit encoder.



SGMCS

(Small Capacity, Coreless, Inner Rotor or Medium Capacity, with Core, Inner Rotor)...... 196

- High-speed operation can shorten takt time.
- Built-in 20-bit encoder.

SGM7D SGM7E SGM7F SGMCV SGMCS

SGM7D (With Core, Outer Rotor)

Model Designations



SGM7D

1st+2nd digits Rated Torque

Code	Specification	Code	Specification	Code	Specification
01	1.30 N•m	18	18.0 N•m	58	58.0 N•m
02	2.06 N•m	20	20.0 N•m	70	70.0 N•m
03	3.00 N•m	24	24.0 N•m	90	90.0 N•m
05	5.00 N•m	28	28.0 N•m	1Z	100 N•m
06	6.00 N•m	30	30.0 N•m	1A	110 N·m
08	8.00 N•m	34	34.0 N•m	1C	130 N•m
09	9.00 N•m	38	38.0 N•m	2B	220 N·m
12	12.0 N•m	45	45.0 N•m	2D	240 N·m

3rd digit Servomotor Outer Diameter

Code	Specification	Code	Specification
F	264-mm dia.	J	150-mm dia.
G	160-mm dia.	K	107-mm dia.
Н	116-mm dia.	L	224 mm × 224 mm
1	264-mm dia.		

1 204-mm uia.

 This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

4th digit Serial Encoder

Code	Specification
7	24-bit multiturn absolute encoder*
F	24-bit incremental encoder*

* Both multiturn absolute encoder and incremental encoder can be used as a single-turn absolute encoder by setting parameters.



С

6th digit Flange

Code		Mounting	Servomotor Outer Diameter Code (3rd Digit)								
			F	G	Н	Ι	J	K	L		
4	load de	With cable on side	~	~	~	-	-	-	~		
5	Non-lo: side	With cable on bottom	~	√*	-	~	~	✓	-		

✓: Applicable models.

7th digit Options

Code	Specification
1	Standard mechanical precision
2	High mechanical precision*

* The SGM7D-01G, -05G, and -03H are available only with high mechanical precision.

Manufactured Models

Rated	Servomotor Outer Diameter									
Torque	F	G	Н	I	J	К	L (224 mm ×			
N∙m	(264-mm dia.)	(160-mm dia.)	(116-mm dia.)	(264-mm dia.)	(150-mm dia.)	(107-mm dia.)	224 mm)			
1.30	_	SGM7D-01G	-	-	-	_	-			
2.06	_	-	-	-	-	SGM7D-02K	-			
3.00	-	-	SGM7D-03H	-	-	-	-			
5.00	-	SGM7D-05G	-	-	-	-	-			
6.00	-	-	-	-	SGM7D-06J	SGM7D-06K	SGM7D-06L			
8.00	-	SGM7D-08G	-	-	-	SGM7D-08K	-			
9.00	-	-	-	-	SGM7D-09J	-	-			
12.0	-	-	-	-	-	-	SGM7D-12L			
18.0	-	SGM7D-18G	-	-	SGM7D-18J	-	-			
20.0	-	-	-	-	SGM7D-20J	-	-			
24.0	-	SGM7D-24G	-	-	-	-	-			
28.0	-	-	-	SGM7D-28I	-	-	-			
30.0	SGM7D-30F	-	-	-	-	-	SGM7D-30L			
34.0	-	SGM7D-34G	-	-	-	-	-			
38.0	-	-	-	-	SGM7D-38J	-	-			
45.0	-	SGM7D-45G	-	-	-	-	-			
58.0	SGM7D-58F	-	-	-	-	-	-			
70.0	-	-	-	SGM7D-70I	-	-	-			
90.0	SGM7D-90F	-	-	-	-	-	-			
100	-	_	-	SGM7D-1ZI	-	-	_			
110	SGM7D-1AF	_	_	-	-	-	_			
130	-	-	-	SGM7D-1CI	-	-	-			
220	-	_	-	SGM7D-2BI	-	-	_			
240	-	_	-	SGM7D-2DI	-	-	_			

Note: The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

Note: 1. Direct Drive Servomotors are not available with holding brakes.

^{*} SGM7D-01G and -05G are not available with a cable extending from the bottom.

Specifications and Ratings

Specifications

♦ SGM7D-□□F, -□□G, and -□□H

	Voltage						200 V									
	Model	SGM7D	-		30F	58F	90F	1AF	01G	05G	08G	18G	24G	34G	45G	03H
Time	Rating					Continuous										
Thern	nal Class					F										
	Insulation Resistance					500 VDC, 10 M Ω min.										
Withstand Voltage									1,50	00 VA	C for	1 mir	ute			
Excita	ation										e-pha					
Moun	0									Flange						
	Method										ect dri					
	ion Direction				Cour	nterclo	ckwis	e (CCV	N) for f			nce wł	nen vi	ewed	from t	ne load side
Absolute Accuracy											⊧15 s					
Repe	Repeatability								1		1.3 s					
Protective Structure ^{*1}						Totally enclosed, Totally enclosed, Totally enclosed, Totally enclosed, Totally enclosed, Totally enclosed, Self-cooled, P20 Self-cooled, P30 Self-cooled, P20 Self-cooled, P30										
SL	Surrounding /									40°C	`			0,		
tior	Surrounding /	Air Humi	dity		20% to 80% relative humidity (with no condensation)Must be indoors and free of corrosive and explosive gases.											
Environmental Conditions	Installation Si	te			 Mu Mu Mu 	ist be ist fac ist ha	well- cilitate	venti e insp altitu	lated a bection ude of	e of co and fre n and 1,000 nagnet	ee of clean) m o	dust ing. r less	and i			Ses.
Environm	Storage Environment				the p Stora	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)										
echanical erances ^{*2}	Runout of Output Shaft	Standard Precision	Mechanical	mm		0	.1			_		0.1		0.	.1	-
Mechanical Tolerances*	또 등 Surface/Runout at End of Output Shaft Precision			mm	0.005 0.01 0.005				5	0.01		.01				
	SGD7S-			-		120)A*3		2R8A*3	, 2R8F*3		1	20A*	3		2R8A*3, 2R8F*3
Applie	Applicable SERVOPACKs SGD7W- SGD7C-									-						

*1. The hollow hole section, motor mounting surface, and gap around the rotating part on non-load side are excluded. Protective structure specifications apply only when the special cable is used.

*2. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.

Runout at end of output shaft Load side Non-load side -

🗆 dia.

Runout of output shaft surface D: Diameter determined by motor model.

*3. An SGM7D Servomotor is used together with an FT-specification SERVOPACK. The following SERVOPACK models can be used.
• SGD7S-DDDDDDADDEF82D

• SGD7S-0000000F830

♦ SGM7D-□□I and -□□J

	Voltage					200 V									
	Mode	el SG	M7D-		281	701	1ZI	1CI	2BI	2DI	06J	09J	18J	20J	38J
Time F	Rating				Continuous										
Therm	al Class				F										
	ion Resista				500 VDC, 10 M Ω min.										
	and Voltage	Э						1,5	500 VA			ute			
	Excitation									ee-ph					
-	Mounting									je-moi					
	Drive Method									ect dr					
Rotation Direction					Count	erclock	wise (C	CW) for				en view	ed from	the loa	ad side
Absolute Accuracy										±15 s					
	Repeatability									±1.3 s					
Protec	Protective Structure ^{*1}						To	otally e	enclose	ed, sel	f-cool	ed, IP3	30		
S	Surrounding Air Temperature					0°C to 40°C (with no freezing)									
ion	Surrounding Air Humidity					20% to 80% relative humidity (with no condensation)Must be indoors and free of corrosive and explosive gases.									
Environmental Conditions	Installation Site				• Mu • Mu • Mu		well-ve litate i e an a	entilate nspect Ititude	ed and ion an of 1,0	free o d clea 00 m	f dust ning. or less	and m			
Environm	Storage E	Envirc	onment		with Stora	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)									
Mechanical Tolerances ^{*2}	Runout of Standard Output Shaft Mechanical mm Surface/ Precision		0.1												
Mech Tolera	SERunout atHighDEnd of Out-Mechanicalmmput ShaftPrecisionPrecision		mm	0.005 0.02 0.005 0.0						0.01					
Annlie	Applicable SGD7S-			120A*3											
	SGD7W- SGD7C-		_												

*1. The hollow hole section, motor mounting surface, and gap around the rotating part on non-load side are excluded. Protective structure specifications apply only when the special cable is used.

*2. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.



*3. An SGM7D Servomotor is used together with an FT-specification SERVOPACK. The following SERVOPACK models can be used.

• SGD7S-00000A000F820

• SGD7S-0000000F830

♦ SGM7D-□□K and -□□L

	Voltage					200 V						
	Mode	el SG	M7D-		02K	06K	08K	06L	12L	30L		
Time F	Rating						Conti	nuous				
Therm	al Class							F				
Insulat	ion Resista	nce			500 VDC, 10 M Ω min.							
Withst	and Voltage	Э					1,500 VAC	for 1 minute	e			
Excitat	tion							-phase				
Mount	Mounting						Flange-r	mounted				
	Drive Method							t drive				
Rotatio	Rotation Direction					kwise (CCW)			viewed from	the load side		
	Absolute Accuracy							5 s				
	Repeatability						±1	.3 s				
Protec	Protective Structure ^{*1}					Totally	y enclosed,	self-coolec	I, IP30			
S	ع Surrounding Air Temperature					0°C to 40°C (with no freezing)						
ion	Surrounding Air Humidity					% to 80% re	elative humi	dity (with no	o condensat	tion)		
nental Condit	Surrounding Air Humidity				 Must be Must fae Must had 		ated and fre action and o de of 1,000	e of dust a cleaning. m or less.	l explosive g nd moisture			
Environm	Storage E	Envirc	onment		with the p Storage T	ower cable emperature	disconnect : -20°C to 6	ted. 60°C (with r	onment if yo no freezing) y (with no co			
Mechanical Tolerances ^{*2}	Runout of Standard Output Shaft Mechanical r Surface/ Precision		mm		0.1 0.05							
Mech Tolera	SRunout atHighPEnd of Out-Mechanicalput ShaftPrecision		mm	0.01 0.005								
Annlia	ahle	SG	D7S-			26	78A ^{*3} , 2R8I	=*3		120A*3		
	Applicable SGD70 SERVOPACKs SGD7V- SGD7C-				-	_						

*1. The hollow hole section, motor mounting surface, and gap around the rotating part on non-load side are excluded. Protective structure specifications apply only when the special cable is used.

*2. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.



*3. An SGM7D Servomotor is used together with an FT-specification SERVOPACK. The following SERVOPACK models can be used.

• SGD7S-00000A000F820

• SGD7S-00000000F830

Ratings

◆ SGM7D-□□F, -□□G, and -□□H

	Volta		200 V												
	Model S	GM7D-		30F	58F	90F	1AF	01G	05G	08G	18G	24G	34G	45G	03H
Rate	d Output		W	188	364	565	691	16	63	101	226	302	320	565	38
Rated	d Torque ^{*1}		N∙m	30.0	58.0	90.0	110	1.30	5.00	8.00	18.0	24.0	34.0	45.0	3.00
Rated	Rated Intermittent Torque ^{*2}		N∙m	-	-	-	_	I	_	-	-	27.0	40.0	52.0	-
Instan	taneous Maximu	m Torque	N∙m	50.0	100	150	200	4.00	6.00	15.0	30.0	45.0	60.0	75.0	4.00
Stall	Torque		N∙m	30.0	58.0	90.0	110	1.30	5.00	8.00	18.0	24.0	34.0	45.0	3.00
	d Current		Arms	5.7	6.4	5.9	5.0	1.7	1.6	3.4	3.4	3.1	3.3	4.8	1.1
Instan	taneous Maximu	m Current	Arms		14	4.1		4.2	3.5			10.6			3.5
Rated	d Motor Speed	k	min⁻¹		6	0				120			90	120	120
Maxin	num Motor Spe	ed	min ⁻¹		7	2		18	50			144			150
Torqu	ie Constant		N∙m/ Arms	6.25	12.5	17.8	24.5	1.09	3.84	2.82	5.76	8.57	11.2	10.2	3.01
Motor	Motor Moment of Inertia		×10 ⁻⁴ kg•m ²	960	1190	1420	1670	55.0	75.0	120	150	190	230	270	25.0
Rated	d Power Rate		kW/s	9.38	28.3	57.0	72.5	0.307	3.33	5.33	21.6	30.3	50.3	75.0	3.60
Rated	Angular Acceler	ation Rate	rad/s ²	313	487	634	659	236	667	667	1200	1260	1480	1670	1200
Heat	Sink Size		mm	550 × 550 × 30 (aluminum)							<u>.</u>	350 × 350 × 20 (steel)			
	ble Load Moment Moment of Inertia	a Ratio)	times	200 500 ^{*4}	150 400 ^{*4}	150 350 ^{*4}	130 300 ^{*4}	130	300	400 1000 ^{*4}	350 900 ^{*4}	300 750 ^{*4}	250 650 ^{*4}	200 450 ^{*4}	600
	With External Rege Resistor and Exter Brake Resistor ^{*3}		times	2500	3500	4000	5000	130	300	2000	3000	4000	4000	4000	600
ble s*5	Allowable	Forward	Ν		$4 \times$	10 ⁴		50	200		;	3×10^{-10}	4		50
Allowable Loads ^{*5}	Thrust Load Re		Ν		2 ×	10 ⁴		50	200			1 × 10	4		50
E I	Allowable Moment Load		N∙m		4(Ι	50			200			-
ŝ	Thrust Displacement	Forward	mm/N		2 ×	10 ⁻⁶		-	_		2.	.5 × 10) ⁻⁶		-
iditie		Reverse	mm/N		З×	10 ⁻⁶		-	_		3	3 × 10 ⁻	6		-
Moment Displacement Rigidity		rad∕ N•m		$4 \times$	10 ⁻⁷		- 1 × 10 ⁻⁶				_				

*1. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum or steel heat sink of the dimensions given in the table.

*2. The rated intermittent torque is the value for 60% ED.

*3. To externally connect dynamic brake resistance, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistance if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

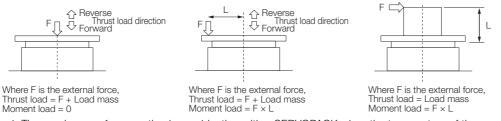
- SGD7S-2R800A020F820
- SGD7S-2R8□00A020F83□

*4. If you use an SGD7S-120A008 SERVOPACK and SGM7D Servomotor together, use the ratios given on the bottom line.
*5. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.

The allowable load is for a static load in one direction. When designing the system, multiply the allowable load by the following safety coefficient depending on the type of load. • Smooth load with no shock: 1/3

Light repetitive load: 1/5

Shock load: 1/10



Note: 1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

2. For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

SGM7D-□□I and -□□J

	V	oltage		200 V										
		el SGM7D-		281	701	1ZI	1CI	2BI	2DI	06J	09J	18J	20J	38J
Rate	ed Output	t	W	264	440	628	817	691	754	75	113	226	251	358
Rate	ed Torque	^{*1}	N∙m	28.0	70.0	100	130	220	240	6.00	9.00	18.0	20.0	38.0
	Instantaneous Maximum Torque		N∙m	50.0	100	150	200	300	400	8.00	15.0	30.0	45.0	60.0
Stall	Torque		N∙m	28.0	70.0	100	130	220	240	6.00	9.00	18.0	20.0	38.0
	ed Currer		Arms	5.2	5.6	5.5	5.0	5.6	4.8	4.0	3.4	3.0	2.2	3.1
	antaneou imum Cu		Arms			14	1.1					10.6		
Rate	ed Motor	Speed	min⁻¹	90		60		3	0		12	20		90
Maxi	mum Mot	or Speed	min ⁻¹	108		72		60	48			144		
Torq	ue Const	tant	N∙m/ Arms	6.90	13.9	20.8	27.8	41.5	54.4	1.71	3.29	6.62	9.88	13.3
Moto	or Momen	t of Inertia	×10 ⁻⁴ kg∙m²	1800	2000	2300	2850	3400	4000	150	210	240	260	330
	ed Power		kW/s	4.36	24.5	43.5	59.3	142	144	2.40	3.86	13.5	15.4	43.8
	ed Angula eleration		rad/s ²	156	350	435	456	647	600	400	429	750	769	1150
Heat	t Sink Siz	e	mm					550	× 550 >					
	ble Load Mor Moment of Ir	nent of Inertia nertia Ratio)	times	50 125 ^{*2}	100 250 ^{*2}	90 230 ^{*2}	80 200 ^{*2}	100	150	350 700 ^{*2}	250 600 ^{*2}	240 550 ^{*2}	220 550 ^{*2}	180 450 ^{*2}
	tive Resisto	al Regenera- r and External rake Resistor ^{*3}	times	800	2000	2500	3000	100	150	700	900	2500	2000	2000
* *	Allowable Thrust Load	Forward	Ν			4 ×	10 ⁴					3 × 10'	1	•
Allowable Loads ^{*3}	Allow Thr Lc	Reverse	Ν			2 ×	10 ⁴					1 × 10'	1	
Ψ Α	Allowable N·m					40	00					200		
Sć	Rigidities Displacement Rigidity Becement Reverse		mm/N			2 ×	10 ⁻⁶					3 × 10⁻	6	
Rigiditi e			mm/N			3 ×	10 ⁻⁶			4 × 10 ⁻⁶				
Moment Displacement Rigidity		rad∕ N∙m			4 ×	10 ⁻⁷			2 × 10 ⁻⁶					

*1. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

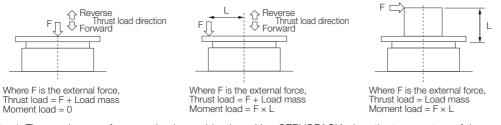
*2. If you use an SGD7S-120A008 SERVOPACK and SGM7D Servomotor together, use the ratios given on the bottom line.

*3. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table. The allowable load is for a static load in one direction.

When designing the system, multiply the allowable load by the following safety coefficient depending on the type of load.

• Smooth load with no shock: 1/3

Light repetitive load: 1/5
 Shock load: 1/10



Note: 1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

2. For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

◆ SGM7D-□□K and -□□L

	Volta	age		200 V							
	Model S	GM7D-		02K	06K	08K	06L	12L	30L		
Rate	ed Output		W	52	151	201	113	226	565		
Rate	Rated Torque ^{*1}			2.06	6.00	8.00	6.00	12.0	30.0		
Repe	etitive Rated Torque	*2	N∙m	-	6.90	-	-	-	_		
Insta	antaneous Maximum	n Torque	N∙m	5.00	10.0	15.0	10.0	20.0	40.0		
Stall	Torque		N∙m	2.06	6.00	8.00	6.00	12.0	30.0		
Rate	ed Current		Arms	1.6	1.8	1.6	1.7	2.1	8.1		
Insta	antaneous Maximum	n Current	Arms		4.2		4.2	4.2	14.1		
Rate	d Motor Speed		min ⁻¹		240			180	<u> </u>		
Maxi	mum Motor Speed		min ⁻¹		360			216			
Torq	ue Constant		N•m/Arms	1.83	3.67	5.50	4.13	6.59	3.95		
Moto	or Moment of Inertia		×10 ⁻⁴ kg·m ²	60.0	70.0	80.0	220	220	370		
Rate	ed Power Rate		kW/s	0.707	5.14	8.00	1.64	6.55	24.3		
Rate	d Angular Accelerat	ion Rate	rad/s ²	343	857	1000	273	545	811		
Heat	Sink Size		mm	550 × 550 × 30			$650 \times 650 \times 30$				
	vable Load Moment of Moment of Inertia		times	200	350	25	450	20	60 130 ^{*4}		
	With External Regenerative Resistor and External Dynamic Brake Resistor* ³		times	200	350	25	450	20	3500		
ole *5	Allowable	Forward	Ν		5×10^{3}			2000			
owal oads	DescriptionAllowableForwardThrust LoadReverseAllowable Moment Load		Ν		3×10^{3}			1000			
Allo	Allowable Moment Load		N∙m		20			100			
es	Thrust Displace- ment Rigidity		mm/N		4×10^{-6}		-				
jiditi			mm/N		8 × 10 ⁻⁶		-				
Moment Displacement Rigidity			rad/N•m		8 × 10 ⁻⁶		-				

*1. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

*2. The rated intermittent torque is the value for 60% ED.

*3. To externally connect dynamic brake resistance, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistance if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-2R8□□□A020F82□

• SGD7S-2R8□00A020F83□

*4. If you use an SGD7S-120A008 SERVOPACK and SGM7D Servomotor together, use the ratios given on the bottom line.

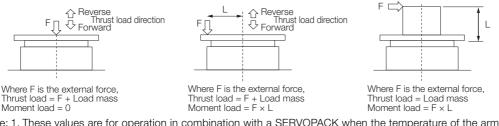
*5. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.

The allowable load is for a static load in one direction.

When designing the system, multiply the allowable load by the following safety coefficient depending on the type of load.

- Smooth load with no shock: 1/3
- Light repetitive load: 1/5

Shock load: 1/10

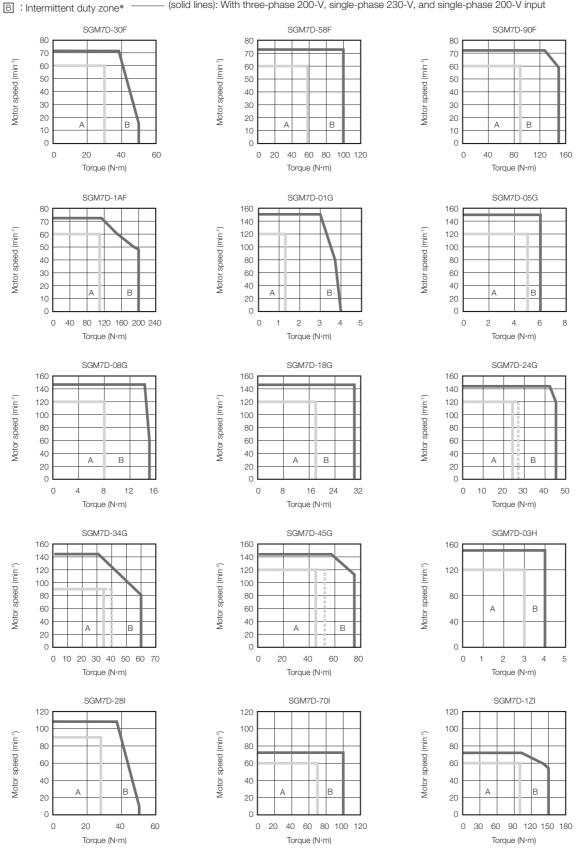


Note: 1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

2. For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

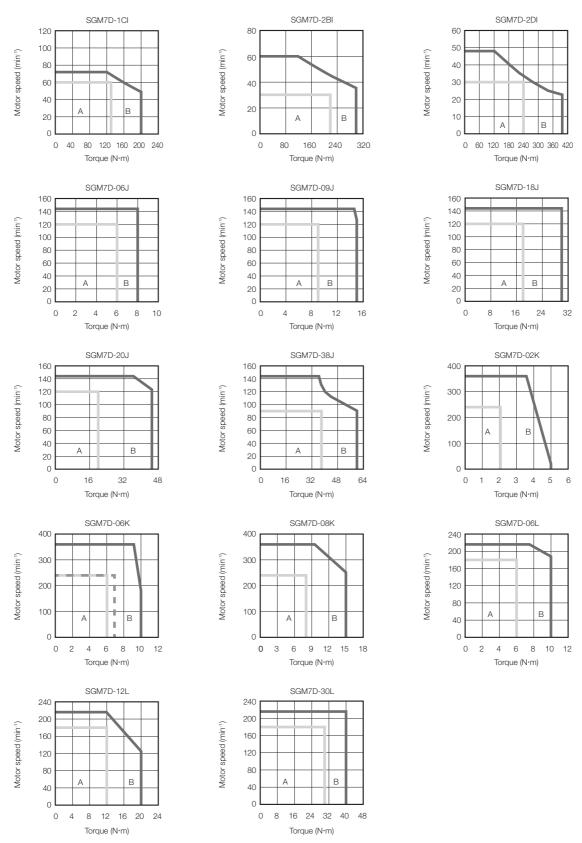
Torque-Motor Speed Characteristics

A : Continuous duty zone (dotted lines): With 60%ED 10 min. duty factor - (solid lines): With three-phase 200-V, single-phase 230-V, and single-phase 200-V input



Direct Drive Servomotors





* The characteristics are the same for three-phase 200 V and single-phase 200 V input.

Contact your Yaskawa representative for information on the characteristics for single-phase 100 V input.

Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.

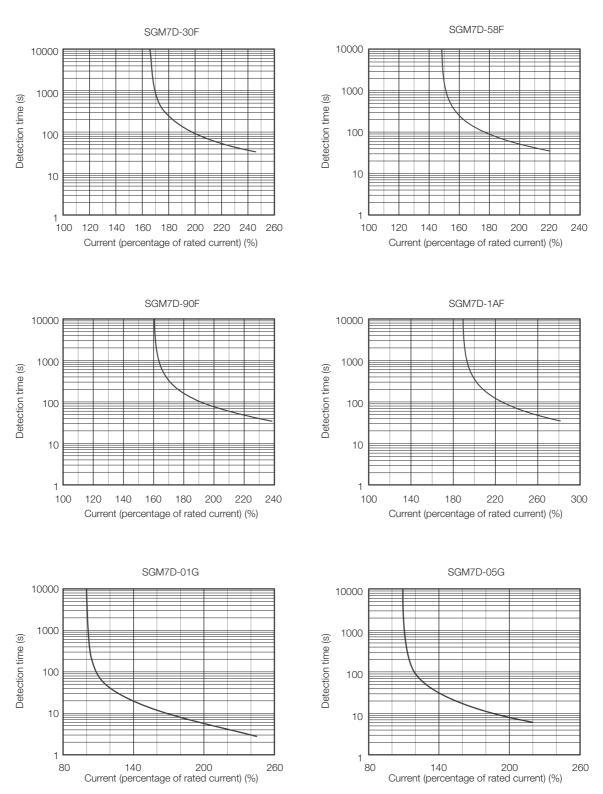
2. The characteristics in the intermittent duty zone depend on the power supply voltage.

3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.

4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

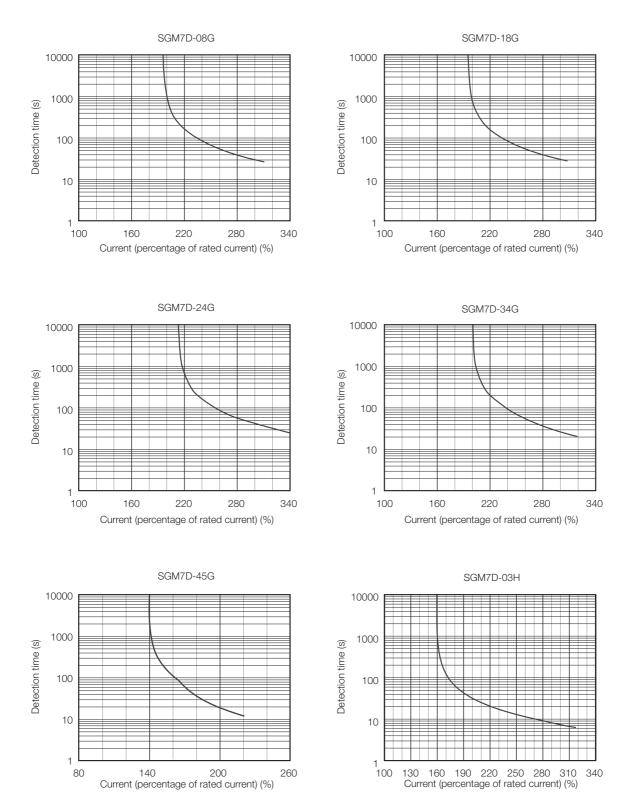
Servomotor Overload Protection Characteristics

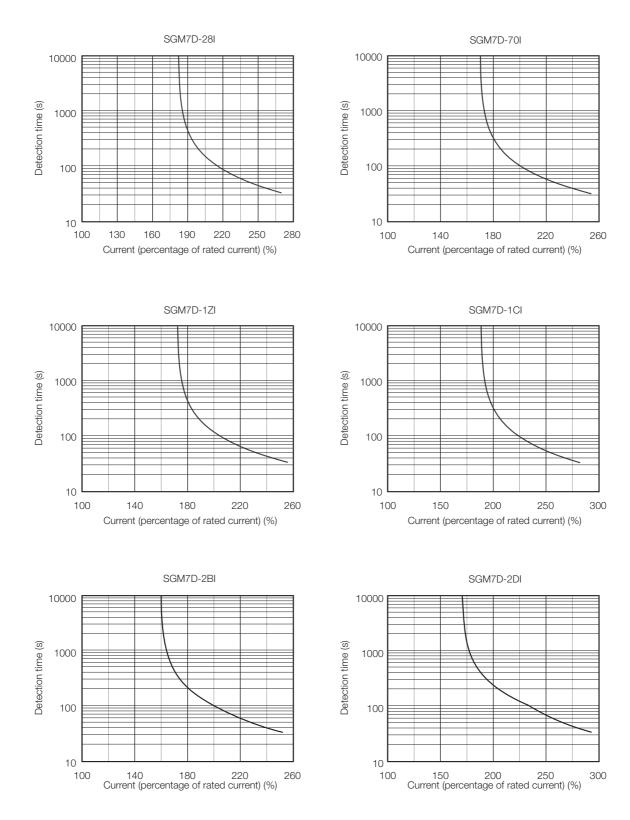
The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



SGM7D

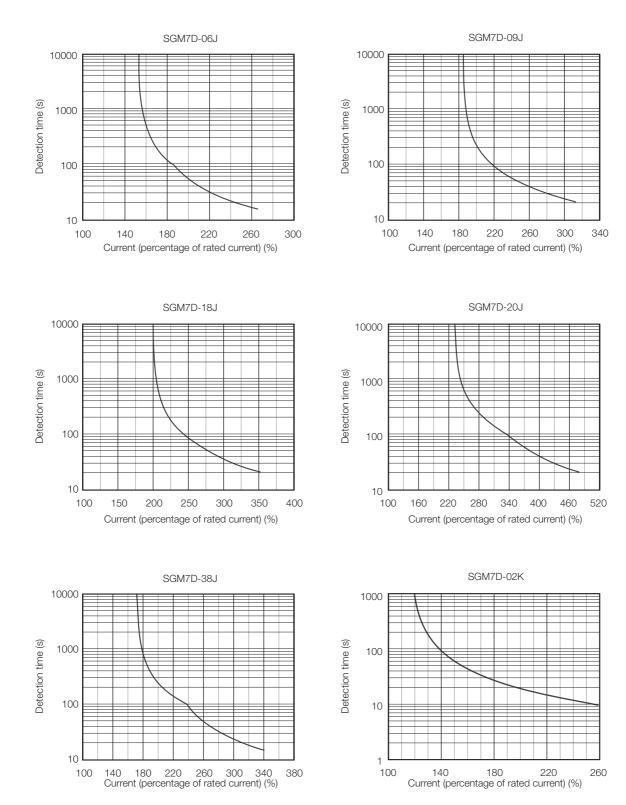
SGM7D (With Core, Outer Rotor)



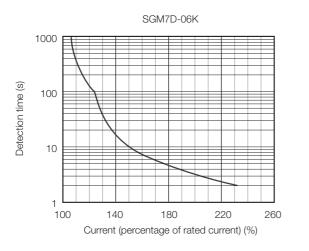


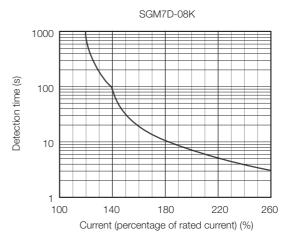
Direct Drive Servomotors

SGM7D (With Core, Outer Rotor)

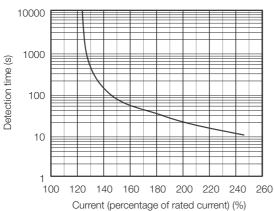




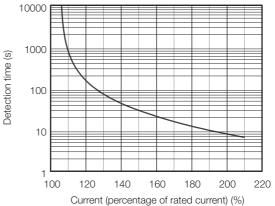


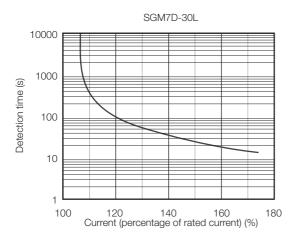


SGM7D-06L



SGM7D-12L





Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

Use the Servomotor so that the effective force remains within the continuous duty zone. Refer to the following section for details on the effective torque.

Torque-Motor Speed Characteristics (page 125)

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings* (pages 122 to 124). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

• Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

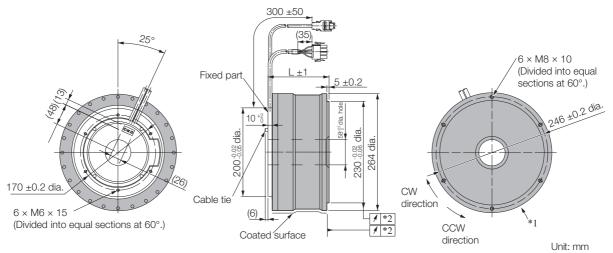
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

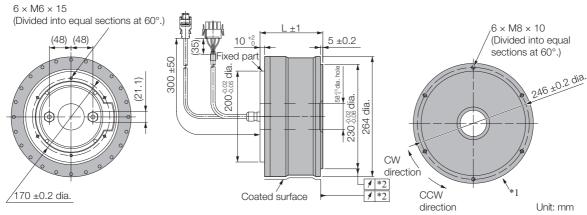
External Dimensions

♦ SGM7D-□□F

· Servomotors with the Cable on the Side



· Servomotors with the Cable on the Bottom



- *1. The shaded section indicates the rotating parts.
- *2. The precision depends on the option specification. Refer to the following section for details. Specifications (page 119)

Note: Values in parentheses are reference dimensions.

Model SGM7D-	L	Approx. Mass [kg]
30F□C□□	113 ±1	14.5
58F □ C □□	138 ±1	19
90F□C□□	163 ±1	24
	188 ±1	29

Connector Specifications

Servomotor Connector

(T

2 3 (4

	1	Phase U	Red
	2	Phase V	Gray
	3	Phase W	Blue
$\left - \right $	4	FG (frame ground)	Green (yellow)
	Mode	ls	

- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
 Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K.
- Mating Connector • Cap: 350780-1
- Socket: 350536-3 or 350550-3
- Encoder Connector

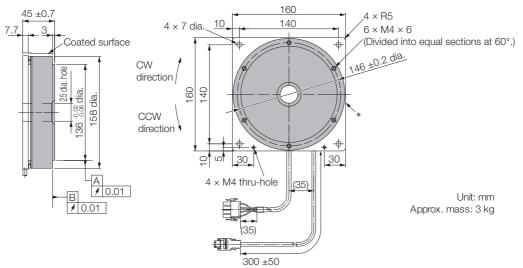
	1	PG5V
5 6	2	PG0V
	3*	BAT
	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

* Only absolute-value models with multiturn data. Model: 55102-0600

Manufacturer: Molex Japan LLC Mating connector: 54280-0609 SGM7D (With Core, Outer Rotor)

♦ SGM7D-01G

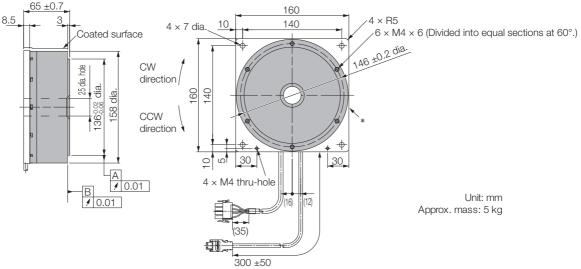
· Servomotors with the Cable on the Side



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

◆ SGM7D-05G

· Servomotors with the Cable on the Side



* The shaded section indicates the rotating parts.

Note: Values in parentheses are reference dimensions.

Connector Specifications Servomotor Connector

			L	
П	1	(1	۴ı	
	_	2	Η	
		3	Н	
Ц	_	4	Ш	

1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green
Mode	ls	

- Plug: 350779-1
 Pins: 350561-3 or 350690-3 (No.1 to 3)
 Ground pin: 350654-1 or 350669-1 (No. 4) Manufacturer: Tyco Electronics Japan G.K.
- Mating Connector

• Cap: 350780-1

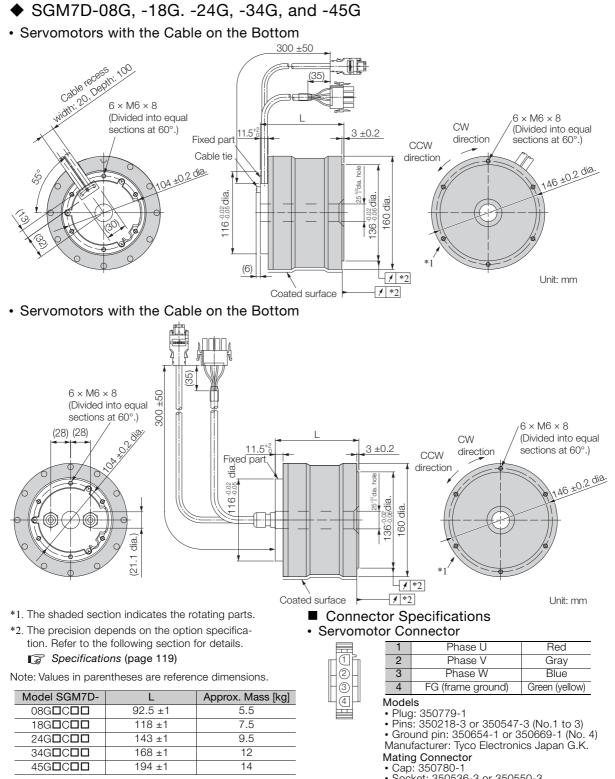
• Socket: 350570-3 or 350689-3

• Encoder Connector

	1	PG5V
6	2	PG0V
	3*	BAT
	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

* Only absolute-value models with multiturn data. Model: 55102-0600

Manufacturer: Molex Japan LLC Mating connector: 54280-0609



• Socket: 350536-3 or 350550-3

Encoder Connector

	1	PG5V	
5 6	2	PG0V	
	3*	BAT	
3 4 4	4*	BAT0	
	5	PS	
	6	/PS	
·,	Connector case	FG (frame ground)	

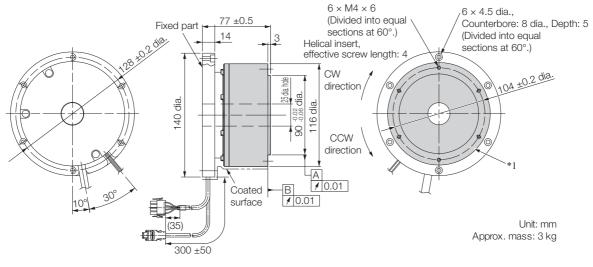
* Only absolute-value models with multiturn data. Model: 55102-0600 Manufacturer: Molex Japan LLC Mating connector: 54280-0609

SGM7D

SGM7D (With Core, Outer Rotor)

♦ SGM7D-03H

· Servomotors with the Cable on the Side



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Connector Specifications

Servomotor Connector



1	Phase U	Red	
2	Phase V	Gray	
3	Phase W	Blue	
4	FG (frame ground)	Green	
Models			

Plug: 350779-1
Pins: 350561-3 or 350690-3 (No.1 to 3)
Ground pin: 350654-1 or 350669-1 (No. 4)
Manufacturer: Tyco Electronics Japan G.K.

Mating Connector • Cap: 350780-1 • Socket: 350570-3 or 350689-3

Encoder Connector

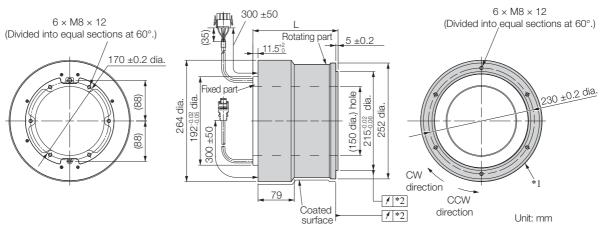
	1	PG5V
6	2	PG0V
	3*	BAT
4	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

* Only absolute-value models with multiturn data. Model: 55102-0600

Manufacturer: Molex Japan LLC Mating connector: 54280-0609

♦ SGM7D-□□I

· Servomotors with the Cable on the Bottom



- *1. The shaded section indicates the rotating parts.
- *2. The precision depends on the option specification. Refer to the following section for details. Specifications (page 119)

Note: Values in parentheses are reference dimensions.

Model SGM7D-	L	Approx. Mass [kg]
28I□C5□	158 ±1	23
70IDC5D	185 ±1	28
1ZIDC5D	212 ±1	33
1CIDC5D	250 ±1	45
2BIDC5D	304 ±1	55
2DIC5D	358 ±1	65

Connector Specifications Servomotor Connector

		1	Phase U	Red
106		2	Phase V	Gray
-2H		3	Phase W	Blue
-13 H		4	FG (frame ground)	Green (yellow)
Models • Plug: 350779-1				

- - Plug: 350779-1
 Pins: 350218-3 or 350547-3 (No.1 to 3)
 Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K. Mating Connector • Cap: 350780-1 • Socket: 350536-3 or 350550-3

• Encoder Connector

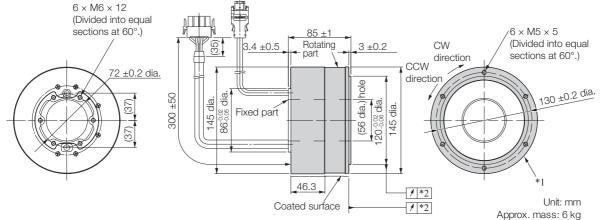
	1	PG5V
5 6	2	PG0V
	3*	BAT
3 4 7 4	4*	BAT0
	5	PS
	6	/PS
<u> </u>	Connector case	FG (frame ground)

* Only absolute-value models with multiturn data. Model: 55102-0600 Manufacturer: Molex Japan LLC Mating connector: 54280-0609

SGM7D (With Core, Outer Rotor)

◆ SGM7D-06J

· Servomotors with the Cable on the Bottom



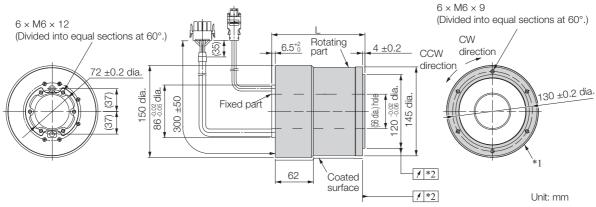
*1. The shaded section indicates the rotating parts.

*2. The precision depends on the option specification. Refer to the following section for details. Specifications (page 119)

Note: Values in parentheses are reference dimensions.

◆ SGM7D-09J, -18J, -20J, and -38J

· Servomotors with the Cable on the Bottom



- *1. The shaded section indicates the rotating parts.
- *2. The precision depends on the option specification. Refer to the following section for details.

Note: Values in parentheses are reference dimensions.

Model SGM7D-	L	Approx. Mass [kg]
09J□C5□	123 ±1	8.0
18J□C5□	151 ±1	11.0
20J□C5□	179 ±1	13.0
38J□C5□	207 ±1	15.5

Connector Specifications Servomotor Connector

	1	Phase U	Red
10h	2	Phase V	Gray
2H	3	Phase W	Blue
31	4	FG (frame ground)	Green (yellow)
47H	Mode	s	

- Plug: 350779-1
 Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K. Mating Connector

PG5V

PG0V

BAT

2

3*

• Cap: 350780-1 • Socket: 350536-3 or 350550-3

Encoder Connector



4* BAT0 5 PS /PS 6 FG (frame ground) Connector case

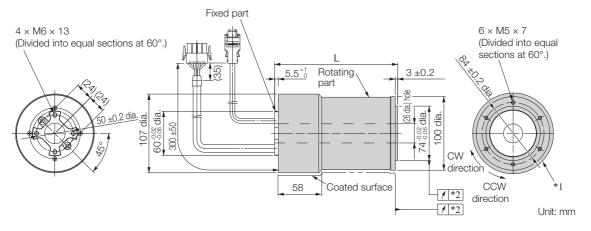
* Only absolute-value models with multiturn data. Model: 55102-0600

Manufacturer: Molex Japan LLC Mating connector: 54280-0609

Specifications (page 119)

♦ SGM7D-□□K

· Servomotors with the Cable on the Bottom



*1. The shaded section indicates the rotating parts.

*2. The precision depends on the option specification. Refer to the following section for details. Specifications (page 119)

Note: Values in	parentheses are	e reference	dimensions.

Model SGM7D-	L	Approx. Mass [kg]
02K□C5□	113 ±1	4.0
06K□C5□	140 ±1	5.0
08K□C5□	167 ±1	6.5

Connector SpecificationsServomotor Connector

1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green

	-		0 - 0 0 /
٠	Plι	ld:	350779-1

- Pins: 350561-3 or 350690-3 (No.1 to 3)
 Ground pin: 350654-1 or 350669-1 (No. 4)
 Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

• Cap: 350780-1

• Socket: 350570-3 or 350689-3

• Encoder Connector

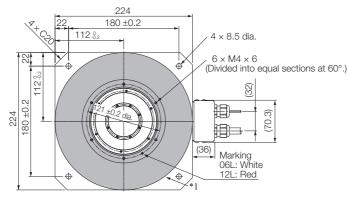
	1	PG5V				
5	2	PG0V				
	3*	BAT				
	4*	BAT0				
	5	PS				
= 1 ²	6	/PS				
	Connector case	FG (frame ground)				

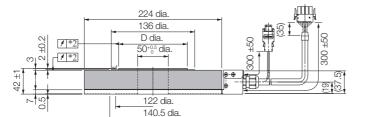
* Only absolute-value models with multiturn data. Model: 55102-0600 Manufacturer: Molex Japan LLC Mating connector: 54280-0609

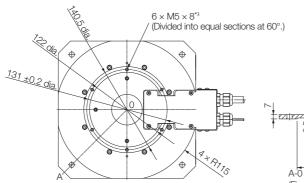
SGM7D (With Core, Outer Rotor)

◆ SGM7D-06L and -12L

· Servomotors with the Cable on the Side







*1. The shaded section indicates the rotating parts.

*2. The precision depends on the option specification. Refer to the following section for details.

Specifications (page 119)

- *3. In the following cases, rigidity is required in the Servomotor. Therefore, secure the Servomotor with these holes.
 - · There is a fluctuating vertical load on the Servomotor.
 - · There is a moment load on the Servomotor.
 - The Servomotor is used hanging upside down.

Note: Values in parentheses are reference dimensions.

Model SGM7D-	D
Standard mechanical precision)	112 ^{-0.02} _{-0.06}
High mechanical precision)	111.9 -0.02 -0.06

(140.5 dia.) R115 A-0 Cross Section (Fixed Part)

H

(122 dia.)

Unit: mm Approx. mass: 8.1 kg

Connector Specifications

Servomotor Connector

	1	Phase U	Red		
d I h	2	Phase V	Gray		
HQH	3	Phase W	Blue		
H3H	4	FG (frame ground)	Green (yellow)		
ЩаШ	Mode	S			

- Plug: 350779-1
 Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K. Mating Connector • Cap: 350780-1 • Socket: 350536-3 or 350550-3

- Encoder Connector

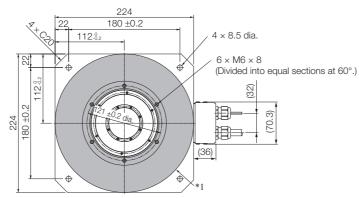
	1	PG5V
5 6	2	PG0V
	3*	BAT
	4*	BAT0
	5	PS
	6	/PS
<u> </u>	Connector case	FG (frame ground)

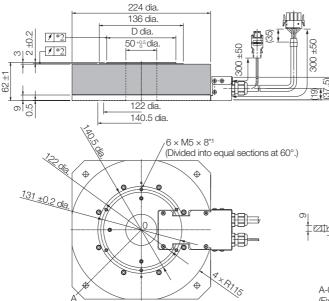
* Only absolute-value models with multiturn data. Model: 55102-0600 Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

♦ SGM7D-30L

· Servomotors with the Cable on the Side

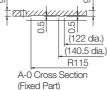




- *1. The shaded section indicates the rotating parts.
- *2. The precision depends on the option specification. Refer to the following section for details.
 - Specifications (page 119)
- *3. In the following cases, rigidity is required in the Servomotor. Therefore, secure the Servomotor with these holes.
 - There is a fluctuating vertical load on the Servomotor.
 - There is a moment load on the Servomotor.
 - The Servomotor is used hanging upside down.

Note: Values in parentheses are reference dimensions.

Model SGM7D-	D
30L□C41 (Standard mechanical precision)	112 ^{-0.02} -0.06
30L□C42 (High mechanical precision)	111.9 -0.02



Unit: mm Approx. mass: 11.8 kg

Connector Specifications Servomotor Connector

—	1	Phase U	Red		
10h	2	Phase V	Gray		
-0H	3	Phase W	Blue		
13H	4	FG (frame ground)	Green (yellow)		
4	Mode	s			

Models

- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3) • Ground pin: 350654-1 or 350669-1 (No. 4) Manufacturer: Tyco Electronics Japan G.K.
- Mating Connector
 - Cap: 350780-1 Socket: 350536-3 or 350550-3

Encoder Connector

	1	PG5V
5 6	2	PG0V
	3*	BAT
	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

* Only absolute-value models with multiturn data. Model: 55102-0600

Manufacturer: Molex Japan LLC Mating connector: 54280-0609

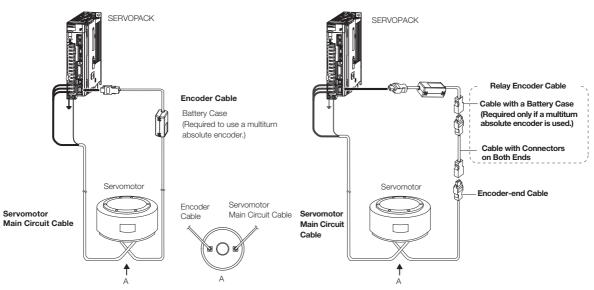
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

- 3. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Length	Order	Appearance		
Servornotor woder	(L)	Standard Cable Flexible Cable*		Appearance	
SGM7D- □□ F	3 m	JZSP-CMM00-03-E	JZSP-C7DM21-03-E	SERVOPACK Motor end	
SGM7D-08G to -45G	5 m	JZSP-CMM00-05-E	JZSP-C7DM21-05-E	end L	
SGM7D-□□I	10 m	JZSP-CMM00-10-E	JZSP-C7DM21-10-E		
SGM7D-DDJ	15 m	JZSP-CMM00-15-E	JZSP-C7DM21-15-E		
SGM7D-DDL	20 m	JZSP-CMM00-20-E	JZSP-C7DM21-20-E		
	3 m	JZSP-CMM00-03-E	JZSP-CMM01-03-E	SERVOPACK Motor end	
SGM7D-01G or -05G	5 m	JZSP-CMM00-05-E	JZSP-CMM01-05-E	end L	
SGM7D- □□ H	10 m	JZSP-CMM00-10-E	JZSP-CMM01-10-E		
SGM7D- □□ K	15 m	JZSP-CMM00-15-E	JZSP-CMM01-15-E		
	20 m	JZSP-CMM00-20-E	JZSP-CMM01-20-E		

* Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

Note: Direct Drive Servomotors are not available with holding brakes.

Encoder Cables of 20 m or Less

Comversator Madal	Neme	Length	Order I	Number	A		
Servomotor Model	Name	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance		
	For incre-	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E			
	mental	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK end Encoder end		
	encoder: Without	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E			
	Battery	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E			
	Case	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E			
	For multi- turn abso- lute encoder: Without Battery Case ^{*2}	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E			
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK end Encoder end		
All SGM7D models		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E			
All SGIVIT D HIOUEIS		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E			
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E			
	For multi-	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	SERVOPACK end Encoder end		
	turn abso-	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E			
	lute encoder:	10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E			
	With Battery	15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	Battery Case (battery included)		
	Case	20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	(Dattery Incidued)		

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 68 mm or larger.

*2. Use one of these Cables if a battery is connected to the host controller.

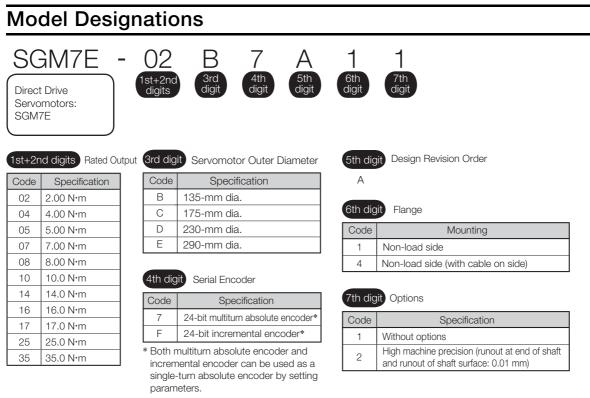
Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number ^{*1}	Appearance
All SGM7D mod- els	Cables with Connec-	30 m	JZSP-UCMP00-30-E	SERVOPACK Encoder end
	tors on Both Ends (for incremental or multiturn absolute encoder)	40 m	JZSP-UCMP00-40-E	
		50 m	JZSP-UCMP00-50-E	
	Cable with a Battery Case (for multiturn absolute encoder) ^{*2}	0.3 m	JZSP-CSP12-E	SERVOPACK Encoder end end Encoder end Battery Case (battery included)

*1. Flexible Cables are not available.

*2. This Cable is not required if a battery is connected to the host controller.

SGM7E (Coreless, Inner Rotor)



Note: 1. Direct Drive Servomotors are not available with holding brakes.

2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Manufactured Models

Rated	Servomotor Outer Diameter							
Torque	В	С	D	E				
N∙m	(135-mm dia.)	(175-mm dia.)	(230-mm dia.)	(290-mm dia.)				
2.00	SGM7E-02B	-	-	-				
4.00	-	SGM7E-04C	_	_				
5.00	SGM7E-05B	SGM7E-05B – –		-				
7.00	SGM7E-07B	-	-	-				
8.00	-	-	SGM7E-08D	-				
10.0	-	SGM7E-10C	-	-				
14.0	0 – SGM7E-14C –		_	_				
16.0	-			SGM7E-16E				
17.0	-	-	SGM7E-17D	-				
25.0	-	-	SGM7E-25D	-				
35.0	_	_	_	SGM7E-35E				

Note: The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

Specifications and Ratings

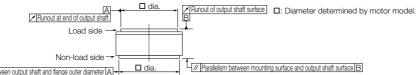
Specifications

	Voltage								200 V	/		
	М	odel SGM	7E-		02B (05B ()7B	04C 1	0C 14C	08D 17D	25D	16E 35E
Time	Rating				Continuous							
Therr	Thermal Class			A								
Insula	ation Resi	stance) VDC, 10			
Withs	stand Volt	age						1,50	0 VAC for	1 minute		
Excita	ation								ermanent r	•		
Mour	nting								-lange-mo	unted		
	Method								Direct di			
	tion Direct				Counte	erclockw	vise (C	CCW) for f	orward refere	ence when view	ved fron	n the load side
Vibra	tion Class	s*1							V15			
Abso	lute Accu	racy							±15 s	6		
Repe	atability								±1.3 s	6		
Prote	ective Stru	icture ^{*2}			Totally er	nclosed,	, self-	cooled, IP	42 (The prote	ctive structure i	is IP40 f	or CE Marking.)
	Surrounding Air Temperature			0°C to 40°C (with no freezing)								
suo	Surround	Surrounding Air Humidity			20% to 80% relative humidity (with no condensation)							
Environmental Conditions	Installation Site			 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. 								
Environm	Storage	torage Environment			Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)							
ő	Runout of	Output Shaft	Surface	mm	0.02 (0.01 for high machine precision option)							
es, es		End of Outpu		mm		0.0	D4 (C	0.01 for l	high mach	ine precisior	n optio	n)
Mechanical Tolerances ^{*3}		n between Ma nd Output Sh	0	mm		0.07			0.08			
Me Tol	Concentricity between Output Shaft and Flange Outer Diameter		0.07 0.08									
Shoc	k	Impact Accel	eration Rate a	t Flange	490 m/s ²							
Resis	stance ^{*4}	Number of	of Impacts						2 time	S		
Vibration Vibration Acceleration Resistance ^{*4} Rate at Flange		49 m/s ²										
٨٠٠	aabla	1	SGD7S-		2R84	4, 2R1	F		2R8A,	2R8F		
	Applicable SGD7W- SERVOPACKs SGD7C-						5R5A					

*1. A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at

*2. The hollow hole section, motor mounting surface, output shaft surface, and gap around the rotating part of the shaft are excluded. Protective structure specifications apply only when the special cable is used.
*3. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Conversion and the rotation on the Intervention on the Intervention.

the individual Servomotors for more information on tolerances.



Concentricity between output shaft and flange outer diameter A

*4. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures. The strength of the vibration that the Servomotor can withstand depends on the application. Check the vibration acceleration rate.



Side to side Г

Vertical

SGM7E (Coreless, Inner Rotor)

Ratings

	Voltage							200	V				
	Model SGM	7E-	02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E
Rated (Dutput ^{*1}	W	42	105	147	84	209	293	168	356	393	335	550
Rated 1	Forque ^{*1, *2}	N∙m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Instanta Maximu	aneous um Torque ^{*1}	N∙m	6.00	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall To	rque ^{*1}	N∙m	2.05	5.15	7.32	4.09	10.1	14.2	8.23	17.4	25.4	16.5	35.6
Rated (Current ^{*1}	Arms	1.8	1.7	1.4	2	2.2	2.8	1.9	2.5	2.6	3.3	3.5
Instanta Maximu	aneous um Current ^{*1}	Arms	5.4	5.1	4.1	7	'.O	8.3	5.6	7.5	8.0	9.4	10.0
Rated N Speed*		min ⁻¹		200			200		20	00	150	200	150
Maximu Speed [*]	um Motor	min⁻¹		500		500	400	300	500	350	250	500	250
Torque	Constant	N•m/Arms	1.18	3.17	5.44	2.04	5.05	5.39	5.10	7.79	10.8	5.58	11.1
Motor N Inertia	Moment of	×10 ⁻⁴ kg·m ²	28.0	51.0	77.0	77.0	140	220	285	510	750	930	1430
Rated F	Power Rate ^{*1}	kW/s	1.43	4.90	6.36	2.08	7.14	8.91	2.25	5.67	8.33	2.75	8.57
Rated A Acceler	Angular ration Rate ^{*1}	rad/s ²	710	980	910	520	710	640	280	3	30	170	240
Heat Si	nk Size	mm	350	× 350	× 12	450	× 450 :	× 12	550	× 550	× 12	650×6	50 × 12
	ble Load Mom Moment of Ine			10 t	imes		5 times			3	times		
	With Externative Resistor nal Dynamic Resistor ^{*3}	and Exter-		10 t	imes		5 times			3	times		
Allow- able	Allowable Thrust Load	Ν		1500			3300			4000		11(000
Load ^{*4}	Allowable Moment Load	N∙m	40	50	64	70	75	90	93	103	135	250	320

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.

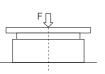
*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70000A020 to -2R800A020

• SGD7W-1R6A20A020 to -2R8A20A020

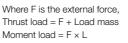
• SGD7C-1R6AMAA020 to -2R8AMAA020

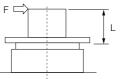
*4. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.





Where F is the external force, Thrust load = F + Load mass Moment load = 0





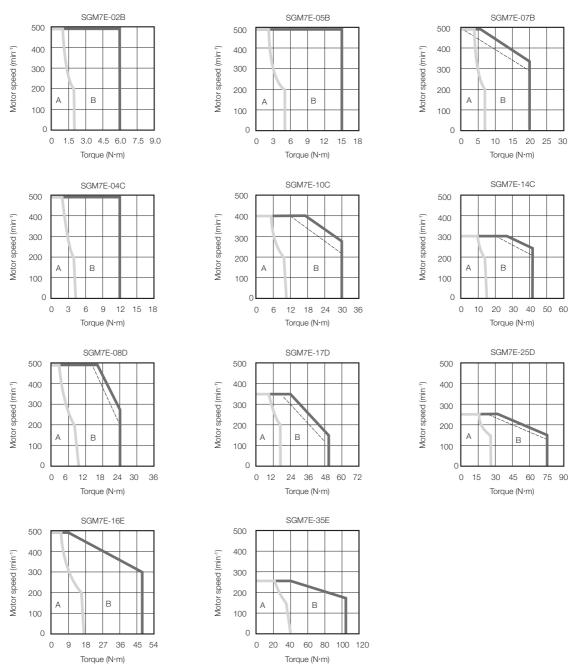
Where F is the external force, Thrust load = Load mass Moment load = $F \times L$

Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

Torque-Motor Speed Characteristics

A : Continuous duty zone -

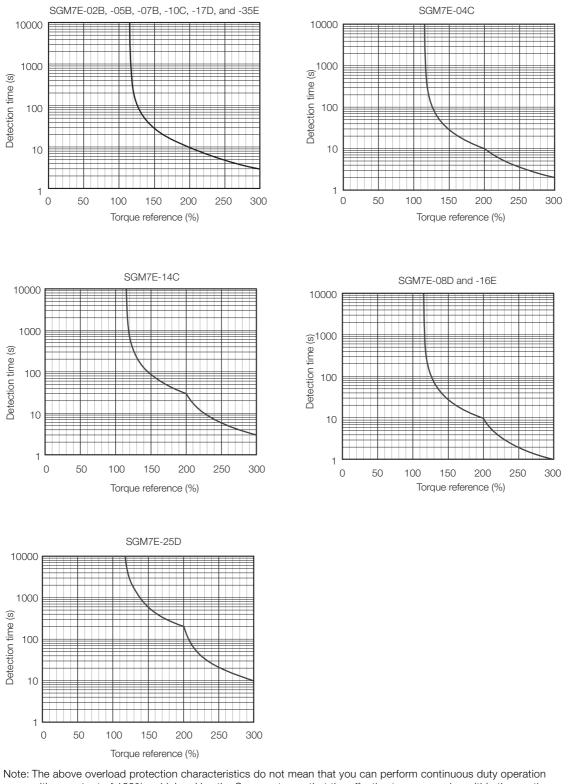
 (solid lines): With three-phase 200-V input B : Intermittent duty zone ------ (dotted lines): With single-phase 100-V input



- Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
 - 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 - 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
 - 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 147.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings* (page 146). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

• Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

If the above steps is not possible, install an external regenerative resistor.

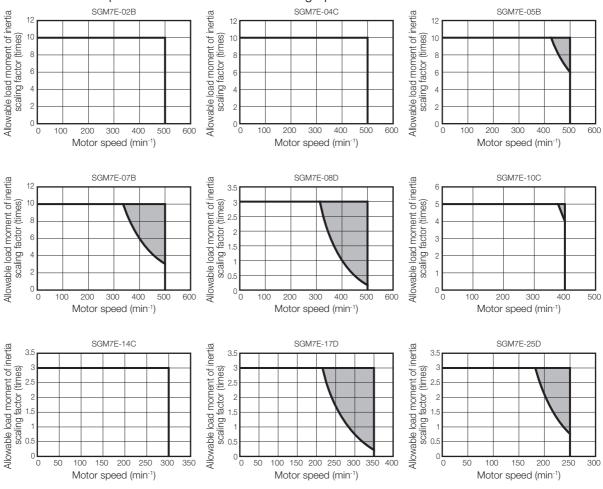
Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SGM7E (Coreless, Inner Rotor)

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-2R8A and -2R8F

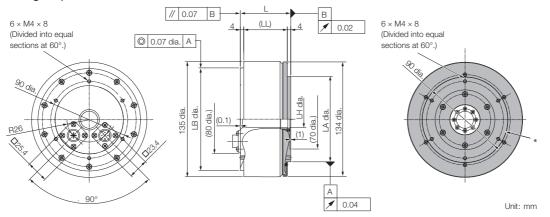
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products. *External Regenerative Resistors* (page 472)

External Dimensions

♦ SGM7E-□□B

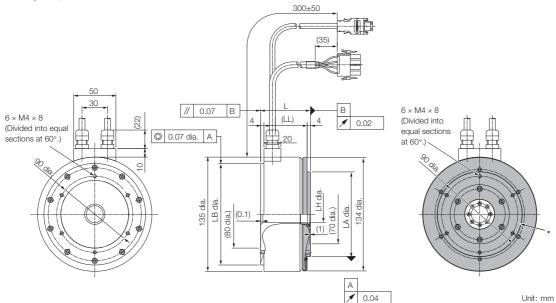
• Flange Specification 1



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
02B D A11	59	51	120 -0.035	20 +0.4	100 -0.035	4.8
05B D A11	88	80	120 -0.035	20 0 +0.4	100 -0.035	5.8
07B D A11	128	120	120 -0.035	20 +0.4	100 0-0.035	8.2

• Flange Specification 4



* The shaded section indicates the rotating parts.

Note: Values in parentheses are reference dimensions.

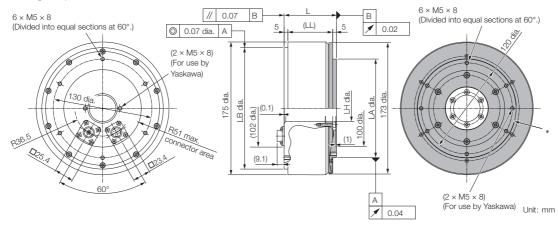
Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
02B D A41	59	51	120 -0.035	20 0 +0.4	100 -0.035	4.8
05B D A41	88	80	120 -0.035	20 0 +0.4	100 -0.035	5.8
07B D A41	128	120	120 -0.035	20 0 +0.4	100 -0.035	8.2

Refer to the following section for information on connectors.

SGM7E (Coreless, Inner Rotor)

♦ SGM7E-□□C

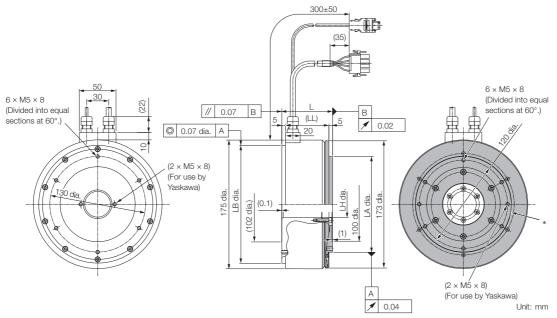
• Flange Specification 1



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04C□A11	69	59	160 0-0.040	35 +0.4	130 -0.040	7.2
10C□A11	90	80	160 .0.040	35 +0.4	130 0.040	10.2
14C□A11	130	120	160 0 -0.040	35 +0.4	130 .0.040	14.2

• Flange Specification 4



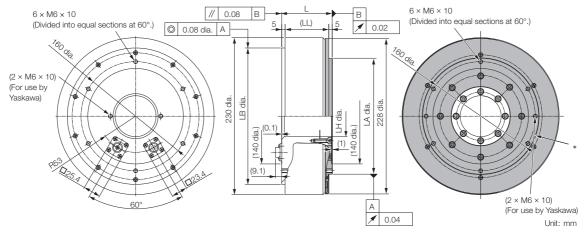
* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04C □ A41	69	59	160 .0.040	35 +0.4 0	130 -0.040	7.2
10C □ A41	90	80	160 0 -0.040	35 +0.4	130 _0.040	10.2
14C D A41	130	120	160 0 -0.040	35 +0.4 0	130 -0.040	14.2

Refer to the following section for information on connectors.

♦ SGM7E-□□D

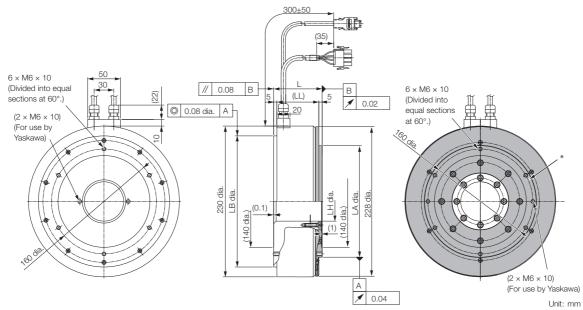
• Flange Specification 1



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08D D A11	74	64	200 .0.046	60 +0.4	170 .0.040	14.0
17D D A11	110	100	200 .0.046	60 +0.4	170 _{-0.040}	22.0
25D D A11	160	150	200 0 -0.046	60 +0.4	170 _{-0.040}	29.7

• Flange Specification 4



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

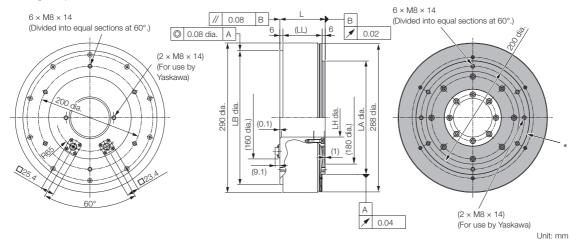
Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08D D A41	74	64	200 0-0.046	60 +0.4	170 -0.040	14.0
17D D A41	110	100	200 0 -0.046	60 +0.4	170 _{-0.040}	22.0
25D D A41	160	150	200 0 -0.046	60 +0.4	170 ⁰ -0.040	29.7

Refer to the following section for information on connectors.

SGM7E (Coreless, Inner Rotor)

♦ SGM7E-□□E

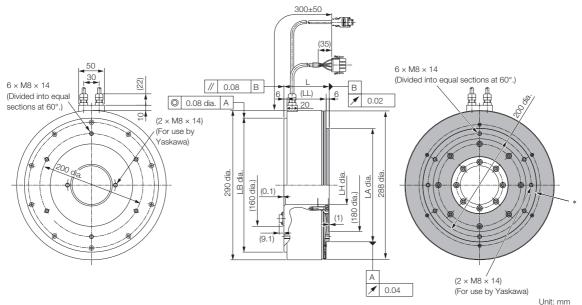
• Flange Specification 1



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16E D A11	88	76	260 0 -0.052	75 +0.4	220 0 -0.046	26.0
35EDA11	112	100	260 .0.052	75 +0.4	220 0 -0.046	34.0

• Flange Specification 4



* The shaded section indicates the rotating parts. Note: Values in parentheses are reference dimensions.

Model SGM7E-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16E D A41	88	76	260 0 -0.052	75 0+0.4	220 0 -0.046	26.0
35E D A41	112	100	260 0 -0.052	75 0+0.4	220 0	34.0

Refer to the following section for information on connectors.

Connector Specifications

◆ Flange Specification 1

Servomotor Connector

1	1	Phase U
1	2	Phase V
	3	Phase W
2	4	FG (frame ground)
4		

Model: JN1AS04MK2R Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS04FK1 (Not provided by Yaskawa.)

• Encoder Connector



* Only absolute-value models with multiturn data.

Model: JN1AS10ML1-R Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

♦ Flange Specification 4

Servomotor Connector

Г	1	ĥ
	2	
╞	3	-
L	(4)	Ш

2Phase VWhite3Phase WBlue450 (framework)0 (cm/c)		Red	Phase U	1
		White	Phase V	2
		Blue	Phase W	3
4 FG (frame ground) Green (yello	w)	Green (yellow)	FG (frame ground)	4

Models

- Plug: 350779-1Pins: 350561-3 or 350690-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

Encoder Connector

5 3-11

	1	PG5V
6	2	PG0V
	3*	BAT
	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

* Only absolute-value models with multiturn data.

Model: 55102-0600 Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

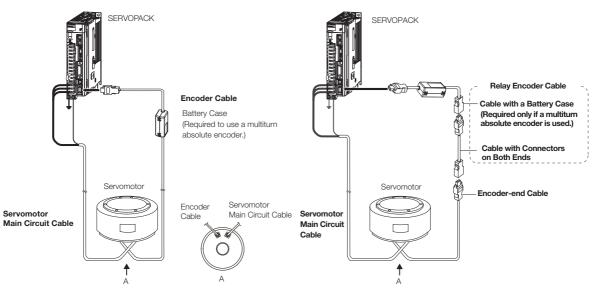
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

- 2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
- 3. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Length	Order I	Number	Annorrango
Servomotor woder	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
SGM7E-DDDD	3 m	JZSP-CMM60-03-E	JZSP-C7MDN23-03-E	
	5 m	JZSP-CMM60-05-E	JZSP-C7MDN23-05-E	SERVOPACK Motor end
Flange specification ^{*2} :	10 m	JZSP-CMM60-10-E	JZSP-C7MDN23-10-E	
Non-load side installa-	15 m	JZSP-CMM60-15-E	JZSP-C7MDN23-15-E	
tion	20 m	JZSP-CMM60-20-E	JZSP-C7MDN23-20-E	
SGM7E-DDDD	3 m	JZSP-CMM00-03-E	JZSP-C7MDS23-03-E	
	5 m	JZSP-CMM00-05-E	JZSP-C7MDS23-05-E	SERVOPACK Motor end
Flange specification ^{*2} :	10 m	JZSP-CMM00-10-E	JZSP-C7MDS23-10-E	
Non-load side installa-	15 m	JZSP-CMM00-15-E	JZSP-C7MDS23-15-E	
tion (with cable on side)	20 m	JZSP-CMM00-20-E	JZSP-C7MDS23-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. Refer to the following section for the flange specifications.

Note: Direct Drive Servomotors are not available with holding brakes.

♦ Encoder Cables of 20 m or Less

Comunication Model	Neme	Length	Order I	Number	A
Servomotor Model	Name	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
		3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E	
SGM7E-DDDF		5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E	SERVOPACK Encoder end
Flange specifica-		10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E	
tion ^{*2} : 1	_ ·	15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E	
	For incre- mental	20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E	
	encoder	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
SGM7E-DDDF		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
Flange specifica-		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
tion ^{*2} : 4		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multi-	3 m	JZSP-C7PI00-03-E	JZSP-C7PI20-03-E	
	turn abso- lute	5 m	JZSP-C7PI00-05-E	JZSP-C7PI20-05-E	SERVOPACK Encoder end
	encoder (without Battery	10 m	JZSP-C7PI00-10-E	JZSP-C7PI20-10-E	
SGM7E-DDD7		15 m	JZSP-C7PI00-15-E	JZSP-C7PI20-15-E	
Flange specifica-	Case ^{*3})	20 m	JZSP-C7PI00-20-E	JZSP-C7PI20-20-E	
tion ^{*2} : 1	For multi-	3 m	JZSP-C7PA00-03-E	JZSP-C7PA20-03-E	SERVOPACK Encoder end
	turn abso- lute	5 m	JZSP-C7PA00-05-E	JZSP-C7PA20-05-E	end L
	encoder	10 m	JZSP-C7PA00-10-E	JZSP-C7PA20-10-E	
	(with Bat-	15 m	JZSP-C7PA00-15-E	JZSP-C7PA20-15-E	Battery Case (battery included)
	tery Case)	20 m	JZSP-C7PA00-20-E	JZSP-C7PA20-20-E	
	For multi-	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
	turn abso- lute	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
	encoder	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
SGM7E-DDD7	(without Battery	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
Flange specifica-	Case ^{*3})	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
tion ^{*2} : 4	For multi-	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	SERVOPACK Encoder end
	turn abso-	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	end L
	lute encoder	10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
	(with Bat-	15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	Battery Case (battery included)
	tery Case)	20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	(שמונפרץ והכוטטפט)

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 68 mm or larger.

*2. Refer to the following section for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.

◆ Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number*1	Appearance
SGM7E-DDDF SGM7E-DDD7 Flange specifica- tion ^{*2} : 1	Encoder-end Cable (for single-turn/multi- turn absolute encoder)	0.3 m	JZSP-C7PRC0-E	SERVOPACK Encoder end end
SGM7E-DDDF SGM7E-DDD7	Cables with Connec-	30 m	JZSP-UCMP00-30-E	SERVOPACK Encoder end
Flange specifica-	tors on Both Ends (for single-turn/multi-	40 m	JZSP-UCMP00-40-E	
tion ^{*2} : 1 or 4	turn absolute encoder)	50 m	JZSP-UCMP00-50-E	
SGM7E-DDD7 Flange specifica- tion ^{*2} : 1 or 4	Cable with a Battery Case (for multiturn absolute encoder) ^{*3}	0.3 m	JZSP-CSP12-E	SERVOPACK Encoder end end Battery Case (battery included)

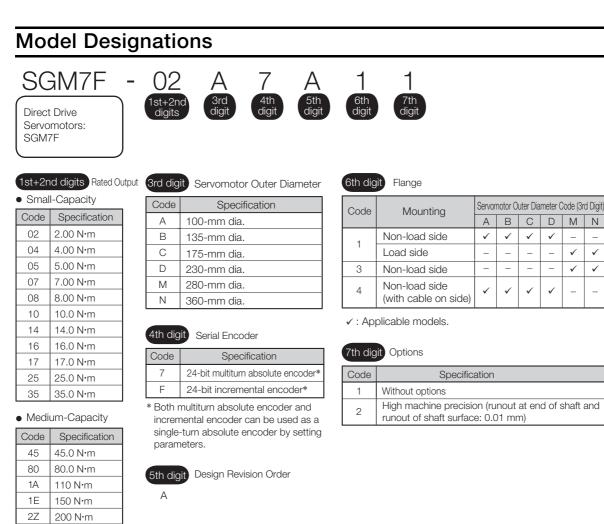
*1. Flexible Cables are not available.

*2. Refer to the following section for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.

MEMO

SGM7F (With Core, Inner Rotor)



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Note: 1. Direct Drive Servomotors are not available with holding brakes.

2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Manufactured Models

Rated			Servomotor C	uter Diameter		
Torque N∙m	A (100-mm dia.)	B (135-mm dia.)	C (175-mm dia.)	D (230-mm dia.)	M (280-mm dia.)	N (360-mm dia.)
2.00	SGM7F-02A	-	-	-	-	-
4.00	-	SGM7F-04B	-	-	-	-
5.00	SGM7F-05A	-	_	_	_	_
7.00	SGM7F-07A	-	-	-	-	_
8.00	-	-	SGM7F-08C	-	-	_
10.0	-	SGM7F-10B	-	-	-	-
14.0	-	SGM7F-14B	-	-	-	-
16.0	-	-	-	SGM7F-16D	-	_
17.0	-	-	SGM7F-17C	-	-	-
25.0	-	-	SGM7F-25C	-	-	-
35.0	-	-	-	SGM7F-35D	-	-
45.0	-	-	-	-	SGM7F-45M	-
80.0	-	-	-	-	SGM7F-80M	SGM7F-80N
110	-	-	-	-	SGM7F-1AM	-
150	-	-	-	-	-	SGM7F-1EN
200	-	-	-	-	-	SGM7F-2ZN

Note: The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

Specifications and Ratings: Small Capacity

Specifications

		Voltage	200 V										
		Model SGM7F-			02A 05A	07A (04B 10B	14B	08C	17C	25C	16D	35D
Time	Rating				Continuous								
Therr	mal Class				A								
Insula	ation Res	istance						/DC, 1					
Withs	stand Vol [.]	tage					1,500	VAC f	or 1 m	ninute			
Excit	ation						Per	maner	nt mag	net			
Mour							Fla	ange-r	nounte	ed			
Drive	Method							Direct	drive				
Rota	tion Direc	tion			Countercloc	kwise (C	CCW) for forv	vard ref	erence v	vhen vie	ewed fro	om the l	oad side
Vibra	ation Clas	s ^{*1}						V1	5				
Abso	lute Accu	iracy						±18	ō s				
Repe	eatability							±1.	3 s				
Prote	ective Stru	ucture ^{*2}			Totally enclo	osed, self	f-cooled, IP42	2 (The pr	otective	structure	e is IP40	for CE I	Marking.)
	Surround	ding Air Temperati	ure				0°C to 40	D°C (w	ith no	freezir	ng)		
ons	Surroun	ding Air Humidi	ity		20%	5 to 80	% relative	humic	dity (wi	th no (conde	nsatio	n)
¹ Environmental Conditions	Runout	Environment of Output Shaft		mm	Must build for the provided the provided to the provided the provided to	 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation) 0.02 (0.01 for high machine precision option) 							
ica		at End of Outpu		mm	0.04 (0.01 for high machine precision option)								
Mechanical Iolerances ^{*3}	Surface	sm between Moi and Output Sha	aft Surface	mm				0.0	07				
Me Tol	Concen Shaft ar	tricity between C Id Flange Outer	Dutput Diameter	mm	0.07								
Shoc	k	Impact Acceleratio	n Rate at Fla	nge	490 m/s ²								
Resis	stance ^{*4}	Number of Imp	oacts		2 times								
Vibration Vibration Acceleration Rate Resistance ^{*4} at Flange				49 m/s ²									
Appli	icable SE	RVOPACKs	SGD7S- SGD7W		2R8A, 2R1F		A, 2R8F	5R5A	2R8A, 2R8F	5R5A	7R6A	5R5A	7R6A*5, 120A
*1 \	bration along	a of V/1E indiantas a	SGD7C-		2R8A 2R8A 7R6 itude of 15 μm maximum on the Servomotor without a load at the rated motor sp							7R6A*5	

σμn *2. The hollow hole section, motor mounting surface, output shaft surface, and gap around the rotating part of the shaft are excluded. Protective structure specifications apply only when the special cable is used.

*3. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.



A Parallelism between mounting surface and output shaft surface B 🗆 dia Oconcentricity between output shaft and flange outer diameter A-

*4. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures. The strength of the vibration that the Servomotor can withstand depends on the application. Check the vibration

acceleration rate.



Vibration Applied to the Servomotor Shock Applied to the Servomotor

*5. Use derated values for this combination. Refer to the following section for information on derating values. Ratings (page 162)

Ratings

Voltage			200 V										
_	Model SGM7F	-	02A	05A	07A	04B	10B	14B	08C	17C	25C	16D	35D
Rated Ou	Rated Output ^{*1}		63	157	220	126	314	440	251	534	785	503	1100 1000 *5
Rated Tor	que ^{*1, *2}	N∙m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Instantane Torque ^{*1}	eous Maximum	N∙m	6.00	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall Torqu	ue ^{*1}	N∙m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Rated Cu	rrent ^{*1}	Arms	1.7	1.8	2.1	2.0	2.8	4.6	2.4	4	.5	5	.0
Instantane Current ^{*1}	Instantaneous Maximum Current ^{*1}		5.1	5.4	6.3	6.4	8.9	14.1	8.6	14.7	13.9	16.9	16.0
Rated Mo	Rated Motor Speed ^{*1} min ⁻¹		300			300			300				300 270 ^{*5}
Maximum	Motor Speed ^{*1}	min ⁻¹		600			600		60	00	500	600	400
Torque Co	onstant	N•m/Arms	1.28	3.01	3.64	2.21	3.81	3.27	3.52	4.04	6.04	3.35	7.33
Motor Mo	ment of Inertia	×10 ⁻⁴ kg·m ²	8.04	14.5	19.3	16.2	25.2	36.9	56.5	78.5	111	178	276
Rated Pov	wer Rate ^{*1}	kW/s	4.98	17.2	25.4	9.88	39.7	53.1	11.3	36.8	56.3	14.4	44.4
Rated Ang Accelerati	•	rad/s ²	2490	3450	3630	2470	3970	3790	1420	2170	2250	899	1270
Heat Sink	Size	mm	300	× 300	× 12	350	× 350	× 12	450	× 450	× 12	550 × 5	50 x 12
	Load Moment of Inertia R		25 times	35 times	35 times	25 times	40 times	45 times	15 times	25 times	25 times	10 times	15 times
	With External Regenerative Resistor and External Dynamic Brake Resistor ^{*3}		25 times	35 times	35 times	25 times	40 times	45 times	15 times	25 times	25 times	10 times	15 times
Allow- able	Allowable Thrust Load	Ν	22	24	26		1500			3300		40	00
Load ^{*4}	Allowable Moment Load	N∙m	1100	1100	1100	45	55	65	92	98	110	210	225

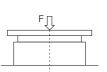
*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.

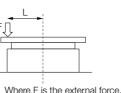
*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70□□□A020 to -2R8□□□A020

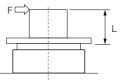
- SGD7W-1R6A20A020 to -2R8A20A020
- · SGD7C-1R6AMAA020 to -2R8AMAA020
- *4. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.



Moment load = 0



Where F is the external force, Thrust load = F + Load mass Thrust load = F + Load mass Moment load = $F \times L$



Where F is the external force, Thrust load = Load mass Moment load = $F \times L$

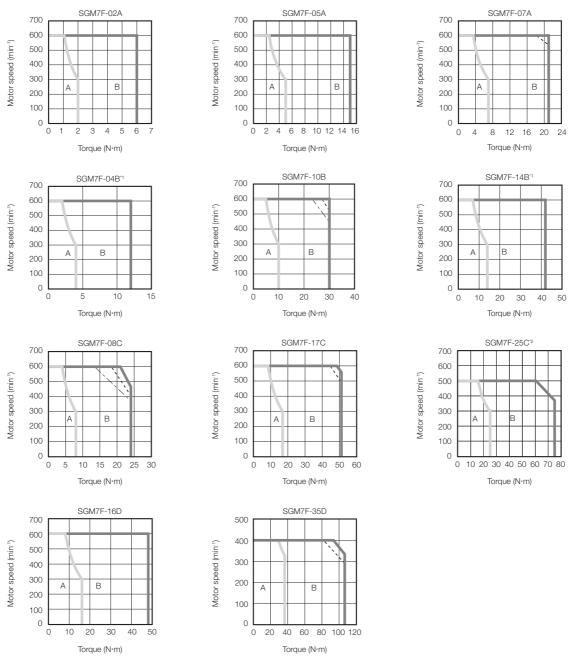
*5. If you use an SGD7S-7R6A SERVOPACK and SGM7F-35D Servomotor together, use this value (a derated value).

Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

Torque-Motor Speed Characteristics

A : Continuous duty zone ——— (solid lines): With three-phase 200-V or single-phase 230-V input

B : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input



*1. The characteristics are the same for three-phase 200 V, single-phase 200 V, and single-phase 100 V.

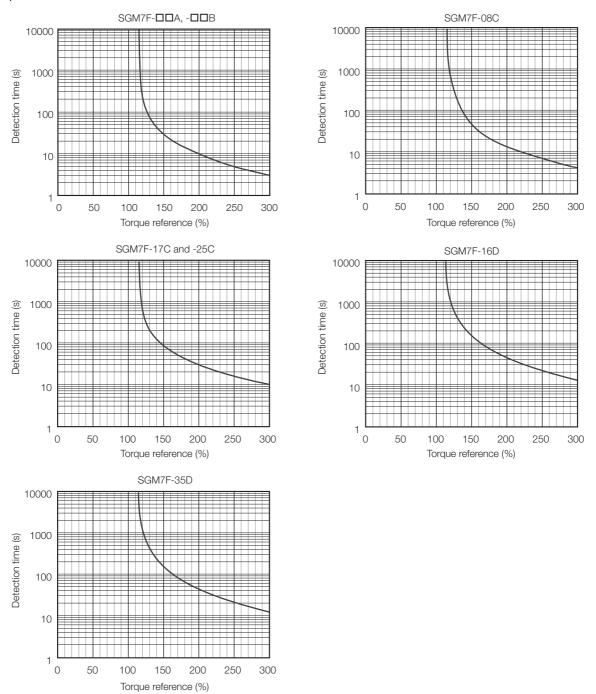
*2. Contact your Yaskawa representative for information on the SGM7F-25C.

Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 163.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings* (page 162). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

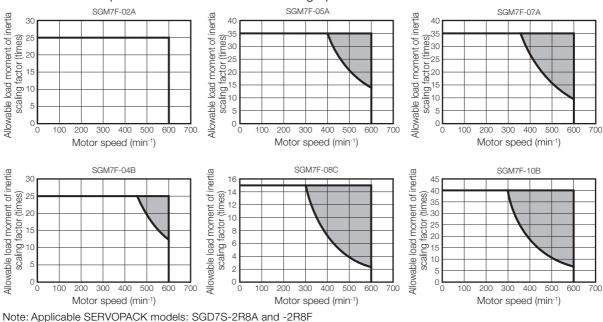
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

Specifications and Ratings: Medium Capacity

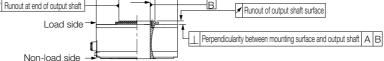
Specifications

	Voltage					200 V						
	M	odel SGI	M7F-		45M	80M	1AM	80N	1EN	2ZN		
Time	Rating				Continuous							
Therr	mal Class				F							
Insula	ation Resi	stance					500 VDC,	10 M Ω min.				
Withs	stand Volt	age					1,500 VAC	for 1 minute	Э			
Excit								nt magnet				
Mour	nting						Flange-ı	mounted				
Drive	Method							t drive				
-	tion Direc				Countercloo	ckwise (CCW)	for forward re		viewed from t	he load side		
Vibra	tion Class	S^{*1}					V	15				
Abso	lute Accu	iracy					±1	5 s				
Repe	eatability						±1	.3 s				
Prote	ective Stru	ucture ^{*2}				Totall	y enclosed,	self-cooled	, IP44			
S	Surround	ding Air T	emperature			0°0	C to 40°C (w	vith no freez	zing)			
ion	Surround	ding Air H	umidity		209	% to 80% re	elative humi	dity (with nc	condensat	tion)		
Environmental Conditions	Installation Site			 Must be Must fac Must hat Must be 	e well-ventil cilitate insp ve an altitu e free of stro	nd free of co ated and fre ection and c de of 1,000 ong magnet	e of dust ar cleaning. m or less. ic fields.	nd moisture				
Environ	Storage	Environr	nent		Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)					nsation)		
	Runout o	f Output S	Shaft Surface	mm			for high ma		1 1			
*3 *3			utput Shaft	mm		0.04 (0.01	for high ma	chine precis	sion option)			
Mechanical Tolerances ^{*3}	Surface a		Shaft Surface	mm			-	_				
Mech Tolera	Shaft and		iter Diameter	mm	0.08							
		cularity bet	ween Mount- tput Shaft	mm			0.	08				
Shoc	k	Impact Ac	celeration Rate at	: Flange			490	m/s ²				
Resis	Resistance ^{*4} Number of Impacts				2 times							
	Vibration Vibration Acceleration Resistance ^{*4} Rate at Flange						24.5	m/s ²				
			SGD7S-		7R6A	120A	180A	120A	20	0 A		
SER\	icable VOPACKs		SGD7W- SGD7C-		7R6A –							

*1. A vibration class of V15 indicates a vibration amplitude of 15 µm maximum on the Servomotor without a load at

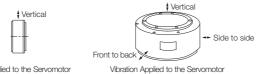
*2. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.
*3. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.





*4. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.

The strength of the vibration that the Servomotor can withstand depends on the application. Check the vibration acceleration rate.



Shock Applied to the Servomotor

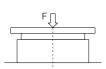
Ratings

	Voltage	200 V						
	Model SGM7F-	45M	80M	1AM	80N	1EN	2ZN	
Rated Outp	Rated Output ^{*1}		707	1260	1730	1260	2360	3140
Rated Torq	ue ^{*1, *2}	N∙m	45.0	80.0	110	80.0	150	200
Instantaneo	ous Maximum Torque ^{*1}	N∙m	135	240	330	240	450	600
Stall Torque	e ^{*1}	N∙m	45.0	80.0	110	80.0	150	200
Rated Curr	ent*1	Arms	5.8	9.7	13.4	9.4	17.4	18.9
Instantaneo	ous Maximum Current ^{*1}	Arms	17.0	28.0	42.0	28.0	56.0	56.0
Rated Moto	min⁻¹		150		150			
Maximum N	Maximum Motor Speed ^{*1} n			300		300 250		
Torque Cor	nstant	N•m/Arms	8.39	8.91	8.45	9.08	9.05	11.5
Motor Mon	nent of Inertia	$\times 10^{-4} \text{ kg} \cdot \text{m}^2$	388	627	865	1360	2470	3060
Rated Pow	er Rate ^{*1}	kW/s	52.2	102	140	47.1	91.1	131
Rated Ang	ular Acceleration Rate ^{*1}	rad/s ²	1160	1280	1270	588	607	654
Heat Sink S	Size	mm			750 × 7	50 × 45		
	oad Moment of Inertia nent of Inertia Ratio)		3 times					
	With External Regenerative Resistor and External Dynamic Brake Resistor				3 tii	mes		
Allowable	А	mm		33			37.5	
Load ^{*3}	Allowable Thrust Load	Ν		9000			16000	
2000	Allowable Moment Load	N∙m		180			350	

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.

*3. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.



Where F is the external force, Thrust load = F + Load mass Moment load = 0

Where F is the external force, Thrust load = F + Load mass Moment load = $F \times L$

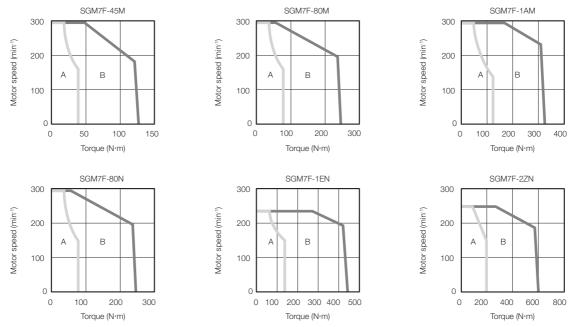
F \leftarrow A (Refer to the values in the table.) Where F is the external force, Thrust load = Load mass Moment load = F × (L + A)

Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

Torque-Motor Speed Characteristics

A : Continuous duty zone

B : Intermittent duty zone



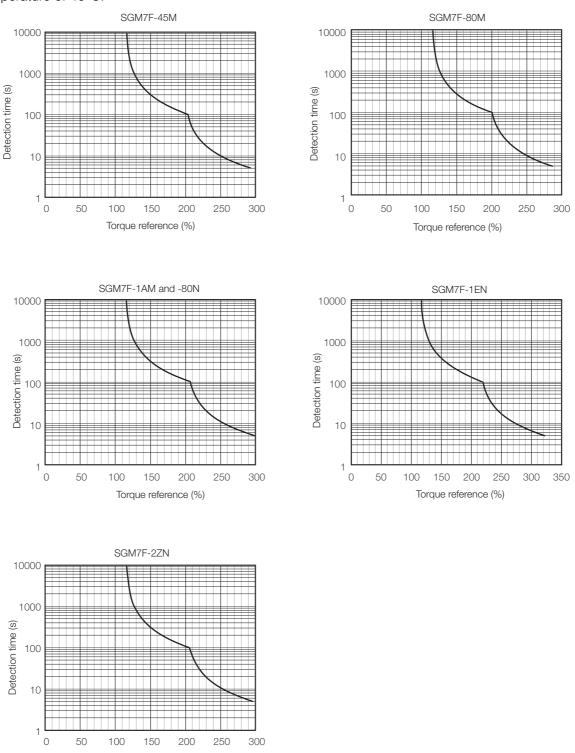
Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.

2. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.

3. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 168.

Torque reference (%)

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings* (page 167). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

• Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

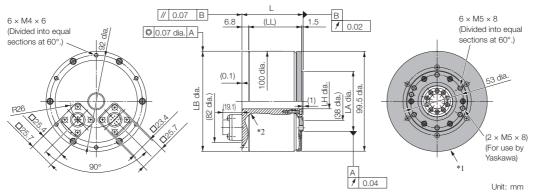
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

External Dimensions

♦ SGM7F-□□A

• Flange Specification 1



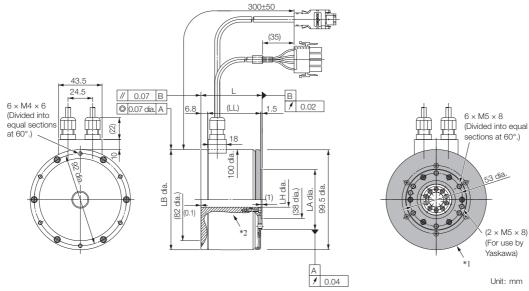
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
02A□A11	61	(52.7)	100 _0.035	15 +0.4	60 _{-0.030}	2.5
05ADA11	96	(87.7)	100 _0.035	15 +0.4	60 _{-0.030}	5.0
07ADA11	122	(113.7)	100 _0.035	15 +0.4	60 ⁰ -0.030	6.5

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

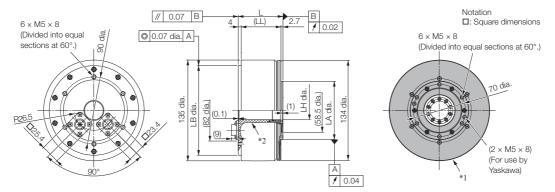
Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
02A D A41	61	(52.7)	100 _{-0.035}	15 ^{+0.4}	60 _{-0.030}	2.5
05A D A41	96	(87.7)	100 _0.035	15 ^{+0.4}	60 ⁰ _{-0.030}	5.0
07A D A41	122	(113.7)	100 _0.035	15 ^{+0.4}	60 ⁰ _{-0.030}	6.5

Refer to the following section for information on connectors. Connector Specifications (page 177) SGM7F (With Core, Inner Rotor)

♦ SGM7F-□□B

• Flange Specification 1



Unit: mm

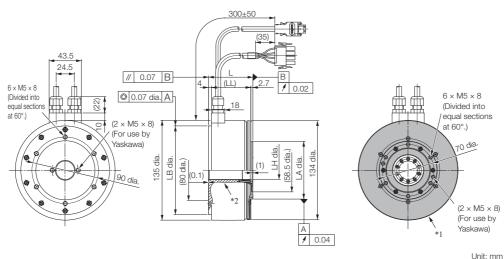
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04B D A11	60	53.3	120 0 -0.035	$25_{+0.1}^{+0.3}$	78 .0.030	5.0
10B D A11	85	78.3	120 .0.035	25 +0.3 +0.1	78 .0.030	6.5
14B D A11	115	108.3	120 -0.035	25 +0.3 +0.1	78 .0.030	9.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

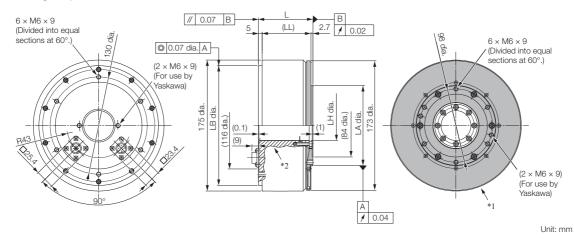
Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04B D A41	60	53.3	120 0.035	$25^{+0.3}_{+0.1}$	78 -0.030	5.0
10B D A41	85	78.3	120 0	25 ^{+0.3} _{+0.1}	78 -0.030	6.5
14B D A41	115	108.3	120 0 -0.035	$25^{+0.3}_{+0.1}$	78 .0.030	9.0

Refer to the following section for information on connectors.

♦ SGM7F-□□C

• Flange Specification 1



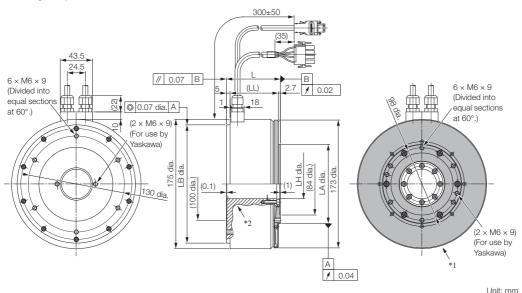
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08C□A11	73	65.3	160 0 -0.040	$40^{+0.3}_{+0.1}$	107 .0.035	9.0
17C□A11	87	79.3	160 0 -0.040	40 +0.3 +0.1	107 .0.035	11.0
25C□A11	117	109.3	160 0.040	$40_{+0.1}^{+0.3}$	107 .0.035	15.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

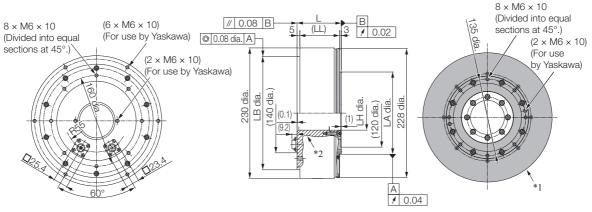
Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08C □ A41	73	65.3	160 0.040	40 +0.3 +0.1	107 0.035	9.0
17C □ A41	87	79.3	160 0 -0.040	40 +0.3 +0.1	107 0.035	11.0
25C □ A41	117	109.3	160 0 -0.040	40 +0.3 +0.1	107 0.035	15.0

Refer to the following section for information on connectors. Connector Specifications (page 177) SGM7F (With Core, Inner Rotor)

♦ SGM7F-□□D

• Flange Specification 1



Unit: mm

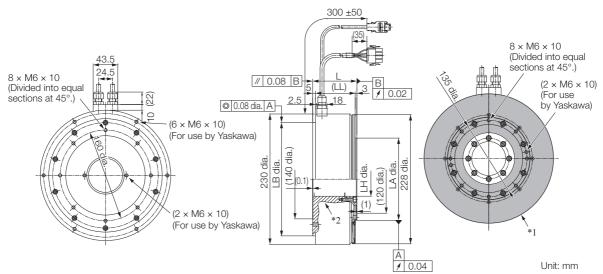
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16D D A11	78	70	200 0 -0.046	60 0 +0.4	145 .0.040	16.0
35D D A11	107	99	200 -0.046	60 0 0 0	145 0-0.040	25.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

 $\ast 2.$ The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

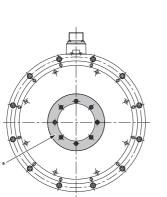
Model SGM7F-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16D D A41	78	70	200 .0.046	60 0 +0.4	145 0.040	16.0
35D D A41	107	99	200 0 -0.046	60 0 0 0	145 .0.040	25.0

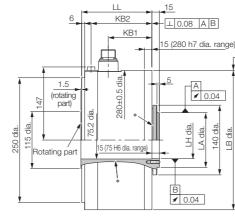
Refer to the following section for information on connectors.

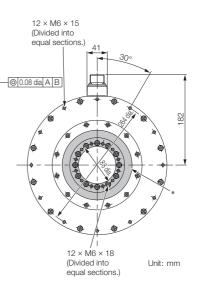
Connector Specifications (page 177)



• Flange Specification 1



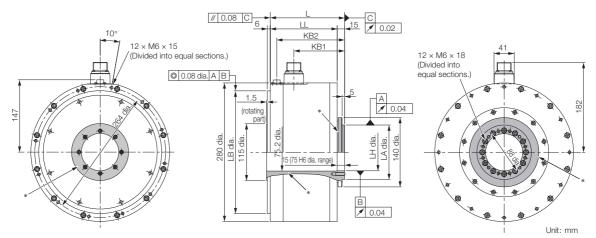




* The shaded section indicates the rotating parts.

Model SGM7F-	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
45M□A11	141	87.5	122	280 0 -0.052	75 0+0.019	110 ⁰ _{-0.035}	38
80MDA11	191	137.5	172	280 .0.052	75 +0.019	110 ⁰ -0.035	45
1AMDA11	241	187.5	222	280 0 -0.052	75 +0.019	110 ⁰ -0.035	51

• Flange Specification 3



* The shaded section indicates the rotating parts.

Model SGM7F-	L	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
45M D A31	150	135	102.5	137	248 .0.046	75 +0.019	110 ⁰ -0.035	38
80MDA31	200	185	152.5	187	248 0 -0.046	75 +0.019	110 ⁰ -0.035	45
1AMDA31	250	235	202.5	237	248 0 -0.046	75 +0.019	110 ⁰ -0.035	51

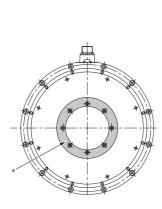
Refer to the following section for information on connectors.

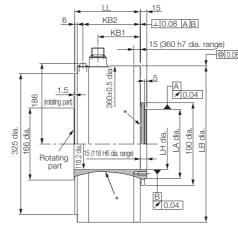
Connector Specifications (page 177)

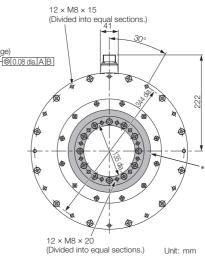
SGM7F (With Core, Inner Rotor)

♦ SGM7F-□□N

• Flange Specification 1



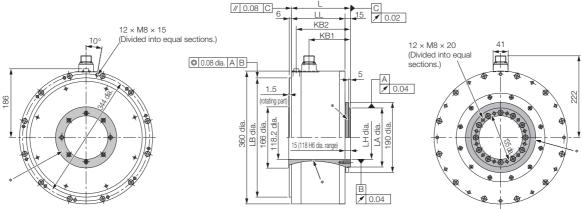




* The shaded section indicates the rotating parts.

Model SGM7F-	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
80N D A11	151	98	132	360 0.057	118 0+0.022	160 0 -0.040	50
1EN□A11	201	148	182	360 .0.057	118 0+0.022	160 .0.040	68
2ZN D A11	251	198	232	360 .0.057	118 0+0.022	160 .0.040	86

• Flange Specification 3



Unit: mm

* The shaded section indicates the rotating parts.

Model SGM7F-	L	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
80NDA31	160	145	113	147	323 .0.057	118 0+0.022	160 .0.040	50
1EN D A31	210	195	163	197	323 0 -0.057	118 ^{+0.022} ₀	160 0 -0.040	68
2ZNDA31	260	245	213	247	323 0 -0.057	118 +0.022 0	160 0 -0.040	86

Refer to the following section for information on connectors.

Connector Specifications (page 177)

Connector Specifications

♦ SGM7F-□□A, -□□B, -□□C, or -□□D: Flange Specification 1

Servomotor Connector

1	1	Phase U
€ 3	2	Phase V
	3	Phase W
2	4	FG (frame ground)

Model: JN1AS04MK2R Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS04FK1 (Not provided by Yaskawa.)

Encoder Connector



* Only absolute-value models with multiturn data.

Model: JN1AS10ML1-R

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

◆ SGM7F-□□A, -□□B, -□□C, or -□□D: Flange Specification 4

5、 3-11

Servomotor Connector

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1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Models

- Plug: 350779-1
 Pins: 350561-3 or 350690-3 (No.1 to 3)
 Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

• Cap: 350780-1

• Socket: 350570-3 or 350689-3

Encoder Connector

	1	PG5V
$\begin{pmatrix} & & \\ & & & \\ & & & \end{pmatrix}^6$	2	PG0V
	3*	BAT
	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

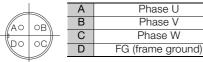
* Only absolute-value models with multiturn

data. Model: 55102-0600 Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

SGM7F-□□M or -□□N with Flange Specification 1 or 3

Servomotor Connector

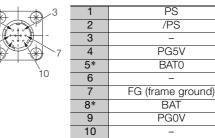


Model: CE05-2A18-10PD Manufacturer: DDK Ltd.

Mating Connector

- Plug: CE05-6A18-10SD-B-BSS
- Cable clamp: CE3057-10A-□(D265)

Encoder Connector



Only absolute-value models with multiturn data. Model: JN1AS10ML1

PS

/PS

PG5V

BAT0

BAT

PG0V

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1

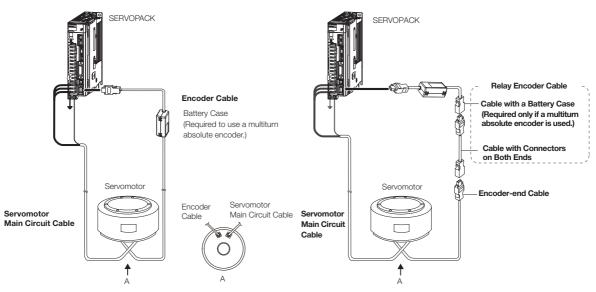
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

- 2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
- 3. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Length	Order I	Number	Appearance
Servomotor woder	Servomotor Model (L)		Flexible Cable ^{*1}	Appearance
SGM7F-□□A SGM7F-□□B	3 m	JZSP-CMM60-03-E	JZSP-C7MDN23-03-E	
SGM7F-□□C SGM7F-□□D	5 m	JZSP-CMM60-05-E	JZSP-C7MDN23-05-E	SERVOPACK Motor end
	10 m	JZSP-CMM60-10-E	JZSP-C7MDN23-10-E	
Flange specification ^{*2} : 1	15 m	JZSP-CMM60-15-E	JZSP-C7MDN23-15-E	
Non-load side installa- tion	20 m	JZSP-CMM60-20-E	JZSP-C7MDN23-20-E	
SGM7F-□□A SGM7F-□□B	3 m	JZSP-CMM00-03-E	JZSP-C7MDS23-03-E	
SGM7F-□□C SGM7F-□□D	5 m	JZSP-CMM00-05-E	JZSP-C7MDS23-05-E	SERVOPACK Motor end
	10 m	JZSP-CMM00-10-E	JZSP-C7MDS23-10-E	
Flange specification ^{*2} : 4	15 m	JZSP-CMM00-15-E	JZSP-C7MDS23-15-E	
Non-load side installa- tion (with cable on side)	20 m	JZSP-CMM00-20-E	JZSP-C7MDS23-20-E	

Continued on next page.

O amagene a transmission	Length	Order Number		A
Servomotor Model	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
	3 m	JZSP-USA101-03-E	JZSP-USA121-03-E	
	5 m	JZSP-USA101-05-E	JZSP-USA121-05-E	SERVOPACK Motor end
	10 m	JZSP-USA101-10-E	JZSP-USA121-10-E	
SGM7F-DDM	15 m	JZSP-USA101-15-E	JZSP-USA121-15-E	
SGM7F-□□N	20 m	JZSP-USA101-20-E	JZSP-USA121-20-E	
DD : 45	3 m	JZSP-USA102-03-E	JZSP-USA122-03-E	
	5 m	JZSP-USA102-05-E	JZSP-USA122-05-E	SERVOPACK Motor end
	10 m	JZSP-USA102-10-E	JZSP-USA122-10-E	
	15 m	JZSP-USA102-15-E	JZSP-USA122-15-E	
	20 m	JZSP-USA102-20-E	JZSP-USA122-20-E	
	3 m	JZSP-USA301-03-E	JZSP-USA321-03-E	
	5 m	JZSP-USA301-05-E	JZSP-USA321-05-E	SERVOPACK Motor end
	10 m	JZSP-USA301-10-E	JZSP-USA321-10-E	
SGM7F-DDM	15 m	JZSP-USA301-15-E	JZSP-USA321-15-E	
SGM7F-DDN	20 m	JZSP-USA301-20-E	JZSP-USA321-20-E	*
	3 m	JZSP-USA302-03-E	JZSP-USA322-03-E	
□□: 1A	5 m	JZSP-USA302-05-E	JZSP-USA322-05-E	SERVOPACK Motor end
	10 m	JZSP-USA302-10-E	JZSP-USA322-10-E	
	15 m	JZSP-USA302-15-E	JZSP-USA322-15-E	
	20 m	JZSP-USA302-20-E	JZSP-USA322-20-E	
	3 m	JZSP-USA501-03-E	JZSP-USA521-03-E	
	5 m	JZSP-USA501-05-E	JZSP-USA521-05-E	SERVOPACK Motor end
	10 m	JZSP-USA501-10-E	JZSP-USA521-10-E	
SGM7F-DDM	15 m	JZSP-USA501-15-E	JZSP-USA521-15-E	
SGM7F-□□N	20 m	JZSP-USA501-20-E	JZSP-USA521-20-E	*
DD: 1E	3 m	JZSP-USA502-03-E	JZSP-USA522-03-E	
DD : 2Z	5 m	JZSP-USA502-05-E	JZSP-USA522-05-E	SERVOPACK Motor end
	10 m	JZSP-USA502-10-E	JZSP-USA522-10-E	
	15 m	JZSP-USA502-15-E	JZSP-USA522-15-E	
	20 m	JZSP-USA502-20-E	JZSP-USA522-20-E	

Continued from previous page.

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius of the Flexible Cables are given in the following table.

Order Number	Recommended Bending Radius (R)	Order Number	Recommended Bending Radius (R)	
JZSP-C7MDN23-DD-E	90 mm min.	JZSP-USA321-□□-E	113 mm min.	
JZSP-C7MDS23-□□-E	90 1111 11111.	JZSP-USA322-□□-E		
JZSP-USA121-DD-E	96 mm min.	JZSP-USA521-□□-E	150 mm min.	
JZSP-USA122-DD-E	90 1111 11111.	JZSP-USA522-□□-E		

*2. Refer to the following section for the flange specifications.

Note: Direct Drive Servomotors are not available with holding brakes.

SGM7F (With Core, Inner Rotor)

Encoder Cables of 20 m or Less

	N	Length	Order Number		
Servomotor Model	Name	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
		3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E	
SGM7F-DDDF		5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E	SERVOPACK Encoder end
Flange specifica-		10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E	
tion ^{*2} : 1 or 3		15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E	
	For incre-	20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E	
SGM7F-DDAF	mental	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
SGM7F-□□BF SGM7F-□□CF	encoder	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
SGM7F-DDF		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
Flange specifica-		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
tion*2: 4		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multi-	3 m	JZSP-C7PI00-03-E	JZSP-C7Pl20-03-E	
	turn abso- lute	5 m	JZSP-C7PI00-05-E	JZSP-C7PI20-05-E	SERVOPACK Encoder end
	encoder (without Battery	10 m	JZSP-C7PI00-10-E	JZSP-C7Pl20-10-E	
SGM7F-DDD7		15 m	JZSP-C7PI00-15-E	JZSP-C7Pl20-15-E	
Flange specifica-	Case ^{*3})	20 m	JZSP-C7PI00-20-E	JZSP-C7PI20-20-E	
tion ^{*2} : 1 or 3	For multi-	3 m	JZSP-C7PA00-03-E	JZSP-C7PA20-03-E	SERVOPACK Encoder end
	turn abso-	5 m	JZSP-C7PA00-05-E	JZSP-C7PA20-05-E	end L
	lute encoder	10 m	JZSP-C7PA00-10-E	JZSP-C7PA20-10-E	
	(with Bat-	15 m	JZSP-C7PA00-15-E	JZSP-C7PA20-15-E	Battery Case (battery included)
	tery Case)	20 m	JZSP-C7PA00-20-E	JZSP-C7PA20-20-E	(battory molddod)
	For multi- turn abso-	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
	lute	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
SGM7F-DDA7	encoder	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
SGM7F-□□B7 SGM7F-□□C7	(without Battery	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
SGM7F-DD7	Case*3)	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
Flange specifica-	For multi-	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	SERVOPACK Encoder end
tion ^{*2} : 4	turn abso-	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	
	lute encoder	10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
	(with Bat-	15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	Battery Case (battery included)
	tery Case)	20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	(ballely included)

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 68 mm or larger.

*2. Refer to the following section for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.

◆ Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number ^{*1}	Appearance
SGM7F-DDDF SGM7F-DDD7 Flange specifica- tion ^{*2} : 1 or 3	Encoder-end Cable (for single-turn/multi- turn absolute encoder)	0.3 m	JZSP-C7PRC0-E	SERVOPACK Encoder end end Encoder end Encoder end
SGM7F-DDDF SGM7F-DDD7	Cables with Connec- tors on Both Ends (for single-turn/multi- turn absolute encoder)	30 m	JZSP-UCMP00-30-E	SERVOPACK Encoder end
Flange specifica-		40 m	JZSP-UCMP00-40-E	
tion ^{*2} : 1, 3 or 4		50 m	JZSP-UCMP00-50-E	
SGM7F-□□□7 Flange specifica- tion*2: 1, 3 or 4	Cable with a Battery Case (for multiturn absolute encoder)* ³	0.3 m	JZSP-CSP12-E	SERVOPACK Encoder end end Encoder end Encoder encoder encoder Encoder encoder Encoder Encoder encoder Encoder

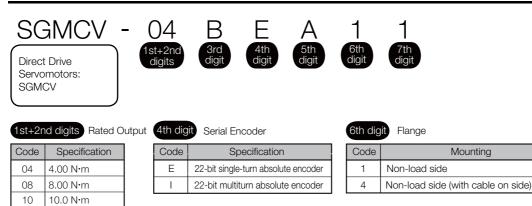
*1. Flexible Cables are not available.

*2. Refer to the following section for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.

SGMCV (Small Capacity, with Core, Inner Rotor)

Model Designations



5th digit Design Revision Order

7th digit	Options	

(

Code	Specification			
1	Without options			
5	High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm)			



14

16

17

25

35

Servomotor	Outer	Diameter

Code	Specification			
В	135-mm dia.			
С	175-mm dia.			
D	230-mm dia.			

14.0 N·m

16.0 N•m

17.0 N•m

25.0 N•m

35.0 N·m

Note: 1. Direct Drive Servomotors are not available with holding brakes.

А

2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Manufactured Models

Rated	Servo	motor Outer Dia	imeter
Torque N∙m	B (135-mm dia.)	C (175-mm dia.)	D (230-mm dia.)
4.00	SGMCV-04B	-	-
8.00	-	SGMCV-08C	-
10.0	SGMCV-10B	-	-
14.0	SGMCV-14B	_	-
16.0	-	-	SGMCV-16D
17.0	-	SGMCV-17C	-
25.0	-	SGMCV-25C	-
35.0	_	_	SGMCV-35D

Note: The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

Specifications and Ratings

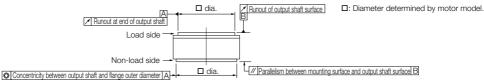
Specifications

		Voltage			200 V							
	1	Vodel SGMCV-			04B							35D
Time	Rating					Continuous						
	nal Class				A							
Insula	ation Res	istance						00 VDC,				
Withs	Withstand Voltage							500 VAC				
Excita								Permane				
Mour	-							•	-mounte	ed		
	Method								ct drive			
	ion Direc				Counter	clockwise	(CCW) fo			when view	ed from th	ne load side
	tion Class								/15			
	lute Accu	iracy							15 s			
	atability								1.3 s			
Prote	ctive Stru	ucture ^{*2}					Totally e	enclosed	, self-co	oled, IP	42	
S	Surrounding Air Temperature							o 40°C (<u> </u>
ion	5 Surrounding Air Humidity							tive hum				
Environmental Conditions	Installation Site			 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. Store the Servomotor in the following environment if you store it with								
Environ		Environment			the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)							
* <u>*</u>		of Output Shaft S		mm								
ica		at End of Output		mm	0.04 (0.01 for high machine precision option)							
Mechanical Tolerances ^{*3}	Surface	om between Mou and Output Shaf	t Surface	mm	0.07							
₽ Pol		tricity between O d Flange Outer D		mm	0.07							
Shoc		Impact Acceleration	n Rate at Fla	ange				490) m/s ²			
Resis	stance*4	Number of Imp	pacts					2 1	times			
Vibra Resis	tion stance ^{*4}	Vibration Acce at Flange	leration F	late	49 m/s ²							
		RVOPACKs	SGD7S-		2R8A,	2R8F	5R5A	2R8A, 2R8F	5R5A	7R6A	5R5A	7R6A ^{*5} , 120A
, 1991,			SGD7W SGD7C		2R	8A	511671	2R8A	511071	11071	511671	7R6A*5

*1. A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at the rated motor speed.

*2. The hollow hole section, motor mounting surface, output shaft surface, and gap around the rotating part of the shaft are excluded. Protective structure specifications apply only when the special cable is used.

*3. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.



*4. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures. The strength of the vibration that the Servomotor can withstand depends on the application. Check the vibration acceleration rate.



- Shock Applied to the Servomotor Vibration Applied to the Servomotor
- *5. Use derated values for this combination. Refer to the following section for information on derating values. *Refer to the following section for information on derating values.*

SGMCV

Ratings

	Voltage					20	00 V			
	Model SGMCV-		04B	10B	14B	08C	17C	25C	16D	35D
Rated Output	t*1 W		126	314	440	251	534	785	503	1100 1000 ^{*5}
Rated Torque	*1, *2	N∙m	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Instantaneou	s Maximum Torque *1	N∙m	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall Torque ^{*1}		N∙m	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Rated Curren	t*1	Arms	2.0	2.8	4.6	2.4	4	.5	5	.0
Instantaneou	s Maximum Current ^{*1}	Arms	6.4	8.9	14.1	8.6	14.7	13.9	16.9	16.0
Rated Motor Speed ^{*1} mir		min ⁻¹	300			300				300 270 ^{*5}
Maximum Mo	Maximum Motor Speed ^{*1}		600			600 500			600	400
Torque Const	tant	N•m/Arms	2.21	3.81	3.27	3.52	4.04	6.04	3.35	7.33
Motor Mome	nt of Inertia	×10 ⁻⁴ kg·m ²	16.2	25.2	36.9	56.5	78.5	111	178	276
Rated Power	Rate ^{*1}	kW/s	9.88	39.7	53.1	11.3	36.8	56.3	14.4	44.4
Rated Angula	ar Acceleration Rate ^{*1}	rad/s ²	2470	3970	3790	1420	2170	2250	899	1270
Heat Sink Siz	:e	mm	350	× 350	× 12	450	× 450	× 12	550 × 5	50 × 12
	ad Moment of Inertia ent of Inertia Ratio)		25 times	40 times	45 times	15 times	25 times	25 times	10 times	15 times
	With External Regenerative Resis- tor and External Dynamic Brake Resistor ^{*3}		25 times	40 times	45 times	15 times	25 times	25 times	10 times	15 times
Allowable	Allowable Thrust Load	Ν		1500			3300		40	00
Load ^{*4}	Allowable Moment Load	N∙m	45	55	65	92	98	110	210	225

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.

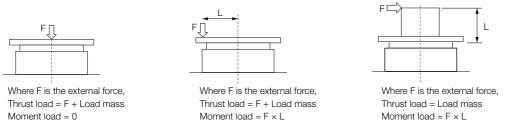
*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70

• SGD7W-1R6A20A020 to -2R8A20A020

• SGD7C-1R6AMAA020 to -2R8AMAA020

*4. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.



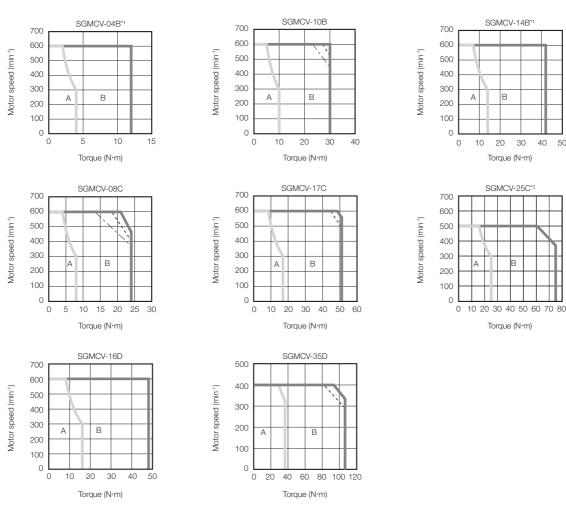
*5. If you use an SGD7S-7R6A SERVOPACK and SGMCV-35D Servomotor together, use this value (a derated value).

Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

Torque-Motor Speed Characteristics

A : Continuous duty zone -(solid lines): With three-phase 200-V or single-phase 230-V input

B : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input ----- (dashed-dotted lines): With single-phase 100-V input



*1. The characteristics are the same for three-phase 200 V, single-phase 200 V, and single-phase 100 V.

*2. Contact your Yaskawa representative for information on the SGMCV-25C.

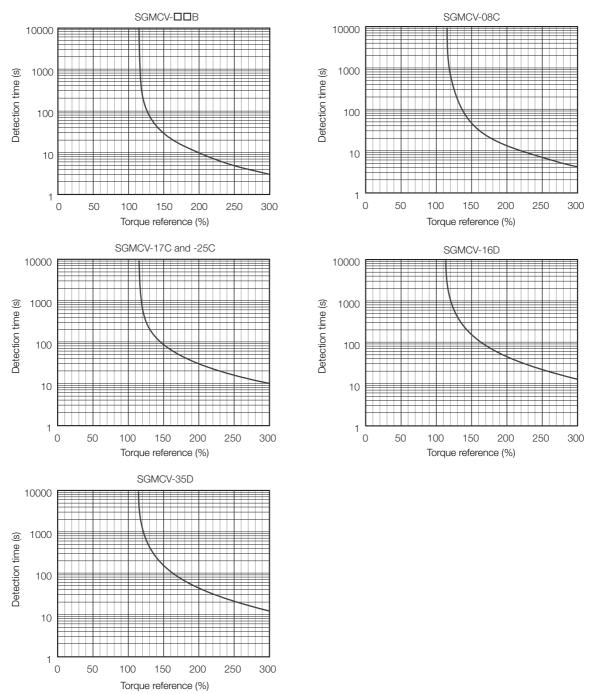
Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

2. The characteristics in the intermittent duty zone depend on the power supply voltage.

3. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Torque-Motor Speed Characteristics* on page 185.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Ratings* (page 184). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

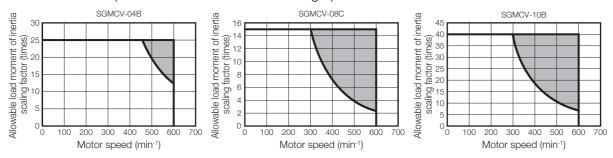
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-2R8A and -2R8F

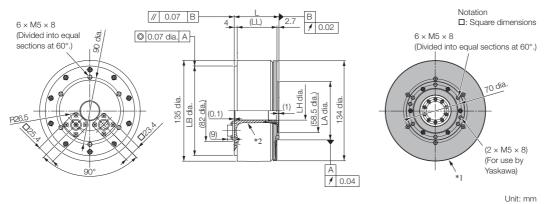
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the following section for the recommended products.

External Dimensions

♦ SGMCV-□□B

• Flange Specification 1



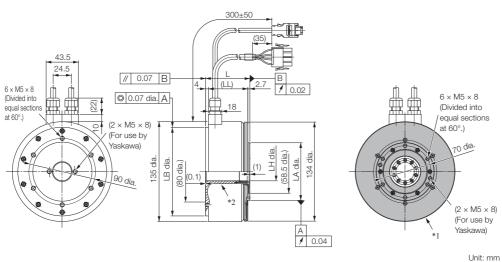
*1. The shaded section indicates the rotating parts.

 $\ast 2$. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04B D A11	60	53.3	120 0	$25^{+0.3}_{+0.1}$	78 -0.030	5.0
10B D A11	85	78.3	120 -0.035	25 +0.3 +0.1	78 -0.030	6.5
14B D A11	115	108.3	120 -0.035	25 +0.3 +0.1	78 -0.030	9.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

 $\ast 2.$ The hatched section indicates the non-rotating parts.

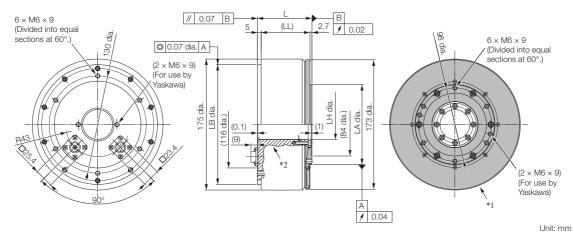
Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04B D A41	60	53.3	120 0	$25^{+0.3}_{+0.1}$	78 .0.030	5.0
10B D A41	85	78.3	120 0	$25_{+0.1}^{+0.3}$	78 .0.030	6.5
14B D A41	115	108.3	120 0	25 ^{+0.3} _{+0.1}	78 .0.030	9.0

Refer to the following section for information on connectors.

♦ SGMCV-□□C

• Flange Specification 1



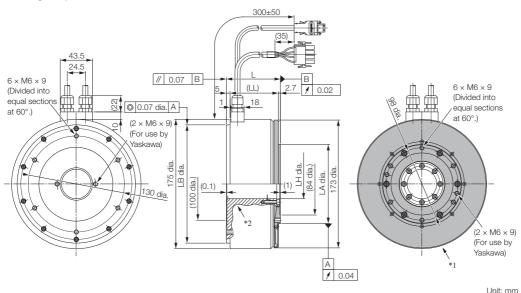
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08C□A11	73	65.3	160 0.040	$40^{+0.3}_{+0.1}$	107 .0.035	9.0
17C□A11	87	79.3	160 0 -0.040	40 +0.3 +0.1	107 .0.035	11.0
25C □ A11	117	109.3	160 0-0.040	$40_{+0.1}^{+0.3}$	107 .0.035	15.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

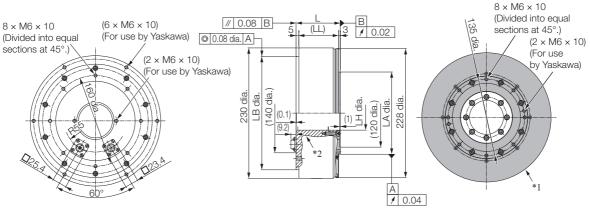
Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08C □ A41	73	65.3	160 0 -0.040	$40^{+0.3}_{+0.1}$	107 .0.035	9.0
17C □ A41	87	79.3	160 0 -0.040	40 +0.3 +0.1	107 0.035	11.0
25C □ A41	117	109.3	160 0 -0.040	40 +0.3 +0.1	107 0.035	15.0

Refer to the following section for information on connectors. Connector Specifications (page 191)

♦ SGMCV-□□D

• Flange Specification 1



Unit: mm

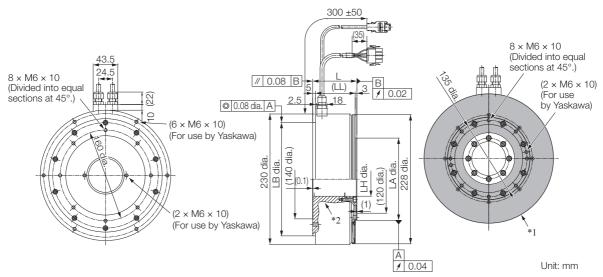
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16D D A11	78	70	200 .0.046	60 0 +0.4	145 .0.040	16.0
35D D A11	107	99	200 0 -0.046	60 0 0 0	145 0-0.040	25.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16D D A41	78	70	200 0 -0.046	60 0 +0.4	145 .0.040	16.0
35D D A41	107	99	200 0 -0.046	60 0 +0.4	145 0.040	25.0

Refer to the following section for information on connectors.

Connector Specifications (page 191)

Connector Specifications

◆ Flange Specification 1

· Servomotor Connector

1	1	Phase U
1	2	Phase V
	3	Phase W
2	4	FG (frame ground)
4		

Model: JN1AS04MK2R Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS04FK1 (Not provided by Yaskawa.)

• Encoder Connector



* Only absolute-value models with multiturn data.

Model: JN1AS10ML1-R

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

◆ Flange Specification 4

Servomotor Connector

(

Ī.	1	Phase U	Red
Ufi	2	Phase V	White
ЭН	3	Phase W	Blue
3)H	4	FG (frame ground)	Green (yellow)
ĮĽ			

Models

- Plug: 350779-1
 Pins: 350561-3 or 350690-3 (No.1 to 3)
 Ground pin: 350654-1 or 350669-1 (No. 4) Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

Encoder Connector

	1	PG5V
5 6	2	PG0V
	3*	BAT
3 4 4	4*	BAT0
	5	PS
	6	/PS
	Connector case	FG (frame ground)

* Only absolute-value models with multiturn

data. Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

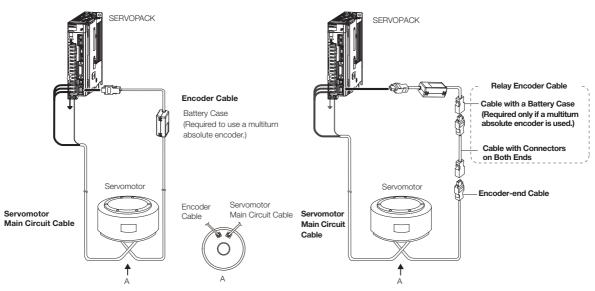
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

- 2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.
- 3. Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Length	Order I	Number	Appearance
	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
SGMCV-DDB	3 m	JZSP-CMM60-03-E	JZSP-C7MDN23-03-E	
	5 m	JZSP-CMM60-05-E	JZSP-C7MDN23-05-E	SERVOPACK Motor end
SGMCV-DDD	10 m	JZSP-CMM60-10-E	JZSP-C7MDN23-10-E	
Flange specification ^{*2} : 1	15 m	JZSP-CMM60-15-E	JZSP-C7MDN23-15-E	
Non-load side installation	20 m	JZSP-CMM60-20-E	JZSP-C7MDN23-20-E	
SGMCV-DDB	3 m	JZSP-CMM00-03-E	JZSP-C7MDS23-03-E	
SGMCV-□□C SGMCV-□□D	5 m	JZSP-CMM00-05-E	JZSP-C7MDS23-05-E	SERVOPACK Motor end end L
*2	10 m	JZSP-CMM00-10-E	JZSP-C7MDS23-10-E	
Flange specification ^{*2} : 4 Non-load side installation	15 m	JZSP-CMM00-15-E	JZSP-C7MDS23-15-E	
(with cable on side)	20 m	JZSP-CMM00-20-E	JZSP-C7MDS23-20-E	

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

*2. Refer to the following section for the flange specifications.

Note: Direct Drive Servomotors are not available with holding brakes.

♦ Encoder Cables of 20 m or Less

	Neme	Length	Order 1	Number	A ====================================
Servomotor Model	Name	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
SGMCV-DDBE		3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E	
		5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E	SERVOPACK Encoder end
SGMCV-DDE	For single-	10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E	
Flange specifica-	turn abso-	15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E	
tion ^{*2} : 1	lute encoder	20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E	
SGMCV-DDBE	(without	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
	Battery	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
SGMCV-DDE	Case)	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
Flange specifica-		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
tion ^{*2} : 4		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multi-	3 m	JZSP-C7PI00-03-E	JZSP-C7PI20-03-E	
	turn abso- lute	5 m	JZSP-C7PI00-05-E	JZSP-C7Pl20-05-E	SERVOPACK Encoder end
SGMCV-DDBI	encoder (without Battery Case ^{*3})	10 m	JZSP-C7PI00-10-E	JZSP-C7Pl20-10-E	
SGMCV-DDCI		15 m	JZSP-C7PI00-15-E	JZSP-C7Pl20-15-E	
SGMCV-DDDI		20 m	JZSP-C7PI00-20-E	JZSP-C7PI20-20-E	
Flange specifica-	For multi-	3 m	JZSP-C7PA00-03-E	JZSP-C7PA20-03-E	SERVOPACK Encoder end
tion ^{*2} : 1	turn abso-	5 m	JZSP-C7PA00-05-E	JZSP-C7PA20-05-E	end L
	lute encoder	10 m	JZSP-C7PA00-10-E	JZSP-C7PA20-10-E	
	(with Bat-	15 m	JZSP-C7PA00-15-E	JZSP-C7PA20-15-E	Battery Case (battery included)
	tery Case)	20 m	JZSP-C7PA00-20-E	JZSP-C7PA20-20-E	
	For multi- turn abso-	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
	lute	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
SGMCV-DDBI	encoder	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
SGMCV-DDCI	(without Battery	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
SGMCV-DDDI	Case ^{*3})	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
Flange specifica-	For multi-	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	SERVOPACK Encoder end
tion*2: 4	turn abso-	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	end L
	lute encoder	10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
	(with Bat-	15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	Battery Case (battery included)
	tery Case)	20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	(buttory monaded)

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 68 mm or larger.

*2. Refer to the following section for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.

◆ Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number ^{*1}	Appearance
SGMCV-DDBE SGMCV-DDBI SGMCV-DDCE SGMCV-DDCI SGMCV-DDDE SGMCV-DDI Flange specifica- tion ^{*2} : 1	Encoder-end Cable (for single-turn/multi- turn absolute encoder)	0.3 m	JZSP-C7PRC0-E	SERVOPACK Encoder end end IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
SGMCV-DDBE SGMCV-DDBI		30 m	JZSP-UCMP00-30-E	
SGMCV-□□CE SGMCV-□□CI SGMCV-□□DE	Cables with Connec- tors on Both Ends	40 m	JZSP-UCMP00-40-E	SERVOPACK Encoder end
SGMCV-□□DI Flange specifica- tion ^{*2} : 1 or 4	(for single-turn/multi- turn absolute encoder)	50 m	JZSP-UCMP00-50-E	
SGMCV-□□BI SGMCV-□□CI SGMCV-□□DI Flange specifica- tion ^{*2} : 1 or 4	Cable with a Battery Case (for multiturn absolute encoder) ^{*3}	0.3 m	JZSP-CSP12-E	SERVOPACK Encoder end end Encoder end Encoder encoder encoder encoder Encoder encoder encoder encoder Encoder encoder encoder encoder Encoder encoder encoder encoder encoder encoder Encoder encoder encoder encoder encoder encoder encoder Encoder encoder

*1. Flexible Cables are not available.

 $\ensuremath{^{\ast}2}\xspace$. Refer to the following section for the flange specifications.

Model Designations (page 182)

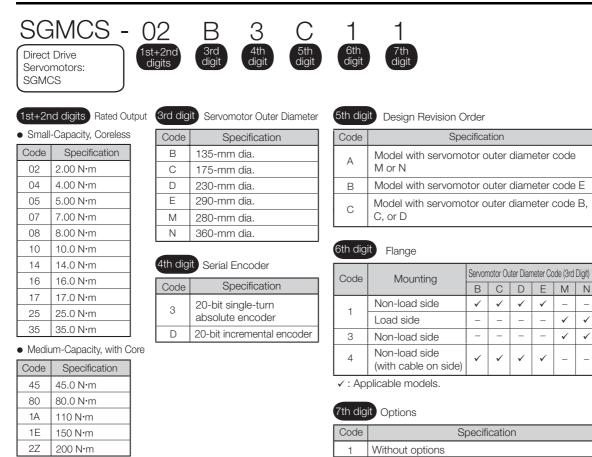
*3. Use one of these Cables if a battery is connected to the host controller.

MEMO

Direct Drive Servomotors

SGMCS (Small Capacity, Coreless, Inner Rotor or Medium Capacity, with Core, Inner Rotor)

Model Designations



Note: 1. Direct Drive Servomotors are not available with holding brakes.

2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Manufactured Models

Rated			Servomotor C	uter Diameter		
Torque	В	С	D	E	M	N
N∙m	(135-mm dia.)	(175-mm dia.)	(230-mm dia.)	(290-mm dia.)	(280-mm dia.)	(360-mm dia.)
2.00	SGMCS-02B	-	-	-	-	-
4.00	_	SGMCS-04C	_	-	_	_
5.00	SGMCS-05B	-	-	-	-	-
7.00	SGMCS-07B	-	-	-	-	-
8.00	-	-	SGMCS-08D	-	-	-
10.0	-	SGMCS-10C	-	-	-	-
14.0	-	SGMCS-14C	-	-	-	-
16.0	-	-	-	SGMCS-16E	-	-
17.0	-	-	SGMCS-17D	-	-	-
25.0	_	_	SGMCS-25D	_	_	-
35.0	-	-	-	SGMCS-35E	-	-
45.0	-	-	-	-	SGMCS-45M	-
80.0	-	-	-	-	SGMCS-80M	SGMCS-80N
110	-	-	-	-	SGMCS-1AM	-
150	-	-	-	-	-	SGMCS-1EN
200	-	-	-	-	-	SGMCS-2ZN

Note: The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

Specifications and Ratings

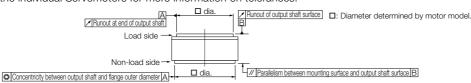
Small-Capacity, Coreless Servomotors: Specifications

		200 V													
	M	odel SGM	CS-		02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E
Time	Rating					Continuous									
Thermal Class						Α									
Insula	Insulation Resistance							5	00 VD	C, 10 N	$\Lambda\Omega$ m	nin.			
Withs	stand Volt	age						1,	500 V/	AC for	1 mir	nute			
Excita	ation								Perma	anent m	nagne	ət			
Mour	nting								Flang	ge-mou	unted				
Drive	Method									rect dri					
	tion Direct				Cour	ntercloc	kwise (CCW) fo	or forwar	rd referer	nce wł	nen viev	ved fror	n the loa	ad side
Vibra	tion Class	s*1								V15					
Abso	lute Accu	racy								±15 s					
Repe	eatability									±1.3 s					
Prote	ective Stru	cture ^{*2}					Т	otally	enclos	ed, self	f-coo	led, IF	42		
	Surround	ding Air Ten	nperature							C (with			,		
suo	Surround	ling Air Hun	nidity			20%	to 80)% rela	ative hu	umidity	(with	no co	ondens	sation)	
Environmental Conditions	Installati	on Site			 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. 						5.				
Environm	Storage	Environme	ent		with Stora	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)									
		Output Shaft		mm						0.02					
cal es*		End of Outpu		mm						0.04					
Mechanical Tolerances ^{*3}		n between Ma nd Output Sh	0	mm			0.	07					0.08		
A6 Tol		city between Flange Outer		mm			0.	07					0.08		
Shoc	k	Impact Accel	eration Rate a	t Flange					4	90 m/s	s ²				
Resis	Resistance ^{*4} Number of Impacts				2 times										
Vibration Vibration Acceleration Resistance ^{*4} Rate at Flange					49 m/s ²										
		1	SGD7S-		2R	8A, 21	R1F			2R8A, 1	2R8F				
	Applicable SGD7W- SERVOPACKs SGD7C-				2R8A, 2R1F 2R8A, 2R8F 5R5A 2R8A 2R8A 5R5A				85A						

*1. A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at

*2. The hollow hole section, motor mounting surface, output shaft surface, and gap around the rotating part of the shaft are excluded. Protective structure specifications apply only when the special cable is used.
*3. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Conversion and the rotation on the Intervention on the Intervention.

the individual Servomotors for more information on tolerances.



*4. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures. The strength of the vibration that the Servomotor can withstand depends on the application. Check the vibration

acceleration rate.

Side to side



Shock Applied to the Servomotor

SGMCS

Small-Capacity, Coreless Servomotors: Ratings

	Voltage		200 V										
	Model SGM	CS-	02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E
Rated (Dutput ^{*1}	W	42	105	147	84	209	293	168	356	393	335	550
Rated 1	Forque ^{*1, *2}	N∙m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Instanta Maximu	aneous ım Torque ^{*1}	N∙m	6.00	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall To	rque ^{*1}	N∙m	2.05	5.15	7.32	4.09	10.1	14.2	8.23	17.4	25.4	16.5	35.6
Rated (Current ^{*1}	Arms	1.8	1.7	1.4	2	2.2	2.8	1.9	2.5	2.6	3.3	3.5
Instanta Maximu	aneous um Current ^{*1}	Arms	5.4	5.1	4.1	7	.0	8.3	5.6	7.5	8.0	9.4	10.0
Rated N Speed*		min ⁻¹		200			200		20	00	150	200	150
Maximu Speed [*]	Im Motor	min ⁻¹	500		500	400	300	500	350	250	500	250	
Torque	Constant	N•m/Arms	1.18	3.17	5.44	2.04	5.05	5.39	5.10	7.79	10.8	5.58	11.1
Motor N Inertia	Noment of	×10 ⁻⁴ kg·m ²	28.0	51.0	77.0	77.0	140	220	285	510	750	930	1430
Rated F	Power Rate ^{*1}	kW/s	1.43	4.90	6.36	2.08	7.14	8.91	2.25	5.67	8.33	2.75	8.57
Rated A Acceler	Angular ation Rate ^{*1}	rad/s ²	710	980	910	520	710	640 280 330			30	170 240	
Heat Si	nk Size	mm	350	× 350	× 12	450	× 450 :	× 12	550	× 550	× 12	650×6	50 × 12
	ble Load Mom Moment of Ine			10 t	imes		5 times		3 times				
	With External Regenera- tive Resistor and Exter- nal Dynamic Brake Resistor ^{*3}		10 times			5 times		3 time					
Allow- able	Allowable Thrust Load	Ν		1500			3300		4000			11000	
Load ^{*4}	Allowable Moment Load	N∙m	40	50	64	70	75	90	93	103	135	250	320

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.

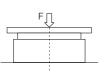
*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70000A020 to -2R800A020

• SGD7W-1R6A20A020 to -2R8A20A020

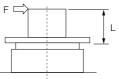
• SGD7C-1R6AMAA020 to -2R8AMAA020

*4. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.





Where F is the external force, Thrust load = F + Load mass Moment load = 0 Where F is the external force, Thrust load = F + Load mass Moment load = F \times L



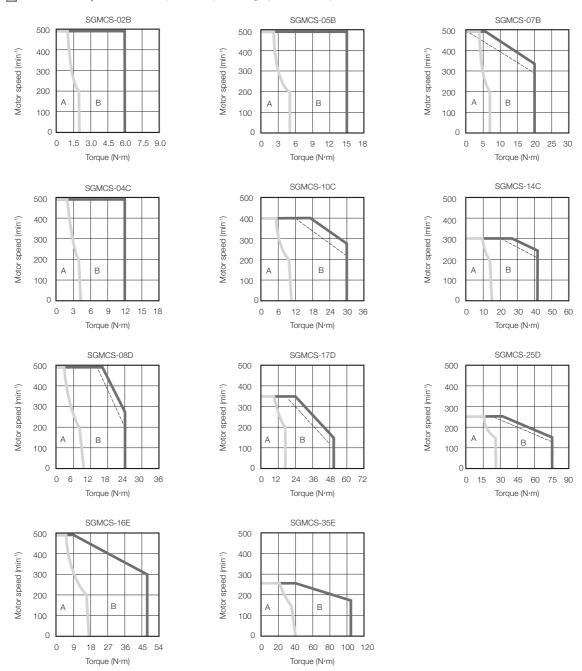
Where F is the external force Thrust load = Load mass Moment load = $F \times L$

Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

Small-Capacity, Coreless Servomotors: Torque-Motor Speed Characteristics

A : Continuous duty zone _____ (solid lines): With three-phase 200-V input

B : Intermittent duty zone ------ (dotted lines): With single-phase 100-V input

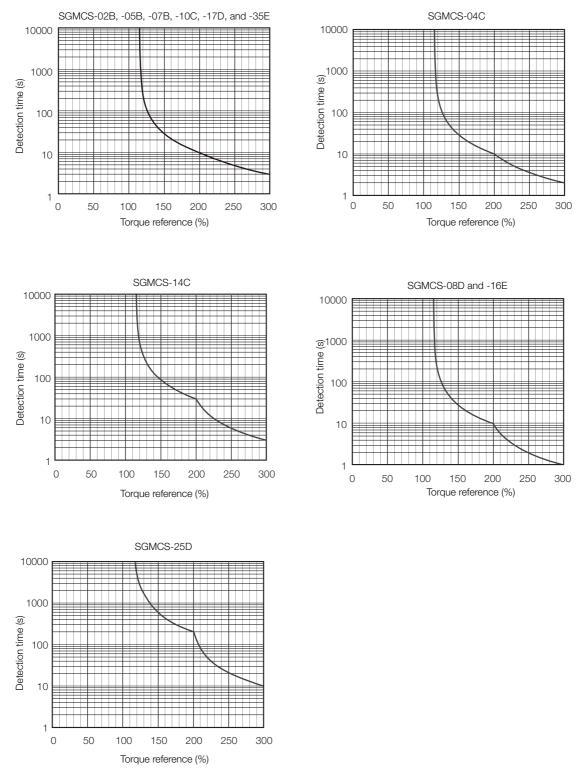


Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Small-Capacity, Coreless Servomotors: Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.

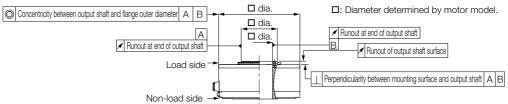


Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Small-Capacity, Coreless Servomotors: Torque-Motor Speed Characteristics* on page 199.

Medium-Capacity Servomotors with Cores: Specifications

		Voltage	Э		200 V							
	M	odel SGN			45M	80M 1AM 80N 1EN 2ZN						
Time	Rating				Continuous							
Ther	mal Class				F							
Insula	ation Resi	istance						10 M Ω min.				
With	stand Volt	age					-	for 1 minute	e			
	ation							nt magnet				
Mour	-						•	mounted				
	Method							t drive				
	tion Direc				Countercloo	ckwise (CCW)	for forward re	eference when	viewed from	the load side		
	ation Class						V	15				
-	olute Accu	iracy						5 s				
	eatability							.3 s				
Prote	ective Stru							self-cooled				
S		0	emperature					vith no freez	0,			
ion	Surround	ding Air H	umidity					dity (with no prrosive and				
Environmental Conditions	Installation Site				 Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. Store the Servomotor in the following environment if you store it with							
Environ	Storage	Environn	nent		the power cable disconnected. Storage Temperature: -20°C to 60°C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)							
			haft Surface	mm	0.02							
*3			utput Shaft	mm			0.	.04				
Mechanical Tolerances ^{*3}	Surface a		Shaft Surface	mm				_				
Mech Tolera		city betwee Flange Ou	en Output ter Diameter	mm			0.	.08				
	Perpendic ing Surfac	cularity bet ce and Out	ween Mount- put Shaft	mm	0.08							
	Shock Impact Acceleration			490 m/s ²								
Resis	Resistance*4 Number of Impacts					2 times						
Vibration Vibration Acceleration Resistance ^{*4} Rate at Flange					24.5 m/s ²							
امد ا	iaabla	1	SGD7S-		7R6A	120A	180A	120A	20	00 A		
SER\	icable VOPACKs		SGD7W- SGD7C-		7R6A							

*1. A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at the rated motor speed.
*2. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.
*3. Refer to the following figure for the relevant locations on the Servomotor. Refer to the dimensional drawings of the individual Servomotors for more information on tolerances.



*4. The given values are for when the Servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures. The strength of the vibration that the Servomotor can withstand depends on the application. Check the vibration acceleration rate.

Vertical



Shock Applied to the Servomotor

SGMCS

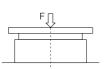
Medium-Capacity Servomotors with Cores: Ratings

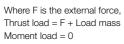
	Voltage		200 V						
	Model SGMCS-		45M	80M	1AM	80N	1EN	2ZN	
Rated Outp	out ^{*1}	W	707	1260	1730	1260	2360	3140	
Rated Torq	ue ^{*1, *2}	N∙m	45.0	80.0	110	80.0	150	200	
Instantaneo	ous Maximum Torque ^{*1}	N∙m	135	240	330	240	450	600	
Stall Torque	e ^{*1}	N∙m	45.0	80.0	110	80.0	150	200	
Rated Curr	ent ^{*1}	Arms	5.8	9.7	13.4	9.4	17.4	18.9	
Instantaneo	ous Maximum Current ^{*1}	Arms	17.0	28.0	42.0	28.0	56.0	56.0	
Rated Moto	or Speed ^{*1}	min⁻¹		150			150		
Maximum N	Motor Speed ^{*1}	min⁻¹		300		300	50		
Torque Cor	nstant	N•m/Arms	8.39	8.91	8.45	9.08	9.05	11.5	
Motor Mon	nent of Inertia	×10 ⁻⁴ kg·m ²	388	627	865	1360	2470	3060	
Rated Pow	er Rate ^{*1}	kW/s	52.2	102	140	47.1	91.1	131	
Rated Ang	ular Acceleration Rate ^{*1}	rad/s ²	1160	1280	1270	588	607	654	
Heat Sink S	Size	mm			750 × 7	50 × 45			
	oad Moment of Inertia				3 tir	nes			
	With External Regenerative F External Dynamic Brake Resi				3 tir	nes			
Allowable	A	mm		33		37.5			
Load*3	Allowable Thrust Load	Ν		9000		16000			
	Allowable Moment Load	N∙m		180			350		

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

*2. The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.

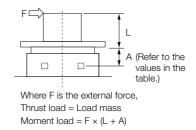
*3. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.







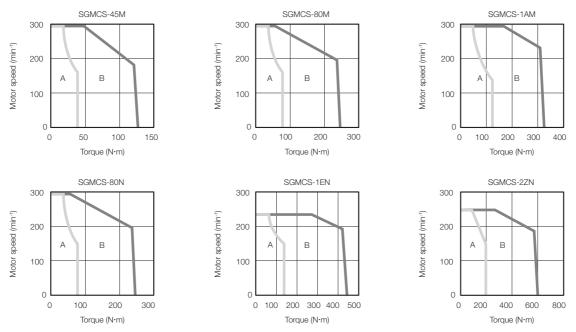
Where F is the external force, Thrust load = F + Load mass Moment load = $F \times L$



Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

Medium-Capacity Servomotors with Cores: Torque-Motor Speed Characteristics

A : Continuous duty zoneB : Intermittent duty zone

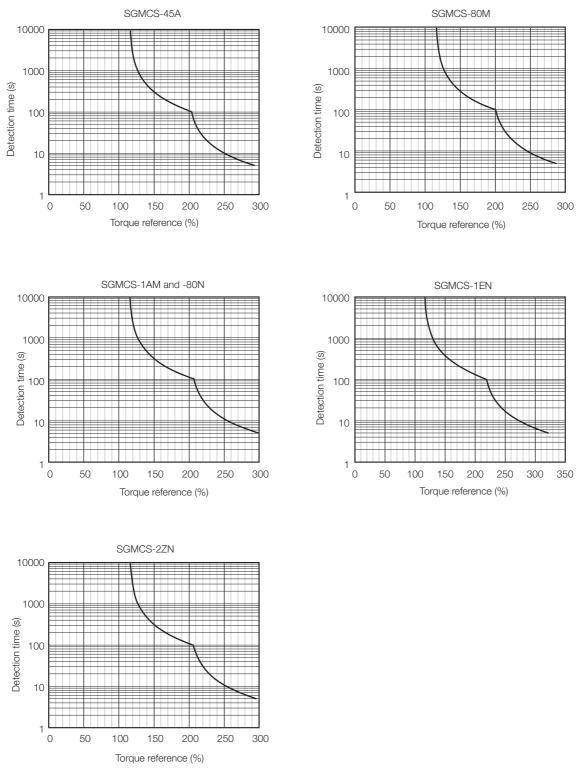


Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.

- 2. If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- 3. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

Medium-Capacity Servomotors with Cores: Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in *Medium-Capacity Servomotors with Cores: Torque-Motor Speed Characteristics* on page 203.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the *Small-Capacity, Coreless Servomotors: Ratings* (page 198) and *Medium-Capacity Servomotors with Cores: Ratings* (page 202). The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. Contact your Yaskawa representative for information on this program.

• Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

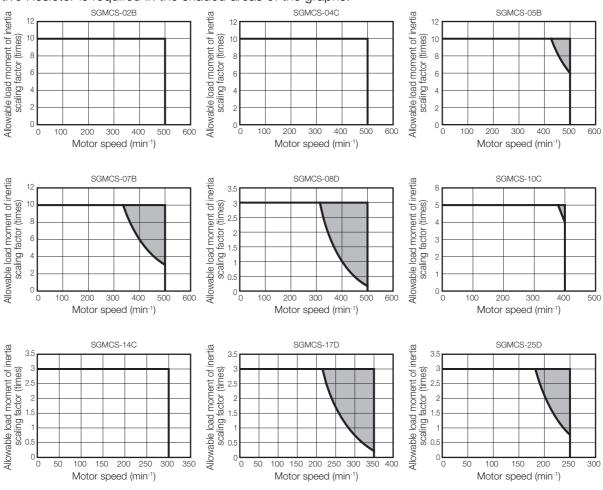
If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to *Built-In Regenerative Resistor* (page 472) for the regenerative power (W) that can be processed by the SERVO-PACKs.

Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, an External Regenerative Resistor is required in the shaded areas of the graphs.



Note: Applicable SERVOPACK models: SGD7S-2R8A and -2R8F

When an External Regenerative Resistor Is Required

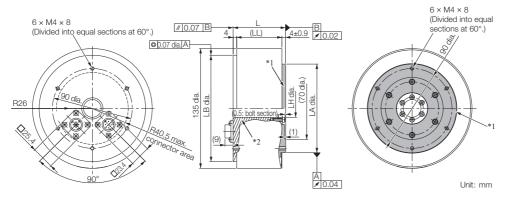
Install the External Regenerative Resistor. Refer to the following section for the recommended products. *External Regenerative Resistors* (page 472)

External Dimensions

Small-Capacity, Coreless Servomotors

♦ SGMCS-□□B

• Flange Specification 1



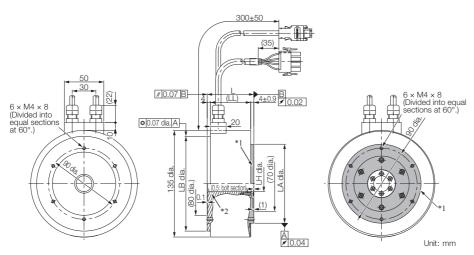
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
02B□C11	59	51	120 0 -0.035	20 +0.4 0	100 0 -0.035	4.8
05B □ C11	88	80	120 0	20 +0.4	100 0 -0.035	5.8
07B □ C11	128	120	120 0	20 +0.4	100 0	8.2

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

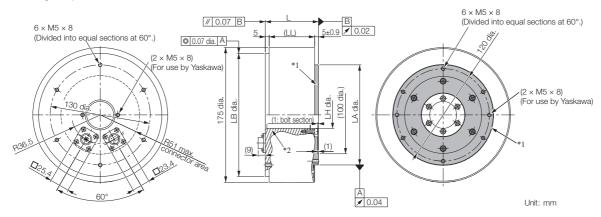
Note: Values in parentheses are reference dimensions.

Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
02B D C41	59	51	120 0 -0.035	20 0 +0.4	100 0	4.8
05B D C41	88	80	120 0	20 +0.4 0	100 -0.035	5.8
07B D C41	128	120	120 0	20 +0.4 0	100 -0.035	8.2

Refer to the following section for information on connectors. *Connector Specifications* (page 213) SGMCS (Small Capacity, Coreless, Inner Rotor or Medium Capacity, with Core, Inner Rotor)

♦ SGMCS-□□C

• Flange Specification 1



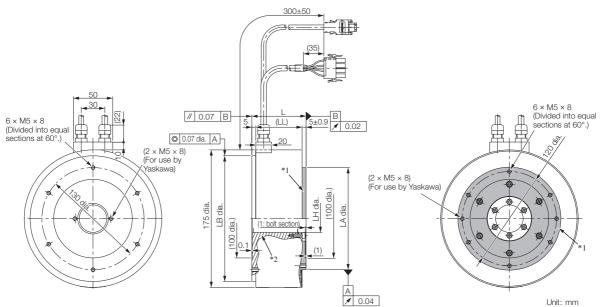
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04C□C11	69	59	160 0 -0.040	35 +0.4	130 0 -0.040	7.2
10C□C11	90	80	160 0 -0.040	35 +0.4	130 _0.040	10.2
14C□C11	130	120	160 .0.040	35 +0.4	130 .0.040	14.2

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

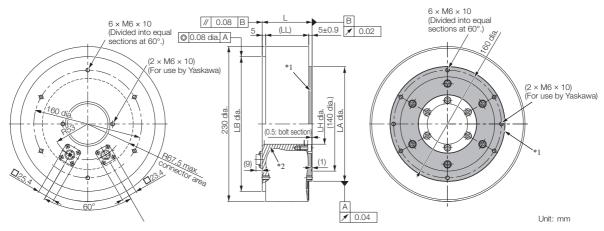
Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04C□C41	69	59	160 0 -0.040	35 0+0.4	130 -0.040	7.2
10C□C41	90	80	160 0 -0.040	35 +0.4	130 -0.040	10.2
14C□C41	130	120	160 0 -0.040	35 +0.4	130 -0.040	14.2

Refer to the following section for information on connectors.

SGMCS (Small Capacity, Coreless, Inner Rotor or Medium Capacity, with Core, Inner Rotor)

♦ SGMCS-□□D

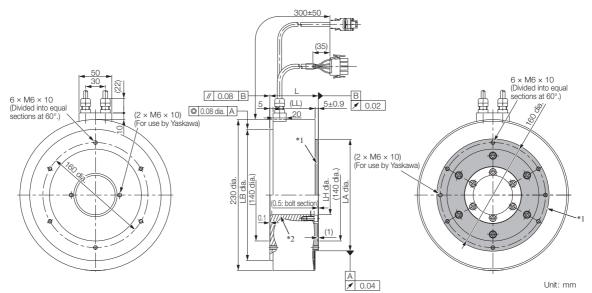
• Flange Specification 1



*1. The shaded section indicates the rotating parts.*2. The hatched section indicates the non-rotating parts. Note: Values in parentheses are reference dimensions.

Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08D □ C11	74	64	200 0	60 +0.4	170 .0.040	14.0
17D0C11	110	100	200 0 -0.046	60 +0.4	170 .0.040	22.0
25D □ C11	160	150	200 -0.046	60 0 0	170 -0.040	29.7

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

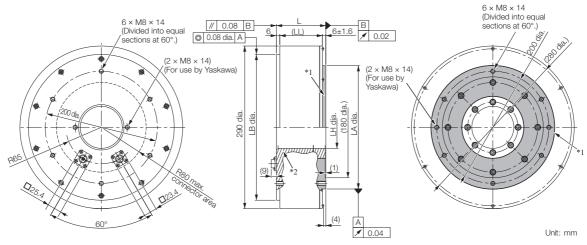
Note: Values in parentheses are reference dimensions.

Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08D D C41	74	64	200 0	60 +0.4	170 -0.040	14.0
17D0C41	110	100	200 0 -0.046	60 +0.4	170 0.040	22.0
25D D C41	160	150	200 0 -0.046	60 +0.4	170 0.040	29.7

Refer to the following section for information on connectors. *Connector Specifications* (page 213)

♦ SGMCS-□□E

• Flange Specification 1



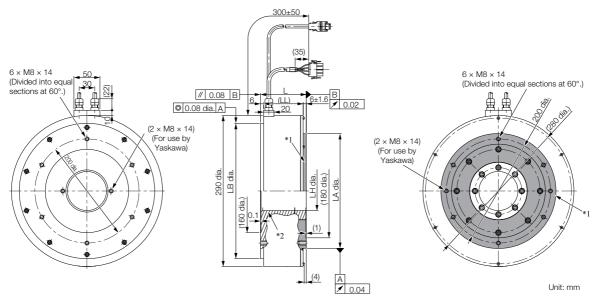
*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are refere	ence dimensions.
--	------------------

Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16E D B11	88	76	260 0	75 +0.4	220 0 -0.046	26.0
35E D B11	112	100	260 .0.052	75 +0.4	220 _0.046	34.0

• Flange Specification 4



*1. The shaded section indicates the rotating parts.

*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

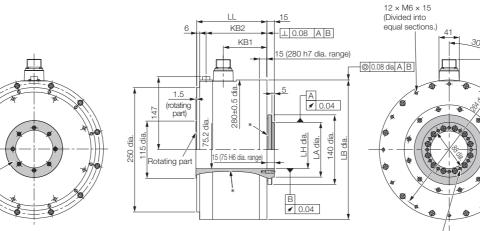
Model SGMCS-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16E D B41	88	76	260 0 -0.052	75 0+0.4	220 0 -0.046	26.0
35E D B41	112	100	260 -0.052	75 0+0.4	220 ⁰ -0.046	34.0

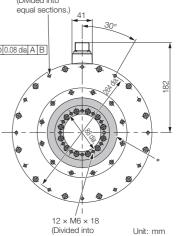
Refer to the following section for information on connectors.

Medium-Capacity Servomotors with Cores

♦ SGMCS-□□M

• Flange Specification 1



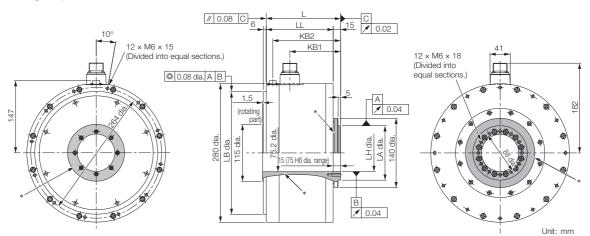


(Divided into equal sections.)

* The shaded section indicates the rotating parts.

Model SGMCS-	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
45M D A11	141	87.5	122	280 0 -0.052	75 +0.019	110 ⁰ -0.035	38
80MDA11	191	137.5	172	280 0 -0.052	75 +0.019	110 _{-0.035}	45
1AMDA11	241	187.5	222	280 -0.052	75 +0.019	110 -0.035	51

• Flange Specification 3



* The shaded section indicates the rotating parts.

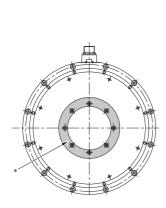
Model SGMCS-	L	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
45M D A31	150	135	102.5	137	248 0 -0.046	75 +0.019	110 ⁰ _{-0.035}	38
80MDA31	200	185	152.5	187	248 .0.046	75 +0.019	110 ⁰ -0.035	45
1AMDA31	250	235	202.5	237	248 -0.046	75 0+0.019	110 ⁰ -0.035	51

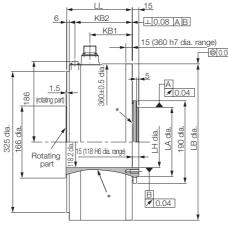
Refer to the following section for information on connectors. Connector Specifications (page 213)

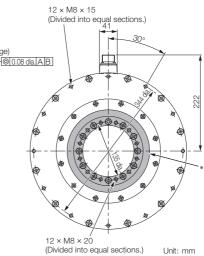
SGMCS (Small Capacity, Coreless, Inner Rotor or Medium Capacity, with Core, Inner Rotor)

♦ SGMCS-□□N

• Flange Specification 1



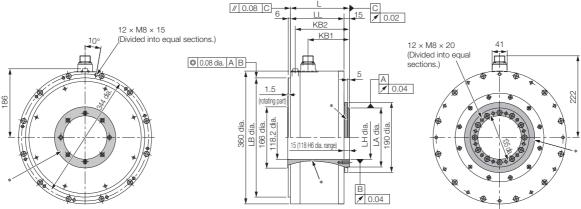




* The shaded section indicates the rotating parts.

Model SGMCS-	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
80N D A11	151	98	132	360 .0.057	118 0+0.022	160 0 -0.040	50
1ENDA11	201	148	182	360 .0.057	118 0+0.022	160 0 -0.040	68
2ZNDA11	251	198	232	360 .0.057	118 0+0.022	160 0 -0.040	86

• Flange Specification 3



Unit: mm

* The shaded section indicates the rotating parts.

Model SGMCS-	L	LL	KB1	KB2	LB	LH	LA	Approx. Mass [kg]
80NDA31	160	145	113	147	323 0.057	118 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	160 0 -0.040	50
1ENDA31	210	195	163	197	323 .0.057	118 +0.022 0	160 0 -0.040	68
2ZNDA31	260	245	213	247	323 .0.057	118 +0.022 0	160 0-0.040	86

Refer to the following section for information on connectors.

Connector Specifications

♦ SGMCS-□□B, -□□C, -□□D, or -□□E with Flange Specification 1

Servomotor Connector



	1	Phase U
3	2	Phase V
-+	3	Phase W
€	4	FG (frame ground)

Model: JN1AS04MK2R Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS04FK1 (Not provided by Yaskawa.)

Encoder Connector



Model: JN1AS10ML1-R Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

SGMCS-□□B, -□□C, -□□D, or -□□E with Flange Specification 4

5. З

Servomotor Connector

Г	1	ĥ
	(2)	Ш
\parallel	3	HI
	ā	Ш
	Ę	

1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Models

• Plug: 350779-1

• Pins: 350561-3 or 350690-3 (No.1 to 3)

- Ground pin: 350654-1 or 350669-1 (No. 4)
- Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1 Socket: 350570-3 or 350689-3

Encoder Connector

	1	PG5V
6	2	PG0V
	3	-
	4	-
	5	PS
	6	/PS
	Connector case	FG (frame ground)
		20

Model: 55102-0600 Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

◆ SGMCS-□□M or -□□N with Flange Specification 1 or 3

Servomotor Connector



А	Phase U						
В	Phase V						
С	Phase W						
D	FG (frame ground)						

Model: CE05-2A18-10PD Manufacturer: DDK Ltd.

Mating Connector Plug: CE05-6A18-10SD-B-BSS Cable clamp: CE3057-10A-D(D265)

• Encoder Connector



1	PS					
2	/PS					
3	-					
4	PG5V					
5	-					
6	-					
7	FG (frame ground)					
8	-					
9	PG0V					
10	-					

Model: JN1AS10ML1 Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1

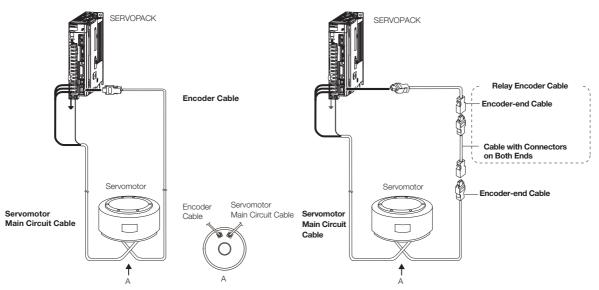
Selecting Cables

Cable Configurations

The cables shown below are required to connect a Servomotor to a SERVOPACK.

Encoder Cable of 20 m or Less

Encoder Cable of 30 m to 50 m (Relay Cable)



Note: 1. If the Encoder Cable length exceeds 20 m, be sure to use a Relay Encoder Cable.

2. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor speed characteristics will become smaller because the voltage drop increases.

- 3. Refer to the following manual for the following information.
- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Length	Order	Number	Appearance	
Servornotor woder	(L)	Standard Cable Flexible Cable ^{*1}		Арреагансе	
SGMCS-□□B SGMCS-□□C	3 m	JZSP-CMM60-03-E	JZSP-CSM60-03-E		
SGMCS-DDD	5 m	JZSP-CMM60-05-E	JZSP-CSM60-05-E	SERVOPACK Motor end	
SGMCS-DDE	10 m	JZSP-CMM60-10-E	JZSP-CSM60-10-E		
Flange specification ^{*2} : 1 Non-load side	15 m	JZSP-CMM60-15-E	JZSP-CSM60-15-E		
installation	20 m	JZSP-CMM60-20-E	JZSP-CSM60-20-E		
SGMCS-□□B SGMCS-□□C	3 m	JZSP-CMM00-03-E	JZSP-CMM01-03-E		
SGMCS-□□D SGMCS-□□E	5 m	JZSP-CMM00-05-E	JZSP-CMM01-05-E	SERVOPACK Motor end	
	10 m	JZSP-CMM00-10-E	JZSP-CMM01-10-E		
Flange specification ^{*2} : 4 Non-load side	15 m	JZSP-CMM00-15-E	JZSP-CMM01-15-E		
installation (with cable on side)	20 m	JZSP-CMM00-20-E	JZSP-CMM01-20-E		

Continued on next page.

SGMCS (Small Capacity, Coreless, Inner Rotor or Medium Capacity, with Core, Inner Rotor)

O a margina a travel Margina la	Length	Order I	Number	
Servomotor Model	(L)	Standard Cable	Flexible Cable ^{*1}	Appearance
	3 m	JZSP-USA101-03-E	JZSP-USA121-03-E	
	5 m	JZSP-USA101-05-E	JZSP-USA121-05-E	SERVOPACK Motor end
	10 m	JZSP-USA101-10-E	JZSP-USA121-10-E	
SGMCS-□□M	15 m	JZSP-USA101-15-E	JZSP-USA121-15-E	
SGMCS-□□N	20 m	JZSP-USA101-20-E	JZSP-USA121-20-E	
□□: 45	3 m	JZSP-USA102-03-E	JZSP-USA122-03-E	
	5 m	JZSP-USA102-05-E	JZSP-USA122-05-E	SERVOPACK Motor end end
	10 m	JZSP-USA102-10-E	JZSP-USA122-10-E	
	15 m	JZSP-USA102-15-E	JZSP-USA122-15-E	
	20 m	JZSP-USA102-20-E	JZSP-USA122-20-E	
	3 m	JZSP-USA301-03-E	JZSP-USA321-03-E	
	5 m	JZSP-USA301-05-E	JZSP-USA321-05-E	SERVOPACK Motor end
	10 m	JZSP-USA301-10-E	JZSP-USA321-10-E	
SGMCS-DDM	15 m	JZSP-USA301-15-E	JZSP-USA321-15-E	
SGMCS-DDN	20 m	JZSP-USA301-20-E	JZSP-USA321-20-E	
	3 m	JZSP-USA302-03-E	JZSP-USA322-03-E	
□□: 1A	5 m	JZSP-USA302-05-E	JZSP-USA322-05-E	SERVOPACK Motor end
	10 m	JZSP-USA302-10-E	JZSP-USA322-10-E	
	15 m	JZSP-USA302-15-E	JZSP-USA322-15-E	
	20 m	JZSP-USA302-20-E	JZSP-USA322-20-E	
	3 m	JZSP-USA501-03-E	JZSP-USA521-03-E	
	5 m	JZSP-USA501-05-E	JZSP-USA521-05-E	SERVOPACK Motor end
	10 m	JZSP-USA501-10-E	JZSP-USA521-10-E	
SGMCS-DDM	15 m	JZSP-USA501-15-E	JZSP-USA521-15-E	
SGMCS-□□N	20 m	JZSP-USA501-20-E	JZSP-USA521-20-E	*
DD : 1E	3 m	JZSP-USA502-03-E	JZSP-USA522-03-E	
DD : 2Z	5 m	JZSP-USA502-05-E	JZSP-USA522-05-E	SERVOPACK Motor end
	10 m	JZSP-USA502-10-E	JZSP-USA522-10-E	
	15 m	JZSP-USA502-15-E	JZSP-USA522-15-E	
	20 m	JZSP-USA502-20-E	JZSP-USA522-20-E	

Continued from previous page.

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius of the Flexible Cables are given in the following table.

Order Number	Recommended Bending Radius (R)	Order Number	Recommended Bending Radius (R)	
JZSP-CSM60- □□ -E	55 mm min.	JZSP-USA321-□□-E	113 mm min.	
JZSP-CMN01-DD-E		JZSP-USA322-□□-E		
JZSP-USA121-DD-E	96 mm min.	JZSP-USA521-□□-E	- 150 mm min.	
JZSP-USA122-DD-E	30 11111 11111.	JZSP-USA522-□□-E		

*2. Refer to the following section for the flange specifications.

Note: Direct Drive Servomotors are not available with holding brakes.

Encoder Cables of 20 m or Less

Servomotor Model	Name	Length	Order I	Number	Appearance	
Servornotor woder	Name	(L)	Standard Cable	Flexible Cable*1	Appearance	
		3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E		
SGMCS-□□		5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E	SERVOPACK Encoder end	
Flange specifica-		10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E		
tion ^{*2} : 1 or 3	For incre-	15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E		
	mental/	20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E		
	absolute	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E		
SGMCS-□□	encoder	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end	
Flange Specifica-		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E		
tion ^{*2} : 4		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E		
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E		

*1. Use Flexible Cables for moving parts of machines, such as robots. The recommended bending radius (R) is 68 mm or larger.

 $\ast 2.$ Refer to the following section for the flange specifications.

Model Designations (page 196)

Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number ^{*1}	Appearance
SGMCS-	Encoder-end Cable (for incremental or	0.3 m	JZSP-CSP15-E	SERVOPACK Encoder end
Flange specifica- tion ^{*2} : 1 or 3	absolute encoder)	0.3 m	Ј25Р-05РТ5-Е	
SGMCS-DD	Cables with Connec-	30 m	JZSP-UCMP00-30-E	SERVOPACK Encoder end
Flange specifica-	tors on Both Ends (for incremental or abso-	40 m	JZSP-UCMP00-40-E	
tion ^{*2} : 1, 3, or 4	lute encoder)	50 m	JZSP-UCMP00-50-E	

*1. Flexible Cables are not available.

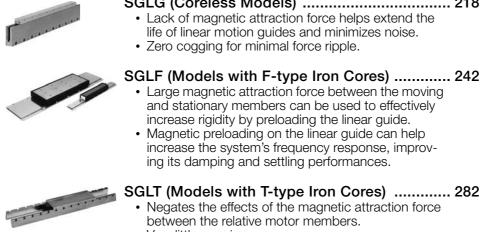
*2. Refer to the following section for the flange specifications.

Model Designations (page 196)

Linear Servomotors

Features





• Very little cogging.

Common

Recommended Linear Encoders and Cables .. 308

SGLG (Coreless Models) 218

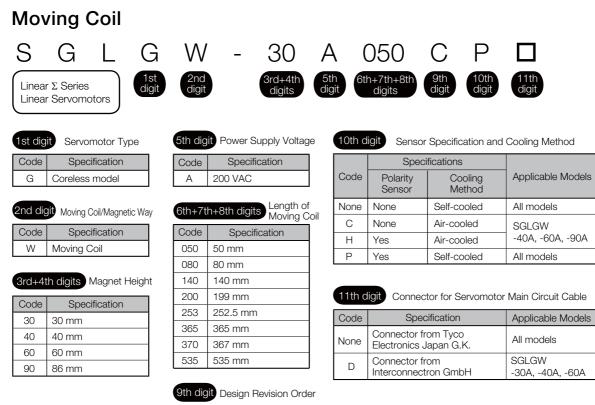
• Lack of magnetic attraction force helps extend the

SGLF SGLT Recommended Linear Encoders and Cables

SGLG

SGLG (Coreless Models)

Model Designations

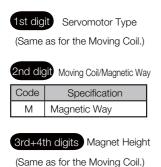


A, B...

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Magnetic Way





Code	Specification
090	90 mm
108	108 mm
216	216 mm
225	225 mm
252	252 mm
360	360 mm
405	405 mm
432	432 mm
450	450 mm
504	504 mm

1th	digit	Options
	angit	optionio

	Code	Specification	Applicable Models
ſ	None	Standard-force	All models
ſ	-M	High-force	SGLGM-40, -60

A, B, C*...

* The SGLGM-40 and SGLGM-60 also have a CT code.
 • C = Without mounting holes on the bottom

C = Without mounting holes on the bottom
 CT = With mounting holes on the bottom

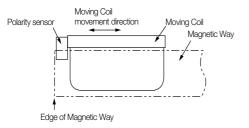
Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Precautions on Moving Coils with Polarity Sensors

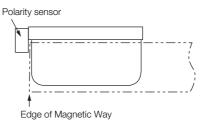
When you use a Moving Coil with a Polarity Sensor, the Magnetic Way must cover the bottom of 1 the polarity sensor. Refer to the example that shows the correct installation. When determining the length of the Moving Coil's stroke or the length of the Magnetic Way, consider the total length (L) of the Moving Coil and the polarity sensor. Refer to the following table.

Correct Installation

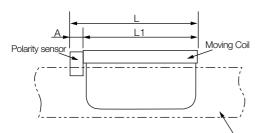
Note



Incorrect Installation



Total Length of Moving Coil with **Polarity Sensor**



Magnetic Way

Moving Coil Model SGLGW-	Length of Moving Coil, L1 [mm]	Length of Polarity Sensor, A [mm]	Total Length, L [mm]
30A050 D P D	50	0	50
30A080 □ P □	80	(Included in the length of Moving Coil.)	80
40A140□H□ 40A140□P□	140		156
40A253□H□ 40A253□P□	252.5	16	268.5
40A365□H□ 40A365□P□	365		381
60A140□H□ 60A140□P□	140		156
60A253□H□ 60A253□P□	252.5	16	268.5
60A365□H□ 60A365□P□	365		381
90A200□H□ 90A200□P□	199	0	199
90A370□H□ 90A370□P□	367	(Included in the length of	367
90A535□H□ 90A535□P□	535	Moving Coil.)	535

Specifications and Ratings

Specifications: With Standard-Force Magnetic Way

Linear	30)A		40A		60A			90A			
•	Coil Model GLGW-	050C	080C	140C	253C	365C	140C	253C	365C	200C	370C	535C
Time Rati	ng					Cc	ntinuou	S				
Thermal (Class	В										
Insulation	Resistance	500 VDC, 10 MΩ min.										
Withstand	d Voltage					1,500 VA	AC for 1	minute				
Excitation	1					Perma	nent ma	agnet				
Cooling N	lethod		(Or	nly self-c		Self-coole nodels a			he SGL	GW-30/	۹.)	
Protective	e Structure						IP00					
	Surround- ing Air Tem- perature		0°C to 40°C (with no freezing)									
Environ- mental Condi-	Surround- ing Air Humidity			20% to	80% re	lative hu	midity (v	with no o	condens	sation)		
tions	Installation Site	MustMustMust	be wel facilitat have a	l-ventilat e inspeo n altitud	ted and ction and e of 1,0	corrosiv free of d d cleanir 00 m or ietic fielc	lust and ng. less.		0			
Shock Resis-	Impact Accelera- tion Rate					1	96 m/s²					
tance	Number of Impacts		2 times									
Vibra- tion Resis- tance	Vibration Accelera- tion Rate	49 m/s ² (the vibration resistance in three directions, vertical, side-to-side, and front-to-back)							d			

Ratings: With Standard-Force Magnetic Way

Linear Servor		30	A		40A			60A		90A			
Moving Coil I SGLGW		050C	080C	140C	253C	365C	140C	253C	365C	200C	370C	535C	
Rated Motor Speed (Reference Speed during Speed Control) ^{*1}	m/s	1.5	1.5	2.0	2.0	2.0	2.3	2.3	2.3	1.8	1.5	1.5	
Maximum Speed ^{*1}	m/s	5.0	5.0	5.0	5.0	5.0	4.8	4.8	4.8	4.0	4.0	4.0	
Rated Force ^{*1, *2}	N	12.5	25	47	93	140	70	140	210	325	550	750	
Maximum Force ^{*1}	Ν	40	80	140	280	420	220	440	660	1300	2200	3000	
Rated Current ^{*1}	Arms	0.51	0.79	0.80	1.6	2.4	1.2	2.2	3.3	4.4	7.5	10.2	
Maximum Current ^{*1}	Arms	1.6	2.5	2.4	4.9	7.3	3.5	7.0	10.5	17.6	30.0	40.8	
Moving Coil Mass	kg	0.10	0.15	0.34	0.60	0.87	0.42	0.76	1.1	2.2	3.6	4.9	
Force Constant	N/Arms	26.4	33.9	61.5	61.5	61.5	66.6	66.6	66.6	78.0	78.0	78.0	
BEMF Constant	Vrms/ (m/s)/ phase	8.80	11.3	20.5	20.5	20.5	22.2	22.2	22.2	26.0	26.0	26.0	
Motor Constant	N/√W	3.66	5.63	7.79	11.0	13.5	11.1	15.7	19.2	26.0	36.8	45.0	
Electrical Time Constant	ms	0.19	0.41	0.43	0.43	0.43	0.45	0.45	0.45	1.4	1.4	1.4	
Mechanical Time Constant	ms	7.5	4.7	5.6	5.0	4.8	3.4	3.1	3.0	3.3	2.7	2.4	
Thermal Resis- tance (with Heat Sink)	K/W	5.19	3.11	1.67	0.87	0.58	1.56	0.77	0.51	0.39	0.26	0.22	
Thermal Resis- tance (without Heat Sink)	K/W	8.13	6.32	3.02	1.80	1.23	2.59	1.48	1.15	1.09	0.63	0.47	
Magnetic Attraction	Ν	0	0	0	0	0	0	0	0	0	0	0	
Maximum Allowable Payload	kg	1.7	3.4	5.9	12	18	9.9	19	48	110	190	260	
Maximum Allowable Payload (With External Regenerative Resistor and Exter- nal Dynamic Brake Resistor ^{*3})	kg	1.7	3.4	5.9	12	18	9.9	19	48	110	190	260	
Combined Magnet SGLGM-		30□		40			60			ę		A	
Combined Serial C Unit, JZDP-DDD		250	251	252	253	254	258	259	260	264	265	266	
Applicable	SGD7S-	R70A, R70F	R90A	, R90F	1R6A, 2R1F	2R8A, 2R8F	1R6A, 2R1F	2R8A, 2R8F	5R5A	120A	180A	200A	
SERVOPACKs	SGD7W- SGD7C-		1B	86A		2R8A	1R6A	2R8A	5R5A		_		

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated forces are the continuous allowable force values at a surrounding air temperature of 40°C with an alu-

minum heat sink of the dimensions given in the following table. • Heat Sink Dimensions

• 200 mm × 300 mm × 12 mm: SGLGW-30A050C, -30A080C, -40A140C, and -60A140C

• 300 mm × 400 mm × 12 mm: SGLGW-40A253C and -60A253C

• 400 mm × 500 mm × 12 mm: SGLGW-40A365C and -60A365C

+ 800 mm \times 900 mm \times 12 mm: SGLGW-90A200C, -90A370C, and -90A535C

*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

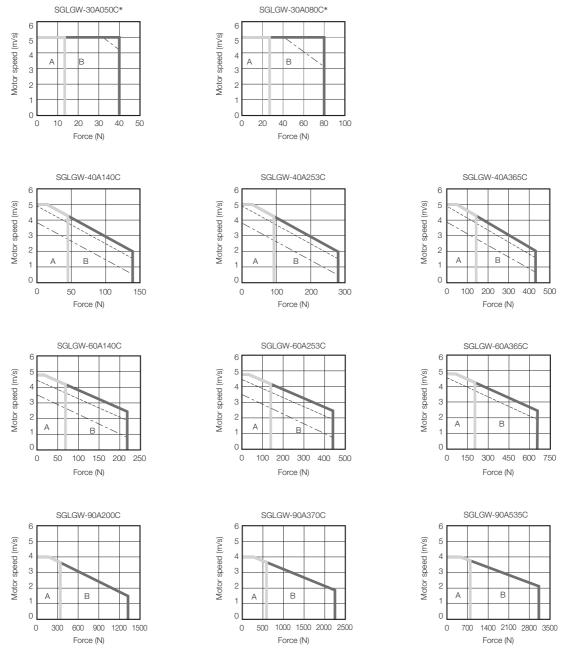
• SGD7S-R70000A020 to -2R800A020

• SGD7W-1R6A20A020 to -2R8A20A020

• SGD7C-1R6AMAA020 to -2R8AMAA020

Force-Motor Speed Characteristics

- A : Continuous duty zone (solid lines)
- B : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input
- (solid lines): With three-phase 200-V input
 - — (dashed-dotted lines): With single-phase 200-V input
 — (dashed-dotted lines): With single-phase 100-V input

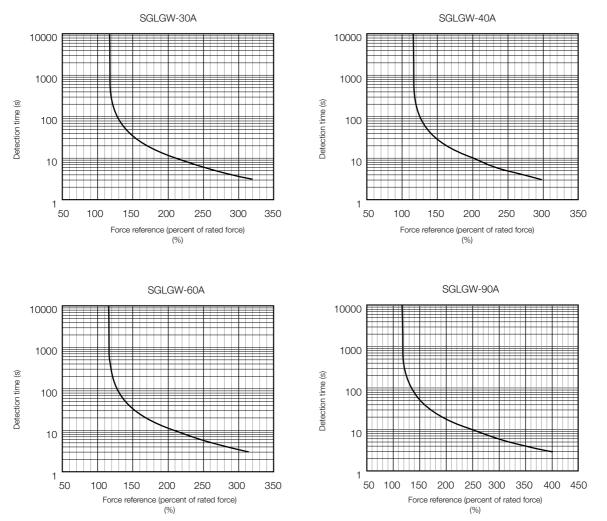


* The characteristics are the same for three-phase 200 V and single-phase 200 V.

- Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
 - 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 - 3. If the effective force is within the allowable range for the rated force, the Servomotor can be used within the intermittent duty zone.
 - 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective force remains within the continuous duty zone given in *Force-Motor Speed Characteristics* on page 222.

Specifications: With High-Force Magnetic Way

Linear Servom	Linear Servomotor Moving Coil Model				60A					
	SGLGW-	140C	253C	365C	140C	253C	365C			
Time Rating				Conti	nuous					
Thermal Class				E	3					
Insulation Resistar	nce		5	500 VDC, ⁻	$10~\text{M}\Omega$ min	l.				
Withstand Voltage)		1	,500 VAC	for 1 minut	te				
Excitation				Permaner	nt magnet					
Cooling Method			Se	elf-cooled	or air-coole	ed				
Protective Structu	Protective Structure			IP00						
	Surrounding Air Temperature	0°C to 40°C (with no freezing)								
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)								
Environmental Conditions	Installation Site	 Must be Must fa Must hat 	e indoors a e well-vent cilitate insp ave an altit e free of st	ilated and pection and ude of 1,0	free of dus d cleaning 00 m or les	st and mois ss.	•			
Shock	Impact Acceleration Rate	196 m/s ²								
Resistance	Number of Impacts	2 times								
Vibration Resistance	Vibration Acceleration Rate	49 m/s ² (the vibration resistance in three directions, vertical, side-to-side, and front-to-back)								

Linear Servomotor Moving C	oil Model		40A		60A			
SGLGW-		140C	253C	365C	140C	253C	365C	
Rated Motor Speed (Reference Speed during Speed Control)*1	m/s	1.0	1.0	1.0	1.0	1.0	1.0	
Maximum Speed ^{*1}	m/s	4.2	4.2	4.2	4.2	4.2	4.2	
Rated Force ^{*1, *2}	Ν	57	114	171	85	170	255	
Maximum Force ^{*1}	Ν	230	460	690	360	720	1080	
Rated Current ^{*1}	Arms	0.80	1.6	2.4	1.2	2.2	3.3	
Maximum Current ^{*1}	Arms	3.2	6.5	9.7	5.0	10.0	14.9	
Moving Coil Mass	kg	0.34	0.60	0.87	0.42	0.76	1.1	
Force Constant	N/Arms	76.0	76.0	76.0	77.4	77.4	77.4	
BEMF Constant	Vrms/(m/s)/ phase	25.3	25.3	25.3	25.8	25.8	25.8	
Motor Constant	N/√W	9.62	13.6	16.7	12.9	18.2	22.3	
Electrical Time Constant	ms	0.43	0.43	0.43	0.45	0.45	0.45	
Mechanical Time Constant	ms	3.7	3.2	3.1	2.5	2.3	2.2	
Thermal Resistance (with Heat Sink)	K/W	1.67	0.87	0.58	1.56	0.77	0.51	
Thermal Resistance (without Heat Sink)	K/W	3.02	1.80	1.23	2.59	1.48	1.15	
Magnetic Attraction	Ν	0	0	0	0	0	0	
Maximum Allowable Payload	kg	12	24	58	18	61	91	
Maximum Allowable Payload (With External Regenerative Resistor and External Dynamic Brake Resistor ^{*3})	kg	12	24	58	18	61	91	
Combined Magnetic Way, SGLGM-		4		M	6		M	
Combined Serial Converter Unit, JZI	DP- 000 -	255	256	257	261	262	263	
Applicable SERVOPACKs	SGD7S-	1R6A, 2R1F	2R8A, 2R8F	3R8A	1R6A, 2R1F	3R8A	7R6A	
	SGD7W- SGD7C-	1R6A	2R8A	5R5A	1R6A	5R5A	7R6A	

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated forces are the continuous allowable force values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the following table.

Heat Sink Dimensions

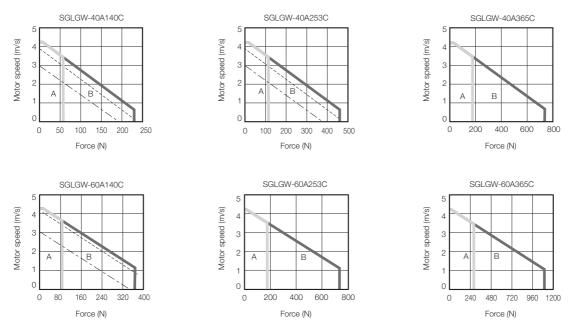
- + 200 mm \times 300 mm \times 12 mm: SGLGW-40A140C and -60A140C
- + 300 mm \times 400 mm \times 12 mm: SGLGW-40A253C and -60A253C
- + 400 mm \times 500 mm \times 12 mm: SGLGW-40A365C and -60A365C

*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

- SGD7S-R70□□□A020 to -2R8□□□A020
- SGD7W-1R6A20A020 to -2R8A20A020
- SGD7C-1R6AMAA020 to -2R8AMAA020

Force-Motor Speed Characteristics

- A : Continuous duty zone ——— (solid lines): With three-phase 200-V input
- B : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input
 - ------ (dashed-dotted lines): With single-phase 100-V input

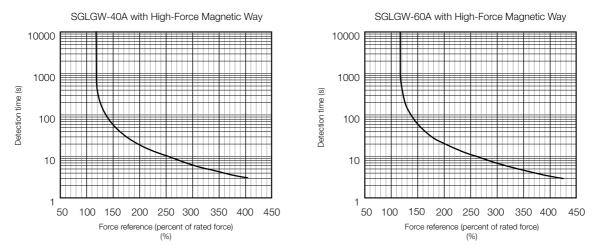


Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective force is within the allowable range for the rated force, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

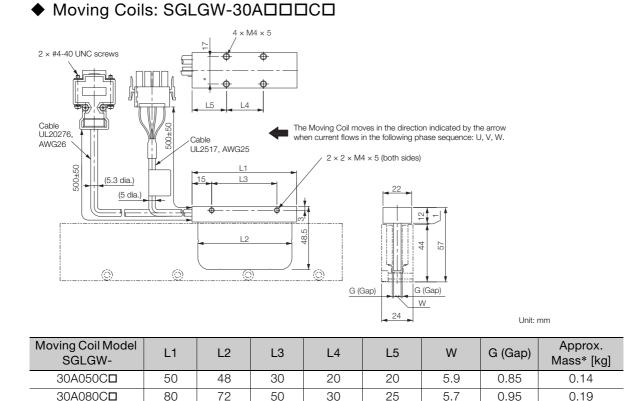
The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective force remains within the continuous duty zone given in *Force-Motor Speed Characteristics* on page 226.

External Dimensions

SGLGW-30



* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector

	1	Phase U	Red
HUCOGH	2	Phase V	White
	3	Phase W	Blue
	4	FG	Green

Plug: 350779-1 Pins: 350924-1 or 770672-1 From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350925-1 or 770673-1

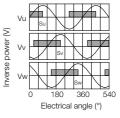
· Polarity Sensor Connector

9	1	+5 V (power supply)	6	
5	2	Phase U	7	Not used
	3	Phase V	8	1101 0300
	4	Phase W	9	
	5	0 V (power supply)	_	_

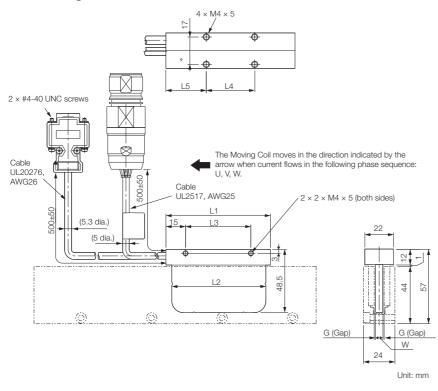
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Moving Coils: SGLGW-30A□□□C□D



Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	W	G (Gap)	Approx. Mass* [kg]
30A050C□D	50	48	30	20	20	5.9	0.85	0.14
30A080C□D	80	72	50	30	25	5.7	0.95	0.19

* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	_
5	Not used	_
6	FG	Green

Extension: SROC06JMSCN169 Pins: 021.423.1020 From Interconnectron GmbH Mating Connector Plug: SPUC06KFSDN236 Socket: 020.030.1020

· Polarity Sensor Connector



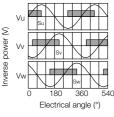
1	+5 V (power supply)	6	
2	Phase U	7	National
3	Phase V	8	Not used
4	Phase W	9	
5	0 V (power supply)	-	-

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

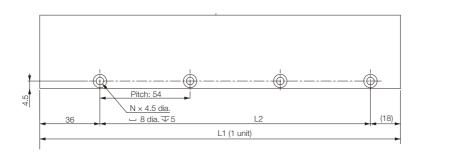
Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

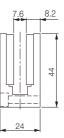
Polarity Sensor Output Signal

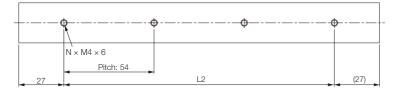
The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Standard-Force Magnetic Ways: SGLGM-30□□□A







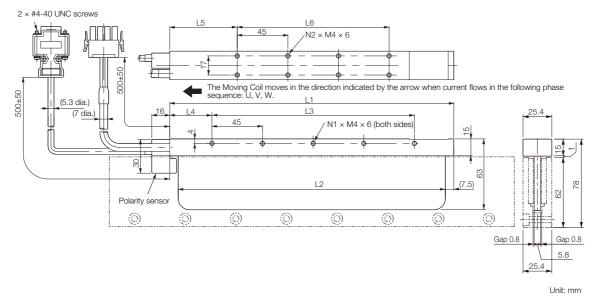
Unit: mm

Magnetic Way Model SGLGM-	L1	L2	Ν	Approx. Mass [kg]
30108A	108 -0.1	54	2	0.6
30216A	216 -0.1	162	4	1.1
30432A	432 -0.1	378	8	2.3

SGLG

SGLGW-40

◆ Moving Coils: SGLGW-40A□□□C□



Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* [kg]
40A140C	140	125	90	30	52.5	45	3	4	0.40
40A253Cロ	252.5	237.5	180	37.5	60	135	5	8	0.66
40A365Cロ	365	350	315	30	52.5	270	8	14	0.93

* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector

1	Phase U	Red	
2	Phase V	White	
3	Phase W	Blue	
4	FG	Green	

Plug: 350779-1 Pins: 350561-3 or 350690-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350570-3 or 350689-3

Polarity Sensor Connector

96
5

1	+5 V (power supply)	6	
2	Phase U	7	Not used
3	Phase V	8	1101 0300
4	Phase W	9	
5	0 V (power supply)	—	-

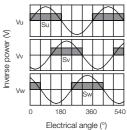
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

Mating Connector

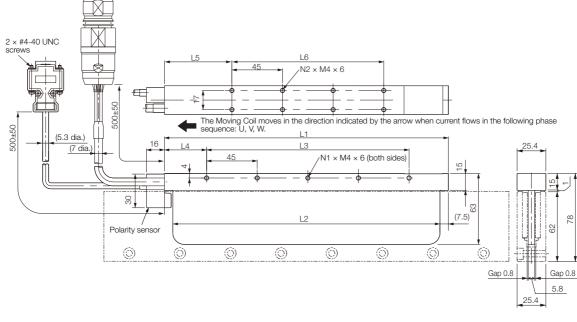
Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Moving Coils: SGLGW-40A□□□C□D



Unit: mm

Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* [kg]
40A140C D D	140	125	90	30	52.5	45	3	4	0.40
40A253C D D	252.5	237.5	180	37.5	60	135	5	8	0.66
40A365C D D	365	350	315	30	52.5	270	8	14	0.93

* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector

-	1	Phase U	Red
-3	2	Phase V	White
4	3	Phase W	Blue
	4	Not used	_
	5	Not used	_
	6	FG	Green

Extension: SROC06JMSCN169 Pins: 021.423.1020 From Interconnectron GmbH Mating Connector Plug: SPUC06KFSDN236 Socket: 020.030.1020

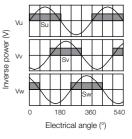
· Polarity Sensor Connector

9	1	+5 V (power supply)	6	
5 1	2	Phase U	7	Not used
	3	Phase V	8	Not used
	4	Phase W	9	
	5	0 V (power supply)	-	-

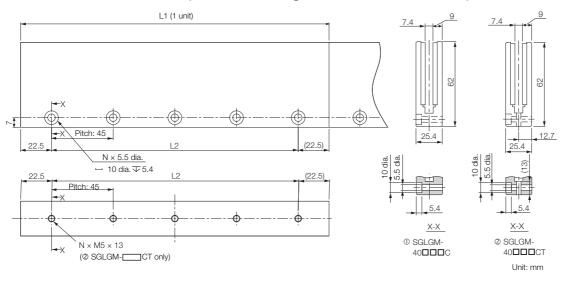
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

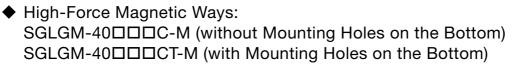
The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.

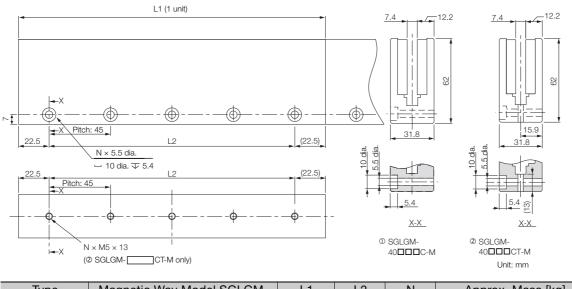


Standard-Force Magnetic Ways: SGLGM-40□□□C (without Mounting Holes on the Bottom) SGLGM-40□□□CT (with Mounting Holes on the Bottom)



Туре	Magnetic Way Model SGLGM-	L1	L2	Ν	Approx. Mass [kg]
Standard-Force	40090C or 40090CT	90 -0.1	45	2	0.8
	40225C or 40225CT	225 -0.1	180	5	2.0
	40360C or 40360CT	360 -0.1	315	8	3.1
	40405C or 40405CT	405 -0.1	360	9	3.5
	40450C or 40450CT	450 -0.1	405	10	3.9

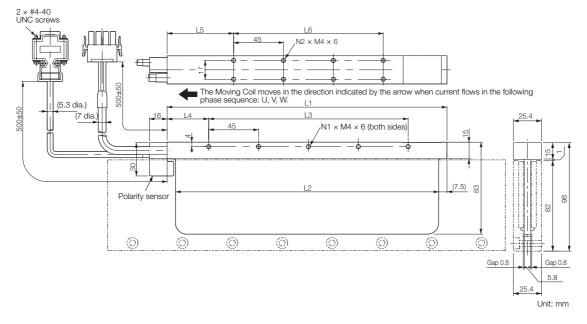




Туре	Magnetic Way Model SGLGM-	L1	L2	Ν	Approx. Mass [kg]
High-Force	40090C-M or 40090CT-M	90 -0.1	45	2	1.0
	40225C-M or 40225CT-M	225 -0.1	180	5	2.6
	40360C-M or 40360CT-M	360 -0.1	315	8	4.1
	40405C-M or 40405CT-M	405 -0.1	360	9	4.6
	40450C-M or 40450CT-M	450 -0.1	405	10	5.1

SGLGW-60

◆ Moving Coils: SGLGW-60A□□□C□



	Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* [kg]
	60A140C□	140	125	90	30	52.5	45	3	4	0.48
-	60A253Cロ	252.5	237.5	180	37.5	60	135	5	8	0.82
-	60A365Cロ	365	350	315	30	52.5	270	8	14	1.16

* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector

1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Plug: 350779-1 Pins: 350561-3 or 350690-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350570-3 or 350689-3

Polarity Sensor Connector

,, ,				
⁹	1	+5 V (power supply)	6	
5	2	Phase U	7	Not used
	3	Phase V	8	Not used
	4	Phase W	9	
	5	0 V (power supply)	-	-

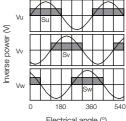
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

Mating Connector

Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

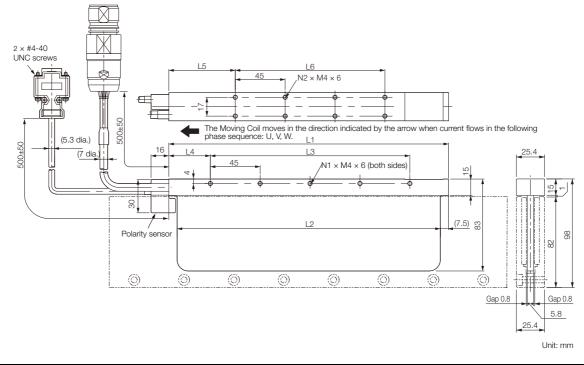
The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



Inverse



◆ Moving Coils: SGLGW-60A□□□C□D



Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* [kg]
60A140C D	140	125	90	30	52.5	45	3	4	0.48
60A253CロD	252.5	237.5	180	37.5	60	135	5	8	0.82
60A365C D D	365	350	315	30	52.5	270	8	14	1.16

* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector

1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	_
5	Not used	_
6	FG	Green
	- 3 4	2 Phase V 3 Phase W 4 Not used 5 Not used

Extension: SROC06JMSCN169 Pins: 021.423.1020 From Interconnectron GmbH Mating Connector Plug: SPUC06KFSDN236 Socket: 020.030.1020

· Polarity Sensor Connector

9	6
्राःः	
5	1

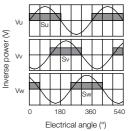
1	+5 V (power supply)	6			
2	Phase U	7	Not used		
3	Phase V	8	Not used		
4	Phase W	9			
5	0 V (power supply)	-	_		

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector

Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

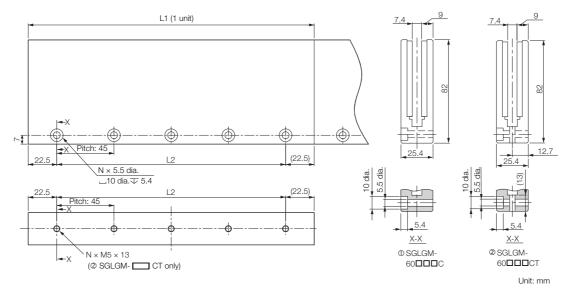
The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



SGLG

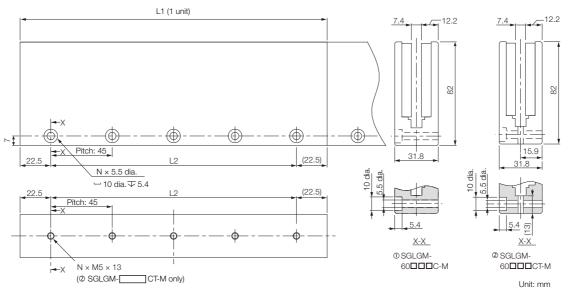
Standard-Force Magnetic Ways: SGLGM-60□□□C (without Mounting Holes on the Bottom)

SGLGM-60



Туре	Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass [kg]
	60090C or 60090CT	90 -0.1	45	2	1.1
	60225C or 60225CT	225 -0.1	180	5	2.6
Standard-Force	60360C or 60360CT	360 -0.1	315	8	4.1
	60405C or 60405CT	405 -0.1	360	9	4.6
	60450C or 60450CT	450 -0.1	405	10	5.1

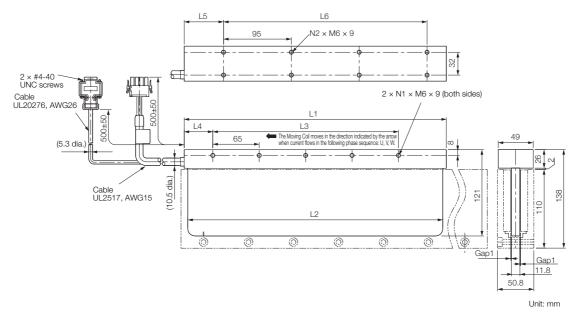
High-Force Magnetic Ways: SGLGM-60□□□C-M (without Mounting Holes on the Bottom) SGLGM-60□□□CT-M (with Mounting Holes on the Bottom)



Туре	Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass [kg]
	60090C-M or 60090CT-M	90 -0.1	45	2	1.3
	60225C-M or 60225CT-M	225 -0.1	180	5	3.3
High-Force	60360C-M or 60360CT-M	360 -0.1	315	8	5.2
	60405C-M or 60405CT-M	405 -0.1	360	9	5.9
	60450C-M or 60450CT-M	450 -0.1	405	10	6.6

SGLGW-90

◆ Moving Coils: SGLGW-90A□□□C□



Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* [kg]
90A200C	199	189	130	40	60	95	3	4	2.2
90A370Cロ	367	357	260	40	55	285	5	8	3.65
90A535Cロ	535	525	455	40	60	380	8	10	4.95

* The mass is for a Moving Coil with a Polarity Sensor.

Connector Specifications

Servomotor Connector

1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Plug: 350779-1

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350537-3 or 350550-3

· Polarity Sensor Connector

3 4 5

9 ~ 6
5

1	+5 V (power supply)	6	Not used	
2	Phase U	7		
3	Phase V	8	Not used	
4	Phase W	9		
5	0 V (power supply)	-	-	

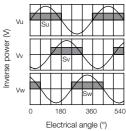
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

Mating Connector

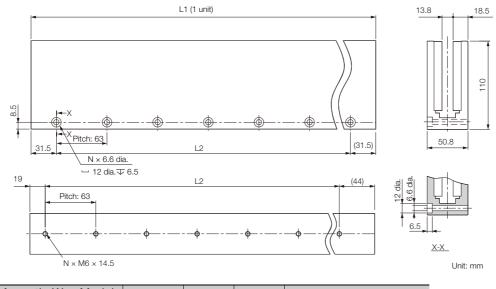
Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Standard-Force Magnetic Ways: SGLGM-90□□□A

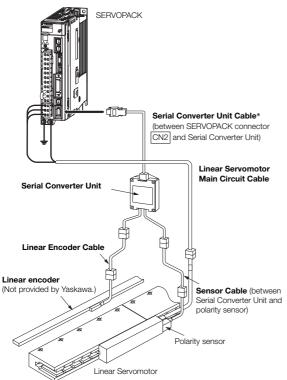


Magnetic Way Model SGLGM-	L1	L2	Ν	Approx. Mass [kg]
90252A	252 -0.1	189	4	7.3
90504A	504 -0.1	441	8	14.7

Selecting Cables

◆ Cable Configurations

To select a Linear Encoder, use *Recommended Linear Encoders* (pages 308 and 309). Prepare the cable required for the encoder.



* You can connect directly to an absolute linear encoder.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Linear Servomotor Model	Length (L)	Order Number	Appearance
	1 m	JZSP-CLN11-01-E	
	3 m	JZSP-CLN11-03-E	SERVOPACK end Linear Servomotor
SGLGW-30A, -40A, -60A	5 m	JZSP-CLN11-05-E	
3GLGW-30A, -40A, -60A	10 m	JZSP-CLN11-10-E	
	15 m	JZSP-CLN11-15-E	
	20 m	JZSP-CLN11-20-E	*
	1 m	JZSP-CLN21-01-E	
	3 m	JZSP-CLN21-03-E	SERVOPACK end Linear Servomotor
SGLGW-90A	5 m	JZSP-CLN21-05-E	
SGLGW-90A	10 m	JZSP-CLN21-10-E	
	15 m	JZSP-CLN21-15-E	
	20 m	JZSP-CLN21-20-E	
	1 m	JZSP-CLN14-01-E	
	3 m	JZSP-CLN14-03-E	SERVOPACK end Linear Servomotor end
	5 m	JZSP-CLN14-05-E	
-40A□□□□□D -60A□□□□□D	10 m	JZSP-CLN14-10-E	
	15 m	JZSP-CLN14-15-E	
	20 m	JZSP-CLN14-20-E	

◆ Linear Servomotor Main Circuit Cables

*1. Connector from Tyco Electronics Japan G.K.

*2. Connector from Interconnectron GmbH

SGLF (Models with F-type Iron Cores)

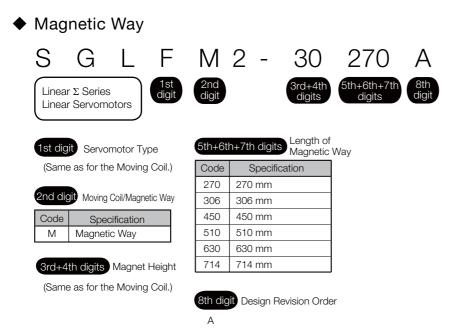
Model Designations

SGLFW2 Models

Moving Coil W 2 -30 S G F Α 070 А 1st digit 6th+7th+8th 2nd diai Linear Σ Series Linear Servomotors 1st digit Servomotor Type 5th digit Power Supply Voltage 10th digit Sensor Specification Code Specification Code Specification Code Specification With F-type iron core 200 VAC S With polarity sensor and Thermal Protector F А Т Without polarity sensor, with thermal protector 6th+7th+8th digits Length of Moving Coil 2nd digit Moving Coil/Magnetic Way 11th digit Specification Code Specification Code Cooling Method Moving Coil W 070 70 mm Code Specification 120 125 mm None Self-cooled 200 205 mm Water-cooled* 3rd+4th digits Magnet Height L 230 230 mm Code Specification 380 384 mm 30 30 mm 560 563 mm 45 45 mm 90 90 mm 9th digit Design Revision Order 1D 135 mm А

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

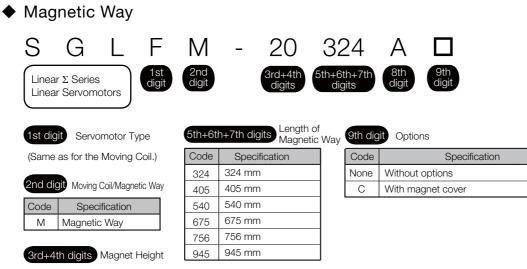
* Contact your Yaskawa representative for information on water-cooled models.



SGLFW Models

IVIOV	ring C	oil									
S	G	L	F	W	-	20	А	090	А	Ρ	
	r Σ Series r Servom		1st digit	2nd digit		3rd+4th digits	5th digit	6th+7th+8th digits	9th digit	10th digit	11th digit
1st dig	git Servo	motor T	ype	5th digit	Voltage	Э	10	h digit Se	nsor Specific	ation	
Code	Spec	ification		Code	Spec	ification	Co	de	Specif	ication	
F	With F-t	ype iron	core	А	200 VAC)	F	With pol	arity sensor		
2nd di		Coll/Magaz		6th+7th	+8th diai	te Length c		ne Without	polarity sense	or	
2nd di Code	Spec	Coil/Magne	etic Way	6th+7th Code	Spec	ts Length c Moving (h digit Conr	nector for Ser	vomoto	or Main Circuit C
_		cification	etic Way	Code 090	Spec 91 mm	Moving (of Coil	h digit Conr de Spe	nector for Ser	vomoto	or Main Circuit C pplicable Model
Code W	Spec Moving	cification Coil		Code 090 120	Spec	Moving (h digit Conr de Spe de Connect	nector for Ser	vomoto Al	
Code W 3rd+4	Spece Moving th digits	Coil Magnet		Code 090 120 200	Spec 91 mm 127 mm	Moving (of Coil Coil Nor	h digit Conr de Spe ne Connect Electroni Connect	nector for Ser cification or from Tyco cs Japan G.k or from	vomoto All C. SG	pplicable Model models LFW-35, -50,
Code W 3rd+4 Code	Spec Moving th digits Spec	cification Coil		Code 090 120 200 230	Spec 91 mm 127 mm 215 mm	Moving (of Coil Coil	h digit Conr de Spe ne Connect Electroni Connect	nector for Ser cification or from Tyco cs Japan G.K	vomoto All C. SG	pplicable Model
Code W 3rd+4 Code 20	Spect Moving the digits Spect 20 mm	Coil Magnet		Code 090 120 200 230	Spec 91 mm 127 mm 215 mm 235 mm	Moving (of Coil Coil Nor	h digit Conr de Spe ne Connect Electroni Connect	nector for Ser cification or from Tyco cs Japan G.k or from	vomoto All C. SG	pplicable Model models LFW-35, -50,
Code W 3rd+4 Code 20 35	Spect Moving the digits Spect 20 mm 36 mm	Coil Magnet		Code 090 120 200 230 380	Spec 91 mm 127 mm 215 mm 235 mm 395 mm	Moving (of Coil Coil Nor	h digit Conr de Spe ne Connect Electroni Connect	nector for Ser cification or from Tyco cs Japan G.k or from	vomoto All C. SG	pplicable Model models LFW-35, -50,
Code W 3rd+4 Code 20	Spect Moving the digits Spect 20 mm	Coil Magnet		Code 090 120 200 230 380	Spec 91 mm 127 mm 215 mm 235 mm 395 mm	ification	of Coil Coil Nor	h digit Conr de Spe ne Connect Electroni Connect	nector for Ser cification or from Tyco cs Japan G.k or from	vomoto All C. SG	pplicable Model models LFW-35, -50,

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.



(Same as for the Moving Coil.)

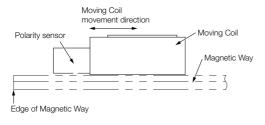
8th digit Design Revision Order A, B ...

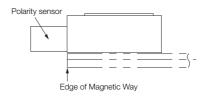
Precautions on Moving Coils with Polarity Sensors

Note When you use a Moving Coil with a Polarity Sensor, the Magnetic Way must cover the bottom of the polarity sensor. Refer to the example that shows the correct installation. When determining the length of the Moving Coil's stroke or the length of the Magnetic Way, consider the total length (L) of the Moving Coil and the polarity sensor. Refer to the following table.

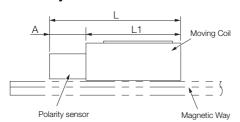
Correct Installation

Incorrect Installation





Total Length of Moving Coil with _ Polarity Sensor



Moving Coil Model SGLFW2-	Length of Moving Coil, L1 [mm]	Length of Polarity Sensor, A [mm]	Total Length, L [mm]
30A070AS	70		97
30A120AS	125	29	152
30A230AS	230		257
45A200AS	205	34	237
45A380AS	384	- 54	416
90A200AS	205		237
90A380AS	384	34	416
90A560AS	563		595
1DA380AS	384	32	416
1DA560AS	563	52	595
Moving Coil Model SGLFW-	Length of Moving Coil, L1 [mm]	Length of Polarity Sensor, A [mm]	Total Length, L [mm]
Model	Moving Coil,	Polarity Sensor, A [mm]	Length,
Model SGLFW-	Moving Coil, L1 [mm]	Polarity Sensor,	Length, L [mm]
Model SGLFW- 20A090AP	Moving Coil, L1 [mm] 91	Polarity Sensor, A [mm] 22	Length, L [mm]
Model SGLFW- 20A090AP 20A120AP	Moving Coil, L1 [mm] 91 127	Polarity Sensor, A [mm]	Length, L [mm] 113 149
Model SGLFW- 20A090AP 20A120AP 35A120AP□	Moving Coil, L1 [mm] 91 127 127	Polarity Sensor, A [mm] 22 22	Length, L [mm] 113 149 149
Model SGLFW- 20A090AP 20A120AP 35A120AP□ 35A230AP□	Moving Coil, L1 [mm] 91 127 127 235	Polarity Sensor, A [mm] 22	Length, L [mm] 113 149 149 257
Model SGLFW- 20A090AP 20A120AP 35A120AP□ 35A230AP□ 50A200BP□	Moving Coil, L1 [mm] 91 127 127 235 215	Polarity Sensor, A [mm] 22 22	Length, L [mm] 113 149 149 257 237

Specifications and Ratings: SGLFW2 Models

Specifications

Linear Se	rvomotor Moving Coil		30A		45	5A		90A		10	A
M	odel SGLFW2-	070A🗆	120A🗆	230A🗆	200Aロ	380A🗆	200Aロ	380A🗆	560A🗆	380Aロ	560AD
Time Rati	ing					Conti	nuous				
Thermal (Class					E	3				
Insulation	Resistance				500	VDC,	10 M Ω r	nin.			
Withstand	d Voltage				1,50	O VAC	for 1 mi	nute			
Excitation	١				Pe	ermaner	nt magn	iet			
Cooling N	Nethod				Self-cod	oled and	d water-	cooled*			
Protective	e Structure					IP	00				
	Surrounding Air Tem- perature		0°C to 40			40°C (w	/ith no f	reezing)			
Environ- mental	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)									
Condi- tions	Installation Site	 Must be indoors and free of corre Must be well-ventilated and free Must facilitate inspection and cle Must have an altitude of 1,000 m Must be free of strong magnetic 				free of nd clean)00 m o	dust an ing. r less.	•		3.	
Shock	Impact Acceleration Rate					196	m/s ²				
Resis- tance	Number of Impacts	2 times									
Vibra- tion Resis- tance	Vibration Accelera- tion Rate	49 m/s ² (the vibration resistance in three directions, vertical, side-to- and front-to-back)					-side,				

* Contact your Yaskawa representative for information on water-cooled models.

Ratings

Linear Servon	notor Movi	ing Coil		30)A		45A			
	SGLFW2-		070Aロ	120Aロ	230	DAD	200Aロ	380	AD	
Rated Motor Sp (Reference Spee Speed Control)*	ed during	m/s	4.0	4.0	4	.0	4.0	4	.0	
Maximum Spee	d*1	m/s	5.0	5.0	5	.0	4.5	4.5		
Rated Force*1,*	2	Ν	45	90	180 170		280	56	60	
Maximum Force	e*1	Ν	135	270	540	500	840	1680	1500	
Rated Current*1		Arms	1.4	1.5	2.9	2.8	4.4	8	.7	
Maximum Curre	ent ^{*1}	Arms	5.3	5.2	10.5	9.3	16.4	32.7	27.5	
Moving Coil Ma	SS	kg	0.50	0.90	1	.7	2.9	5	.5	
Force Constant		N/Arms	33.3	64.5	64	1.5	67.5	67	'.5	
BEMF Constant	:	Vrms/ (m/s)/ phase	11.1	21.5	2-	1.5	22.5	22	2.5	
Motor Constant		N/√W	11.3	17.3	24	1.4	36.9		52.2	
Electrical Time	Constant	ms	7.6	7.3	7	.3	19	19		
Mechanical Tim Constant	е	ms	3.9	3.0	2	.9	2.1 2.0		.0	
Thermal Resista (with Heat Sink)		K/W	2.62	1.17	0.	79	0.60 0.44		44	
Thermal Resista (without Heat Si		K/W	11.3	4.43	2.	55	2.64	1.	49	
Magnetic Attrac		Ν	200	630	12	260	2120	42	40	
Maximum Allow Payload		kg	5.6	9.4	34	10	58	110	95	
Maximum Allow Payload (With External F tive Resistor and Dynamic Brake tor ^{*3})	legenera- d External Resis-	kg	5.6	11	34	20	64	110	110	
Combined Mag SGLFM2-				300				45 000 A		
Combined Seria	al Converte	er Unit,	628	629	6	30	631	60	32	
Applicable	SGD7S-		1R6A,	2R1F	3R8A	2R8A, 2R8F	5R5A	180A	120A	
SERVOPACKs	SGD7W- SGD7C-		1R	6A	_	2R8A	5R5A	-	_	

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated forces are the continuous allowable force values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the following table.

Heat Sink Dimensions

- 150 mm × 100 mm × 10 mm: SGLFW2-30A070A
- 254 mm × 254 mm × 25 mm: SGLFW2-30A120A and -30A230A
- + 400 mm \times 500 mm \times 10 mm: SGLFW2-45A200A and -45A380A
- *3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

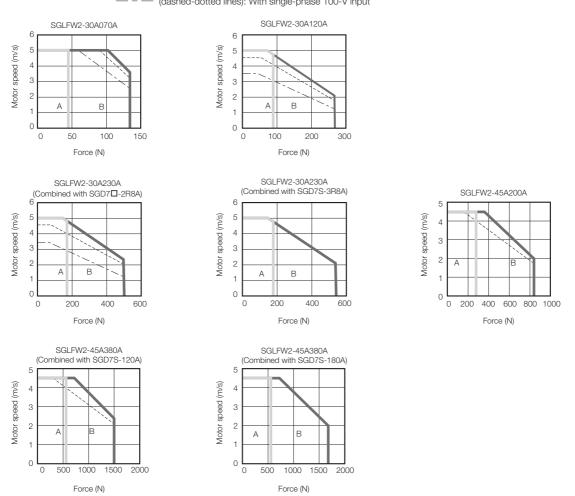
• SGD7S-R70 C A020 to -2R8 C A020

• SGD7W-1R6A20A020 to -2R8A20A020

• SGD7C-1R6AMAA020 to -2R8AMAA020

Force-Motor Speed Characteristics

- A : Continuous duty zone (solid lines): With three-phase 200-V input
- B : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input
 - — (dashed-dotted lines): With single-phase 200-V input



- Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
 - 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 - 3. If the effective force is within the allowable range for the rated force, the Servomotor can be used within the intermittent duty zone.
 - 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

Ratings

Linear Servor	notor Movir	ng Coil		90A		1DA		
Model	SGLFW2-	Ŭ	200Aロ	380Aロ	560Aロ	380Aロ	560Aロ	
Rated Motor Sp (Reference Spe Speed Control)	ed during	m/s	4.0	4.0	4.0	2.0	2.0	
Maximum Spee	ed ^{*1}	m/s	4.0	4.0	4.0	2.5	2.5	
Rated Force ^{*1,*}	*2	Ν	560	1120	1680	1680	2520	
Maximum Force	e*1	Ν	1680	3360	5040	5040	7560	
Rated Current*	1	Arms	7.2	14.4	21.6	14.4	21.6	
Maximum Curre	ent ^{*1}	Arms	26.9	53.9	80.8	53.9	80.8	
Moving Coil Ma	ISS	kg	5.3	10.1	14.9	14.6	21.5	
Force Constant	t	N/Arms	82.0	82.0	82.0	123	123	
BEMF Constan	t	Vrms/ (m/s)/ phase	27.3	27.3	27.3	41.0	41.0	
Motor Constan	t	N/\sqrt{W}	58.1	82.2	101	105	129	
Electrical Time	Constant	ms	24	23	24	25	25	
Mechanical Tim Constant	ıe	ms	1.6	1.5	1.5	1.3	1.3	
Thermal Resista (with Heat Sink		K/W	0.45	0.21	0.18	0.18	0.12	
Thermal Resista (without Heat S		K/W	1.81	1.03	0.72	0.79	0.55	
Magnetic Attrac		Ν	4240	8480	12700	12700	19100	
Maximum Allow Payload	vable	kg	130	160	360	690	1000	
Payload (With External F tive Resistor an	Maximum Allowable Payload (With External Regenera- tive Resistor and Exter- nal Dynamic Brake		140	290	440	710	1000	
Combined Mag SGLFM2-	Combined Magnetic Way, SGLFM2-			90 000 A		1D □		
Combined Seria		^r Unit,	633	634	648	649	650	
Applicable	SGD7S-		120A	200A	330A	200A	330A	
Applicable SERVOPACKs SGD7W- SGD7C-					_			

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated forces are the continuous allowable force values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the following table.

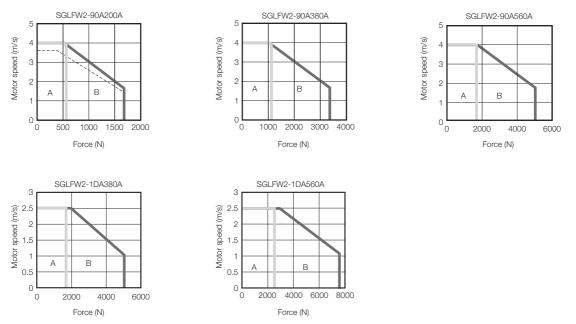
Heat Sink Dimensions

- 400 mm × 500 mm × 10 mm: SGLFW2-90A200A
- 609 mm × 762 mm × 10 mm: SGLFW2-90A380A
- + 900 mm \times 762 mm \times 10 mm: SGLFW2-90A560A and -1DA380A
- 1,200 mm × 762 mm × 10 mm: SGLFW2-1DA560A

Force-Motor Speed Characteristics

A : Continuous duty zone ——— (solid lines): With three-phase 200-V input

E : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input

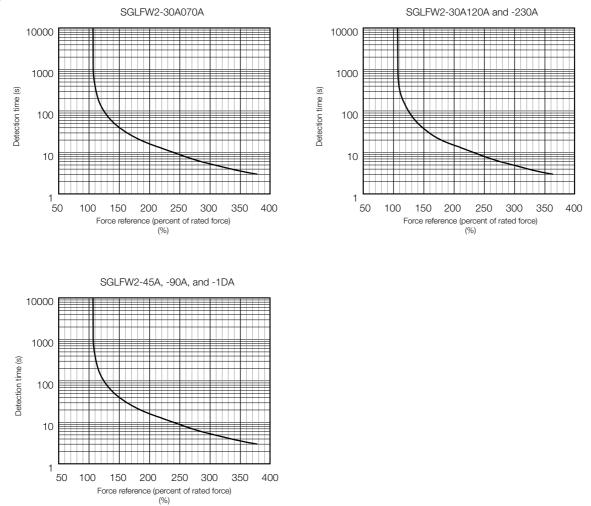


Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective force is within the allowable range for the rated force, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective force remains within the continuous duty zone given in *Force-Motor Speed Characteristics* on page 247 and on page 249.

Specifications and Ratings: SGLFW Models

Specifications

Linear Ser	vomotor Moving Coil Model	20)A	35	5A	50)A	1ZA	
	SGLFW-	090A 120A 120A 230A 200B 380B 200B 380E						380B	
Time Rating					Conti	nuous			
Thermal Class	3				E	3			
Insulation Res	istance			500) VDC, ⁻	10 MΩ r	nin.		
Withstand Vol	tage			1,50	DO VAC	for 1 mi	nute		
Excitation				Р	ermanei	nt magn	et		
Cooling Metho	bd				Self-c	cooled			
Protective Str	ucture				IP	00			
	Surrounding Air Temperature	0°C to 40°C (with no freezing)							
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)							
Environmen- tal Condi- tions	nmen-		 Must be indoors and free of corrosive and explosive gases. Must be well-ventilated and free of dust and moisture. Must facilitate inspection and cleaning. Must have an altitude of 1,000 m or less. Must be free of strong magnetic fields. 						
Shock	Impact Acceleration Rate	196 m/s ²							
Resistance	Number of Impacts	2 times							
Vibration Resistance	ation Vibration Acceleration Bate		49 m/s ² (the vibration resistance in three directions, vertical, side-to-side, and front-to-back)						

Ratings

Linear Serve	omotor Moving	Coil Model	20)A	3	ōΑ	50	DA	12	ZA
	SGLFW-		090A	120A	120A	230A	200B	380B	200B	380B
Rated Motor Sp (Reference Spe Speed Control)	ed during	m/s	5.0	3.5	2.5	3.0	1.5	1.5	1.5	1.5
Maximum Spee	ed ^{*1}	m/s	5.0	5.0	5.0	5.0	5.0	5.0	4.9	4.9
Rated Force*1,*	*2	N	25	40	80	160	280	560	560	1120
Maximum Force	e*1	N	86	125	220	440	600	1200	1200	2400
Rated Current*	1	Arms	0.70	0.80	1.4	2.8	5.0	10.0	8.7	17.5
Maximum Curre	ent ^{*1}	Arms	3.0	2.9	4.4	8.8	12.4	25.0	21.6	43.6
Moving Coil Ma	ISS	kg	0.70	0.90	1.3	2.3	3.5	6.9	6.4	12
Force Constant	t	N/Arms	36.0	54.0	62.4	62.4	60.2	60.2	69.0	69.0
BEMF Constan	t	Vrms/(m/s)/ phase	12.0	18.0	20.8	20.8	20.1	20.1	23.0	23.0
Motor Constan	t	N/ _√ W	7.95	9.81	14.4	20.4	34.3	48.5	52.4	74.0
Electrical Time	Constant	ms	3.2	3.3	3.6	3.6	16	16	18	18
Mechanical Tim	ne Constant	ms	11	9.4	6.3	5.5	3.0	2.9	2.3	2.1
Thermal Resista (with Heat Sink)		K/W	4.35	3.19	1.57	0.96	0.56	0.38	0.47	0.20
Thermal Resista (without Heat S		K/W	7.69	5.02	4.10	1.94	1.65	0.95	1.30	0.73
Magnetic Attrac	ction	N	310	460	810	1590	1650	3260	3300	6520
Maximum Allow	vable Payload	kg	3.2	4.8	8.7	29	33	67	66	78
(With External F Resistor and Ex	Maximum Allowable Payload (With External Regenerative Resistor and External Dynamic Brake Resistor ^{*3})		3.2	4.8	8.7	29	40	80	82	160
Combined Mag	Combined Magnetic Way, SGLFM-		2000		3500		5000		1ZDD	
Combined Seria		it,	017	018	019	020	181	182	183	184
Applicable	SGD7S-		1F	R6A, 2R	1F	3R8A	5R5A	12	0A	200A
SERVOPACKs	SGD7W- SGD7C-			1R6A		5R	85A	_		

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated forces are the continuous allowable force values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the following table.

• Heat Sink Dimensions

- + 125 mm \times 125 mm \times 13 mm: SGLFW-20A090A and -20A120A
- + 254 mm \times 254 mm \times 25 mm: SGLFW-35A120A and -35A230A
- 400 mm × 500 mm × 40 mm: SGLFW-50A200B, 50A380B, and -1ZA200B
- 600 mm × 762 mm × 50 mm: SGLFW-1ZA380B
- *3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

• SGD7S-R70□□□A020 to -2R8□□□A020

- SGD7W-1R6A20A020 to -2R8A20A020
- SGD7C-1R6AMAA020 to -2R8AMAA020

Force-Motor Speed Characteristics

- A : Continuous duty zone (solid lines): With three-phase 200-V input
- B : Intermittent duty zone ----- (dotted lines): With single-phase 200-V input
 - — (dashed-dotted lines): With single-phase 200-V input
 — (dashed-dotted lines): With single-phase 100-V input

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2

1

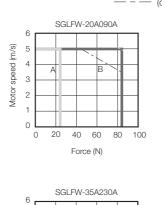
0

Motor speed (m/s)

SGLFW-20A120A

0 20 40 60 80 100 120 140

Force (N)



В

100 200 300

Force (N)

400 500

5

4

3

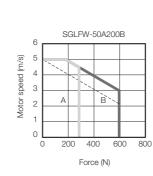
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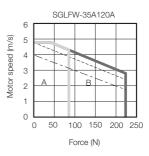
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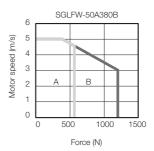
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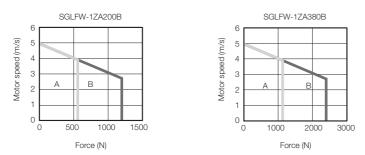
0

Motor speed (m/s)







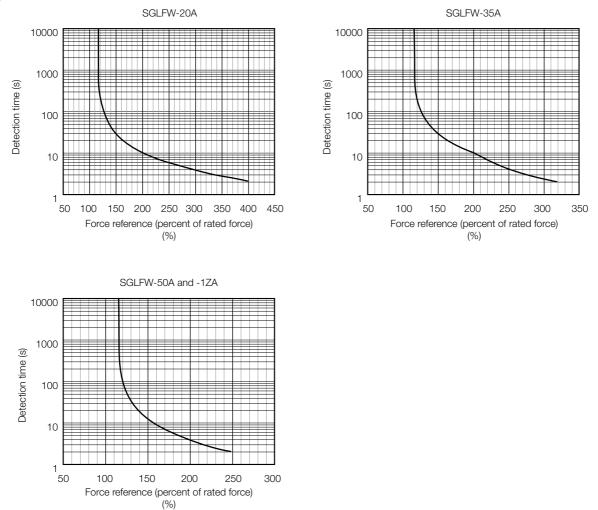


Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

- 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
- 3. If the effective force is within the allowable range for the rated force, the Servomotor can be used within the intermittent duty zone.
- 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

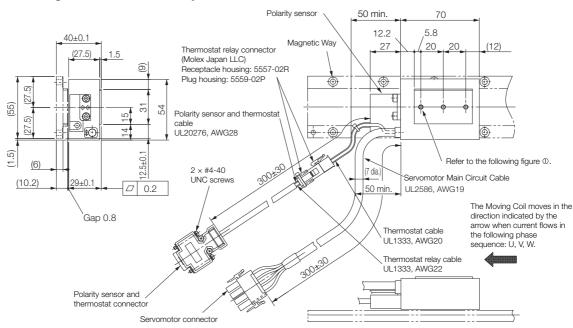
The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.

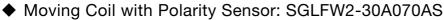


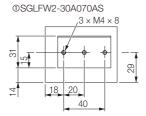
Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective force remains within the continuous duty zone given in *Force-Motor Speed Characteristics* on page 253.

External Dimensions

SGLFW2-30







Connector Specifications

Servomotor Connector

1234	1	Phase U		Red			
	2	Phase V		White			
	3	Phase W		Black			
	4	FG	Green				
	Plug: 350779-1 Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3						
 Polarity Set 	ensor	and Thermos	stat (Connector			
9	1	+5 V (thermal protector), +5 V (power sup					
5 1	2	Su	6				
	3	Sv	7	Not used			
	4	Sw	8				

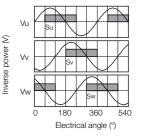
 5
 0 V (power supply)
 9
 Thermal protector

 Pin connector: 17JE-23090-02 (D8C) -CG
 From DDK Ltd.
 Mating Connector

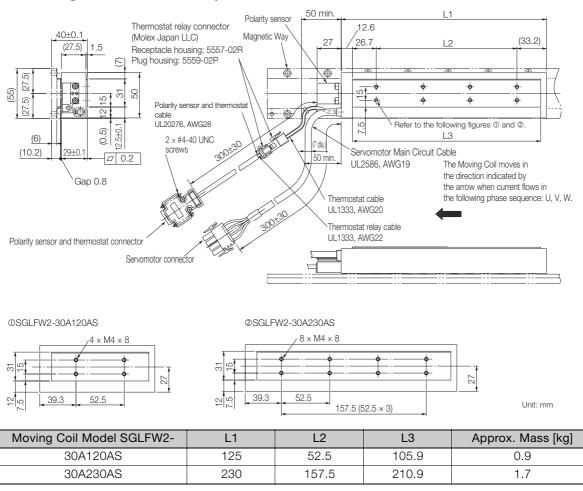
Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



Approx. mass: 0.5 kg Unit: mm



Moving Coils with Polarity Sensors: SGLFW2-30ADDDAS

Connector Specifications

Servomotor Connector

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234	1	Phase U	Red		
	2	Phase V	White		
	3	Phase W	Black		
	4	FG	Green		

Plug: 350779-1 Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3

· Polarity Sensor and Thermostat Connector

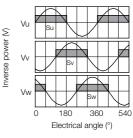
	1	+5 V (thermal prote	+5 V (thermal protector), +5 V (power supply)				
1	2	Su	6				
	3	Sv	7	Not used			
	4	Sw	8				
	5	0 V (power supply)	9	Thermal protector			

Pin connector: 17JE-23090-02 (D8C) -CG From DDK Ltd.

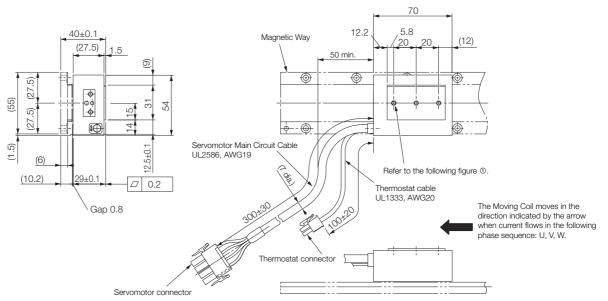
Mating Connector

Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

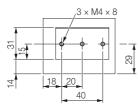
Polarity Sensor Output Signal



Moving Coil without Polarity Sensor: SGLFW2-30A070AT



@SGLFW2-30A070AT



Approx. mass: 0.5 kg Unit: mm

Connector Specifications

Servomotor Connector

)(4)	1	Phase U	Red
	2	Phase V	White
	3	Phase W	Black
	4	FG	Green

Plug: 350779-1

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3

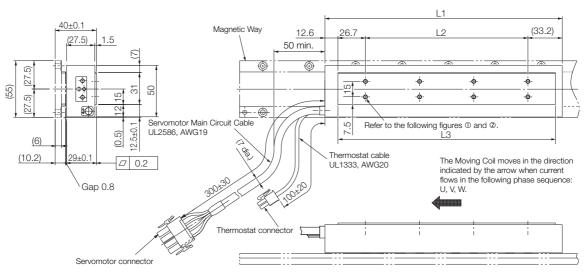
Thermostat Connector

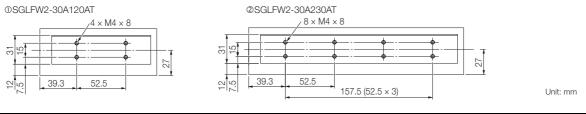
1

	1	Thermal protector
	2	Thermal protector
_	Termina	acle housing: 5557-02R als: 5556T or 5556TL

From Molex Japan LLC Mating Connector Plug housing: 5559-02P Terminals: 5558T or 5558TL

◆ Moving Coils without Polarity Sensors: SGLFW2-30A□□□AT





Moving Coil Model SGLFW2-	L1	L2	L3	Approx. Mass [kg]
30A120AT	125	52.5	105.9	0.9
30A230AT	230	157.5	210.9	1.7

Connector Specifications

Servomotor Connector

34	1	Phase U	Red
	2	Phase V	White
	3	Phase W	Black
	4	FG	Green

Plug: 350779-1 Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3

Thermostat Connector

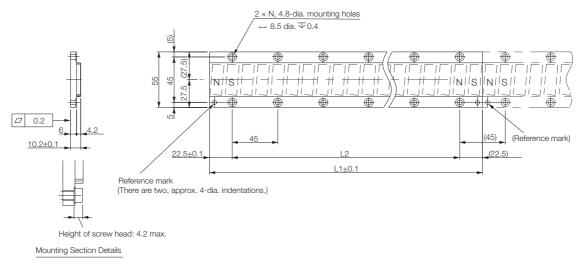
2

	1
	2
	$\left - \right $
F	

Thermal protector Thermal protector

Receptacle housing: 5557-02R Terminals: 5556T or 5556TL From Molex Japan LLC Mating Connector Plug housing: 5559-02P Terminals: 5558T or 5558TL

◆ Magnetic Ways: SGLFM2-30□□□A



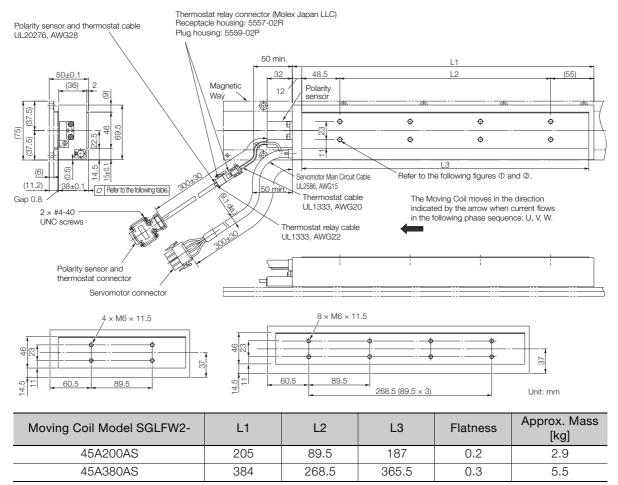
Unit: mm

Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM2-	L1 ± 0.1	L2	N	Approx. Mass [kg]
30270A	270	225 (45 × 5)	6	0.9
30450A	450	405 (45 × 9)	10	1.5
30630A	630	585 (45 × 13)	14	2.0

SGLFW2-45

◆ Moving Coils with Polarity Sensors: SGLFW2-45A□□□AS



Connector Specifications

Servomotor Connector

1234	1	Phase U	Red
	2	Phase V	White
	3	Phase W	Black
	4	FG	Green
	0	350779-1	

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector

Cap: 350780-1

Socket: 350536-3 or 350550-3

· Polarity Sensor and Thermostat Connector

9 6	1	+5 V (thermal protector), +5 V (power supply)			
5	2	Su 6			
	3	Sv	7	Not used	
	4	Sw	8		
	5	0 V (power supply)	9	Thermal protector	

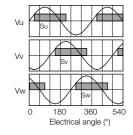
Pin connector: 17JE-23090-02 (D8C) -CG From DDK Ltd. Mating Connector

Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

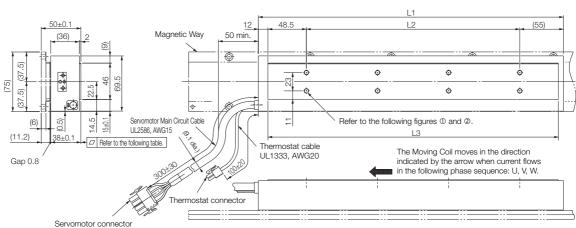
Polarity Sensor Output Signal

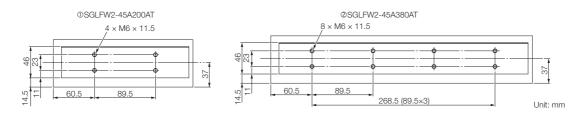
S

nverse power



◆ Moving Coils without Polarity Sensors: SGLFW2-45A□□□AT





Moving Coil Model SGLFW2-	L1	L2	L3	Flatness	Approx. Mass [kg]
45A200AT	205	89.5	187	0.2	2.9
45A380AT	384	268.5	365.5	0.3	5.5

Connector Specifications

Servomotor Connector

1	Phase U	Red			
2	Phase V	White			
3	Phase W	Black			
4	FG	Green			
Plug: 350779-1					
350654-1 or 350669-1 (No. 4)					
From 7	yco Electronics Jaj	pan G.K.			
Mating Connector					
Cap: 350780-1					
Socket: 350536-3 or 350550-3					
	3 4 Plug: 3 Pins: 3 3 From 1 Mating Cap: 3	3 Phase W 4 FG Plug: 350779-1 Pins: 350218-3 or 35054 350654-1 or 35066 From Tyco Electronics Jag Mating Connector Cap: 350780-1			

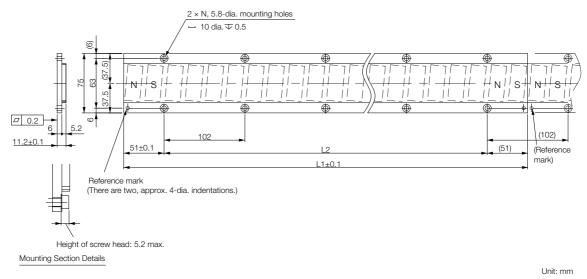
Thermostat Connector



Thermal protector Thermal protector

Receptacle housing: 5557-02R Terminals: 5556T or 5556TL From Molex Japan LLC Mating Connector Plug housing: 5559-02P Terminals: 5558T or 5558TL

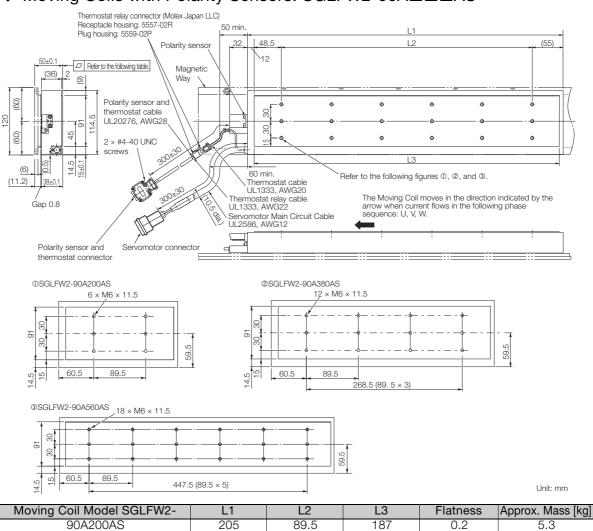
◆ Magnetic Ways: SGLFM2-45□□□A



Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM2-	L1 ± 0.1	L2	Ν	Approx. Mass [kg]
45306A	306	204 (102 × 2)	3	1.5
45510A	510	408 (102 × 4)	5	2.5
45714A	714	612 (102 × 6)	7	3.4

SGLFW2-90



268.5

447.5

◆ Moving Coils with Polarity Sensors: SGLFW2-90A□□□AS

90A560AS Connector Specifications

90A380AS

Servomotor Connector

B1B2	A1	Phase U	Red		
38	A2	Phase V	White		
A1 A2	B1	Phase W	Black		
	B2	FG	Green		
	Tab housing: 1-917808-2				
Contacts: 917803-2 (A1, A2, and B1) 84695-1 (B2)					
	From Tyco Electronics Japan G.K.				
Mating Connector					
	Receptacle housing: 1-917807-2 Contacts: 179956-2				
Delevite O		The summer a set set	O		

Polarity Sensor and Thermostat Connector

9	1	+5 V (thermal prote	ector), +	5 V (power supply)	
5	2	Su	6		-

≯1	2	Su	6	
	3	Sv	7	Not used
	4	Sw	8	

5 0 V (power supply) 9 Thermal protector Pin connector: 17JE-23090-02 (D8C) -CG From DDK Ltd.

384

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Mating Connector

Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

0.3

0.3

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.

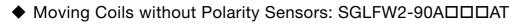
365.5

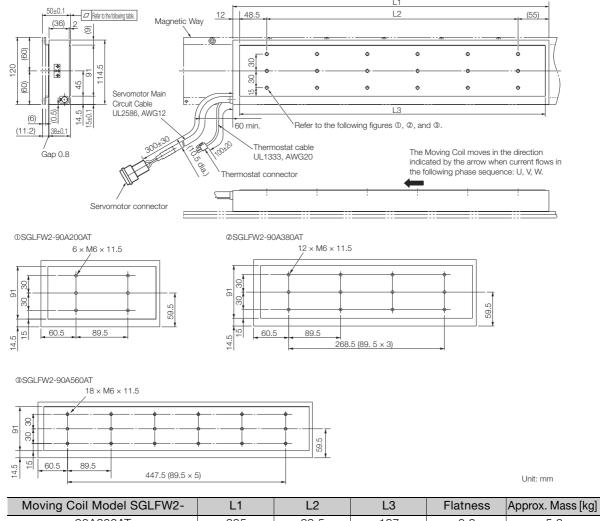
544

Vu	Su				
w		Sv			
vw			Sw		
0		30	360		540
	Eleo	ctrical	angl	e (°)	

10.1

14.9





Moving Coll Model SGLFW2-	LI	L2	L3	Flatness	Approx. Mass [kg]
90A200AT	205	89.5	187	0.2	5.3
90A380AT	384	268.5	365.5	0.3	10.1
90A560AT	563	447.5	544	0.3	14.9

Connector Specifications

Servomotor Connector

B1	A1	Phase U	Red
	A2	Phase V	White
	B1	Phase W	Black
	B2	FG	Green

Tab housing: 1-917808-2 Contacts: 917803-2 (A1, A2, and B1) 84695-1 (B2) From Tyco Electronics Japan G.K. Mating Connector Receptacle housing: 1-917807-2 Contacts: 179956-2

Thermostat Connector

	1	
[2	

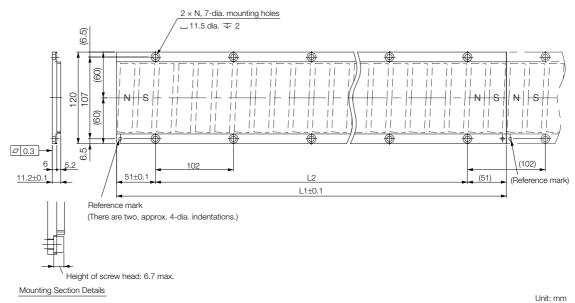
 1
 Thermal protector

 2
 Thermal protector

 Receptacle housing: 5557-02R
 Terminals: 5556T or 5556TL

From Molex Japan LLC Mating Connector Plug housing: 5559-02P Terminals: 5558T or 5558TL

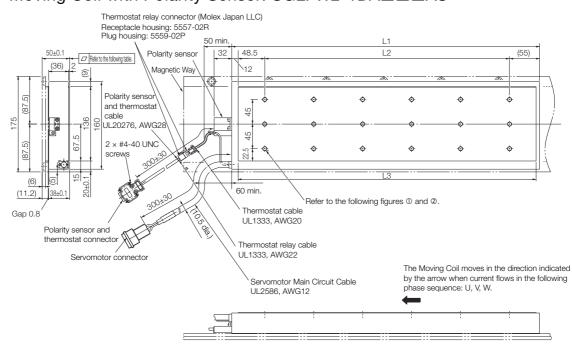
◆ Magnetic Ways: SGLFM2-90□□□A



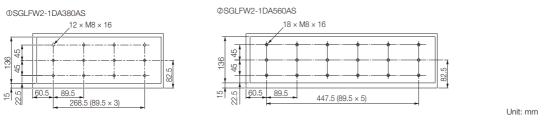
Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM2-	L1±0.1	L2	Ν	Approx. Mass [kg]
90306A	306	204 (102 × 2)	3	2.6
90510A	510	408 (102 × 4)	5	4.2
90714A	714	612 (102 × 6)	7	5.9

SGLFW2-1D







Moving Coil Model SGLFW2-	L1	L2	L3	Flatness	Approx. Mass [kg]
1DA380AS	384	268.5	365.5	0.3	14.6
1DA560AS	563	447.5	544	0.3	21.5

Connector Specifications

Servomotor Connector

1000
A

A1	Phase U	Red				
A2 Phase V White						
B1 Phase W Black						
B2 FG Green						
Tab housing: 1-917808-2						
Contacts: 9)17803-2 (A1, A2	, and B1)				
84695-1 (B2)						
From Tyco Electronics Japan G.K.						
Mating Con	Mating Connector					

Receptacle housing: 1-917807-2 Contacts: 179956-2

· Polarity Sensor and Thermostat Connector

⁹ **1** +5 V (thermal protector), +5 V (power supply)

2	Su	0	
3	Sv	7	Not used
4	Sw	8	

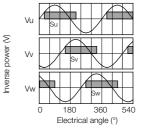
 5
 0 V (power supply)
 9
 Thermal protector

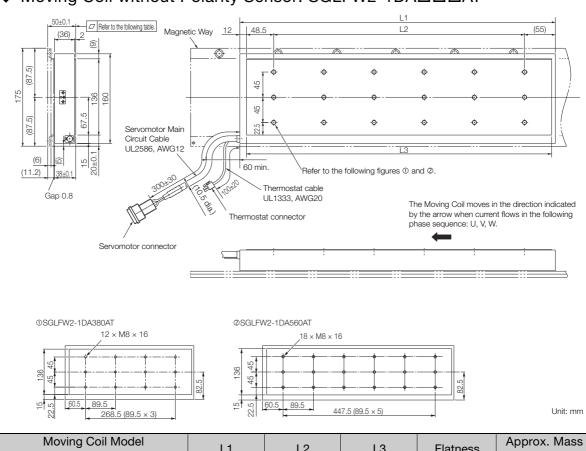
 Pin connector:
 17JE-23090-02 (D8C) -CG

From DDK Ltd. Mating Connector

Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal





◆ Moving Coil without Polarity Sensor: SGLFW2-1DA□□□AT

Moving Coil Model SGLFW2-	L1	L2	L3	Flatness	Approx. Mass [kg]
1DA380AT	384	268.5	365.5	0.3	14.6
1DA560AT	563	447.5	544	0.3	21.5

Connector Specifications

Servomotor Connector

B1B2	A1	Phase U	Red
	A2	Phase V	White
AT AZ	B1	Phase W	Black
	B2	FG	Green

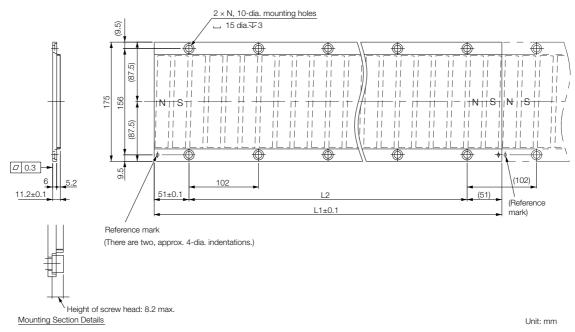
Tab housing: 1-917808-2 Contacts: 917803-2 (A1, A2, and B1) 84695-1 (B2) From Tyco Electronics Japan G.K. Mating Connector Receptacle housing: 1-917807-2 Contacts: 179956-2

Thermostat Connector

	1 Thermal protector					
	2	Thermal protector				
2	Receptacle housing: 5557-02R					
	Terminals: 5556T or 5556TL					
	From Molex Japan LLC					
		O • • • • • • • • •				

Mating Connector Plug housing: 5559-02P Terminals: 5558T or 5558TL

◆ Magnetic Ways: SGLFM2-1D□□□A

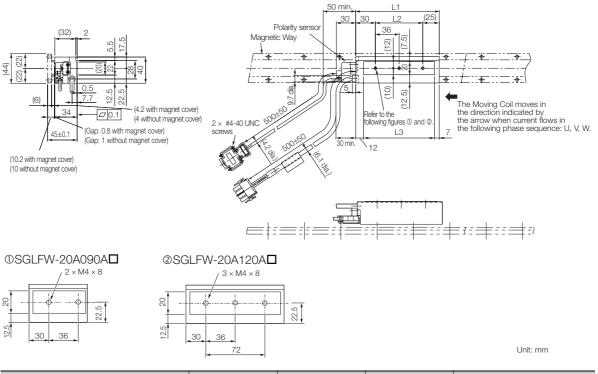


Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM2-	L1±0.1	L2	Ν	Approx. Mass [kg]	
1D306A	306	204 (102 × 2)	3	3.7	
1D510A	510	408 (102 × 4)	5	6.2	
1D714A	714	612 (102 × 6)	7	8.6	

SGLFW-20

◆ Moving Coils: SGLFW-20A□□□A□



Moving Coil Model SGLFW-	L1	L2	L3	Approx. Mass [kg]
20A090A	91	36	72	0.7
20A120AD	127	72	108	0.9

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Connector Specifications

Servomotor Connector

 1	Phase U	Red
2	Phase V	White
3	Phase W	Black
4	FG	Green

Plug: 350779-1 Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector

Cap: 350780-1

Socket: 350536-3 or 350550-3

Polarity Sensor Connector

-6

g	
~	
	J

100

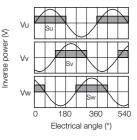
+5 V (thermal protector), +5 V (power supply) 1 2 Su 6 3 Sv 7 Not used 4 Sw 8 5 0 V (power supply) 9 Thermal protector

Pin connector: 17JE-23090-02 (D8C) -CG From DDK Ltd.

Mating Connector

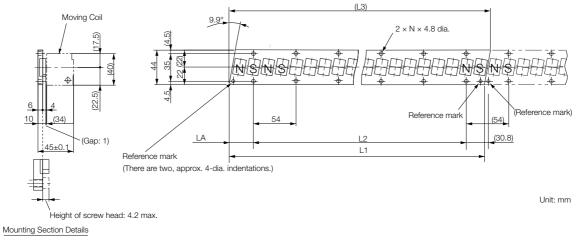
Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal



SGLF (Models with F-type Iron Cores)

◆ Magnetic Ways: SGLFM-20□□□A

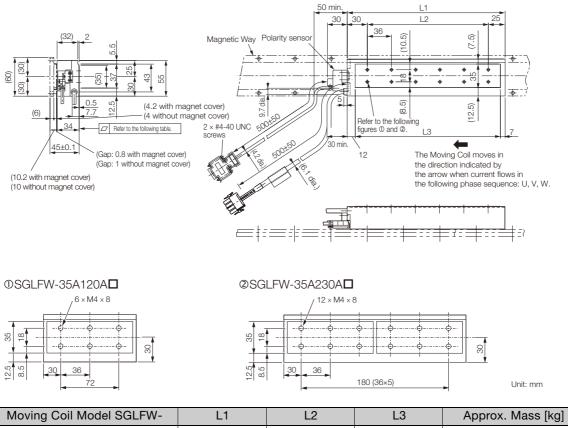


Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM-	L1	L2	(L3)	LA	N	Approx. Mass [kg]
20324A	324 -0.1	270 (54 × 5)	(331.6)	30.8 0	6	0.9
20540A	540 -0.1	486 (54 × 9)	(547.6)	30.8 .0.2	10	1.4
20756A	756 -0.1	702 (54 × 13)	(763.6)	30.8 .0.2	14	2

SGLFW-35

◆ Moving Coils: SGLFW-35A□□□A□



35A120AD	127	72	108	1.3
35A230AD	235	180	216	2.3

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Connector Specifications

Servomotor Connector

	1	Phase U	Red
1234	2	Phase V	White
	3	Phase W	Black
	4	FG	Green

Plug: 350779-1

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3

· Polarity Sensor Connector

9	1	+5 V (thermal prote	5 V (power supply)	
5	2	Su	6	
	3	Sv 7		Not used
	4	Sw	8	
	5	0 V (power supply)	9	Thermal protector

Pin connector: 17JE-23090-02 (D8C) -CG From DDK Ltd.

Mating Connector

Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

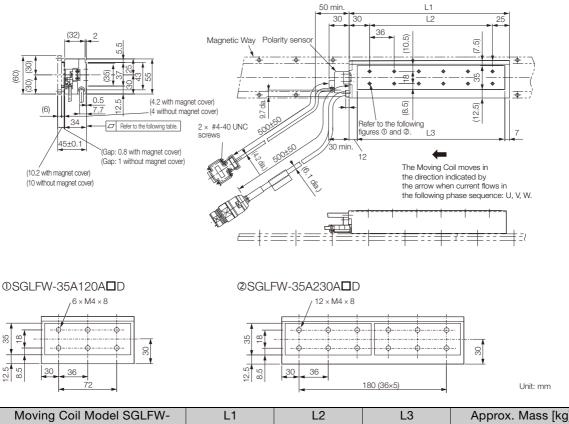
Polarity Sensor Output Signal

S

Inverse power

Vu		(Gu				/	/		$\left<\right>$
Vv		/	/	(Sv				/	
Vw	X	/			/	(Sw			
	0	E	18 lec		al a	36 ang			540

♦ Moving Coils: SGLFW-35A□□□A□D



 35A120A□D
 127
 72
 108
 1.3

 35A230A□D
 235
 180
 216
 2.3

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Connector Specifications

Servomotor Connector



9 5-

ĺ	1	Phase U	5	Not used
Ī	2	Phase V	6	Not used
	4	Phase W		Ground

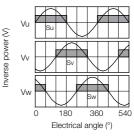
Extension: ARRA06AMRPN182 Pins: 021.279.1020 From Interconnectron GmbH Mating Connector Plug: APRA06BFRDN170 Socket: 020.105.1020

• Polarity Sensor Connector

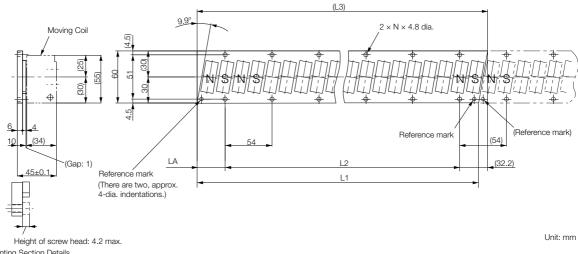
6	1	+5 V (power supply)	6			
1	2	Phase U		Not used		
	3	Phase V		NOT USED		
	4	Phase W	9			
	5	0 V (power supply)	-	-		

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal



◆ Magnetic Ways: SGLFM-35□□□A



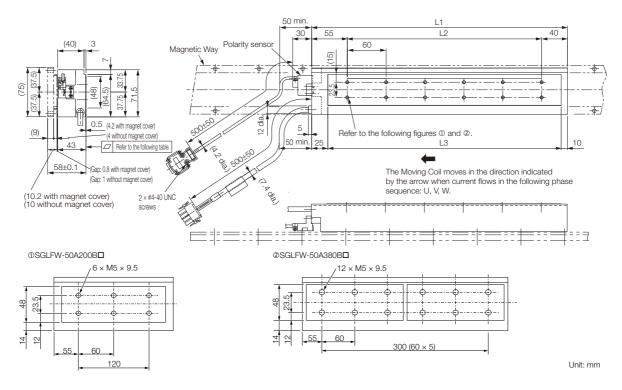
Mounting Section Details

Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM-	L1	L2	(L3)	LA	N	Approx. Mass [kg]
35324A	324 -0.1	270 (54 × 5)	(334.4)	32.2 ⁰ _{-0.2}	6	1.2
35540A	540 -0.1	486 (54 × 9)	(550.4)	32.2 .0.2	10	2
35756A	756 -0.1	702 (54 × 13)	(766.4)	32.2 0	14	2.9

SGLFW-50

◆ Moving Coils: SGLFW-50A□□□B□



Moving Coil Model SGLFW-	L1	L2	L3	Approx. Mass [kg]
50A200Bロ	215	120	180	3.5
50A380Bロ	395	300	360	6.9

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Connector Specifications

Servomotor Connector

1	Phase U	Red
2 Phase V		White
3	Phase W	Black
4	FG	Green

Plug: 350779-1

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3

· Polarity Sensor Connector

⁹	1	+5 V (thermal protector), +5 V (power supply)				
5	2	Su	6			

1	2	Su	6	
	3	Sv	7	Not used
	4	Sw	8	
	5	0 V (power supply)	9	Thermal protector

Pin connector: 17JE-23090-02 (D8C) -CG From DDK Ltd.

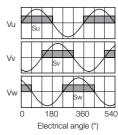
Mating Connector

Socket connector: 17JE-13090-02 (D8C) A-CG Studs: 17L-002C or 17L-002C1

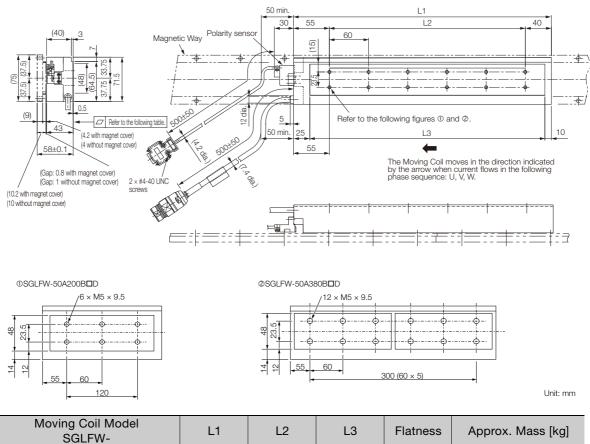
Polarity Sensor Output Signal

S

Inverse power



◆ Moving Coils: SGLFW-50A□□□B□D



SGLFW-	L1	L2	L3	Flatness	Approx. Mass [kg]
50A200BDD	215	120	180	0.2	3.5
50A380BDD	395	300	360	0.3	6.9

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Connector Specifications

Servomotor Connector



 1
 Phase U
 5
 Not used

 2
 Phase V
 6
 Not used

 4
 Phase W

 Ground

 Extension: ARRA06AMRPN182

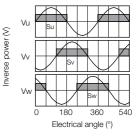
Extension: ARRAUGAMIRPN18 Pins: 021.279.1020 From Interconnectron GmbH Mating Connector Plug: APRA06BFRDN170 Socket: 020.105.1020

· Polarity Sensor Connector

9	1	+5 V (power supply)	6	
5 1	2	Phase U	7	Not used
	3	3 Phase V		NOT USED
	4	Phase W	9	
	5	0 V (power supply)		_

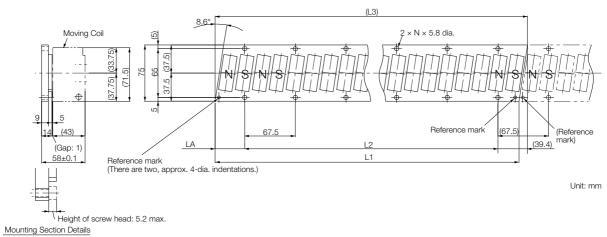
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal



SGLF (Models with F-type Iron Cores)

◆ Magnetic Ways: SGLFM-50□□□A

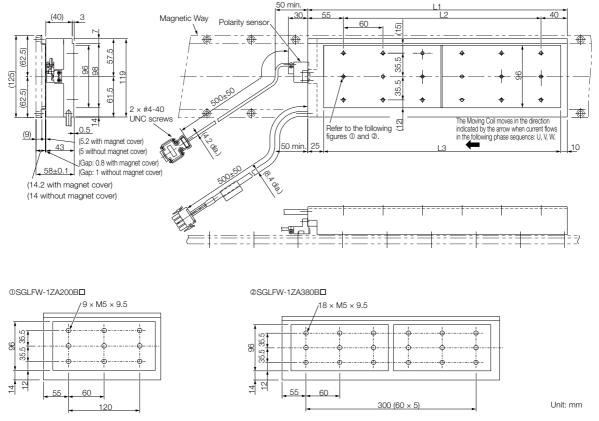


Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM-	L1	L2	(L3)	LA	Ν	Approx. Mass [kg]
50405A	405 -0.1	337.5 (67.5 × 5)	(416.3)	39.4 0.0	6	2.8
50675A	675 ^{-0.1} -0.3	607.5 (67.5 × 9)	(686.3)	39.4 0.2	10	4.6
50945A	945 -0.1	877.5 (67.5 × 13)	(956.3)	39.4 0.2	14	6.5

SGLFW-1Z

♦ Moving Coils: SGLFW-1ZA□□□B□



Moving Coil Model SGLFW-	L1	L2	L3	Approx. Mass [kg]
1ZA200Bロ	215	120	180	6.4
1ZA380Bロ	395	300	360	11.5

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Connector Specifications

· Servomotor Connector

1	Phase U	Red
2 Phase V		White
3	Phase W	Black
4	FG	Green

Plug: 350779-1 Pins: 350218-3 or 350547-3 (No.1 to 3)

350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350536-3 or 350550-3

Polarity Sensor Connector

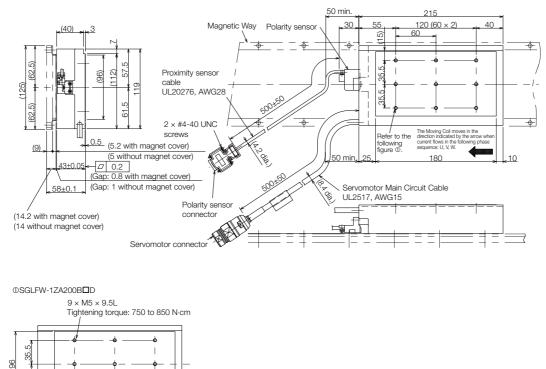
9	1	+5 V (power supply)	6	
5 1	2	Phase U	7	Not used
	3	B Phase V		NOT USED
	4	Phase W	9	
	5	0 V (power supply)	_	_

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

	•									
S	Vu	/	Su				/	/		
Inverse power (V)	Vv				(Sv					
Inve	Vw					/	(Sw			
		0		18	30		36	60		540
			E	lec	tric	al a	ang	le (°)	

◆ Moving Coils: SGLFW-1ZA200B□D



Approx. mass: 6.4 kg Unit: mm

Note: The above dimensional drawing gives the dimensions for both models with polarity sensors and models without polarity sensors.

Not used

Not used

Ground

Connector Specifications

2

60

120

Servomotor Connector



20.0

 \sim

3Phase W6Extension: SROC06JMSCN169Pins: 021.423.1020From Interconnectron GmbHMating ConnectorPlug: SPUC06KFSDN236Socket: 020.030.1020

Phase U

Phase V

4

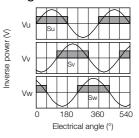
5

· Polarity Sensor Connector

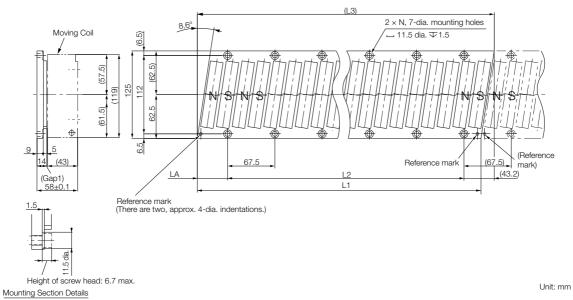
•				
9 6	1	+5 V (power supply)	6	
5	2	Phase U	7	Not used
	3	Phase V		Not used
	4	Phase W	9	
	5	(vlqque rewoq) V 0	_	-

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal



◆ Magnetic Ways: SGLFM-1Z□□□A



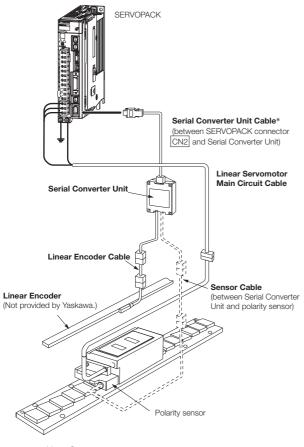
Note: More than one Magnetic Way can be connected. Connect the Magnetic Ways so that the reference marks on them are aligned in the same direction as shown in the figure.

Magnetic Way Model SGLFM-	L1	L2	(L3)	LA	N	Approx. Mass [kg]
1Z405A	405 -0.1	337.5 (67.5 × 5)	(423.9)	43.2 -0.2	6	5
1Z675A	675 -0.1	607.5 (67.5 × 9)	(693.9)	43.2 -0.2	10	8.3
1Z945A	945 -0.3	877.5 (67.5 × 13)	(963.9)	43.2 ⁰ -0.2	14	12

Selecting Cables

◆ Cable Configurations

To select a Linear Encoder, use *Recommended Linear Encoders* (pages 308 and 309). Prepare the cable required for the encoder.



Linear Servomotor

* You can connect directly to an absolute linear encoder.

- Note: Refer to the following manual for the following information.
 - Cable dimensional drawings and cable connection specifications
 - Order numbers and specifications of individual connectors for cables
 - Order numbers and specifications for wiring materials
 - Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

◆ Linear Servomotor Main Circuit Cables

Linear Servomotor Model	Length (L)	Order Number	Appearance
	1 m	JZSP-CLN11-01-E	
	3 m	JZSP-CLN11-03-E	SERVOPACK end Linear Servomotor
	5 m	JZSP-CLN11-05-E	
SGLFW-20A, -35A	10 m	JZSP-CLN11-10-E	
	15 m	JZSP-CLN11-15-E	
	20 m	JZSP-CLN11-20-E	
	1 m	JZSP-CLN21-01-E	
	3 m	JZSP-CLN21-03-E	SERVOPACK end Linear Servomotor
	5 m	JZSP-CLN21-05-E	L end
SGLFW-50A, -1ZA	10 m	JZSP-CLN21-10-E	
	15 m	JZSP-CLN21-15-E	
	20 m	JZSP-CLN21-20-E	
	1 m	JZSP-CLN14-01-E	
	3 m	JZSP-CLN14-03-E	SERVOPACK end Linear Servomotor
	5 m	JZSP-CLN14-05-E	
SGLFW-DDADDDDDD	10 m	JZSP-CLN14-10-E	
	15 m	JZSP-CLN14-15-E	
	20 m	JZSP-CLN14-20-E	_
	1 m	JZSP-CL2N703-01-E	
	3 m	JZSP-CL2N703-03-E	SERVOPACK end Linear Servomotor
SGLFW2-30A070A	5 m	JZSP-CL2N703-05-E	
SGLFW2-30A120A□ SGLFW2-30A230A□	10 m	JZSP-CL2N703-10-E	
	15 m	JZSP-CL2N703-15-E	
	20 m	JZSP-CL2N703-20-E	
	1 m	JZSP-CL2N603-01-E	
	3 m	JZSP-CL2N603-03-E	SERVOPACK end Linear Servomotor
SGLFW2-45A200A□	5 m	JZSP-CL2N603-05-E	
SGLFW2-45A380A□	10 m	JZSP-CL2N603-10-E	
	15 m	JZSP-CL2N603-15-E	
	20 m	JZSP-CL2N603-20-E	
	1 m	JZSP-CL2N503-01-E	
SGLFW2-90A200A□ SGLFW2-90A380A□	3 m	JZSP-CL2N503-03-E	SERVOPACK end Linear Servomotor
SGLFW2-90A380AL SGLFW2-90A560AL	5 m	JZSP-CL2N503-05-E	
SGLFW2-1DA380A	10 m	JZSP-CL2N503-10-E	
SGLFW2-1DA560A□	15 m	JZSP-CL2N503-15-E	
	20 m	JZSP-CL2N503-20-E	

Note: Estimates are available for models other than those listed above (SGLFW2-90ADDDADL and SGLFW2-1DDDDADL).

*1. Connector from Tyco Electronics Japan G.K.

*2. Connector from Interconnectron GmbH

SGLT (Models with T-type Iron Cores)

Model Designations

Mov	ing Coil							
S	GLT	W 2nd			170 h+7th+8th	A F 9th 1) Oth	11th
Linea	r Σ Series r Servomotors	digit			digits	9th digit d	igit	11th digit
1st dig	it Servomotor Type	5th dig	pit Power Supply Voltage	10th d	igit Sensor S	Specification	and C	Cooling Method
Code	Specification	Code	Specification		Spe	ecifications		
Т	With T-type iron core	A	200 VAC	Code	Polarity Sensor	Cooling M	ethod	Applicable Models
2nd dig	dit Moving Coil/Magnetic Way	6th 7	th+8th digits Length of	None	None	Self-cooled	k	All models
				C*	None	Water-coo	led	
Code	Specification	Code	Specification	H*	Yes	Water-coo	led	SGLTW-40, -80
W	Moving Coil	170	170 mm	Р	Yes	Self-cooled	k	All models
		320	315 mm					
3rd+4	th digits Magnet Height	400	394.2 mm	11th d		or for Sonyo	motor	Main Circuit Cable
Code	Specification	460	460 mm					
20	20 mm	600	574.2 mm	Code	Specifi	cation	Ap	oplicable Models
35	36 mm		_		Connector fi Electronics	,	SGL	TW-20ADDDDD,
40	40 mm	9th dig	git Design Revision Order			•		-35ADDDDD
50	51 mm	А, В Ц: Ці	 gh-efficiency model	None	MS connect	or	SGL1	FW-40A□□□B□, -80A□□□B□
80	76.5 mm	п. Пі	gn-eniciency model		Loose lead v		SGLI	TW-35A□□□H□, -50A□□□H□

* Contact your Yaskawa representative for the characteristics, dimensions, and other details on Servomotors with these specifications.

Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

Mag	gnetic	: Way	/								
S	G	L	Т	Μ	-	20	З	24	А		
	ır Σ Series ır Servomo		1st digit	2nd digit		3rd+4th digits		6th+7th digits	8th digit	9th digit	
1st dig	git Servor	notor Type		5th+6th	n+7th digit	Length of Magnetic		9th dig	it Option	S	
(Same	as for the M	loving Coil.)		Code	Specifi	cation	1	Code	Specif	ication	Applicable Models
	_			324	324 mm]	None	Without o	ptions	-
2nd di	git Moving	Coil/Magnetic	Way	405	405 mm			С	With mag	net cover	All models
Code	Spec	cification		540	540 mm			Y	With base		SGLTM-20, -35*, -40,
М	Magnetic	Way		675	675 mm			·	magnet co	over	-80
				756	756 mm						
3rd+4	th digits	Magnet Hei	ght	945	945 mm						
(Same	as for the M	loving Coil.)		8th dig	it Design I	Revision Orc	der				
				A, B . H: Hiç	 gh-efficienc	y model					

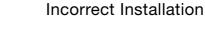
* The SGLTM-35DDDH (high-efficiency models) do not support this specification.

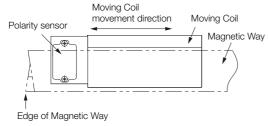
Note: This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

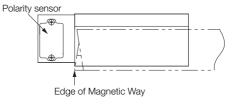
Precautions on Moving Coils with Polarity Sensors

When you use a Moving Coil with a Polarity Sensor, the Magnetic Way must cover the bottom of the polarity sensor. Refer to the example that shows the correct installation. When determining the length of the Moving Coil's stroke or the length of the Magnetic Way, consider the total length of the Moving Coil and the polarity sensor. Refer to the following table.

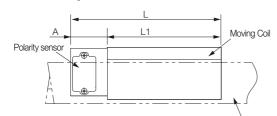
Correct Installation







Total Length of Moving Coil with Polarity Sensor



Magnetic Way

Moving Coil Model SGLTW-	Length of Moving Coil, L1 [mm]	Length of Polarity Sensor, A [mm]	Total Length, L [mm]
20A170AP	170		204
20A320AP	315	34	349
20A460AP	460		494
35A170AP	170		204
35A320AP	315	34	349
35A460AP	460		494
35A170HPD	170	34	204
35A320HP	315	04	349
50A170HP	170	34	204
50A320HP	315	04	349
40A400BH D 40A400BP D	394.2	26	420.2
40A600BH □ 40A600BP □	574.2	26	600.2
80A400BH D 80A400BP D	394.2	26	420.2
80A600BH □ 80A600BP □	574.2	26	600.2

Specifications and Ratings

Specifications

	Servomotor				Sta	andaro	d Mod	els				Н		ficienc dels	у
•	g Coil Model GLTW-		20A			35A		40)A	80	AC	35	δA	50	A
	GEIW	170A											170H	320H	
Time Ra	ting		Continuous												
Thermal	Class		В												
Insulatio	n Resistance		500 VDC, 10 M Ω min.												
Withstar	id Voltage		1,500 VAC for 1 minute												
Excitatio	n		Permanent magnet												
Cooling	Method		Self-cooled												
Protectiv	e Structure		IP00												
	Surrounding Air Tempera- ture		0°C to 40°C (with no freezing)												
Envi- ron- mental	Surrounding Air Humidity			20)% to	80% r	elative	humia	dity (w	ith no	conde	ensatio	n)		
Condi- tions	Installation Site	 Mu: Mu: Mu: 	st be st faci st hav	well-ve litate i e an a	s and entilate nspec ltitude strone	ed and tion ar of 1,0	l free d nd clea 000 m	of dust aning. or less	and n		0	5.			
Shock Resis-	Impact Accelera- tion Rate							196	m/s²						
tance	Number of Impacts	2 times													
Vibra- tion Resis- tance	Vibration Accelera- tion Rate	49 m/	′s² (the	vibrati	on resi	stance	in thre	e direc	tions, v	vertical	, side-t	to-side,	and fr	ront-to-	back)

Ratings

Linear Servomoto	or Moving				St	andaro	d Mode	els				F	ligh-ef Mo	ficienc dels	зy
Coil Model SG			20A			35A		40)A	8	DA	35	ōΑ	50)A
		170A	320A	460A	170A	320A	460A	400B	600B	400B	600B	170H	320H	170H	320H
Rated Motor Speed (Reference Speed Speed Control) ^{*1}		3.0	3.0	3.0	2.5	2.5	2.5	1.5	2.0	2.0	2.0	2.5	2.0	2.0	2.0
Maximum Speed ^{*1}	m/s	5.0	5.0	5.0	5.0	5.0	5.0	3.1	3.1	2.5	2.5	4.8	4.8	3.2	3.1
Rated Force*1,*2	Ν	130	250	380	220	440	670	670	1000	1300	2000	300	600	450	900
Maximum Force ^{*1}	N	380	760	1140	660	1320	2000	2600	4000	5000	7500	600	1200	900	1800
Rated Current*1	Arms	2.3	4.4	6.7	3.5	7.0	10.7	7.3	10.9	11.1	17.1	5.1	10.1	5.1	10.2
Maximum Current ^{*1}	Arms	7.7	15.4	23.2	12.1	24.2	36.7	39.4	60.6	57.9	86.9	11.9	23.9	11.8	23.6
Moving Coil Mass	kg	2.5	4.6	6.7	3.7	6.8	10	15	23	24	35	4.9	8.8	6.0	11
Force Constant	N/Arms	61.0	61.0	61.0	67.5	67.5	67.5	99.1	99.1	126	126	64.0	64.0	95.2	95.2
BEMF Constant	Vrms/ (m/s)/ phase	20.3	20.3	20.3	22.5	22.5	22.5	33.0	33.0	42.0	42.0	21.3	21.3	31.7	31.7
Motor Constant	N/√W	18.7	26.5	32.3	26.7	37.5	46.4	61.4	75.2	94.7	116	37.4	52.9	48.6	68.7
Electrical Time Constant	ms	5.9	5.9	5.9	6.9	6.8	6.9	15	15	17	17	15	16	16	17
Mechanical Time Constant	ms	7.1	6.6	6.4	5.2	4.8	4.6	4.0	4.1	2.7	2.6	3.5	3.1	2.5	2.4
Thermal Resistance (with Heat Sink)	K/W	1.01	0.49	0.38	0.76	0.44	0.32	0.24	0.20	0.22	0.18	0.76	0.40	0.61	0.30
Thermal Resistance (without Heat Sink)	K/W	1.82	1.11	0.74	1.26	0.95	0.61	0.57	0.40	0.47	0.33	1.26	0.83	0.97	0.80
Magnetic Attrac- tion ^{*3}	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnetic Attraction on One Side ^{*4}	N	800	1590	2380	1400	2780	4170	3950	5890	7650	11400	1400	2780	2000	3980
Maximum Allow- able Payload	kg	25	50	76	44	88	130	280	440	690	1000	33	67	92	190
Maximum Allow- able Payload (With External Regenerative Resistor and External Dynamic Brake Resistor)	kg	25	50	76	44	88	130	280	440	690	1000	40	82	95	190
Combined Magnet SGLTM-	ic Way,	20			35	5000A		40 0 0		80 0 0		35□□	ОНО	50 0 0	ОНО
Combined Serial C Unit, JZDP-		011	012	013	014	015	016	185	186	187	188	105	106	108	109
Applicable SERVOPACKs	SGD7S- SGD7W-	3R8A 5R5A	7R6A 7R6A	120A _	5R5A 5R5A	120A	18	80A	33	0A	550A	5R5A 5R5A	120A _	5R5A 5R5A	120A _
	SGD7C-	UNDA	TIUA	_	UNUA			-				UNUA	_	UNUA	_

*1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

*2. The rated forces are the continuous allowable force values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the following table.

• Heat Sink Dimensions

+ 254 mm \times 254 mm \times 25 mm: SGLTW-20A170A and -35A170A

+ 400 mm \times 500 mm \times 40 mm: SGLTW-20A320A, -20A460A, -35A170H, -35A320A, -35A320H, -35A460A, and -50A170H

• 609 mm × 762 mm × 50 mm: SGLTW-40A400B, -40A600B, -50A320H, -80A400B, and -80A600B

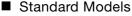
*3. The unbalanced magnetic gap that results from the Moving Coil installation condition causes a magnetic attraction on the Moving Coil.

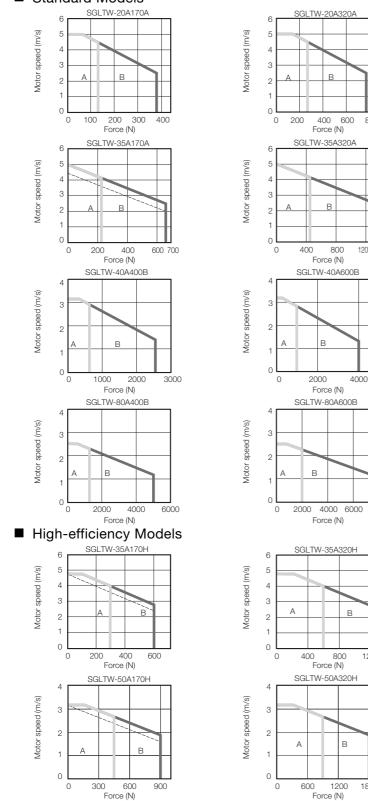
*4. The value that is given is the magnetic attraction that is generated on one side of the Magnetic Way.

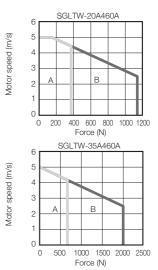
Force-Motor Speed Characteristics

A : Continuous duty zone — (solid lines): With three-phase 200-V input

B : Intermittent duty zone ------ (dotted lines): With single-phase 200-V input







800

1200 1400

8000

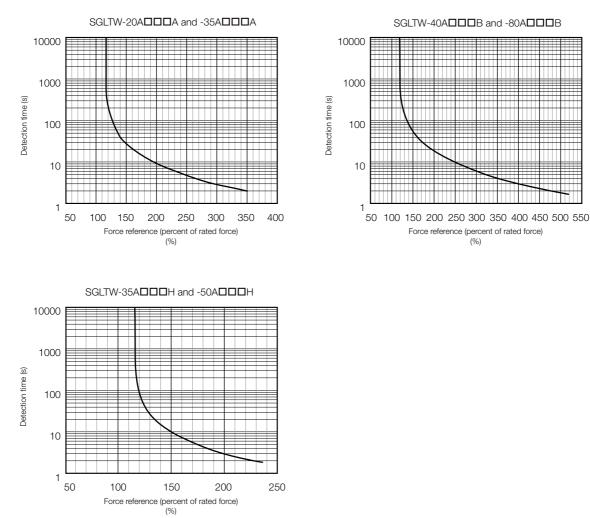
1200

1800

- Note: 1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
 - 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 - If the effective force is within the allowable range for the rated force, the Servomotor can be used within the intermittent duty zone.
 - 4. If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40°C.

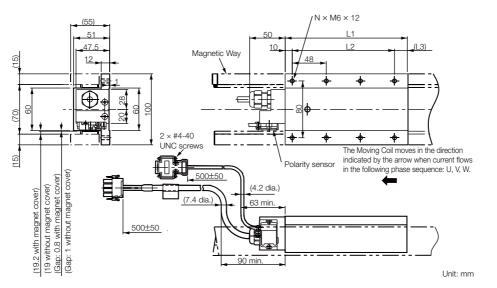


Note: The above overload protection characteristics do mean that you can perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective force remains within the continuous duty zone given in *Force-Motor Speed Characteristics* on page 286.

External Dimensions

SGLTW-20: Standard Models

◆ Moving Coils: SGLTW-20A□□□A□



Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass [kg]
20A170Aロ	170	144 (48 × 3)	(16)	8	2.5
20A320A	315	288 (48 × 6)	(17)	14	4.6
20A460A	460	432 (48 × 9)	(18)	20	6.7

Connector Specifications

Servomotor Connector

1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Plug: 350779-1

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350537-3 or 350550-3

Polarity Sensor Connector



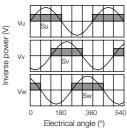
10

1	+5 V (DC)	6	
2	Phase U	7	Not used
3	Phase V	8	NOL USEU
4	Phase W	9	
5	0 V	_	_

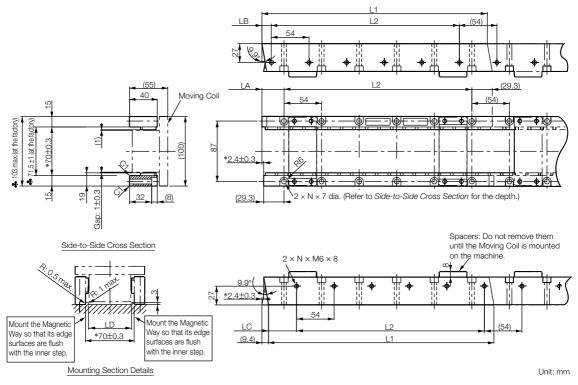
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Magnetic Ways: SGLTM-20□□□A



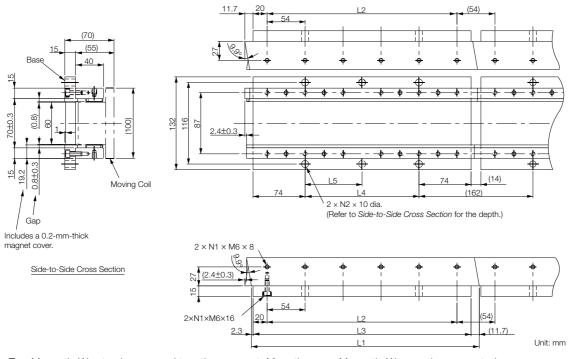
- Note: 1. Two Magnetic Way tracks are used together as a set. For safety, when they are shipped, the two tracks are secured to a mounting spacer made from aluminum.
 - 2. More than one Magnetic Way can be connected.

Dimensions with asterisks are the distances between the Magnetic Way tracks. Install the tracks according to the specified dimensions. Observe the dimensions given in *Mounting Section Details* after installation. Dimensions when the Magnetic Way is shipped from the factory are indicated by .

4. Use socket head screws of strength class 10.9 or higher for the Magnetic Way mounting screws. (Do not use stainless steel screws.)

Magnetic Way Model SGLTM-	L1	L2	LA	LB	LC	LD	Ν	Approx. Mass [kg]
20324A	324 -0.3	270 (54 × 5)	31.7 -0.2	13.7 .0.2	40.3 0.2	62 +0.6	6	3.4
20540AD	540 -0.1	486 (54 × 9)	31.7 .0.2	13.7 .0.2	40.3 0.2	62 +0.6	10	5.7
20756AD	756 -0.1	702 (54 × 13)	31.7 -0.2	13.7 -0.2	40.3 -0.2	62 +0.6	14	7.9

◆ Magnetic Ways with Bases: SGLTM-20□□□AY

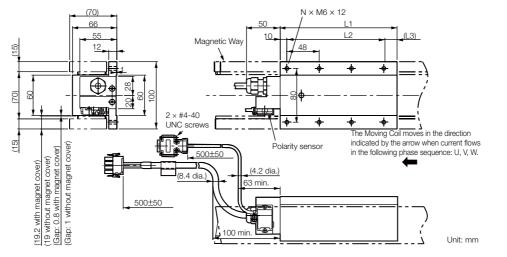


Note: Two Magnetic Way tracks are used together as a set. More than one Magnetic Way can be connected.

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	Approx. Mass [kg]
20324AY	324 -0.3	270	310	162	162	6	2	5.1
20540AY	540 -0.3	486	526	378	189	10	3	8.5
20756AY	756 -0.3	702	742	594	198	14	4	12

SGLTW-35: Standard Models

◆ Moving Coils: SGLTW-35A□□□A□



Moving Coil Model SGLTW-	L1	L2	(L3)	Ν	Approx. Mass [kg]
35A170Aロ	170	144 (48 × 3)	(16)	8	3.7
35A320Aロ	315	288 (48 × 6)	(17)	14	6.8
35A460Aロ	460	432 (48 × 9)	(18)	20	10

Connector Specifications

Servomotor Connector

1234	1	Phase U	Red		
HOGOGH	2	Phase V	White		
	3	Phase W	Blue		
	4	FG	Green		

Plug: 350779-1

Pins: 350218-3 or 350547-3 (No.1 to 3) 350654-1 or 350669-1 (No. 4) From Tyco Electronics Japan G.K. Mating Connector Cap: 350780-1 Socket: 350537-3 or 350550-3

Polarity Sensor Connector

9	1	+5 V (DC)	6			
5	2	Phase U	7	Not used		
	3	Phase V	8			
	4	Phase W	9			
	5	0 V	_	-		

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

Mating Connector

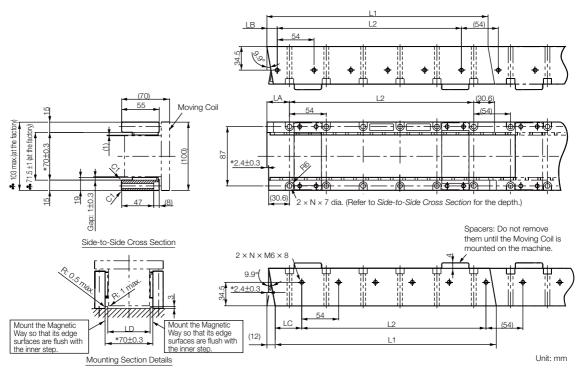
Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.

	Vu		Su				/	/			
liverse powel	Vv				(Sv				/		
	Vw				/	/	(Sw				
		0	E	18 ect	30 rica	al ai	36 ngle)	540)

◆ Magnetic Ways: SGLTM-35□□□A□

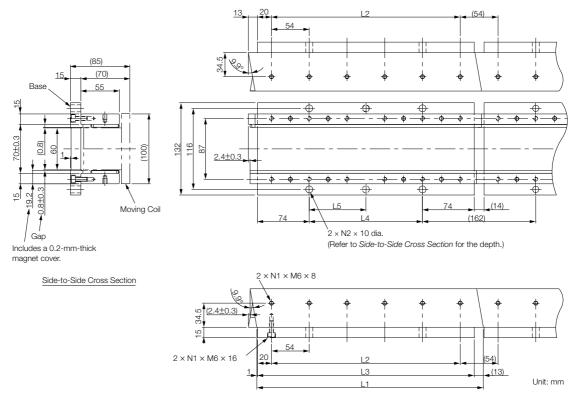


Note: 1. Two Magnetic Way tracks are used together as a set. For safety, when they are shipped, the two tracks are secured to a mounting spacer made from aluminum.

- 2. More than one Magnetic Way can be connected.
- 3. Dimensions with asterisks are the distances between the Magnetic Way tracks. Install the tracks according to the specified dimensions. Observe the dimensions given in *Mounting Section Details* after installation. Dimensions when the Magnetic Way is shipped from the factory are indicated by ♣.
- 4. Use socket head screws of strength class 10.9 or higher for the Magnetic Way mounting screws. (Do not use stainless steel screws.)

Magnetic Way Model SGLTM-	L1	L2	LA	LB	LC	LD	Ν	Approx. Mass [kg]
35324A□	324 -0.3	270 (54 × 5)	33 .0.2	15 .0.2	39 .0.2	62 +0.6	6	4.8
35540A□	540 -0.3	486 (54 × 9)	33 -0.2	15 .0.2	39 .0.2	62 +0.6	10	8
35756A□	756 -0.1	702 (54 × 13)	33 .0.2	15 ⁰ -0.2	39 .0.2	62 +0.6	14	11

◆ Magnetic Ways with Bases: SGLTM-35□□□AY

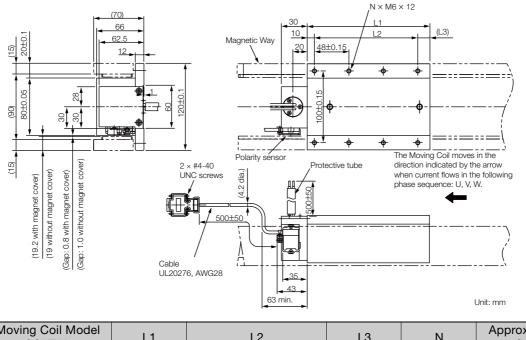


Note: Two Magnetic Way tracks are used together as a set. More than one Magnetic Way can be connected.

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	Approx. Mass [kg]
35324AY	324 -0.1	270	310	162	162	6	2	6.4
35540AY	540 -0.1	486	526	378	189	10	3	11
35756AY	756 -0.1	702	742	594	198	14	4	15

SGLTW-35DDDHD: High-Efficiency Models

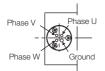
◆ Moving Coils: SGLTW-35A□□□H□



Moving Coil Model SGLTW-	L1	L2	L3	N	Approx. Mass [kg]
35A170Hロ	170	144 (48 × 3)	(16)	8	4.7
35A320Hロ	315	288 (48 × 6)	(17)	14	8.8

Connector Specifications

· Moving Coil Lead



 Phase U
 Red
 U

 Phase V
 White
 V

 Phase W
 Black
 W

 Ground
 Green

9 5 Secure the lead from the Moving Coil of the Linear Servomotor so that it moves together with the Moving Coil.

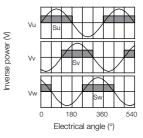
Polarity Sensor Connector

1	+5 V (DC)	6			
2	Phase U	7	Not used		
3	Phase V	8	NUL USEU		
4	Phase W	9			
5	0 V	_	-		

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

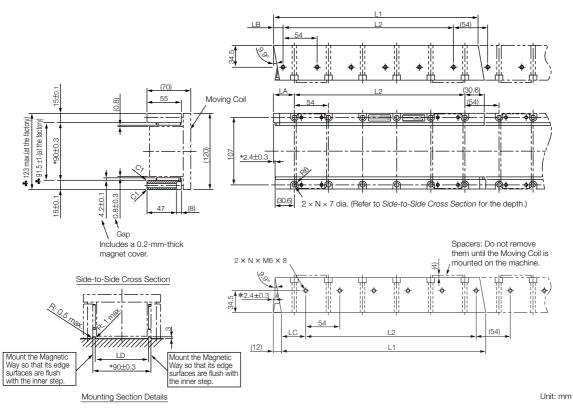
Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



⁽Viewed from the top surface of the Moving Coil.)

◆ Magnetic Ways: SGLTM-35□□□H□

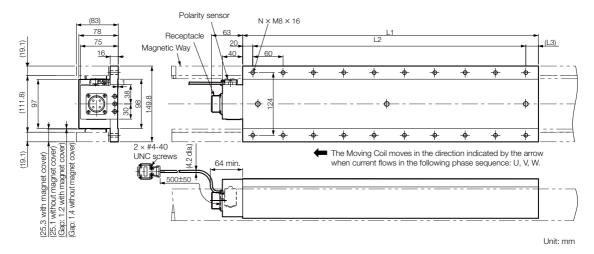


- Note: 1. Two Magnetic Way tracks are used together as a set. For safety, when they are shipped, the two tracks are secured to a mounting spacer made from aluminum.
 - 2. More than one Magnetic Way can be connected.
 - 3. Dimensions with asterisks are the distances between the Magnetic Way tracks. Install the tracks according to the specified dimensions. Observe the dimensions given in *Mounting Section Details* after installation. Dimensions when the Magnetic Way is shipped from the factory are indicated by ♣.
 - 4. Use socket head screws of strength class 10.9 or higher for the Magnetic Way mounting screws. (Do not use stainless steel screws.)

Magnetic Way Model SGLTM-	L1	L2	LA	LB	LC	LD	Ν	Approx. Mass [kg]
35324H □	324 -0.1	270 (54 × 5)	33 .0.2	15 _{-0.2}	39 .0.2	82 +0.6	6	4.8
35540H □	540 -0.1	486 (54 × 9)	33 .0.2	15 _{-0.2}	39 .0.2	82 +0.6	10	8
35756H□	756 -0.1	702 (54 × 13)	33 -0.2	15 .0.2	39 .0.2	82 +0.6	14	11

SGLTW-40: Standard Models

◆ Moving Coils: SGLTW-40A□□□B□



Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass [kg]	
40A400Bロ	394.2	360 (60 × 6)	(15)	14	15	
40A600Bロ	574.2	540 (60 × 9)	(15)	20	22	

Connector Specifications

Servomotor Connector



Receptacle: MS3102A-22-22P From DDK Ltd. Mating Connector Right-angle plug: MS3108B22-22S Straight plug: MS3106B22-22S Cable clamp: MS3057-12A

· Polarity Sensor Connector

9 6	1	+5 V (power supply)	6	
5	2	Phase U	7	Not used
		Phase V		NOT USED
	4	Phase W	9	
	5	0 V (power supply)	_	-

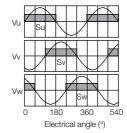
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

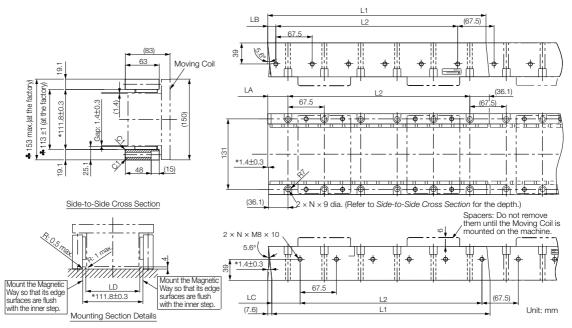
Polarity Sensor Output Signal

Inverse power (V)

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Magnetic Ways: SGLTM-40□□□A□



Note: 1. Two Magnetic Way tracks are used together as a set. For safety, when they are shipped, the two tracks are secured to a mounting spacer made from aluminum.

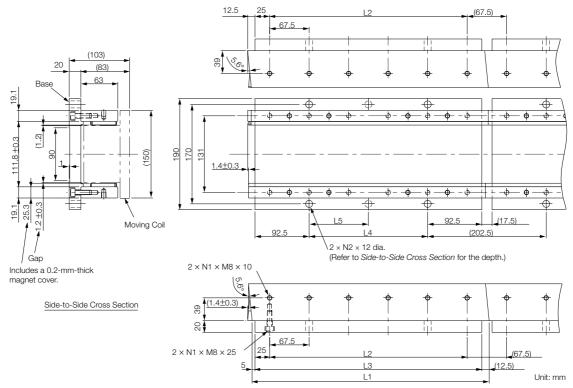
2. More than one Magnetic Way can be connected.

Dimensions with asterisks are the distances between the Magnetic Way tracks. Install the tracks according to the specified dimensions. Observe the dimensions given in *Mounting Section Details* after installation. Dimensions when the Magnetic Way is shipped from the factory are indicated by .

4. Use socket head screws of strength class 10.9 or higher for the Magnetic Way mounting screws. (Do not use stainless steel screws.)

Magnetic Way Model SGLTM-	L1	L2	LA	LB	LC	LD	Ν	Approx. Mass [kg]
40405AD	405 -0.1	337.5 (67.5 × 5)	37.5 0.2	15 .0.2	52.5 0	100 +0.6	6	9
40675AD	675 -0.1	607.5 (67.5 × 9)	37.5 .0.2	15 .0.2	52.5 0 -0.2	100 +0.6	10	15
40945AD	945 -0.1	877.5 (67.5 × 13)	37.5 .0.2	15 .0.2	52.5 0-0.2	100 0+0.6	14	21



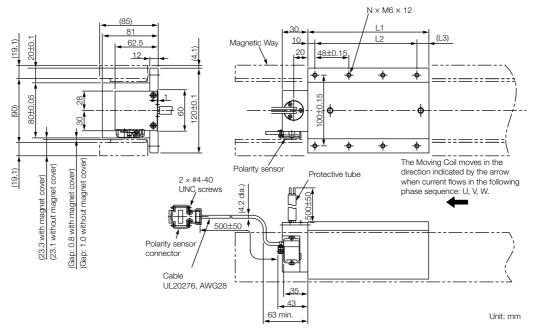


Note: Two Magnetic Way tracks are used together as a set. More than one Magnetic Way can be connected.

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	Approx. Mass [kg]
40405AY	405 -0.1	337.5	387.5	202.5	202.5	6	2	13
40675AY	675 -0.1	607.5	657.5	472.5	236.25	10	3	21
40945AY	945 -0.1	877.5	927.5	742.5	247.5	14	4	30

SGLTW-50: High-Efficiency Models

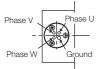
♦ Moving Coils: SGLTW-50A□□□H□



Moving Coil Model SGLTW-	L1	L2	(L3)	Ν	Approx. Mass [kg]
50A170Hロ	170	144 (48 × 3)	(16)	8	6
50A320Hロ	315	288 (48 × 6)	(17)	14	11

Connector Specifications

· Moving Coil Lead



Phase U Red U Phase V White V 2 mm² Phase W Black W Ground Green

(Viewed from the top surface of the Moving Coil.)

Secure the lead from the Moving Coil of the Linear Servomotor so that it moves together with the Moving Coil.

· Polarity Sensor Connector

9 6	1	+5 V (DC)	6	
5	2	Phase U	7	Not used
	3	Phase V	8	NOL USEU
	4	Phase W	9	
	5	0 V	_	-

Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd. Mating Connector Socket connector: 17JE-13090-02 (D8C)A-CG

Studs: 17L-002C or 17L-002C1

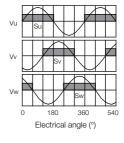
Polarity Sensor Output Signal

ε

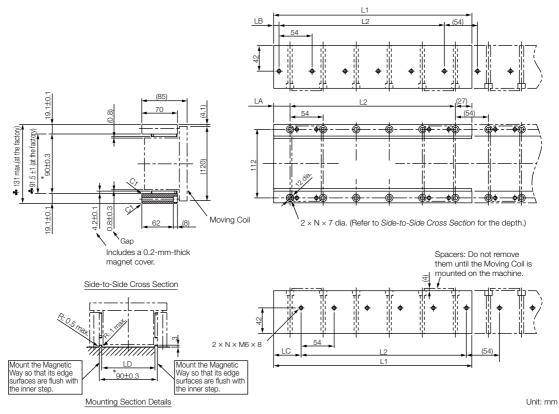
power

Inverse |

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Magnetic Ways: SGLTM-50□□□H□



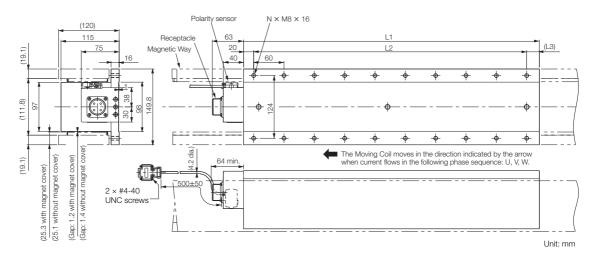
Note: 1. Two Magnetic Way tracks are used together as a set. For safety, when they are shipped, the two tracks are secured to a mounting spacer made from aluminum.

- 2. More than one Magnetic Way can be connected.
- 3. Dimensions with asterisks are the distances between the Magnetic Way tracks. Install the tracks according to the specified dimensions. Observe the dimensions given in *Mounting Section Details* after installation. Dimensions when the Magnetic Way is shipped from the factory are indicated by ♣.
- 4. Use socket head screws of strength class 10.9 or higher for the Magnetic Way mounting screws. (Do not use stainless steel screws.)

Magnetic Way Model SGLTM-	L1	L2	LA	LB	LC	LD	Ν	Approx. Mass [kg]
50324H□	324 -0.1	270 (54 × 5)	27 .0.2	9 .0.2	45 .0.2	$82^{+0.6}_{0}$	6	8
50540H D	540 -0.3	486 (54 × 9)	27 .0.2	9 _0.2	45 .0.2	82 +0.6	10	13
50756H D	756 -0.1	702 (54 × 13)	27 .0.2	9 .0.2	45 .0.2	82 +0.6	14	18

SGLTW-80: Standard Models

◆ Moving Coils: SGLTW-80A□□□B□



Moving Coil Model SGLTW-	L1	L2	(L3)	Ν	Approx. Mass [kg]
80A400Bロ	394.2	360 (60 × 6)	(15)	14	24
80A600Bロ	574.2	540 (60 × 9)	(15)	20	35

Connector Specifications

Servomotor Connector

	А	Phase U
Do oA	В	Phase V
Co ob	С	Phase W
	D	Ground

Receptacle: MS3102A-22-22P From DDK Ltd. Mating Connector Right-angle plug: MS3108B22-22S Straight plug: MS3106B22-22S Cable clamp: MS3057-12A

· Polarity Sensor Connector

9	1	+5 V (power supply)	6	
5	2	Phase U	7	Not used
	3	Phase V	8	NOT USED
	Δ	Phase W	a	

 4
 Phase W
 9

 5
 0 V (power supply)

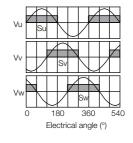
Pin connector: 17JE-23090-02 (D8C)-CG From DDK Ltd.

Mating Connector

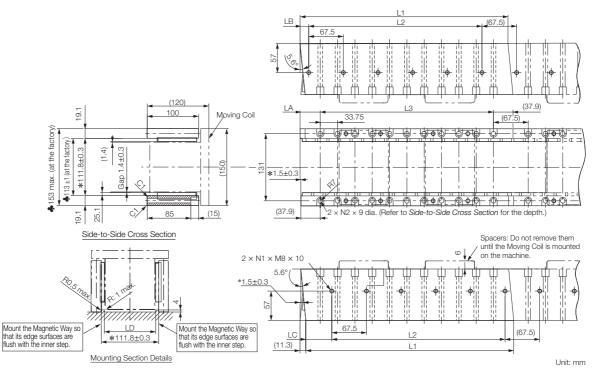
Socket connector: 17JE-13090-02 (D8C)A-CG Studs: 17L-002C or 17L-002C1

Polarity Sensor Output Signal

The figure on the right shows the relationship between the Su, Sv, and Sw polarity sensor output signals and the inverse power of each motor phase Vu, Vv, and Vw when the Moving Coil moves in the direction indicated by the arrow in the dimensional drawings of the Moving Coil.



◆ Magnetic Ways: SGLTM-80□□□A□



Note: 1. Two Magnetic Way tracks are used together as a set. For safety, when they are shipped, the two tracks are secured to a mounting spacer made from aluminum.

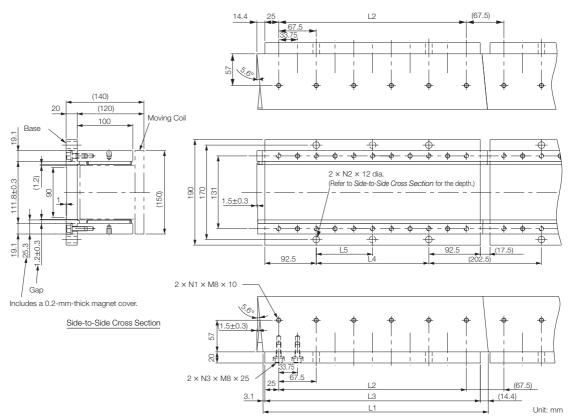
2. More than one Magnetic Way can be connected.

3. Dimensions with asterisks are the distances between the Magnetic Way tracks. Install the tracks according to the specified dimensions. Observe the dimensions given in *Mounting Section Details* after installation. Dimensions when the Magnetic Way is shipped from the factory are indicated by ♣.

4. Use socket head screws of strength class 10.9 or higher for the Magnetic Way mounting screws. (Do not use stainless steel screws.)

Magnetic Way Model SGLTM-	L1	L2	L3	LA	LB	LC	LD	N1	N2	Approx. Mass [kg]
80405A□	405 -0.1	337.5 (67.5 × 5)	337.5 (33.75 × 10)	39.4 0.2	16.9 0.2	50.6 0 -0.2	100 0	6	11	14
80675A□	675 ^{-0.1}	607.5 (67.5 × 9)	607.5 (33.75 × 18)	39.4 0-0.2	16.9 0.2	50.6 0	100 0+0.6	10	19	24
80945Aロ	945 -0.1	877.5 (67.5 × 13)	887.5 (33.75 × 26)	39.4 0.2	16.9 -0.2	50.6 -0.2	100 0+0.6	14	27	34

◆ Magnetic Ways with Bases: SGLTM-80□□□AY



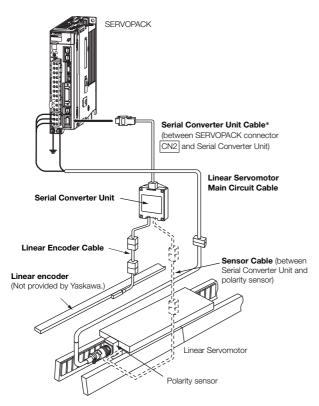
Note: Two Magnetic Way tracks are used together as a set. More than one Magnetic Way can be connected.

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	N3	Approx. Mass [kg]
80405AY	405 -0.1	337.5	387.5	202.5	202.5	6	2	11	18
80675AY	675 -0.1	607.5	657.5	472.5	236.25	10	3	19	31
80945AY	945 -0.1	877.5	927.5	742.5	247.5	14	4	27	43

Selecting Cables

◆ Cable Configurations

To select a Linear Encoder, use *Recommended Linear Encoders* (pages 308 and 309). Prepare the cable required for the encoder.



* You can connect directly to an absolute linear encoder.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Order numbers and specifications for wiring materials
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Linear Servomotor Model	Length (L)	Order Number	Appearance
	1 m	JZSP-CLN21-01-E	
	3 m	JZSP-CLN21-03-E	SERVOPACK end Linear Servomotor
SGLTW-20A, -35A	5 m	JZSP-CLN21-05-E	
3GLI W-20A, -35A	10 m	JZSP-CLN21-10-E	
	15 m	JZSP-CLN21-15-E	
	20 m	JZSP-CLN21-20-E	*
	1 m	JZSP-CLN14-01-E	
	3 m	JZSP-CLN14-03-E	SERVOPACK end Linear Servomotor end
SGLTW-DDADDDDDD	5 m	JZSP-CLN14-05-E	
	10 m	JZSP-CLN14-10-E	
	15 m	JZSP-CLN14-15-E	
	20 m	JZSP-CLN14-20-E	*
	1 m	JZSP-CLN39-01-E	
	3 m	JZSP-CLN39-03-E	SERVOPACK end Linear Servomotor end
SGLTW-40000B0	5 m	JZSP-CLN39-05-E	
-80 000 B0	10 m	JZSP-CLN39-10-E	
	15 m	JZSP-CLN39-15-E	
	20 m	JZSP-CLN39-20-E	*

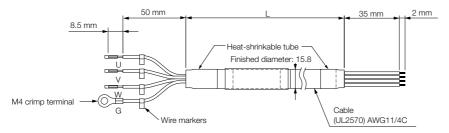
Linear Servomotor Main Circuit Cables

*1. Connector from Tyco Electronics Japan G.K.

*2. Connector from Interconnectron GmbH

*3. A connector is not provided on the Linear Servomotor end. Obtain a connector according to your specifications. Refer to the next page for information on connectors.

■ JZSP-CLN39-□□-E Cables



• Wiring Specifications

SERVOPACK	Leads	Servomotor Connector			
Wire Color	Signal	Signal	Pin		
Red	Phase U	 Phase U	А		
White	Phase V	Phase V	В		
Blue	Phase W	Phase W	С		
Green/yellow	FG	FG	D		

JZSP-CLN39 Cable Connectors

Applicable	Connector	PI	ug			
Servomotor	· · Provided with		Straight Bight-angle		Cable Clamp	
SGLTW-40 and -80	MS3102A22-22P	MS3106B22-22S or MS3106A22-22S	MS3108B22-22S	MS3057-12A		

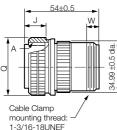
• MS3106B22-2S: Straight Plug with Two-piece Shell

Unit: mm

Unit: mm

55.57 max.					Onit. min
	Shell Size	Joint Thread A	Length of Joint J ±0.12	Joint Nut Outer Diameter Q ⁺⁰ _{-0.38}	Effective Thread Length W min.
Cable Clamp	22	1-3/8-18UNEF	18.26	40.48	9.53
mounting thread: [/] 1-3/16-18UNEF					

• MS3106A22-2S: Straight Plug with Solid Shell



Shell Size	Joint Thread A	Length of Joint J ±0.12	Joint Nut Outer Diameter Q ⁺⁰ _{-0.38}	Effective Thread Length W min.
22	1-3/8-18UNEF	18.26	40.48	9.53

mounting thread: 1-3/16-18UNEF

• MS3108B22-2S: Right-angle Plug with Two-piece Shell

Unit: mm

76.98 max.					Unit: mm
	Shell Size	Joint Thread A	Length of Joint J ± 0.12	Joint Nut Outer Diameter Q ⁺⁰ -0.38	Effective Thread Length W min.
Cable Clamp	22	1-3/8-18UNEF	18.26	40.48	9.53
mounting thread:/ 1-3/16-18UNEF					

Dimensional Drawings: MS3057-12A Cable Clamp with Rubber Bushing

Unit: mm

23.8±0.7 1.6 (bushing inner diameter) 19.0 dia. (Cable Clamp inner diameter)	Applicable Connector Shell Size	Effective Thread Length C	Mounting Thread V	Attached Bushing
4.0 (slide range)	20.22	10.3	1-3/16- 18UNEF	AN3420-12

MEMO

Recommended Linear Encoders and Cables

Recommended Linear Encoders

Incremental Linear Encoders

◆ 1 Vp-p Analog Voltage

You must also use a Yaskawa Serial Converter Unit. The output signal will be multiplied by 8 bits (256 divisions) or 12 bits (4,096 divisions) in the Serial Converter Unit.

			Мс	odel	Linear		Maxi-	Support	Applica-	Applica-	
Manufacturer	Linear Encoder Type	Scale	Sensor Head	Relay Device between SERVOPACK and Linear Encoder ^{*3}	Encoder Pitch [µm]	luwi	mum Speed ^{*1} [m/s]	for Polarity Sensor Input	tion to Linear Servo- motors	tion to Fully- Closed Loop Control	Reference
		LIDA48		JZDP-H003/-H006	20	78.1	5	\checkmark	✓	✓	page 310
Heidenhain	Eveneed	ed	40Ц	JZDP-J003/-J006	20	4.9	2	\checkmark	✓	*4	page 311
Corporation	Exposed		LIF480	JZDP-H003/-H006	4	15.6	1	\checkmark	\checkmark	✓	page 310
		LIF4	юЦ	JZDP-J003/-J006	4	1.0	0.4	\checkmark	*4	*4	page 311
Denich aus pla*?	Renishaw plc*2 Exposed	RGS20		JZDP-H005/-H008	20	78.1	5	\checkmark	~	✓	page 313
Renishaw plc*2 Expc		Exposed	NG920	RGH22B	JZDP-J005/-J008	20	4.9	2	\checkmark	~	*4

✓: Applicable

*1. The maximum speeds given in the above table are the maximum applicable speeds of the encoders when combined with a Yaskawa SERVOPACK.

The actual speed will be restricted by either the maximum speed of the Linear Servomotor or the maximum speed of the Linear Encoder (given above).

*2. If you use the origin signals with a Linear Encoder from Renishaw plc, the origin may sometimes be falsely detected. If that occurs, use the BID/DIR signal to output the origin signal only in one direction.

- *3. These are the models of Serial Converter Units.
- *4. Contact your Yaskawa representative.

Note: Confirm detailed specifications, such as the tolerances, dimensions, and operating environment, with the manufacturer of the Linear Encoder before you use it.

Encoder for Yaskawa's Serial Interface

The multiplier (number of divisions) depends on the Linear Encoder. Also, you must write the Servomotor constant file to the Linear Encoder in advance.

			Mc	odel	Linear		Maxi-	Sup-	Applica-	Applica-										
Manufacturer	Linear Encoder Type	Scale	Sensor Head	Relay Device between SERVOPACK and Linear Encoder	Encoder Pitch [µm]	Reso- lution [nm]	mum Speed ^{*1} [m/s]	port for Polarity Sensor Input	tion to Linear Servo- motors	tion to Fully- Closed Loop Control	Reference									
	Exposed		SL7⊡0		PL101-RY*2	800	97.7	10	-	~	~	page 316								
			PL101	MJ620-T13*3	000	51.1	10	✓	~	*4	page 317									
	Expoded		SQ10	SQ10	SQ10	SQ10	SQ10	SQ10	SO10		PQ10	MQ10-FLA	400	48.83	3	-	✓	✓	page 319	
Magnescale									FQIU	MQ10-GLA	400	40.03	0	✓	✓	-	page 019			
Co., Ltd.											SR75-DD	IDDDLF	_	80	9.8	3.33	-	✓	✓	
	Sealed	SR75-□□	IDDDMF	_	80	78.1	3.33	-	✓	✓	page 321									
	Sealeu	SR85-DD	IDDDLF	_	80	9.8	3.33	-	~	✓	paye 32 I									
		SR85-□□	IDDDMF	_	80	78.1	3.33	-	~	✓										

✓: Applicable

*1. The maximum speeds given in the above table are the maximum applicable speeds of the encoders when combined with a Yaskawa SERVOPACK.

The actual speed will be restricted by either the maximum speed of the Linear Servomotor or the maximum speed of the Linear Encoder (given above).

*2. This is the model of the Sensor Head with Interpolator.

*3. This is the model of the Interpolator.

*4. Contact your Yaskawa representative.

Note: Confirm detailed specifications, such as the tolerances, dimensions, and operating environment, with the manufacturer of the Linear Encoder before you use it.

Absolute Linear Encoders

Encoder for Yaskawa's Serial Interface

The multiplier (number of divisions) depends on the Linear Encoder. Also, you must write the Servomotor constant file to the Linear Encoder in advance.

			Мс	del	Linear		Maxi-	Sup-	Applica-	Applica-						
Manufacturer	Linear Encoder Type	Scale	Sensor Head	Relay Device between SERVOPACK and Linear Encoder	Encoder Pitch ^{*1} [µm]	Reso- lution [nm]	mum Speed ^{*2} [m/s]	port for	tion to Linear Servo- motors	tion to Fully- Closed Loop Control	Reference					
		SR77-DD	DOOLF	_	80	9.8	3.33	_	✓	✓						
Magnescale	Sealed	SR77-DD	IDDDMF	_	80	78.1	3.33	_	✓	✓	page					
Co., Ltd.	Sealeu	SR87-DD	JOOOLF	_	80	9.8	3.33	_	✓	✓	321					
		SR87-DD	IDDDMF	_	80	78.1	3.33	-	✓	✓						
	Exposed						ST7	81A	_	256	500	5	-	✓	✓	
		ST7	82A	-	256	500	5	-	✓	✓						
		ST7	83A	_	51.2	100	5	_	✓	\checkmark						
Mitutoyo		E		84A	_	51.2	100	5	-	✓	\checkmark	page				
Corporation		ST7	88A	-	51.2	100	5	-	✓	✓	322					
		ST78	39A*3	_	25.6	50	5	_	✓	\checkmark						
		ST1	381	_	5.12	10	8	-	✓	✓						
			ST1	382	_	0.512	1	3.6*4	_	✓	✓					
Heidenhain	Exposed	LIC410	0 Series		20.48	5	10	_	✓	✓	page					
Corporation	Sealed	LC.	115	EIB3391Y*5	40.96	10	3	_	✓	✓	312					
		EL36Y-DD	1050F □□ □	_	12.8	50	100	_	✓	✓	2222					
Renishaw plc	Exposed	EL36Y-DD	100F DDD	_	25.6	100	100	_	✓	✓	page 315					
		EL36Y-DD	1500F000	_	128	500	100	_	✓	~	010					

✓: Applicable

*1. These are reference values for setting SERVOPACK parameters. Contact the manufacturer for actual linear encoder scale pitches.

*2. The maximum speeds given in the above table are the maximum applicable speeds of the encoders when combined with a Yaskawa SERVOPACK.

The actual speed will be restricted by either the maximum speed of the Linear Servomotor or the maximum speed of the Linear Encoder (given above).

*3. Contact Mitutoyo Corporation for details on the Linear Encoders.

*4. The speed is restricted for some SERVOPACKs.

*5. This is the model of the Interpolator.

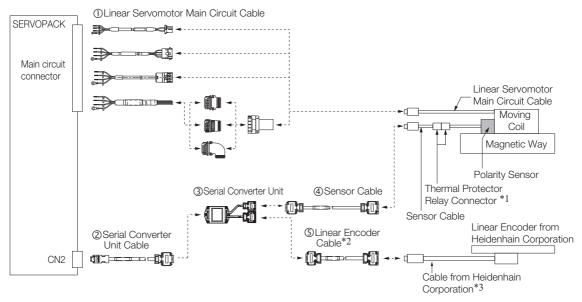
Note: Confirm detailed specifications, such as the tolerances, dimensions, and operating environment, with the manufacturer of the Linear Encoder before you use it.

Connections to Linear Encoder from Heidenhain Corporation

Connections for a 1 Vp-p Analog Voltage Output Signal

You must make the connections through a Yaskawa Serial Converter Unit. The output signal will be multiplied by 8 bits (256 divisions) or 12 bits (4,096 divisions) in the Serial Converter Unit.

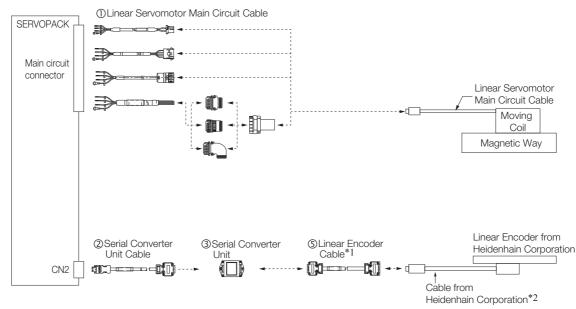
Connecting to a Linear Servomotor with a Polarity Sensor



*1. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

*3. Contact Heidenhain Corporation for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Heidenhain Corporation.

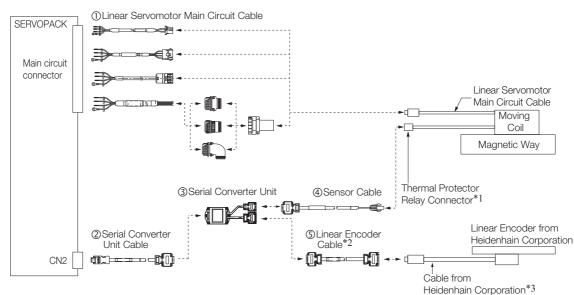
Connecting to a Linear Servomotor without a Polarity Sensor



Servomotors Other Than the SGLFW2

*1. When using a JZDP-J00D-DDD Serial Converter Unit, do not use a Yaskawa Linear Encoder Cable that is longer than 3 m.

*2. Contact Heidenhain Corporation for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Heidenhain Corporation.



SGLFW2 Servomotors

*1. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

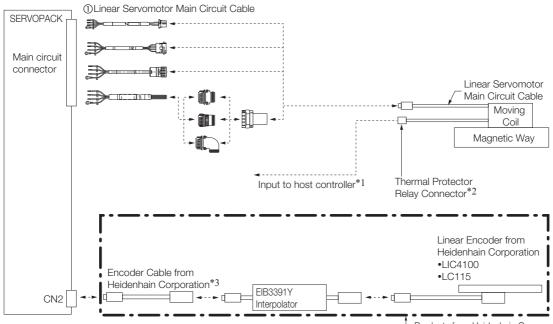
*3. Contact Heidenhain Corporation for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Heidenhain Corporation.

No.	Cable Type	Reference					
NO.	Cable Type	SGLG	SGLF	SGLT			
1	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305			
2	Serial Converter Unit Cable	page 324					
3	Serial Converter Unit		page 323				
4	Sensor Cable	page 324					
5	Linear Encoder Cable		page 324				

LIC4100 and LC115 Linear Encoder with EIB3391Y Interpolator

1. You cannot use an LIC4100 and LC115 Linear Encoder together with a Linear Servomotor with a Polarity Sensor.
2. If you use an SGLFW2 Servomotor, input the thermal protector signal from the Linear Servo-

Important 2. If you use an SGLFW2 Servonotor, input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is activated. Do not exceed 3 A or 30 V.



—Products from Heidenhain Corp.

*1. Cables to connect to the host controller are not provided by Yaskawa. Refer to the following manual for information on connector models.

Ω *Σ*-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

*3. Use an Encoder Cable from Heidenhain Corporation. Contact Heidenhain Corporation for detailed Encoder Cable specifications.

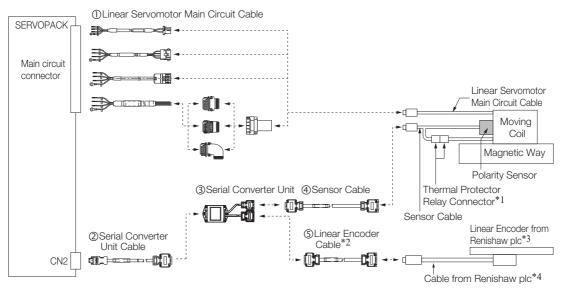
No.	Cable Type	Reference				
	Cable Type	SGLG	SGLF	SGLT		
0	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305		

Connections to Linear Encoder from Renishaw plc

Connections for a 1 Vp-p Analog Voltage Output Signal

You must make the connections through a Yaskawa Serial Converter Unit. The output signal will be multiplied by 8 bits (256 divisions) or 12 bits (4,096 divisions) in the Serial Converter Unit.

Connecting to a Linear Servomotor with a Polarity Sensor



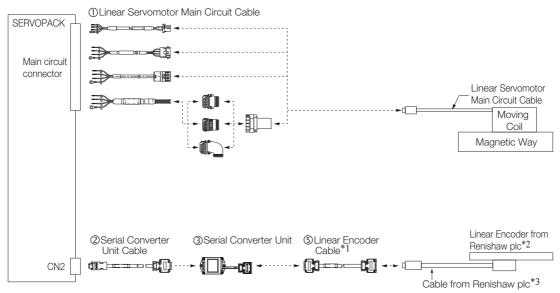
- *1. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.
- *2. When using a JZDP-J00D-DDD Serial Converter Unit, do not use a Yaskawa Linear Encoder Cable that is longer than 3 m.
- *3. If you use the origin signals with a Linear Encoder from Renishaw plc, the origin may sometimes be falsely detected.

If that occurs, use the BID/DIR signal to output the origin signal only in one direction.

*4. Contact Renishaw plc for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Renishaw plc. However, the BID and DIR signals are not connected.

Connecting to a Linear Servomotor without a Polarity Sensor

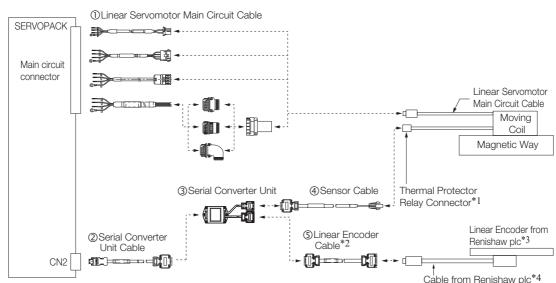
Servomotors Other Than the SGLFW2



*1. When using a JZDP-J00 --- Serial Converter Unit, do not use a Yaskawa Linear Encoder Cable that is longer than 3 m.

*2. If you use the origin signals with a Linear Encoder from Renishaw plc, the origin may sometimes be falsely detected. If that occurs, use the BID/DIR signal to output the origin signal only in one direction.

*3. Contact Renishaw plc for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Renishaw plc. However, the BID and DIR signals are not connected.



SGLFW2 Servomotors

*1. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

*2. When using a JZDP-J00D-DDD Serial Converter Unit, do not use a Yaskawa Linear Encoder Cable that is longer than 3 m.
*3. If you use the origin signals with a Linear Encoder from Renishaw plc, the origin may sometimes be falsely detected. If that occurs, use the BID/DIR signal to output the origin signal only in one direction.

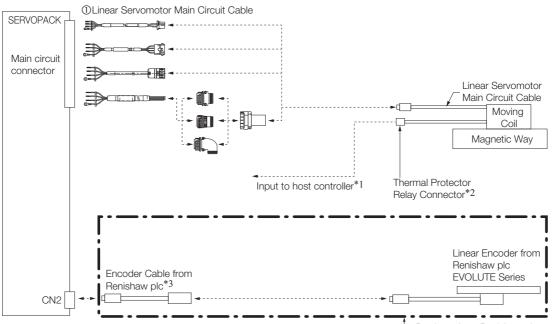
*4. Contact Renishaw plc for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Renishaw plc. However, the BID and DIR signals are not connected.

No.	Cable Type	Reference					
NO.	Cable Type	SGLG	SGLF	SGLT			
0	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305			
2	Serial Converter Unit Cable	page 324					
3	Serial Converter Unit		page 323				
4	Sensor Cable	page 324					
5	Linear Encoder Cable		page 324				

◆ EVOLUTE Series Linear Encoder (model: EL36Y-□□□□□□□□□□)

1. You cannot use an EVOLUTE Series Linear Encoder together with a Linear Servomotor with a Polarity Sensor.

If you use an SGLFW2 Servomotor, input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is activated. Do not exceed 3 A or 30 V.



Products from Renishaw plc

*1. Cables to connect to the host controller are not provided by Yaskawa.

Refer to the following manual for information on connector models.

Ω *Σ*-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

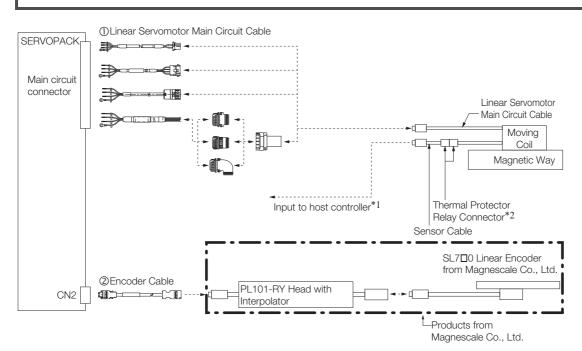
*3. Use an Encoder Cable from Renishaw plc. Contact Renishaw plc for detailed Encoder Cable specifications.

No.	Cable Type	Reference		
	Cable Type	SGLG	SGLF	SGLT
0	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305

Connections to Linear Encoder from Magnescale Co., Ltd.

◆ SL7□0 Linear Encoder and PL101-RY Sensor Head with Interpolator

You cannot use a PL101-RY Sensor Head with an Interpolator together with a Linear Servomotor with a Polarity Sensor.
 If you use an SGLFW2 Servomotor, input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is activated. Do not exceed 3 A or 30 V.



*1. Cables to connect to the host controller are not provided by Yaskawa. Refer to the following manual for information on connector models.

Ω 2-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

No.	Cable Type	Reference			
NO.	No. Cable Type	SGLG	SGLF	SGLT	
0	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305	
2	Encoder Cable	Refer to the below.		/.	

Encoder Cable

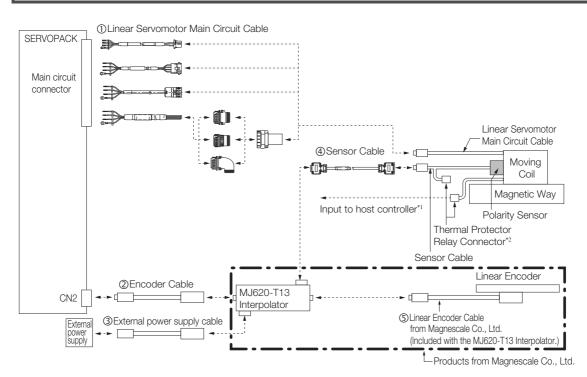
Name	Length	Order Number		Appearance
Name	(L)	Standard Cable	Flexible Cable*	Appearance
	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	SERVOPACK Encoder end
Cable with Connectors on Both Ends	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	1

* Use Flexible Cables for moving parts of machines, such as robots.

The recommended bending radius (R) is 68 mm or larger.

◆ SL7□0 Linear Encoder, PL101 Sensor Head, and MJ620-T13 Interpolator

- Important
- 1. A 5-VDC power supply is required for the MJ620-T13. (The 5-VDC power supply is not provided by Yaskawa.)
- 2. Refer to the MJ620-T13 specifications from Magnescale Co., Ltd. for the current consumption of the MJ620-T13.
- 3. If you use an SGLFW2 Servomotor, remove the thermal protector relay connector and input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is activated. Do not exceed 3 A or 30 V.



*1. Cables to connect to the host controller are not provided by Yaskawa.

Refer to the following manual for information on connector models.

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

No	No. Cable Type		Reference		
NO.			SGLG	SGLF	SGLT
0	Linear Servomotor Main Circ	cuit Cable	page 241	page 281	page 305
2	Encoder Cable	These cables are not provided		page 318	
3	External power supply cable	by Yaskawa.	page 318		
4	Sensor Cable			page 324	
5	Linear Encoder Cable	Use the cables that come with the MJ620-T13 Interpolator. For details, refer to the specifications for the MJ620- T13 Interpolator.		_	

Encoder Cables

These cables are not provided by Yaskawa. Use a shielded cable. Refer to the following tables for the pin layouts.

SERVOPACK End of Cable (CN2)

- Plug Connector: 55100-0670 (Molex Japan LLC)
- Connector order number: JZSP-CMP9-1-E (SERVOPACK Connector Kit)

Pin	Signal	Function
1	PG+5 V	Encoder power supply +5 V
2	PG0 V	Encoder power supply 0 V
3	-	_
4	-	_
5	PS	Serial data
6	/PS	Senardata
Shell	Shield	-

MJ620-T13 End of Cable

For details, refer to the specifications for the MJ620-T13 from Magnescale Co., Ltd..

- Receptacle: PCR-E20LMD+ (Honda Tsushin Kogyo Co., Ltd.)
- Plug: PCR-E20FS+ (Honda Tsushin Kogyo Co., Ltd.)
- Shell: PCS-E20LD (Honda Tsushin Kogyo Co., Ltd.)

Pin	Signal	Function	Pin	Signal	Function
1	Do not connect.	-	12	0 V	0 V
2	Do not connect.	_	13	Do not connect.	_
3	Do not connect.	_	14	0 V	0 V
4	Do not connect.	_	15	Do not connect.	_
5	SD	Serial data	16	0 V	0 V
6	/SD	Senai uata	17	Do not connect.	_
7	Do not connect.	_	18	Do not connect.	_
8	Do not connect.	_	19	Do not connect.	_
9	Do not connect.	_	20	Do not connect.	_
10	Do not connect.	_	Shell	Shield	_
11	Do not connect.	_			

Cables without Connectors

Name	Longth (L)	Order Number		
Name	Length (L)	Standard Cable	Flexible Cable	
	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	
Cables without	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E	
Connectors	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E	
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E	

Note: We recommend that you use Flexible Cables.

External Power Supply Cables

This cable is not provided by Yaskawa. Refer to the table on the right for the pin layout.

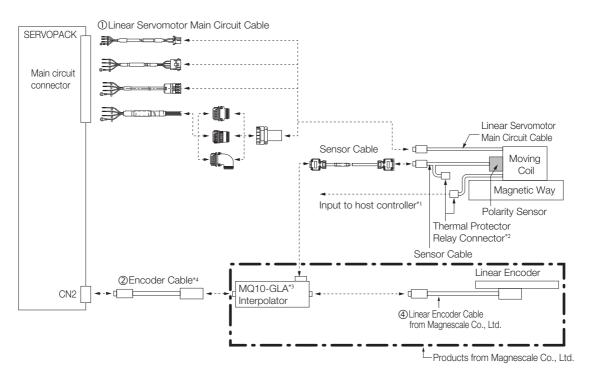
For details, refer to the specifications for the MJ620-T13 from Magnescale Co., Ltd..

- Connector Header: MC1.5/2-GF-3.81 (Phoenix Contact)
- Connector Plug: MC1.5/2-STF-3.81 (Phoenix Contact)

Pin	Signal	Function
1	+5 V	+5 V
2	0 V	0 V

SmartSCALE Linear Encoder (SQ10 Scale + MQ10-□LA Interpolator)

If you use an SGLFW2 Servomotor, remove the thermal protector relay connector and input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is acti-Important vated. Do not exceed 3 A or 30 V.



*1. Cables to connect to the host controller are not provided by Yaskawa. Refer to the following manual for information on connector models. Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

*3. This cable configurations shown above is the connection when you use the MQ10-GLA interpolator with polarity sensor.

*4. The maximum length of the Serial Converter Unit Cable is 15 m.

No.	Cable Type		Reference			
NO.			SGLG	SGLF	SGLT	
0	Linear Servomotor Main Ci	page 241	page 281	page 305		
2	Encoder Cable		page 320			
3	Sensor Cable		page 324			
4	Linear Encoder Cable	Use the cables that come with the MQ10-□LA Interpolator. For details, refer to the specifications for the MQ10- □LA Interpolator.		_		

Encoder Cables

These cables are not provided by Yaskawa. Use a shielded cable. Refer to the following tables for the pin layouts.

SERVOPACK End of Cable (CN2)

- Plug Connector: 55100-0670 (Molex Japan LLC)
- Connector order number: JZSP-CMP9-1-E (SERVOPACK Connector Kit)

Pin	Signal	Function
1	PG+5 V	Encoder power supply +5 V
2	PG0 V	Encoder power supply 0 V
3	-	-
4	-	-
5	PS	Serial data
6	/PS	Senardata
Shell	Shield	-

MQ10-DLA End of Cable

For details, refer to the specifications for the MQ10-□LA from Magnescale Co., Ltd..

Cables without Connectors

Name	Longth (L)	Order Number		
Name	Length (L)	Standard Cable	Flexible Cable	
	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	
Cables without Connectors	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E	
Connectors	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E	

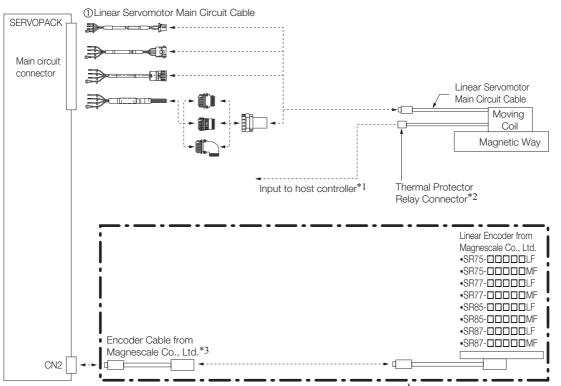
Note: We recommend that you use Flexible Cables.

SR-75, SR-77, SR-85, and SR-87 Linear Encoders



1. You cannot use an SR-75, SR-77, SR-85, or SR-87 Linear Encoder with a Linear Servomotor with a Polarity Sensor.

2. If you use an SGLFW2 Servomotor, input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is activated. Do not exceed 3 A or 30 V.



Products from Magnescale Co., Ltd.

*1. Cables to connect to the host controller are not provided by Yaskawa.

Refer to the following manual for information on connector models.

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

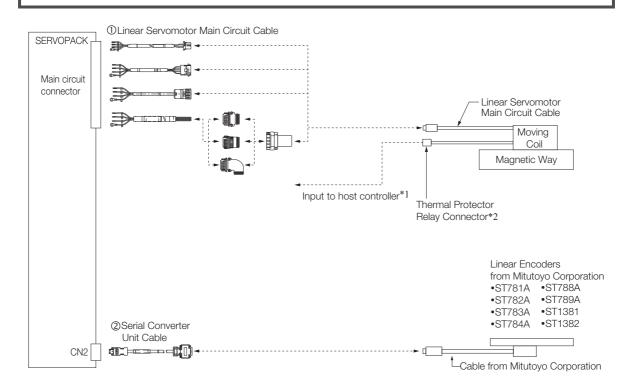
*3. To connect the SERVOPACK and Linear Encoder, use a CH33-xx□□G Cable from Magnescale Co., Ltd. (This cable has connectors designed for use with Yaskawa products.)

No.			Reference	
INO.	Cable Type	SGLG	SGLF	SGLT
0	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305

Connections to Linear Encoders from Mitutoyo Corporation

◆ ST78□A/ST13□□ Linear Encoders

- 1. You cannot use a ST78^DA Linear Encoder together with a Linear Servomotor with a Polarity Sensor.
- Sensor.
 If you use an SGLFW2 Servomotor, input the thermal protector signal from the Linear Servomotor to the host controller. The thermal protector signal is closed when the temperature is normal and open when the thermal protector is activated. Do not exceed 3 A or 30 V.



- *1. Cables to connect to the host controller are not provided by Yaskawa.
 Refer to the following manual for information on connector models.
 Ω *Σ*-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)
- *2. Only SGLFW2 Servomotors come equipped with Thermal Protector Relay Connectors.

No.	Cable Type	Reference					
NO.	Cable Type	SGLG	SGLF	SGLT			
0	Linear Servomotor Main Circuit Cable	page 241	page 281	page 305			
2	Serial Converter Unit Cable		page 324				

Serial Converter Units

Order Number

Use the following tables to select the Serial Converter Unit.

		JZDP	' - <u>C</u>									
	Serial Conver	ter Unit Model				Applicable Linear Servomotor						
		Applicable	ty or	lal tor	Servomot	or Model	Code	Servomotor Model		Code		
Code	Appearance	Linear	Polarity Sensor	Thermal Protector		30A050C	250		30A070A	628		
		Encoder	ų ų	Th Prc		30A080C	251		30A120A	629		
H003		From Heid-			SGLGW -	40A140C	252		30A230A	630		
J003		enhain Corp.	None	None	(coreless	40A253C	253	SGLFW2-	45A200A	631		
					models)	40A365C	254	(models	45A380A	632		
H005		From Renishaw	None	None	For Stan-	60A140C	258	with F-type iron cores)	90A200A	633		
J005		PLC	None		dard-force Magnetic	60A253C	259	IIOIT COLES)	90A380A	634		
					Way	60A365C	260		90A560A	648		
H006	H006 J006	Yes	Yes		90A200C	264		1DA380A	649			
J006		enhain Corp.				90A370C	265		1DA560A	650		
		From				90A535C	266	-	20A170A	011		
H008		Renishaw	Yes	Yes	SGLGW -	40A140C	255		20A320A	012		
J008		PLC			- SGLGM -	40A253C	256		20A460A	013		
					Coreless	40A365C	257		35A170A	014		
					models)	60A140C	261	001714	35A320A	015		
					For High-	60A253C	262	SGLTW- (models	35A460A	016		
					force Mag- netic Way	60A365C	263	with T-	35A170H	105		
						20A090A	017	type iron cores)	35A320H	106		
						20A120A	018	00103/	50A170H	108		
					SGLFW-	35A120A	019		50A320H	109		
					(models	35A230A	020		40A400B	185		
					with F-type	50A200B	181		40A600B	186		
					iron cores)	50A380B	182		80A400B	187		
						1ZA200B	183		80A600B	188		
						1ZA380B	184					

Note: 1. Refer to the following manual for detailed specifications of the Serial Converter Units.

Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

2. Contact your Yaskawa representative for information on the water cooling specifications of the SGLFW2.

Serial Converter Unit Cables

Linear Servomotor Model	Length (L)	Order Number	Appearance			
	1 m	JZSP-CLP70-01-E				
	3 m	JZSP-CLP70-03-E	SERVOPACK Serial Converter			
All Models	5 m	JZSP-CLP70-05-E	end L Unit end			
All Models	10 m	JZSP-CLP70-10-E				
	15 m	JZSP-CLP70-15-E				
	20 m	JZSP-CLP70-20-E				

Sensor Cables

Linear Servomotor Model	Length (L)	Order Number	Appearance
	1 m	JZSP-CLL10-01-E	Serial Converter Polarity sensor end
SGLGW-□□A	3 m	JZSP-CLL10-03-E	Unit end
SGLFW-DDA	5 m	JZSP-CLL10-05-E	
SGLTW-□□A	10 m	JZSP-CLL10-10-E	
	15 m	JZSP-CLL10-15-E	
	1 m	JZSP-CL2L100-01-E	
	3 m	JZSP-CL2L100-03-E	Serial Converter Polarity sensor end Unit end L
SGLFW2-DDADDDASD (With Polarity Sensor)	5 m	JZSP-CL2L100-05-E	
(With Folding Sensor)	10 m	JZSP-CL2L100-10-E	
	15 m	JZSP-CL2L100-15-E	
	1 m	JZSP-CL2TH00-01-E	
	3 m	JZSP-CL2TH00-03-E	Serial Converter Thermal Protector Unit end L end
SGLFW2-DDADDDATD (Without Polarity Sensor)	5 m	JZSP-CL2TH00-05-E	
(Without Folianty Gensor)	10 m	JZSP-CL2TH00-10-E	
	15 m	JZSP-CL2TH00-15-E	ي الله الله الله الله الله الله الله الل

Linear Encoder Cables

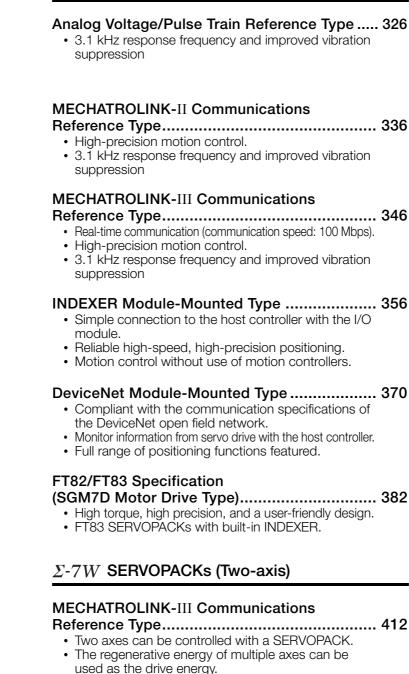
Name	Linear Servomotor Model	Length* (L)	Order Number	Appearance
		1 m	JZSP-CLL00-01-E	
For linear		3 m	JZSP-CLL00-03-E	
encoder from	– All Models	5 m	JZSP-CLL00-05-E	
Renishaw PLC		10 m	JZSP-CLL00-10-E	Serial Converter Linear encoder
		15 m	JZSP-CLL00-15-E	Unit end end
		1 m	JZSP-CLL30-01-E	
For linear		3 m	JZSP-CLL30-03-E	
encoder from Heidenhain		5 m	JZSP-CLL30-05-E	
Corporation		10 m	JZSP-CLL30-10-E	
·		15 m	JZSP-CLL30-15-E	

* When using a JZDP-J00D-DDD-E Serial Converter Unit, do not exceed a cable length of 3 m.

SERVOPACKs

Features

Σ -7S SERVOPACKs (Single-axis)



Σ -7C SERVOPACKs (Two-axis, with built-in Controllers)



- Build small-scale equipment system without PLC using one SERVOPACK. Expand functionality by mounting an option unit.
 - · Reduce burden of designing software when part of the equipment changes.

Common

SERVOPACK External Dimensions	136
Peripheral Devices	148

 Σ -7S Analog Σ -7S M-II Σ -7S M-III Σ -7S INDEXER Σ -7S DeviceNet Σ -7S FT82 Σ -7S FT83 Σ -7W M-III Σ -7C SERVOPACK **External Dimensions** Peripheral Devices









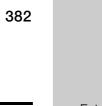












SERVOPACKs

Σ -7S Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs

SGI	D7S	6 - <u>R70</u>	Α	00	Α	С	01	000	В
Σ-7 Ser Σ-7S SI	ies ERVOP.	ACKs 1st+2nd+3rd digits	4th digit	5th+6th digits	7th digit	8th+	9th+10t digits	h 11th+12th+13t digits	h 14th digit
	d+3rd d		4010	git Voltage		8	8th+9th	+10th digits Specifica	
/oltage	Code	Specification	Code		ation		Code	Specification	Applicable Models
-	R70*1 R90*1	0.05 kW 0.1 kW	A F	200 VAC 100 VAC			None 000	Without options	All models
	1R6*1 2R8*1	0.2 kW 0.4 kW	5th+6	oth digits Inte	erface*4			Rack-mounted	SGD7S-R70A to -330A
	3R8 5R5*1	0.5 kW 0.75 kW	Code	Code Specification				nack mounted	SGD7S-R70F to -2R8F
Three- phase, 200 VAC	7R6	1.0 kW		Analog voltag				Duct-ventilated	SGD7S-470A
	120*2	1.5 kW	00	train reference	Э			Duct-ventilated	to -780A
	180	2.0 kW					002	Varnished	All models
	200* ³ 330	3.0 kW 5.0 kW	A 7th d	igit Design Re	vision Orde	r	008	Single-phase, 200-VAC power supply input	SGD7S-120A
	470	6.0 kW							SGD7S-R70A
-	550	7.5 kW						No dynamic brake	to -2R8A
	590	11 kW					020*5	No dynamie brake	SGD7S-R70F to -2R8F
	780	15 kW						External dynamic	SGD7S-3R8A
	R70	0.05 kW						brake resistor	to -780A
Single- ohase,	R90	0.1 kW							
100 VAC	2R1	0.2 kW				(1th+12	th+13th digits FT/E	K Specification
	2R8	0.4 kW					Code	Specification	1
			-				None		1
							000	None	
								BTO Specification	*6
						Į	4th dig	(Available in Japar	
							Code	Specification	
							None	None]
							В	BTO Specification]

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A00A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
- Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

N	lodel SGD7S	-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A			
Maximum App	licable Motor Ca	apacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0			
Continuous (Dutput Curren	it [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9			
Instantaneous Maximum Output Current [Arms]		2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0				
Main	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	·			
Circuit	Input Curren	nt [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25			
Construct	Power Supp	ly		200) VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	1525Hz0.250.35.97.5			
Control Input Current [Arms]*		nt [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3			
Power Supply Capacity [kVA]*		0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5				
	Main Circuit Pc	wer Loss [W]	5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6			
Power	Control Circuit F	Power Loss [W]	12	12	12	12	14	14	14	15	16	16	19			
Loss*	Built-in Regen Resistor Powe		_	_	_	_	8	8	8	10	16	16	36			
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6			
	Built-In Regenerative	Resistance $[\Omega]$	_	_	_	_	40	40	40	20	12	12	8			
Regenerative Resistor	Resistor	Capacity [W]	-	-	_	_	40	40	40	60	60	60	180			
110010101	Minimum All External Res		40	40	40	40	40	40	40	20	12	12	8			
Overvoltage	Category															

* This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Appli	cable Motor Capa	city [kW]	6.0	7.5	11	15
Continuous Out	put Current [Arms]	46.9	54.7	58.6	78.0
Instantaneous N	/laximum Output C	Current [Arms]	110	130	140	170
Main Cinquit	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms] ^{*1}	29	37	54	73
Control	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms] ^{*1}	0.3	0.3	0.4	0.4
Power Supply C	Power Supply Capacity [kVA]*1			14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	Power Loss [W]	21	21	28	28
Power Loss ^{*1}	External Regene Unit Power Loss		180 ^{*2}	180*3	350 ^{*3}	350 ^{*3}
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25 ^{*2}	3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}
External Regenerative	Regenerative Resistor Unit	Capacity [W]	880*2	1760 ^{*3}	1760 ^{*3}	1760 ^{*3}
Resistor Unit	Minimum Allowa Resistance $[\Omega]$	ble External	5.8	2.9	2.9	2.9
Overvoltage Ca	tegory			I	11	

*1. This is the net value at the rated load.

*2. This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

*3. This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

SERVOPACKs Σ-7S Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs

♦ Single-phase, 200 VAC

	Model SGD7S-		R70A	R90A	1R6A	2R8A	5R5A	120A
Maximum App	licable Motor Ca	pacity [kW]	0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous I	Instantaneous Maximum Output Current [Arms]			3.2	5.9	9.3	16.9	28
Main Circuit	Power Supply	200	VAC to 24	0 VAC, -15	5% to +10%	%, 50 Hz/6	0 Hz	
Main Circuit	Input Current [0.8	1.6	2.4	5.0	8.7	16	
Construct	Power Supply	200	VAC to 24	0 VAC, -15	5% to +109	%, 50 Hz/6	0 Hz	
Control	Input Current [0.2	0.2	0.2	0.2	0.2	0.25	
Power Supply	Power Supply Capacity [kVA]*			0.3	0.6	1.2	1.9	4.0
	Main Circuit Po	5.0	7.1	12.1	23.7	39.2	71.8	
	Control Circuit Power Loss [W]		12	12	12	12	14	16
Power Loss*		Built-in Regenerative Resistor Power Loss [W]		-	-	-	8	16
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	-	-	-	-	40	12
Regenerative	Regenerative Resistor	Capacity [W]	-	-	-	-	40	60
Resistor	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	12
Overvoltage Ca	ategory						•	·

* This is the net value at the rated load.

◆ 270 VDC

	Model SGD7S-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A				
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5				
Continuous Ou	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6				
Instantaneous Maximum Output Current [Arms]			3.2	5.9	9.3	11.0	16.9	17.0	28.0				
Main Circulit	Power Supply		270) VDC to	5 324 VI	DC, -15	% to +1	0%					
Main Circuit	Input Current [Arms] ^{*1}	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11				
Constral	Power Supply	270 VDC to 324 VDC, -15% to +10%											
Control	Input Current [Arms] ^{*1}	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2				
Power Supply	Capacity [kVA] ^{*1}	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2				
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8				
Power Loss ^{*1}	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15				
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8				
Overvoltage Ca	Overvoltage Category			•			•						

*1. This is the net value at the rated load.

*2. The value is 0.25 Arms for the SGD7S-120A00A008.

	Model SGD7S-	180A	200A	330A	470A	550A	590A	780A	
Maximum Applicable Motor Capacity [kW]		2.0	3.0	5.0	6.0	7.5	11.0	15.0	
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0	
Instantaneous N	Aaximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170	
Main Circuit	Power Supply		+10%						
Main Circuit	Input Current [Arms]*	14	20	34	36	48	68	92	
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4	
Power Supply	Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6	
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4	
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28	
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4	
Overvoltage Ca	Overvoltage Category							·	

* This is the net value at the rated load.

	Model SGD7S-	R70F	R90F	2R1F	2R8F				
Maximum App	licable Motor Capacity [kW]	0.05	0.05 0.1 0.2		0.4				
Continuous Ou	Itput Current [Arms]	0.66	0.91	2.1	2.8				
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3				
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	5% to +10%, 50) Hz/60 Hz				
Main Circuit	Input Current [Arms]*	1.5	2.5	5	10				
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz							
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38				
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4				
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2				
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12				
	Total Power Loss [W]	17.3	19.8	26.2	38.2				
Regenerative Resistor	Minimum Allowable External Resistance $[\Omega]$	40	40	40	40				
Overvoltage C	ategory								

Single-phase, 100 VAC

* This is the net value at the rated load.

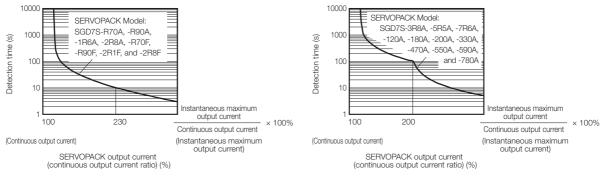
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

	Item			Specification						
Сс	ontrol Method	IGBT-base	ed PWM contro	I, sine wave current drive						
ack	With Rotary Servomotor	Serial enc	20 bits or	bsolute encoder) 24 bits (incremental encoder/absolute encoder) bsolute encoder)						
Feedback	With Linear Servomotor	absolute • Increme	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 							
	Surrounding Air Temperature ^{*1}	Refer to the	ting, usage is p	ossible between 55°C and 60°C. ction for derating specifications. s (page 333)						
	Storage Temperature	-20°C to 85°C								
	Surrounding Air Humidity	95% relat	ive humidity ma	x. (with no freezing or condensation)						
	Storage Humidity		-	x. (with no freezing or condensation)						
	Vibration Resistance	4.9 m/s ²								
			1							
SU	Shock Resistance	19.6 m/s ²								
ditio		Class		SERVOPACK Model: SGD7S-						
ouo			870A 890A	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,						
al C	Degree of Protection	IP20	R70F, R90F, 2							
Environmental Conditions		IP10		, 180A, 200A, 330A, 470A, 550A, 590A,						
Enviro	Pollution Degree	Must be		r flammable gases. 5 water, oil, or chemicals.						
	Altitude ^{*1} Others	Refer to the formation of the formation	ting, usage is p ne following sec ing Specification e the SERVOPA static electricit	ossible between 1,000 m and 2,000 m. ction for derating specifications. <i>s</i> (page 333) ACK in the following locations: Locations y noise, strong electromagnetic/magnetic						
Ap	oplicable Standards	UL 61800 EN 55011 EN 61800 EN 61800	fields, or radioactivity UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1							
		M	ounting	SERVOPACK Model: SGD7S-						
		Base-mo		All Models						
M	ounting	Rack-mc		R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F						
		Duct-ver	ntilated	470A, 550A, 590A, 780A						
	Speed Control Range			ue, the lower limit of the speed control range protor to stop.)						
00				nax. (for a load fluctuation of 0% to 100%)						
anc	Coefficient of Speed			(for a voltage fluctuation of $\pm 10\%$)						
Jrm	Fluctuation ^{*2}			(for a temperature fluctuation of ± 10.00)						
Performance	Torque Control Precision		atou specu max							
-	(Repeatability)	±1%	o (Cor bo+							
	Soft Start Time Setting	US 10 10	s (Can be set s	eparately for acceleration and deceleration.) Continued on next page.						

Continued on next page.

Continued from previous page.

Continued from previous page								
	Item	Specification						
Enc	coder Divided Pulse Output	Phase A, phase B, phase C: Line-driver output						
		Number of divided output pulses: Any setting is allowed.						
Ove	erheat Protection Input	Number of input points: 1 Input voltage range: 0 V to +5 V						
		Allowable voltage range: 5 VDC ±5%						
	Fixed Input	Number of input points: 1						
		Absolute Data Request (SEN)						
		Allowable voltage range: 24 VDC ±20%						
		Number of input points: 7						
		Input method: Sink inputs or source inputs						
		Input Signals						
als		/S-ON (Servo ON) signal /D CON (Propertienal Control) Signal						
ign		 /P-CON (Proportional Control) Signal P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals 						
rt S		 /ALM-RST (Alarm Reset) signal 						
ndr		• /P-CL (Forward External Torque Limit) and /N-CL (Reverse External						
Ce	Input Signals That Can Be	Torque Limit) signals						
	Allocated	/SPD-D (Motor Direction) signal /SPD A and (SPD D (Internal Categoria) signal						
edr		 /SPD-A and /SPD-B (Internal Set Speed Selection) signals /C-SEL (Control Selection) signal 						
S		// Control Selection signal // ZCLAMP (Zero Clamping) signal						
		/INHIBIT (Reference Pulse Inhibit) signal						
lais		 /G-SEL (Gain Selection) signal 						
Signals		/P-DET (Polarity Detection) signal SEN (Abackuta Data Deswart) signal						
0/		 SEN (Absolute Data Request) signal /PSEL (Reference Pulse Input Multiplication Switch) Signal 						
-		FSTP (Forced Stop Input) signal						
		A signal can be allocated and the positive and negative logic can be changed.						
		Allowable voltage range: 5 VDC to 30 VDC						
	Fixed Output	Number of output points: 1						
		Output signal: Servo Alarm (ALM)						
		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6						
S		(A photocoupler output (isolated) is used for three of the outputs.)						
Signals		(An open-collector output (non-isolated) is used for the other three outputs.)						
Sio		Output Signals						
Sequence Output		/COIN (Positioning Completion) Signal						
Out		/V-CMP (Speed Coincidence Detection) Signal //CON (Detation Detection) Signal						
ce	Output Signals That Can Be	 /TGON (Rotation Detection) Signal /S-RDY (Servo Ready) signal 						
uer	Allocated	/CLT (Torque Limit Detection) Signal						
edi		AVLT (Speed Limit Detection) Signal						
0)		/BK (Brake) signal						
		 /WARN (Warning) Signal /NEAR (Near) signal 						
		/PSELA (Reference Pulse Input Multiplication Switching Output) signal						
		ALO1, ALO2, and ALO3 (Alarm Code) signals						
		A signal can be allocated and the positive and negative logic can be changed.						
suo	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)						
ns 422A nicati	2 1:N Communications	Up to N = 15 stations possible for RS-422A port						
Communications JSB RS-422A Unications Communications	Axis Address Setting	Set with parameters.						
innr	Interface	Personal computer (with SigmaWin+)						
Commun USB Communications								
USE USE	Communications	Conforms to USB2.0 standard (12 Mbps).						
Comr	Standard							
Display	s/Indicators	CHARGE indicator and five-digit seven-segment display						
		Continued on next page.						

Σ-7S Analog

 $\frac{\mbox{SERVOPACKs}}{\mbox{Σ-7S$ Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs}}$

Continued from previous page.

				Item	Specification					
Pa	anel	Ope	erat	or	Four push switches					
Ar	nalo	g M	onit	or (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)					
D	ynar	nic I	Brał	ke (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.					
Re	eger	nera	tive	Processing	Built-in (An external resistor must be connected to the SGD7S-470A to -780A.)					
0'	verti	rave	I (O	T) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal					
Pr	rote	ctive	e Fu	nctions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.					
Ut	tility	Fun	ictio	ns	Gain adjustment, alarm history, jogging, origin search, etc.					
N	SUC	Inp	outs		/HWBB1 and /HWBB2: Base block signals for Power Modules					
Safety	Functions	Οι	utpu	t	EDM1: Monitors the status of built-in safety circuit (fixed output).					
0)	ЪЦ	Ap	plic	able Standards ^{*3}	ISO13849-1 PLe (Category 3) and IEC61508 SIL3					
O	Option Module		le	Fully-Closed Modules and Safety Modules Note: You cannot use a Fully-Closed Module and a Safety Module together.						
		Soft Start Time Setting Performed by the setting Soft Start Time Setting Reference Voltage Input Impedance Circuit Time Constant Time Setting Reference Voltage Input Impedance Selection Selection		tart Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)					
	itrol				 Maximum input voltage: ±12 V (forward motor rotation for positive reference). 6 VDC at rated speed (default setting). Input gain setting can be changed. 					
	Cor				Approx. 14 kΩ 30 μs					
	eed (t.		Circuit Time Constant Rotation Direction						
	Spe	al Se	ntrol	Selection	With Proportional Control signal					
		Internal Set		Speed Selection	With Forward/Reverse External Torque Limit signals (speed 1 to 3 selection). Servomotor stops or another control method is used when both signals are OFF.					
				orward Compensation	0% to 100%					
				t Signal Positioning leted Width Setting	0 to 1,073,741,824 reference units					
S	_			Reference Pulse Form	One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential					
Controls	ntrc		pulses	Input Form	Line driver or open collector					
CO	Position Control	Input Signals	Reference puls	Maximum Input Frequency	 Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps 					
				Input Multiplication Switching	1 to 100 times					
			Cl	ear Signal	Position deviation clear Line driver or open collector					
	Torque Control	ut Signal	Re	eference Voltage	 Maximum input voltage: ±12 V (forward torque output for positive reference). 3 VDC at rated torque (default setting). Input gain setting can be changed. 					
	Jrdr	Input	Inp	out Impedance	Approx. 14 kΩ					
	Ĕ		Ci	rcuit Time Constant	16 μs					

- *1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable range cannot be increased by derating.
- *2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

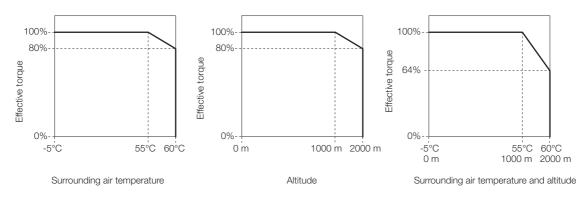
Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

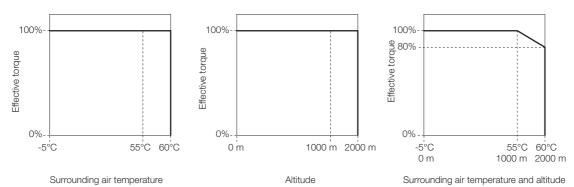
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

◆ SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F



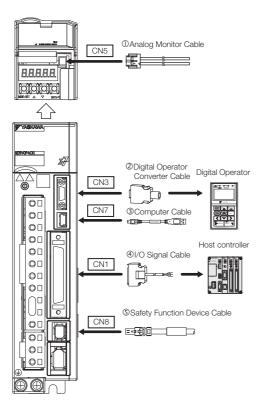
SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



 Σ -7S Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs

Selecting Cables

System Configurations



Selection Table

Important

1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
 - Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	N	ame	Length (L)	Order Number	Appearance			
0	Analog Moni	tor Cable	1 m	JZSP-CA01-E				
2	Digital Opera Cable	ator Converter	0.3 m	JZSP-CVS05-A3-E*1				
3	Computer Cable		2.5 m	JZSP-CVS06-02-E				
		Soldered Conn	ector Kit	JZSP-CSI9-1-E				
		Connector- Terminal Block Con- verter Unit (with cable)	0.5 m	JUSP-TA50PG-E				
			1 m	JUSP-TA50PG-1-E				
4	I/O Signal Cables		2 m	JUSP-TA50PG-2-E				
		Cable with Loose Wires	1 m	JZSP-CSI01-1-E				
		at One End (loose wires	2 m	JZSP-CSI01-2-E				
		on peripheral device end)	3 m	JZSP-CSI01-3-E				
		Cables with	1 m	JZSP-CVH03-01-E	L L			
	Safety Function	Connectors*2	3 m	JZSP-CVH03-03-E				
5	Device Cables	Connector Kit*3		Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug Con- nector Kit Model number: 2013595-1				

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

*2. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*3. Use the Connector Kit when you make cables yourself.

SERVOPACKs

Σ -7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs

	D7S	1st+2nd+3rd	A 4th digit	10 5th+6th	A 7th digit	0(8th+9t	n+10th 11th+12th	0 B +13th 14th
	ERVOP			digits git Voltage	digit	diç 8th+	Otherst Othersterit	ware Options
Voltage	Code	Specification	Code	Specificati	on	Cod	e Specification	Applicable Models
	R70*1 R90*1	0.05 kW 0.1 kW	A F	200 VAC 100 VAC		None	Without options	All models
Three-	1R6*1 2R8*1	0.2 kW 0.4 kW		th digits Interfa			Rack-mounted	SGD7S-R70A to -330A
phase,	3R8 5R5*1	0.5 kW 0.75 kW	Code			001		SGD7S-R70F to -2R8F
200 VAC	7R6	1.0 kW	10	MECHATROLINI communications			Duct-ventilated	SGD7S-470A
	120*2	1.5 kW		•				to -780A
	180	2.0 kW	7th dig	git Design Revisio	on Order	002		All models
	200* ³ 330	3.0 kW 5.0 kW	А			008	Single-phase, 200-VAC power supply input	SGD7S-120A
	470	6.0 kW						SGD7S-R70A
	550	7.5 kW					No dynamic brake	to -2R8A
	590	11 kW				020		SGD7S-R70F to -2R8F
	780	15 kW					External dynamic	SGD7S-3R8A
	R70	0.05 kW					brake resistor	to -780A
Single-	R90	0.1 kW						
phase, 100 VAC	2R1	0.2 kW				11th	+12th+13th digits FT	/EX Specification
100 1/10	2R8	0.4 kW				Code	e Specification	
						None		-
						000	None	
						14th	digit BTO Specificatio	
						Code	e Specification	
						None		
						В	BTO Specification	

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A10A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
- Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

N	lodel SGD7S	-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum App	licable Motor Ca	apacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous (Dutput Curren	it [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	aximum Output C	urrent [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz										
Circuit	Input Currer	nt [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	oly	200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz										
Control	Control Input Current [Arms]*		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k	VA]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
	Built-In Regenerative	Resistance $[\Omega]$	_	_	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	-	-	-	-	40	40	40	60	60	60	180
16313101	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category												

* This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Appli	cable Motor Capa	city [kW]	6.0	7.5	11	15
Continuous Out	put Current [Arms]]	46.9	54.7	58.6	78.0
Instantaneous N	Aaximum Output C	Current [Arms]	110	130	140	170
Main Cinquit	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms] ^{*1}	29	37	54	73
Cantual	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Control Input Current [Arms]*1			0.3	0.3	0.4	0.4
Power Supply C	Capacity [kVA] ^{*1}		10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	ower Loss [W]	21	21	28	28
Power Loss ^{*1}	External Regene Unit Power Loss		180 ^{*2}	180*3	350 ^{*3}	350 ^{*3}
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25 ^{*2}	3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}
External Regenerative	Regenerative Resistor Unit	Capacity [W]	880*2	1760*3	1760 ^{*3}	1760 ^{*3}
Resistor Unit	Minimum Allowa Resistance $[\Omega]$	ble External	5.8	2.9	2.9	2.9
Overvoltage Ca	tegory					

*1. This is the net value at the rated load.

*2. This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

*3. This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

SERVOPACKs Σ-7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs

♦ Single-phase, 200 VAC

	Model SGD7S-		R70A	R90A	1R6A	2R8A	5R5A	120A		
Maximum App	licable Motor Ca	pacity [kW]	0.05	0.1	0.2	0.4	0.75	1.5		
Continuous Ou	Continuous Output Current [Arms]			0.91	1.6	2.8	5.5	11.6		
Instantaneous	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9	28		
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz							
Main Circuit	Input Current [Arms]*	0.8	1.6	2.4	5.0	8.7	16		
Control	Power Supply		200	VAC to 24	0 VAC, -15	% to +10%	%, 50 Hz/6	0 Hz		
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.25		
Power Supply	Capacity [kVA]*		0.2	0.3	0.6	1.2	1.9	4.0		
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8		
	Control Circuit Power Loss [W]		12	12	12	12	14	16		
Power Loss*	•	Built-in Regenerative Resistor Power Loss [W]		_	-	-	8	16		
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8		
	Built-In	Resistance $[\Omega]$	-	-	-	-	40	12		
Regenerative Resistor	Regenerative Resistor	Capacity [W]	_	-	-	-	40	60		
NG212101	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	12		
Overvoltage C	ategory									

* This is the net value at the rated load.

◆ 270 VDC

	Model SGD7S-			1R6A	2R8A	3R8A	5R5A	7R6A	120A	
Maximum Applicable Motor Capacity [kW]			0.1	0.2	0.4	0.5	0.75	1.0	1.5	
Continuous Ou	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	
Instantaneous N	Aaximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0	
Main Circuit	Power Supply	270 VDC to 324 VDC, -15% to +10%								
	Input Current [Arms] ^{*1}	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11	
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%								
Control	Input Current [Arms] ^{*1}	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2	
Power Supply (Capacity [kVA]*1	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2	
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8	
Power Loss ^{*1}	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15	
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8	
Overvoltage Category					I					

*1. This is the net value at the rated load.

*2. The value is 0.25 Arms for the SGD7S-120A00A008.

	Model SGD7S-	180A	200A	330A	470A	550A	590A	780A		
Maximum Appl	2.0	3.0	5.0	6.0	7.5	11.0	15.0			
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0		
Instantaneous N	Aaximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170		
Main Circuit	Power Supply	270 VDC to 324 VDC, -15% to +10%								
	Input Current [Arms]*	14	20	34	36	48	68	92		
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%								
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4		
Power Supply	Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6		
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4		
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28		
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4		
Overvoltage Ca	itegory		•					·		

* This is the net value at the rated load.

	Model SGD7S-	R70F	R90F	2R1F	2R8F					
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4					
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8					
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3					
Main Circuit	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz								
	Input Current [Arms]*	1.5	2.5	5	10					
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz								
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38					
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4					
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2					
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12					
	Total Power Loss [W]	17.3	19.8	26.2	38.2					
Regenerative Resistor	Minimum Allowable External Resistance $[\Omega]$	40	40	40	40					
Overvoltage C	ategory	lii lii								

Single-phase, 100 VAC

* This is the net value at the rated load.

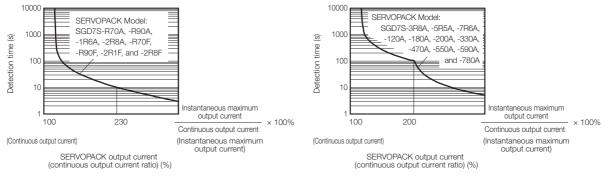
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

	Item			Specification				
Со	ntrol Method	IGBT-base	ed PWM control	, sine wave current drive				
ack	With Rotary Servomotor	Serial end	20 bits or 2	osolute encoder) 24 bits (incremental encoder/absolute encoder) osolute encoder)				
Feedback	With Linear Servomotor	absolute • Increme	e linear encoder. ntal linear encoc	(The signal resolution depends on the) der (The signal resolution depends on the der or Serial Converter Unit.)				
	Surrounding Air Temperature*1	Refer to t	ting, usage is po	ossible between 55°C and 60°C. tion for derating specifications. s (page 343)				
	Storage Temperature	-20°C to	85°C					
	Surrounding Air Humidity	95% relat	ive humidity max	k. (with no freezing or condensation)				
	Storage Humidity	95% relat	ive humidity max	k. (with no freezing or condensation)				
	Vibration Resistance	4.9 m/s ²						
S	Shock Resistance	19.6 m/s ²	<u>.</u>					
tion			1					
ipu		Class		SERVOPACK Model: SGD7S-				
tal Co	Degree of Protection	IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, R1F, 2R8F				
Environmental Conditions		IP10	120A10A008, 780A	180A, 200A, 330A, 470A, 550A, 590A,				
Enviro	Pollution Degree	Must be	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 					
	Altitude ^{*1}	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications.						
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity						
Ар	plicable Standards	UL 61800 EN 55011 EN 61800 EN 61800	-5-1 (E147823), group 1 class A, -3 (Category C2,	CSA C22.2 No.274, EN ISO13849-1: 2015, , EN 61000-6-2, EN 61000-6-4, . Second environment), EN 50178, -1, IEC 61508 series, IEC 62061, 1326-3-1				
		N	lounting	SERVOPACK Model: SGD7S-				
		Base-m	=	All Models				
Mc	bunting	Rack-m	ounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F				
		Duct-ve	ntilated	470A, 550A, 590A, 780A				
	Speed Control Range		t the rated torqu cause the Servo	e, the lower limit of the speed control range motor to stop.)				
Сe	.			ax. (for a load fluctuation of 0% to 100%)				
าลท	Coefficient of Speed			for a voltage fluctuation of $\pm 10\%$)				
orm	Fluctuation ^{*2}			. (for a temperature fluctuation of $25^{\circ}C \pm 25^{\circ}C$)				
Performance	Torque Control Precision (Repeatability)	±1%		(
	Soft Start Time Setting	0 s to 10	s (Can be set se	parately for acceleration and deceleration.)				
				Continued on next page.				

Continued on next page.

Continued from previous page.

			Item	Continued from previous page. Specification					
	[Phase A, phase B, phase C: Line-driver output					
	End	code	r Divided Pulse Output	Number of divided output pulses: Any setting is allowed.					
	Ove	erhe	at Protection Input	Number of input points: 1					
				Input voltage range: 0 V to +5 V					
	als			Allowable voltage range: 24 VDC ±20% Number of input points: 7					
	: Signals			Input method: Sink inputs or source inputs Input Signals					
	Sequence Input		ut Signals That Can Be ocated	 P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) and /N-CL (Reverse External Torque Limit) 					
	nence			 Torque Limit) signals /DEC (Origin Return Deceleration Switch) signal 					
	equ			/EXT1 to /EXT3 (External Latch Input 1 to 3) signals EXTD (Ferred Step Input) signal					
als	0)			 FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed. 					
I/O Signals		Fixe	ed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1					
0/				Output signal: Servo Alarm (ALM)					
	als			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3					
	Signa			(A photocoupler output (isolated) is used.)					
	Sequence Output Signals			Output Signals /COIN (Positioning Completion) signal 					
	Out	-		 /V-CMP (Speed Coincidence Detection) signal 					
	JCe		tput Signals That Can Be	/TGON (Rotation Detection) signal // //					
	luer			 /S-RDY (Servo Ready) signal /CLT (Torque Limit Detection) signal 					
	Sec			/VLT (Speed Limit Detection) signal					
				• /BK (Brake) signal					
				 /WARN (Warning) signal /NEAR (Near) signal 					
				A signal can be allocated and the positive and negative logic can be changed.					
	00	2	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)					
SI	RS-422A	(CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port					
nications	RS-422A Communications		Axis Address Setting	41 to 5F hex (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).					
Communi		0 D	Interface	Personal computer (with SigmaWin+)					
Corr	USB	(CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).					
Dis	splay		licators	CHARGE, PWR, and COM indicators, and one-digit seven-segment display					
_		Co	mmunications Protocol	MECHATROLINK-II					
-INK-I	ttions	Sta	tion Address Settings	41 to 5F hex (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).					
MECHATROLINK-II	Communications	Bai	ud Rate	10 Mbps, 4 Mbps A DIP switch (S3) is used to select the baud rate.					
HO	omr	Tra	nsmission Cycle	250 μs or 0.5 ms to 4.0 ms (multiples of 0.5 ms)					
ШМ	ŏ		mber of Transmission	17 or 32 bytes/station					
		Byt		A DIP switch (S3) is used to select the number of transmission bytes.					
ence	por	Per	formance	Position, speed, or torque control with MECHATROLINK-II communications					
Reference	Method	Ref	erence Input	MECHATROLINK-I or MECHATROLINK-II commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)					
			LINK-II Communica-	Rotary switch (S2) positions: 16					
tio	ns Se	tions Setting Switches		Number of DIP switch (S3) pins: 4					

Σ-7S M-II

Continued on next page.

SERVOPACKs

 Σ -7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs

Continued from previous page.

	Item	Specification					
Analog	Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)					
Dynam	c Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.					
Regene	erative Processing	Built-in (An external resistor must be connected to the SGD7S-470A to -780A.)					
Overtra	vel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal					
Protect	ive Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.					
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.					
ر su	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules					
Safety ⁻ unctions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).					
S Fur	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3					
Option	Module	Fully-Closed Modules and Safety Modules Note: You cannot use a Fully-Closed Module and a Safety Module together.					

*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable range cannot be increased by derating.

*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

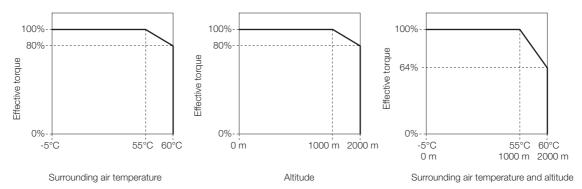
Coefficient of speed fluctuation = $\frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

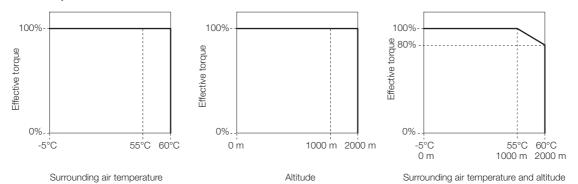
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F



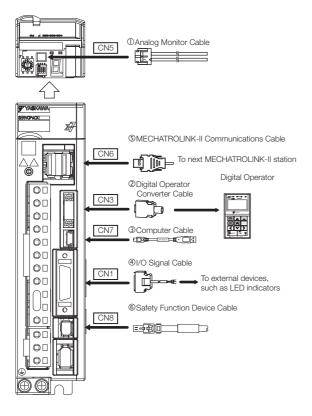
 SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



Σ-7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs

Selecting Cables

System Configurations



Selection Table

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1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
0	Analog Monitor Cable	1 m	JZSP-CA01-E	
2	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

Continued on next page.

SERVOPACKs

Code	N	ame	Length (L)	Order Number	Appearance
		Soldered Conn	ector Kit	JZSP-CSI9-2-E	(L)
		Connector-	0.5 m	JUSP-TA26P-E	
	I/O Signal Cables	Terminal Block Con- verter Unit (with cable)	1 m	JUSP-TA26P-1-E	
4			2 m	JUSP-TA26P-2-E	
		Cable with Loose Wires	1 m	JZSP-CSI02-1-E	
		at One End (loose wires	2 m	JZSP-CSI02-2-E	
		on peripheral device end)	3 m	JZSP-CSI02-3-E	
			0.5 m	JEPMC-W6002-A5-E	
		Cables with	1 m	JEPMC-W6002-01-E	
			3 m	JEPMC-W6002-03-E	
			5 m	JEPMC-W6002-05-E	
		Connectors	10 m	JEPMC-W6002-10-E	
		on Both Ends	20 m	JEPMC-W6002-20-E	
			30 m	JEPMC-W6002-30-E	
			40 m	JEPMC-W6002-40-E	
	MECHATRO LINK-II		50 m	JEPMC-W6002-50-E	
5	Communi-		0.5 m	JEPMC-W6003-A5-E	
٢	cations		1 m	JEPMC-W6003-01-E	
	Cables	Cables with	3 m	JEPMC-W6003-03-E	
		Connectors	5 m	JEPMC-W6003-05-E	
		on Both Ends	10 m	JEPMC-W6003-10-E	
		(with ferrite	20 m	JEPMC-W6003-20-E	
		cores)	30 m	JEPMC-W6003-30-E	
			40 m	JEPMC-W6003-40-E	
			50 m	JEPMC-W6003-50-E	
		Terminators	ļ	JEPMC-W6022-E	
		Cables with	1 m	JZSP-CVH03-01-E	L ,
	Safety	Connectors ^{*2}	3 m	JZSP-CVH03-03-E	
6	Function Device Cables	Connector Kit ^{*3}		Contact Tyco Electronic Product name: Industria nector Kit Model number: 201359	al Mini I/O D-shape Type 1 Plug Con-

Continued from previous page.

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

*2. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*3. Use the Connector Kit when you make cables yourself.

SERVOPACKs

Σ -7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs

Model Designations

lst+2nd	l+3rd dig	Maximum Applicable	e (the clic				are Options
Voltage	Code	Motor Capacity Specification	Code	Voltage Specification	Code		cation Applicable
	R70*1	0.05 kW		200 VAC		Specification	Models
	R90*1	0.1 kW	F	100 VAC	None	Without options	All models
	1R6*1	0.2 kW			000		
	2R8*1	0.4 kW	5th+6t	th digits Interface*4			SGD7S-R7 to -330A
Three-	3R8	0.5 kW	Code	Specification		Rack-mounted	SGD7S-B7
phase, 200	5R5*1	0.75 kW	Coue	MECHATROLINK-III	001		to -2R8F
VAC	7R6	1.0 kW	20	communications reference		Duct-ventilated	SGD7S-47
	120*2	1.5 kW	┨└───				to -780A
	180	2.0 kW	7th die	git Design Revision Order	002	Varnished	All models
	200*3	3.0 kW		Design Revision Order	008	Single-phase, 200-VAC	SGD7S-12
	330	5.0 kW	A		000	power supply input	50D75-12
	470	6.0 kW					SGD7S-R7
	550	7.5 kW				No dynamic brake	to -2R8A
	590	11 kW			020*	5	SGD7S-R7 to -2R8F
	780	15 kW				External dynamic	SGD7S-3R
	R70	0.05 kW				brake resistor	to -780A
Single-	R90	0.1 kW			11th+	12th+13th digits FT/	EX Specificati
phase, 100 VAC	2R1	0.2 kW					-
100 1/10	2R8	0.4 kW			Code	Specification	
			_		None	None	

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A20A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

B BTO Specification

*6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

N	lodel SGD7S	-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum App	licable Motor Ca	apacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous Output Current [Arms]			0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	aximum Output C	Current [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz										
Circuit	Input Current [Arms]*		0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz										
Control	Input Current [Arms]*		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	Power Supply Capacity [kVA]*			0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
	Built-In Regenerative	Resistance $[\Omega]$	_	_	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	-	-	_	_	40	40	40	60	60	60	180
100000	Minimum All External Res		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category												

* This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A			
Maximum Appli	cable Motor Capa	city [kW]	6.0	7.5	11	15			
Continuous Out	put Current [Arms]]	46.9	54.7	58.6	78.0			
Instantaneous N	Aaximum Output C	Current [Arms]	110	130	140	170			
Main Cinquit	Power Supply		200 VAC to	200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz					
Main Circuit	Input Current [A	rms] ^{*1}	29	37	54	73			
Cantual	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz			
Control	Input Current [A	rms] ^{*1}	0.3	0.3	0.4	0.4			
Power Supply C	Capacity [kVA] ^{*1}	10.7	14.6	21.7	29.6				
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4			
	Control Circuit F	ower Loss [W]	21	21	28	28			
Power Loss ^{*1}	External Regene Unit Power Loss		180 ^{*2}	180*3	350 ^{*3}	350 ^{*3}			
	Total Power Los	s [W]	292.7	347.9	393.3	529.4			
	External	Resistance $[\Omega]$	6.25 ^{*2}	3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}			
External Regenerative	Regenerative Resistor Unit	Capacity [W]	880*2	1760*3	1760 ^{*3}	1760 ^{*3}			
Resistor Unit	Minimum Allowa Resistance $[\Omega]$	ble External	5.8	2.9	2.9	2.9			
Overvoltage Ca	tegory								

*1. This is the net value at the rated load.

*2. This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

*3. This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

SERVOPACKs Σ-7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs

♦ Single-phase, 200 VAC

	Model SGD7S-		R70A	R90A	1R6A	2R8A	5R5A	120A		
Maximum App	licable Motor Ca	pacity [kW]	0.05	0.1	0.2	0.4	0.75	1.5		
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6		
Instantaneous	Instantaneous Maximum Output Current [Arms]			3.2	5.9	9.3	16.9	28		
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz							
Main Circuit	Input Current [Arms]*		0.8	1.6	2.4	5.0	8.7	16		
Control	Power Supply		200	VAC to 24	0 VAC, -15	5% to +109	%, 50 Hz/6	0 Hz		
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.25		
Power Supply	Power Supply Capacity [kVA]*			0.3	0.6	1.2	1.9	4.0		
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8		
	Control Circuit Power Loss [W]		12	12	12	12	14	16		
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	-	-	8	16		
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8		
	Built-In	Resistance $[\Omega]$	-	-	-	-	40	12		
Regenerative Resistor	Regenerative Resistor	Capacity [W]	_	-	_	_	40	60		
100000	Minimum Allowable External Resistance $[\Omega]$		40	40	40	40	40	12		
Overvoltage C	Overvoltage Category									

* This is the net value at the rated load.

◆ 270 VDC

	Model SGD7S-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Appl	Maximum Applicable Motor Capacity [kW]			0.2	0.4	0.5	0.75	1.0	1.5
Continuous Ou	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous N	Aaximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0
Main Circult	Power Supply		270 VDC to 324 VDC, -15% to +10%						
Main Circuit	Input Current [Arms] ^{*1}	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Cantral	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms] ^{*1}	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2
Power Supply (Capacity [kVA] ^{*1}	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8
Power Loss ^{*1}	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8
Overvoltage Ca				I					

*1. This is the net value at the rated load.

*2. The value is 0.25 Arms for the SGD7S-120A00A008.

	Model SGD7S-	180A	200A	330A	470A	550A	590A	780A
Maximum Appl	2.0	3.0	5.0	6.0	7.5	11.0	15.0	
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0
Instantaneous N	Aaximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170
Main Circuit	Power Supply	270 VDC to 324 VDC, -15% to +10%						
	Input Current [Arms]*	14	20	34	36	48	68	92
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%						
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4
Power Supply	Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4
Overvoltage Ca	Overvoltage Category							·

* This is the net value at the rated load.

	Model SGD7S-	R70F	R90F	2R1F	2R8F				
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4				
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8				
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3				
Main Circuit	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz							
Main Circuit	Input Current [Arms]*	1.5	2.5	5	10				
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz							
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38				
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4				
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2				
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12				
	Total Power Loss [W]	17.3	19.8	26.2	38.2				
Regenerative Resistor	Minimum Allowable External Resistance $[\Omega]$	40	40	40	40				
Overvoltage C	ategory								

Single-phase, 100 VAC

* This is the net value at the rated load.

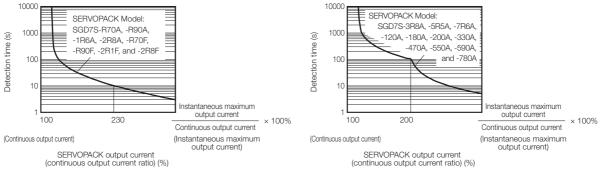
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

Item		Specification		
Drive Method		IGBT-based PWM control, sine wave current drive		
Feedback	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)		
	With Linear Servomotor	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 		
Environmental Conditions	Surrounding Air Temperature ^{*1}	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. <i>Derating Specifications</i> (page 353)		
	Storage Temperature	-20°C to 85°C		
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)		
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²		
	Shock Resistance	19.6 m/s ²		
	Degree of Protection	Class		SERVOPACK Model: SGD7S-
		IP20		1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,
		IP10		180A, 200A, 330A, 470A, 550A, 590A,
	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 		
	Altitude ^{*1}	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. <i>Derating Specifications</i> (page 353)		
	Others	Do not use the SERVOPACK in the following locations: Locations sub- ject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity		
Applicable Standards		UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1		
Mounting		N	lounting	SERVOPACK Model: SGD7S-
		Base-mo	ounted	All Models
		Rack-mo	ounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F
		Duct-ver	ntilated	470A, 550A, 590A, 780A
Performance	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
	Coefficient of Speed Fluctuation ^{*2}	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)		
		0% of rated speed max. (for a voltage fluctuation of ±10%)		
		$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C $\pm 25°$ C)		
	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		

Continued on next page.

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Term Department Phase A, phase B, phase C: Line driver output Phase A, phase B, phase C: Line driver output Incoder Divided Pulse Output Phase A, phase B, phase C: Line driver output Overheat Protection Input Number of divided output pulses: Any setting is allowed. Number of input points: 1 Input Signals Input Signals and Signals Input Signals That Can Be Allocated Allowable voltage range: 0 V to +5 V Allowable voltage range: 0 V to +5 V Allowable voltage range: 0 V to +5 V Input Signals -P.OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -P.OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signal -/P.CT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -/P.OT (Forward Drive Prohibit) signal -/P.CT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signal -/P.OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signal -/P.CT (Forward Structure) To -10 signal -/P.OT (Forward Drive Prohibit) signal -/P.CT (Forward Structure) points: 1 Output Signals -/P.CT (Forward Drive Prohibit) signal -/P.CT (Porced Structure) (solated) is used.) Output signal: Serve Alarm (ALM) Number of output points: 1 Output signal: Serve Alarm (ALM) Ou				ltom	Continued from previous page.
Elitodar Divided Polise Output Number of divided urbut pulses: Any setting is allowed. Overheat Protection Input Number of divided urbut points: 1 Input voltage range: 0 V to +5 V Input Signals That Can Be Allocated Allowable voltage range: 24 VDC ±20% Number of input points: 7 Input method. Sink inputs or source inputs Input Signals • P-OL (Forward Drive Prohibit) and N-OL (Reverse External Torque Limit) signals • P-OL (Forward Drive Prohibit) and N-OL (Reverse External Torque Limit) signals • //ECO (Origin Return Deceleration Switch) signal • //ECO (Origin Return Deceleration Switch) signal • //ECO (Origin Return Deceleration Switch) signal • //ECO (Origin Return Deceleration Switch) signal • //ECO (Origin Return Deceleration Switch) signal • //ECO (Origin Return Deceleration Switch) signal • //ECO (Origin Return Deceleration Switch) signal • //ECO (North Positioning Completion) signal • //ECO (North Positioning Completion) signal • //ECO (North Positioning Completion) signal • //EVE (Perved Output points: 3 • Allowable voltage range: 5 VDC to 30 VDC Number of urbut points: 3 • Allowable voltage range: 5 VDC to 30 VDC Number of urbut points: 3 • //EVE (Serve Ready signal • //EVE (Serve Ready signal • //EVE (Serve Ready signal • //EVE (Serve Ready signal				Item	Specification
Bits Eventeen Protection input Input voltage range: 0 Y to 45 V allowable voltage range: 24 VDC ±20% Number of input points: 7 Input Signals That Can Be Input method: Sink inputs or source inputs Input method: Sink inputs or source inputs Allocated -P-OT (Forward Drive Prohibit) and N-OT (Reverse External Torque Limit) signals -P-OT (Forward Drive Prohibit) signals -P-OT (Forward Drive Prohibit) signal -P-CD (Forward Drive Prohibit) signal -P-COIN (Possitioning Completion) signal -V/COIN (Possition Detection) signal -V/COIN (Possition Detection) signal -V/CI (Forward Drive Prohibit) Signal		End	code	r Divided Pulse Output	
group Allowable voltage range: 24 VDC ±20% Number of input points: 7 Input Signals input Signals That Can Be Allocated P-CI (Forward Drve Prohibit) and N-OT (Reverse Drive Prohibit) signals · /P-CL (Forward Drve Prohibit) and /N-CL (Reverse External Torque Limit) signals · /P-CL (Forward Drve Prohibit) and N-OT (Reverse Drive Prohibit) signals · /P-CL (Forward Drve Prohibit) and N-OT (Reverse Drive Prohibit) signals · /P-CL (Forward External Torque Limit) signal · /P-CL (Forward External Torque Limit Detection) signal · /P-CL (Forward External External Torque (WTR K)GMWI+) · /P-CL (Forward External External Torque Communications · /P-RP (P-R), CN, L1, and L2 Indicators, and one-digit seven-seg- ment display figure of Transmission Py		Ov	erhea	at Protection Input	
generation Number of input points: 7 Input Signals That Can Be Allocated -P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals -P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signal -P-EXT1 to /EXT3 (External Torque Limit) signals -P-EXT1 to /EXT3 (External Latch Input 1 to 3) signals -P-EXT1 to /EXT3 (External Latch Input 1 to 3) signals -P-EXT1 to /EXT3 (External Latch Input 1 to 3) signals -P-EXT1 to /EXT3 (External Carupt) prohits: -P-EXT1 to /EXT3 (External Carupt) prohits: -P-EXT1 to /EXT3 (External Carupt) prohits: -P-EXT1 to /EXT3 (External Carupt) -P-EXT4 (P-EXT3 (External Carupt) prohits: -P-EXT4 (P-EXT3 (External Carupt) prohits: -P-EXT4 (P-EXT3 (External Carupt) prohits: -P-EXT4 (P-EXT4 (P-EXT4 (P-EXT4)) -P-EXT4 (P-EXT4 (P-EXT4)) -P-EXT4 (P-EXT4 (P-EXT4)) -P-EXT4 (P-EXT4 (P-EXT4)) -P-EXT4 (P-EXT4 (P-EXT4)) -P-EXT4 (P-EXT4) (P-EXT4 (P-EXT4)) -P-EXT4 (P-EXT4) (P-EXT4) -P-EXT4 (P-EXT4) (P-EXT4) -P-EXT4) (P-EXT4) (P-EXT4) -P-EXT4 (P-EXT4) (P-EXT4) (P-EXT4) -P-EXT4) (P-EXT4) (P-EXT4) -P-EXT4) (P-EXT4) (P-EXT4) (P-EXT4) -P-EXT4) (P-EXT4) (P-EXT4) (P-EXT4) (P-EXT4) -P-EXT4) (P-EXT4) (P-EX					
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	Å	2	Pro	file	MECHATROLINK-III standard servo profile

Continued on next page.

Σ-7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs

Continued from previous page. Item Specification Rotary switch (S1 and S2) positions: 16 MECHATROLINK-III Communications Setting Switches Number of DIP switch (S3) pins: 4 Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Analog Monitor (CN5) Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ) Activated when a servo alarm or overtravel (OT) occurs, or when the Dynamic Brake (DB) power supply to the main circuit or servo is OFF. Built-in (An external resistor must be connected to the SGD7S-470A to **Regenerative Processing** -780A.) Built-In Regenerative Resistor (page 472) Stopping with dynamic brake, deceleration to a stop, or coasting to a Overtravel (OT) Prevention stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal **Protective Functions** Overcurrent, overvoltage, low voltage, overload, regeneration error, etc. Utility Functions Gain adjustment, alarm history, jogging, origin search, etc. Safety Functions Inputs /HWBB1 and /HWBB2: Base block signals for Power Modules EDM1: Monitors the status of built-in safety circuit (fixed output). Output ISO13849-1 PLe (Category 3), IEC61508 SIL3 Applicable Standards^{*3} Fully-Closed Modules and Safety Modules **Option Module** Note: You cannot use a Fully-Closed Module and a Safety Module together.

*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable range cannot be increased by derating.

*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

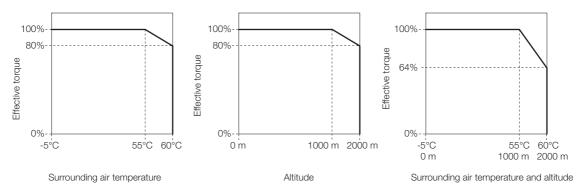
 $Coefficient of speed fluctuation = \frac{No-load motor speed - Total-load motor speed}{Rated motor speed} \times 100\%$

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

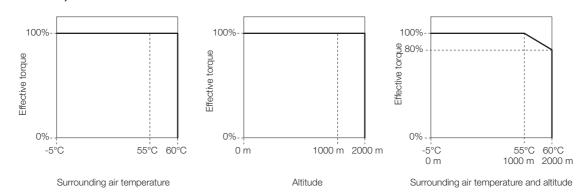
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F



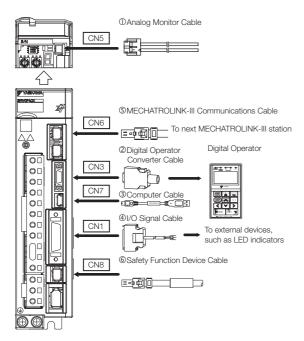
 SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



Σ-7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs

Selecting Cables

System Configurations



Selection Table

 \bigcirc

Important



2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
0	Analog Monitor Cable	1 m	JZSP-CA01-E	
0	Digital Operator Converter 0.3 m		JZSP-CVS05-A3-E ^{*1}	
U)	Cable	0.5 11	JZSP-CVS07-A3-E*2	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

Continued on next page.

SERVOPACKs

			Length	ngth Order Number						
Code	N	ame	(L)	Order Number	Appearance					
		Soldered Conn	ector Kit	JZSP-CSI9-2-E						
		Connector-	0.5 m	JUSP-TA26P-E						
		Terminal Block Con-	1 m	JUSP-TA26P-1-E						
4	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA26P-2-E						
		Cable with Loose Wires	1 m	JZSP-CSI02-1-E						
		at One End (loose wires	2 m	JZSP-CSI02-2-E						
		on peripheral device end)	3 m	JZSP-CSI02-3-E	ط <u>ـــــــــ</u> ه					
			0.2 m	JEPMC-W6012-A2-E						
			0.5 m	JEPMC-W6012-A5-E						
			1 m	JEPMC-W6012-01-E						
			2 m	JEPMC-W6012-02-E						
		Cables with	3 m	JEPMC-W6012-03-E						
		Connectors	4 m	JEPMC-W6012-04-E						
		on Both Ends	5 m	JEPMC-W6012-05-E						
		RO	10 m	JEPMC-W6012-10-E						
			20 m	JEPMC-W6012-20-E						
	MECHATRO		30 m	JEPMC-W6012-30-E						
	LINK-III		50 m	JEPMC-W6012-50-E						
(5)	Communi- cations	Cables with	10 m	JEPMC-W6013-10-E						
	Cables	Connectors	20 m	JEPMC-W6013-20-E						
	Cablec	on Both Ends	30 m	JEPMC-W6013-30-E						
		(with core)	50 m	JEPMC-W6013-50-E						
			0.5 m	JEPMC-W6014-A5-E						
			1 m	JEPMC-W6014-01-E						
		Cable with	3 m	JEPMC-W6014-03-E						
		Loose Wires	5 m	JEPMC-W6014-05-E	◄ →					
		at One End	10 m	JEPMC-W6014-10-E	=-\$••••••••••••••••••••••••••••••••••••					
			30 m	JEPMC-W6014-30-E						
			50 m	JEPMC-W6014-50-E						
		Cables with	1 m	JZSP-CVH03-01-E	, L ,					
	Safety Function	Connectors*3	3 m	JZSP-CVH03-03-E	E=@@@D3ℓ					
6	Device Cables	Connector Kit ^{*4}		Contact Tyco Electronic Product name: Industria nector Kit Model number: 201359	al Mini I/O D-shape Type 1 Plug Con-					

Continued from previous page.

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

*2. If you use a MECHATROLINK-III Communications Reference SERVOPACK, this Converter Cable is required to prevent the cable from disconnecting from the Digital Operator.

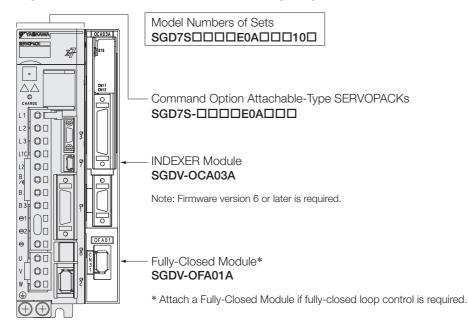
*3. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*4. Use the Connector Kit when you make cables yourself.

$\Sigma\textsc{-7S}$ Single-axis INDEXER Module-Mounted SERVOPACKs

Configuration

A Σ -7S Single-axis INDEXER Module-Mounted SERVOPACK is a Command Option Attachable-Type SERVOPACK with an INDEXER Module mounted on the side of the SERVOPACK. Positioning with single-axis control can be performed by using program table operation and other functions.



Purchase Order Number

Purchasing a Module in a Set with the SERVOPACK

To order SERVOPACKs with a INDEXER Module attached, use the following model numbers.

SG	D7S	*1 P	870	A	A EO	А	000	0 100	
Σ-7 Se Σ-7S S	ries SERVOPA		2nd+3rd ligits	4t dig	h git 5th+6th digits	7th digit	8th+9th+ digits		3th
1st+2nd	d+3rd dig	gits Maximum A Motor Capa		4th dig	it Voltage		8th+9t	h+10th digits Specif	are Options ication
Voltage	Code	Specification		Code	Specification	1	Code	Specification	Applicable Models
	R70*2	0.05 kW		A F	200 VAC 100 VAC		None	Without options	All models
	R90*2 1R6*2	0.1 kW 0.2 kW			100 VAC				SGD7S-R70A to -330A
	2R8*2	0.4 kW		5th+6t	h digits Interface		001	Rack-mounted	SGD7S-R70F
Three-	3R8 5R5*2	0.5 kW 0.75 kW		Code E0	Specification			Duct-ventilated	to -2R8F SGD7S-470A to -780A
phase, 200	7R6	1.0 kW		EU	Command Option Attac	snaple Type	002	Varnished	All models
VAC	120*3 180	1.5 kW 2.0 kW		7th dig	it) Design Revision Orde	r	008	Single-phase, 200-VAC power supply input	SGD7S-120A
-	200*4 330 470	3.0 kW 5.0 kW 6.0 kW		A			020*5	No dynamic brake	SGD7S-R70A to -2R8A SGD7S-R70F
	550	7.5 kW					020 5		to -2R8F
	590	11 kW						External dynamic brake resistor	SGD7S-3R8A to -780A
	780	15 kW					L		
Single-	R70	0.05 kW					11th+	12th+13th digits Op	tion Module
phase,	R90 2R1	0.1 kW 0.2 kW					Code	Specifica	tion
100 VAC_	2R8	0.2 KW 0.4 kW					100	INDEXER Module	
							101	INDEXER Module + Fully-Closed Module	9

*1. The model number of a SERVOPACK with an Option Module is not hyphenated after SGD7S.

- *2. You can use these models with either a single-phase or three-phase power supply input.
- *3. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).

*4. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.

*5. Refer to the following manual for details.

Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

Note: Contact your Yaskawa representative for information on combining options.

Σ-7S Single-axis INDEXER Module-Mounted SERVOPACKs

Purchasing a Module Separately

When ordering SERVOPACKs and Option Modules separately, use the following model numbers.

♦ SE	RVC	PACK							
SG [Σ-7 Sel Σ-7S S		1st+2nd+3rc	A 4th digit	EO 5th+6th digits	A 7th digit	8th+	01 9th+10t digits	digits	digit
1st+2n	d+3rd d	ligits Maximum Applicable Motor Capacity	e 4th di	git Voltage		8	8th+9th-	+10th digits Specifica	e Options ation
Voltage	Code	Specification	Code		ation		Code	Specification	Applicable Models
	R70*1	0.05 kW	A	200 VAC			None		IVIOUEIS
	R90*1 1R6*1	0.1 kW 0.2 kW	F_	100 VAC			000	Without options	All models
	2R8*1	0.4 kW	5th+6	Oth digits Inte	erface*4				SGD7S-R70A to -330A
	3R8 5R5*1	0.5 kW 0.75 kW	Code				001	Rack-mounted	SGD7S-R70F to -2R8F
Three-	7R6	1.0 kW	EO	Command Op Attachable Ty				Duct-ventilated	SGD7S-470A
phase,	120*2	1.5 kW							to -780A
200	180	2.0 kW	7th d	ligit Design Re	vision Orde	r	002	Varnished	All models
VAC	200*3	3.0 kW	А				800	Single-phase, 200-VAC	SGD7S-120A
	330	5.0 kW	-					power supply input	
	470	6.0 kW							SGD7S-R70A to -2R8A
	550	7.5 kW	-				020*5	No dynamic brake	SGD7S-R70F
	590	11 kW	-				020 5		to -2R8F
	780	15 kW	-					External dynamic	SGD7S-3R8A
Single-	R70	0.05 kW						brake resistor	to -780A
phase,	R90	0.1 kW				1	1th+12	th+13th digits FT/E	Specification
100 VAC	2R1	0.2 kW				Ì	Code	Creatification	1
	2R8	0.4 kW						Specification	-
							None 000	None	
						1	4th dig	it BTO Specification*	6
							Code	Specification	1
							None		1
								BTO Specification	1
1 You c	ran use	these models with ei	ther a sing	le-phase or t	hree-nha	se now		•	_

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
- Ω Σ-7-Series AC Servo Drive S-7S/S-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.



One Option Case Kit is required for each SERVOPACK. Option Case Kit model: SGDV-OZA01A

INDEXER Module

SGDV-OCA03A

Fully-Closed Module

SGDV-OFA01A

Ratings and Specifications

SERVOPACK Ratings

◆ Three-Phase, 200 VAC

N	lodel SGD7S	-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum Appl	Maximum Applicable Motor Capacity [kW]			0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous (Dutput Curren	t [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous N	laximum Output	Current [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Circuit	Input Curren	it [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Control	Input Curren	it [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k	VA]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regen Resistor Powe		_	_	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
	Built-In Resistance Regenerative [Ω]		_	_	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	-	-	-	_	40	40	40	60	60	60	180
I IGGIGIUI	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category												

* This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Appli	cable Motor Capa	city [kW]	6.0	7.5	11	15
Continuous Out	put Current [Arms]	46.9	54.7	58.6	78.0
Instantaneous N	Maximum Output C	Current [Arms]	110	130	140	170
Main Oinerit	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms] ^{*1}	29	37	54	73
Caratual	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms] ^{*1}	0.3	0.3	0.4	0.4
Power Supply C	Capacity [kVA]*1		10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	ower Loss [W]	21	21	28	28
Power Loss ^{*1}	External Regene Power Loss [W]	erative Resistor	180 ^{*2}	350 ^{*3}	350 ^{*3}	350 ^{*3}
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External Resistance [Ω]			3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}
Regenerative	Regenerative Resistor Capacity [W]			1760*3	1760*3	1760 ^{*3}
	Minimum Allowable External Resistance $[\Omega]$			2.9	2.9	2.9
Overvoltage Ca	tegory			I	ll	

*1. This is the net value at the rated load.

*2. This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

*3. This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

 Σ -7S Single-axis INDEXER Module-Mounted SERVOPACKs

	Model SGD7S-		R70A	R90A	1R6A	2R8A	5R5A	120A
Maximum App	Maximum Applicable Motor Capacity [kW]			0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous I	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9	28
Main Circuit	Power Supply		200	VAC to 24	0 VAC, -15	5% to +109	%, 50 Hz/6	0 Hz
Main Circuit	Input Current [Arms]*	0.8	1.6	2.4	5.0	8.7	16
Construct	Power Supply		200	VAC to 24	0 VAC, -15	5% to +109	%, 50 Hz/6	0 Hz
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.25
Power Supply	Capacity [kVA]*		0.2	0.3	0.6	1.2	1.9	4.0
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8
	Control Circuit Power Loss [W]		12	12	12	12	14	16
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		-	_	_	_	8	16
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8
Built-In Resistance [Ω]			_	-	-	-	40	12
Regenerative	Regenerative Resistor Capacity [W]			-	-	-	40	60
NESISIOI	Minimum Allowable External Resistance $[\Omega]$			40	40	40	40	12
Overvoltage Ca	ategory					ll		

♦ Single-phase, 200 VAC

* This is the net value at the rated load.

◆ 270 VDC

	Model SGD7S-			1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Appl	cable Motor Capacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5
Continuous Ou	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous N	Aaximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0
Main Circuit	Power Supply		270	OVDC to	5 324 VI	DC, -15	% to +1	0%	
Main Circuit	Input Current [Arms] ^{*1}	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Constral	Power Supply		270	OVDC to	5 324 VI	DC, -15	% to +1	0%	
Control	Input Current [Arms] ^{*1}	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2
Power Supply (Capacity [kVA]*1	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2
	Main Circuit Power Loss [W]		5.9	9.8	17.5	23.0	30.7	38.7	55.8
Power Loss ^{*1}	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8
Overvoltage Category					I				

*1. This is the net value at the rated load.

*2. The value is 0.25 Arms for the SGD7S-120A00A008.

	Model SGD7S-	180A	200A	330A	470A	550A	590A	780A
Maximum Appl	icable Motor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0
Instantaneous N	Maximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170
Main Circuit	Power Supply		270 \	/DC to 32	24 VDC,	-15% to -	+10%	
Main Circuit	Input Current [Arms]*	14	20	34	36	48	68	92
Control	Power Supply		270 \	/DC to 32	24 VDC,	-15% to -	+10%	
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4
Power Supply	Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6
Main Circuit Power Loss [W]		82.7	83.5	146.2	211.6	255.3	243.6	343.4
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4
Overvoltage Ca						•		

* This is the net value at the rated load.

	Model SGD7S-	R70F	R90F	2R1F	2R8F			
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4			
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8			
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3			
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	5% to +10%, 50) Hz/60 Hz			
	Input Current [Arms]*	1.5	2.5	5	10			
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz						
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38			
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4			
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2			
Power Loss*	Power Loss* Control Circuit Power Loss [W]		12	12	12			
Total Power Loss [W]		17.3	19.8	26.2	38.2			
Regenerative Resistor	Minimum Allowable External Resistance $[\Omega]$	40	40	40	40			
Overvoltage C	ategory			II	•			

Single-phase, 100 VAC

* This is the net value at the rated load.

INDEXER Module Power Loss

The power supply for an INDEXER Module is supplied from the control power supply of the SERVO-PACK. The power loss is given in the following table.

Item	Specification
Power Supply Method	5.05 VDC
Maximum Operating Voltage	5.25 VDC
Maximum Operating Current	500 mA
Maximum Power Loss	2.6 W

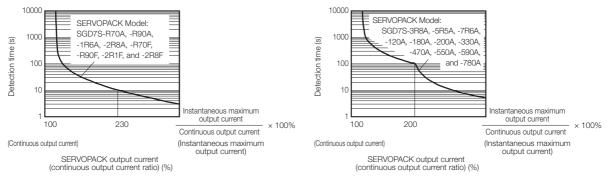
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

The specifications when the INDEXER Module is combined with a Command Option Attachable-Type SERVOPACK are given in the following table.

	Item			Specification					
Со	ntrol Method	IGBT-base	d PWM control	, sine wave current drive					
ack	With Rotary Servomotor	Serial enco	20 bits or	bsolute encoder) 24 bits (incremental encoder/absolute encoder) bsolute encoder)					
Feedback	With Linear Servomotor	lute linea • Increment	ar encoder.) ntal linear enco	r (The signal resolution depends on the abso- der (The signal resolution depends on the der or Serial Converter Unit.)					
	Surrounding Air Temperature	0°C to 55°	O.						
	Storage Temperature	-20°C to 8	5°C						
	Surrounding Air Humidity	90% relative humidity max. (with no freezing or condensation)							
	Storage Humidity	90% relativ	e humidity max	x. (with no freezing or condensation)					
	Vibration Resistance	4.9 m/s ²							
SU	Shock Resistance	19.6 m/s ²							
nditio		Class		SERVOPACK Model: SGD7S-					
Environmental Conditions	Degree of Protection	IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 2R1F, 2R8F					
nemr		IP10	120AE0A008 780A	, 180A, 200A, 330A, 470A, 550A, 590A,					
Enviro	Pollution Degree	Must be		r flammable gases. o water, oil, or chemicals. or iron dust.					
	Altitude	1,000 m m	iax.						
	Others	to static el	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity						
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1							
		M	ounting	SERVOPACK Model: SGD7S-					
		Base-mo	-	All Models					
Мс	punting	Rack-mo		R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F					
		Duct-ven	tilated	470A, 550A, 590A, 780A					
	Speed Control Range	must not o	cause the Serve	ue, the lower limit of the speed control range comotor to stop.)					
nce	Coefficient of Speed			ax. (for a load fluctuation of 0% to 100%)					
rma	Fluctuation ^{*1}			for a voltage fluctuation of $\pm 10\%$					
Performance	Torque Control Precision (Repeatability)	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°±1%							
	Soft Start Time Setting	0 s to 10 s	(Can be set se	eparately for acceleration and deceleration.)					
Signals	Encoder Divided Pulse Output	Phase A, p		C: Line-driver output Number of divided					
I/O Sig	Overheat Protection Input		f input points: 1 ige range: 0 V t						

Continued from previous page.

		ltem	Specification						
			Allowable voltage range: 24 VDC ±20% Number of input points: 6						
	SERVOPACK		Input method: Sink inputs or source Input Signals: • Alarm Reset (/ALM-RST) • Forward Drive Prohibited (P-OT) • Reverse Drive Prohibited (N-OT) • Origin Return Deceleration Switch • Registration (/RGRT) • Servo ON (/S-ON) A signal can be allocated and the positi	(/DEC)					
S			Allowable voltage range: 24 VDC ±2 Number of input points: 11	20%					
Jnal			/MODE 0/1 (Mode Switch Input) sign	nal					
Sic			Mode 0	Mode 1					
I/O Signals Sequence Input Signals	INDEXER Module	Fixed Input	 /START-STOP (Program Table Operation Start-Stop Input) signal /PGMRES (Program Table Opera- tion Reset Input) signal /SEL0 (Program Step Selection Input 0) signal /SEL1 (Program Step Selection Input 1) signal /SEL2 (Program Step Selection Input 2) signal /SEL3 (Program Step Selection Input 3) signal /SEL4 (Program Step Selection Input 4) signal /SEL5 (Program Step Selection Input 4) signal /SEL5 (Program Step Selection Input 5) signal /SEL6 (Program Step Selection Input 6) signal /SEL7 (Program Step Selection Input 7) signal 	 /HOME (Origin Return Input) signal /JOGP (Forward Jog Input) signal /JOGN (Reverse Jog Input) signal /JOG0 (Jog Speed Table Selection Input 0) signal /JOG1 (Jog Speed Table Selection Input 1) signal /JOG2 (Jog Speed Table Selection Input 2) signal /JOG3 (Jog Speed Table Selection Input 3) signal 					
		Fixed Output	Allowable voltage range: 5 VDC to 3 Number of output points: 1 Output signal: Servo Alarm (/ALM)						
out Signals	SERVOPACK	Output Signals for Which Allocations Can Be Changed	Allowable voltage range: 5 VDC to 3 Number of output points: 3 (A photocoupler output (isolated) is Output Signals: • Warning Output (/WARN) • Brake Output (/BK) • Servo Ready Output (/S-RDY) • Alarm Code Output (/ALO1, /ALO2	used.) 2, and /ALO3)					
Sequence Output Signals	INDEXER Module	Fixed Output	A signal can be allocated and the posit Allowable voltage range: 5 VDC to 3 Number of output points: 9 Output Signals: • Positioning Completion Output (/IN • Programmable Output 0 (/POUT0) • Programmable Output 1 (/POUT1) • Programmable Output 2 (/POUT2) • Programmable Output 3 (/POUT3) • Programmable Output 4 (/POUT4) • Programmable Output 5 (/POUT5) • Programmable Output 6 (/POUT6) • Programmable Output 7 (/POUT7)	NPOSITION)					

Continued on next page.

SERVOPACKs Σ-7S Single-axis INDEXER Module-Mounted SERVOPACKs

Continued from previous page.

		Item	Specification				
	RS-422A Communications (CN3)	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with Sig- maWin+)				
suo	RS-422A mmunicatio (CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port				
icati	Comn	Axis Address Setting	Set with parameters.				
unu		Interfaces	Interface Personal computer (with SigmaWin+)				
Communications	USB Communications (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).				
~ 0	SERVO)PACK	CHARGE and PWR indicators, and one-digit seven-segment display				
Displays/ Indicators	INDEX	ER Module	Refer to the following manual for details. $\square \Sigma$ -7-Series AC Servo Drive Σ -7S SERVOPACK Command Option Attach- able Type with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)				
spc		m Table Method	 Program table positioning in which steps are executed sequentially by commands given through contact input or serial communications Positioning in which station numbers are specified by commands given through contact input or serial communications 				
etho		ax. Number of Steps	256				
Ž		ax. Number of Tables	256				
atinç	Ma	ax. Number of Stations	256				
Operating Methods	Serial (Metho	Communications d	Serial command by 1-channel ASCII code Communications specifications: RS-422/485 (50 m max.) Connection topology: Multi-drop connection (16 axes max.) Baud rate: 9600, 19200, 38400 bps				
	Other I	unctions	Registration (positioning by external signals), origin return				
Ana	alog Mo	nitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)				
Dyr	namic B	rake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.				
Re	generati	ve Processing	Built-in (An external resistor must be connected to the SGD7S-470A to - 780A.) Refer to the following section for details. <i>Built-In Regenerative Resistor</i> (page 472)				
Ove	ertravel	(OT) Prevention	Stopping with a dynamic brake (DB), coasting to a stop, performing a hard stop, or performing a smooth stop (decelerating to a stop) for a CCW-OT (CCW Drive Prohibit Input) signal or CW-OT (CW Drive Prohibit Input) signal.				
-		Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.				
Util	lity Func		Gain adjustment, alarm history, jogging, origin search, etc.				
Ę	ູຊ Inp	outs	/HWBB1 and /HWBB2: Base block signals for Power Modules				
Safety	Functions NO 10	ıtput	EDM1: Monitors the status of built-in safety circuit (fixed output).				
	д Ар	plicable Standards ^{*2}	ISO13849-1 PLe (Category 3), IEC61508 SIL3				
Ap	plicable	Option Modules	Fully-Closed Module Note: You cannot use a Safety Module if you are using an INDEXER Module.				

*1. The coefficient of speed fluctuation for load fluctuation is defined as follows: Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed × 100% Rated motor speed

*2. Always perform risk assessment for the system and confirm that the safety requirements are met.

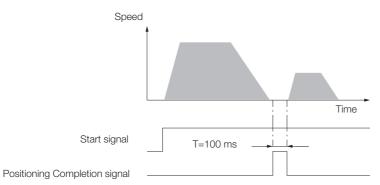
Reference Methods

The INDEXER Module has two reference methods: digital I/O and serial commands. These command methods are described in the following sections.

Digital I/O is used with a program table (mode 0) or a jog speed table (mode 1). You can use a program table (mode 0) to execute the program steps that you select with I/O signal patterns (binary format). If the jog speed table (mode 1) is being used, the jog speed selected with the input signal pattern (binary format) can be executed.

Program Table

	PGMSTEP	POS	SPD	RDST	RSPD	ACC*	DEC*	EVENT	LOOP	NEXT
	/ 0	I+400000	2000	500000	1000	200	100	T5000	1	1
	1	I+100000	1000	200000	2000	100	50	IT0	1	END
	:	÷	:		:			÷		:
256 steps <	n	I+400000	2000	500000	1000	100	50	IT100	1	n+1
sieps /	n+1	I+100000	1000	200000	2000			NT0	1	END
	÷	:	÷	:	÷	-	÷	÷	÷	÷
	254	I+400000	2000	500000	1000	100	50	SEL3T200	1	127
	\ 255	I+100000	1000	200000	2000	100	50	DT0	1	END



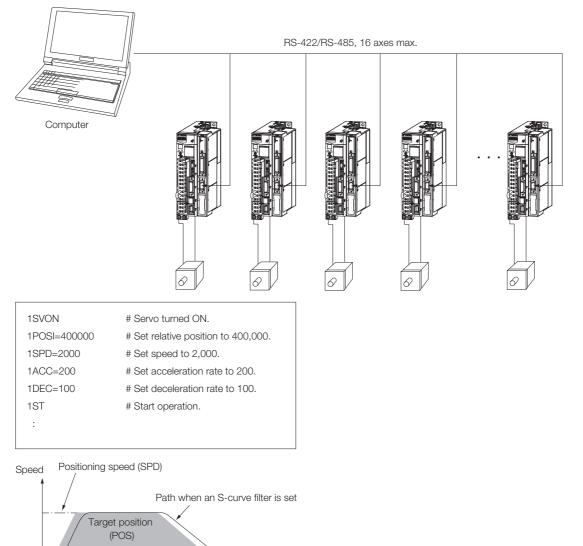
SERVOPACKs Σ-7S Single-axis INDEXER Module-Mounted SERVOPACKs

• Jog Speed Table

	JSPD	JOG3	JOG2	JOG1	JOG0	Jog Speed
	0	0	0	0	0	1000
	1	0	0	0	1	2000
	2	0	0	1	0	4000
16 <	:	:	:	:	:	÷
combi- nations	:	:	:	:	:	÷
	:	:	:	:	:	÷
	15 Note: 1: Signal	1	1	1	1	5500
Speed	J JSPD1 JSPD0	JSPD7 JSPD6 SPD2	SPD5	SPD12	PD14 JSPD10 JSPD1	1 SPD9 JSPD8 JSPD8
/JOGN*2						
/JOG0						
/JOG1						
/JOG2						
/JOG3						

*1. Forward operation at the jog speed is performed while the /JOGP signal is ON. *2. Reverse operation at the jog speed is performed while the /JOGN signal is ON.

With serial commands, ASCII command strings are sent to the INDEXER Module through RS-422 or RS-485 communications and these commands are interpreted and executed immediately. You can use general-purpose serial communications (RS422/RS485) to perform independent control of up to 16 axes from one host controller (e.g., PC or HMI).



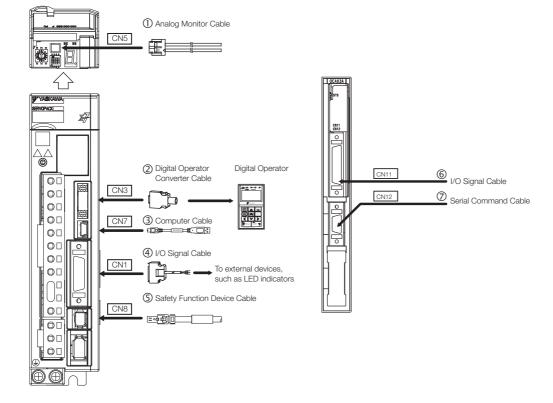
Time

Acceleration rate (ACC) Deceleration rate (DEC)

Σ-7S Single-axis INDEXER Module-Mounted SERVOPACKs

Selecting Cables

- System Configurations
- Σ-7S Single-axis Command Option Attachable-Type SERVOPACKs
- Command Option Module: INDEXER Module



Selection Table

 \odot

Important

1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

Cable dimensional drawings and cable connection specifications

Order numbers and specifications of individual connectors for cables

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance		
0	Analog Monitor Cable	1 m	JZSP-CA01-E			
0	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1			
3	Computer Cable	2.5 m	JZSP-CVS06-02-E			

Continued on next page.

$\Sigma\text{-}7S$ Single-axis INDEXER Module-Mounted SERVOPACKs

					Continued norn previous page.
Code	Ν	ame	Length (L)	Order Number	Appearance
		Soldered Conn	ector Kit	JZSP-CSI9-2-E	
		Connector-	0.5 m	JUSP-TA26P-E	
		Terminal Block Con-	1 m	JUSP-TA26P-1-E	
4	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA26P-2-E	
		Cable with Loose Wires	1 m	JZSP-CSI02-1-E	
		at One End (loose wires	2 m	JZSP-CSI02-2-E	
		on peripheral device end)		JZSP-CSI02-3-E	
	Safety Function Device Cables	Cables with	1 m	JZSP-CVH03-01-E	L .
		Connectors ^{*2}	3 m	JZSP-CVH03-03-E	ੑ ॾ ॒ ∰ <u>।</u> 3१
\$		Connector Kit*	3	Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug nector Kit Model number: 2013595-1	
		Connector Kit		DP9420007-E	
		Cables with	1 m	JZSP-CVI01-1-E	
	I/O Signal	Loose Wires	2 m	JZSP-CVI01-2-E	
6	Cables	at One End	3 m	JZSP-CVI01-3-E	
		Cables with	0.5 m	JUSP-TA36V-E	
		Terminal Block on One	1 m	JUSP-TA36V-1-E	
		End	2 m	JUSP-TA36V-2-E	
Ø	Serial Com- mand Cable		3	JZSP-CHI9-1	Contact Yaskawa Controls Co., Ltd. for the cable.

Continued from previous page.

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

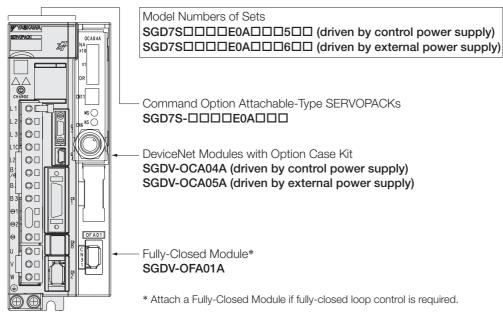
*2. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*3. Use the Connector Kit when you make cables yourself.

Σ-7S Single-axis DeviceNet Module-Mounted SERVOPACKs

Configuration

A Σ -7S Single-axis DeviceNet Module-Mounted SERVOPACK is a Command Option Attachable-Type SERVOPACK with a DeviceNet Module mounted on the side of the SERVOPACK. Positioning and origin returns can be performed by sending commands from the host controller (DeviceNet master).



+Fully-Closed Module

Purchase Order Number

Purchasing a Module in a Set with the SERVOPACK

To order SERVOPACKs with a DeviceNet Module attached, use the following model numbers.

SG	D7S eries		R70 -2nd+3rd	4t dig	th 5th+6th	A 7th digit	00 8th+9th-		3th
Σ-7S \$	SERVOP	ACKs	digits	Ċ	git digits	digit	digit	S Ulgito	
1st+2n	d+3rd dię	gits Maximum Motor Cap		4th digi	it Voltage		8th+9t	h+10th digits Specif	are Options ication
Voltage	Code	Specification		Code	Specificati	on	Code	Specification	Applicable Models
	R70*2	0.05 kW		A	200 VAC		None	Without options	All models
	R90*2	0.1 kW		F	100 VAC		None		SGD7S-R70A
	1R6*2	0.2 kW	-					Rack-mounted	to -330A
	2R8*2	0.4 kW	-				001	Index mounted	SGD7S-R70F
	3R8	0.5 kW		5th+6t	h digits Interface				to -2R8F
Three-	5R5*2	0.75 kW		Code	Specificati	on		Duct-ventilated	SGD7S-470A to -780A
phase,	7R6	1.0 kW	-	E0	Command Option At		002	Varnished	All models
200 VAC	120*3	1.5 kW		EU	Command Option At	lachable Type		Single-phase,	
	180	2.0 kW	-		_		008	200-VAC power supply input	SGD7S-120A
	200*4	3.0 kW	-	7th dig	it Design Revision Or	der			SGD7S-R70A
	330	5.0 kW		А				No dynamic brake	to -2R8A
	470	6.0 kW					020*5	NO UYHAITIIC DIAKE	SGD7S-R70F
	550	7.5 kW						External dynamic	to -2R8F SGD7S-3R8A
	590	11 kW						brake resistor	to -780A
	780	15 kW							
Single-	R70	0.05 kW					(11th+)	12th+13th digits Op	tion Module
phase,	R90	0.1 kW					Code	Specifica	tion
100	2R1	0.2 kW					500	DeviceNet Module	
VAC	2R8	0.4 kW					000	driven by control po	wer supply
. <u></u> ,		·	-				501	DeviceNet Module driven by control pow +Fully-Closed Module	
							600	DeviceNet Module driven by external po	ower supply
							601	DeviceNet Module driven by external po	wer supply

- *1. The model number of a SERVOPACK with an Option Module is not hyphenated after SGD7S.
- *2. You can use these models with either a single-phase or three-phase power supply input.
- *3. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *4. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *5. Refer to the following manual for details.
 - □ *Σ*-7-Series AC Servo Drive *Σ*-7S/*Σ*-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- Note: Contact your Yaskawa representative for information on combining options.

The DeviceNet Module is equipped with an Option Case Kit. (Option Case Kits do not need to be ordered separately.)

Σ-7S Single-axis DeviceNet Module-Mounted SERVOPACKs

Purchasing a Module Separately

When ordering SERVOPACKs and Option Modules separately, use the following model numbers.

SGI	D7S	6 - <u>R</u> 70) A	EO	А	0	01	000	В
Σ-7 Se Σ-7S S	ries ERVOP		digit	5th+6th digits	7th digit		9th+10t ligits	digits	h 14th digit e Options
1st+2n	d+3rd d	igits Maximum Applic Motor Capacity	able 4th di	git Voltage		8	th+9th∙	+10th digits Specifica	ation
Voltage	Code	Specification	Code	s Specific	ation		Code	Specification	Applicable Models
	R70*1	0.05 kW	A	200 VAC			None		WICCEIS
	R90*1	0.1 kW	F	100 VAC			000	Without options	All models
	1R6*1	0.2 kW					000		SGD7S-R70
	2R8*1	0.4 kW	5th+6	6th digits Inte	erface*4			Rack-mounted	to -330A
	3R8	0.5 kW	Code	Specific	ation		001		SGD7S-R70
	5R5*1	0.75 kW		Command O					to -2R8F
Three-	7R6	1.0 kW	EO	Attachable Ty	;		Duct-ventilated	SGD7S-470, to -780A	
phase,	120*2	1.5 kW				002	Varnished	All models	
200 VAC	180	2.0 kW	7th d	igit Design Re	vision Orde	r	002	Single-phase,	
1/10	200*3	3.0 kW	A					200-VAC	SGD7S-120A
	330	5.0 kW						power supply input	0000000000
	470	6.0 kW							SGD7S-R70 to -2R8A
	550	7.5 kW				020*5	5 No dynamic brake	SGD7S-R70	
	590	11 kW					020		to -2R8F
	780	15 kW						External dynamic brake resistor	SGD7S-3R8. to -780A
Cincela	R70	0.05 kW				l		DIARE TESISIOI	10-700A
Single- phase,	R90	0.1 kW				1	1th+12	2th+13th digits FT/E	K Specification
100 VAC	2R1	0.2 kW				ſ	Code	Specification	
	2R8	0.4 kW				ľ	None		1
						ľ	000	None	
						1	4th dig	it BTO Specification*	6
						ſ	Code	Specification	
						Γ	None	None	
						Ī	В	BTO Specification	

- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.
- DeviceNet Modules

SGDV-OCA04A (driven by control power supply) SGDV-OCA05A (driven by external power supply)



The DeviceNet Module is equipped with an Option Case Kit. (Option Case Kits do not need to be ordered separately.)

Fully-Closed Module

SGDV-OFA01A

Ratings and Specifications

SERVOPACK Ratings

◆ Three-Phase, 200 VAC

N	lodel SGD7S	-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum App	Maximum Applicable Motor Capacity [kW]				0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous C	Dutput Curren	t [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	laximum Output	Current [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Circuit	Input Curren	t [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	·
Control	Input Curren	t [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k\	/A]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		-	-	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
	Built-In Regenerative	Resistance $[\Omega]$	_	_	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	-	-	_	_	40	40	40	60	60	60	180
NUSISIUI	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage (Category												

* This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Appli	cable Motor Capa	city [kW]	6.0	7.5	11	15
Continuous Out	put Current [Arms]		46.9	54.7	58.6	78.0
Instantaneous N	Aaximum Output C	Current [Arms]	110	130	140	170
Main Circuit	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
	Input Current [A	rms] ^{*1}	29	37	54	73
Cantual	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms] ^{*1}	0.3	0.3	0.4	0.4
Power Supply C	Capacity [kVA]*1		10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	ower Loss [W]	21	21	28	28
Power Loss ^{*1}	External Regene Power Loss [W]	rative Resistor	180 ^{*2}	350 ^{*3}	350 ^{*3}	350 ^{*3}
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25 ^{*2}	3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}
Regenerative Resistor	Regenerative Resistor	Capacity [W]	880 ^{*2}	1760 ^{*3}	1760 ^{*3}	1760 ^{*3}
	Minimum Allowa Resistance $[\Omega]$	ble External	5.8	2.9	2.9	2.9
Overvoltage Ca	tegory			I	II	

*1. This is the net value at the rated load.

*2. This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

*3. This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

SERVOPACKs Σ-7S Single-axis DeviceNet Module-Mounted SERVOPACKs

♦ Single-phase, 200 VAC

	Model SGD7S-		R70A	R90A	1R6A	2R8A	5R5A	120A
Maximum App	licable Motor Ca	pacity [kW]	0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous	Instantaneous Maximum Output Current [Arms]				5.9	9.3	16.9	28
Main Circuit	Power Supply		200	VAC to 24	0 VAC, -15	5% to +10%	%, 50 Hz/6	i0 Hz
Main Circuit	Input Current [Arms]*	0.8	1.6	2.4	5.0	8.7	16
Control	Power Supply		200	VAC to 24	0 VAC, -15	5% to +10%	%, 50 Hz/6	i0 Hz
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.25
Power Supply	Capacity [kVA]*		0.2	0.3	0.6	1.2	1.9	4.0
	Main Circuit Po	5.0	7.1	12.1	23.7	39.2	71.8	
	Control Circuit	12	12	12	12	14	16	
Power Loss*	Built-in Regene Resistor Powe		_	_	_	_	8	16
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	_	_	_	-	40	12
Regenerative	Regenerative Resistor	Capacity [W]	_	-	-	-	40	60
Resistor		Minimum Allowable External Resistance [Ω]			40	40	40	12
Overvoltage C	ategory					II		•

* This is the net value at the rated load.

◆ 270 VDC

Model SGD7S-		R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Appl	cable Motor Capacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5
Continuous Ou	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous N	Aaximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0
Main Circuit	Power Supply		270	OVDC to	5 324 VI	DC, -15	% to +1	0%	
Main Circuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Power Supply			270 VDC to 324 VDC, -15% to +10%						
Control	Input Current [Arms] ^{*1}	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2^{*2}
Power Supply (Capacity [kVA] ^{*1}	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8
Power Loss ^{*1}	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8
Overvoltage Ca	Itegory				I				

*1. This is the net value at the rated load.

*2. The value is 0.25 Arms for the SGD7S-120A00A008.

Model SGD7S-		180A	200A	330A	470A	550A	590A	780A
Maximum Appl	licable Motor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0
Continuous Ou	Itput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0
Instantaneous N	Maximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170
Power Supply			270 \	/DC to 32	24 VDC,	-15% to -	+10%	
Main Circuit	Input Current [Arms]*	14	20	34	36	48	68	92
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%						
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4
Power Supply	Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4
Overvoltage Ca	ategory						·	

* This is the net value at the rated load.

	Model SGD7S-	R70F	R90F	2R1F	2R8F	
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4	
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8	
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3	
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	5% to +10%, 50	Hz/60 Hz	
Main Circuit	Input Current [Arms]*	1.5	2.5	5	10	
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz				
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38	
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4	
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2	
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12	
	Total Power Loss [W]	17.3	19.8	26.2	38.2	
Regenerative Resistor	Minimum Allowable External Resistance $[\Omega]$	40	40	40	40	
Overvoltage C	ategory			II	•	

◆ Single-phase, 100 VAC

* This is the net value at the rated load.

DeviceNet Module Ratings

The power supply method and power loss of a DeviceNet Module depend on the model of the DeviceNet Module.

SGDV-OCA04A (Interface: Driven by Control Power Supply)

The specifications of the SGDV-OCA04A DeviceNet Module are given in the following table.

Item	Specification				
item	DeviceNet Communications Section	Control Section			
Power Supply Method	Supplied from the DeviceNet communications cable.	Supplied from the control power supply of a Command Option Attachable-Type SERVOPACK.			
Minimum Operating Voltage	11 VDC				
Maximum Operating Voltage	25 VDC	Included in the current consumption of the Command Option Attachable-Type			
Maximum Operating Current	25 mA	SERVOPACK.			
Maximum Power Loss	625 mW				

SGDV-OCA05A (Interface: Driven by External Power Supply)

The specifications of the SGDV-OCA05A DeviceNet Module are given in the following table.

ltem	Specification				
nem	DeviceNet Communications Section	Control Section			
Power Supply Method	Supplied from the DeviceNet communications cable.				
Minimum Operating Voltage	11 VDC				
Maximum Operating Voltage	25 VDC				
Maximum Operating	100 mA for 24-VDC power supply				
Current	200 mA for 11-VDC power supply				
Maximum Power Loss	2.4	W			

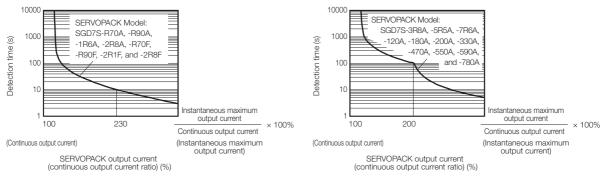
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

The specifications when the DeviceNet Module is combined with a Command Option Attachable-Type SERVOPACK are given in the following table.

	Item	Specification				
Со	ntrol Method	IGBT-based PWM control, sine wave current drive				
ack	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)				
Feedback	With Linear Servomotor	lute linea Increme	ar encoder.) ntal linear encoc	(The signal resolution depends on the abso- ler (The signal resolution depends on the ler or Serial Converter Unit.)		
	Surrounding Air Temperature	0°C to 55	°C			
	Storage Temperature	-20°C to 8	35°C			
	Surrounding Air Humidity	90% relativ	ve humidity max	. (with no freezing or condensation)		
	Storage Humidity	90% relativ	ve humidity max	. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²				
SU	Shock Resistance	19.6 m/s ²				
litio		Class		SERVOPACK Model: SGD7S-		
ono		Class				
ital C	Degree of Protection	IP20	R70F, R90F, 2			
Environmental Conditions		IP10	120AE0A008, 780A	180A, 200A, 330A, 470A, 550A, 590A,		
Enviro	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 				
	Altitude	1,000 m max.				
	Others	Do not use the SERVOPACK in the following locations: Locations su ject to static electricity noise, strong electromagnetic/magnetic field radioactivity				
Ар	olicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1				
		N	lounting	SERVOPACK Model: SGD7S-		
		Base-m	-	All Models		
Мо	unting	Rack-m	ounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F		
		Duct-ve	ntilated	470A, 550A, 590A, 780A		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)				
Сe				ax. (for a load fluctuation of 0% to 100%)		
nan	Coefficient of Speed			or a voltage fluctuation of $\pm 10\%$)		
Performance	Fluctuation ^{*1}	$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of $\pm 10.0\%$) $\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of $25^{\circ}C \pm 25^{\circ}C$)				
Per	Torque Control Precision (Repeatability)	±1%	·			
	Soft Start Time Setting	0 s to 10 s	s (Can be set sei	parately for acceleration and deceleration.)		
Signals	Encoder Divided Pulse Output	Phase A,	phase B, phase	C: Line-driver output pulses: Any setting is allowed.		
I/O Sigı	Overheat Protection Input	Number o	f input points: 1	· · · · · · · · · · · · · · · · · · ·		
¥		Input volta	age range: 0 V to	0 +5 V		

Continued on next page.

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		Item	Specification			
			Allowable voltage range: 24 VDC ±20%			
Signals	Sequence Input Signals	Fixed Input	Number of input points: 4 Input method: Sink inputs or source inputs Input Signals • CCW-OT (CCW Drive Prohibit Input) signal • CW-OT (CW Drive Prohibit Input) signal • /HOME (Origin Signal Input) signal • EXSTOP (External Stop Input) Signal Positive or negative logic can be changed in the parameters.			
0/1	Sequence Output Signals Sequence Output		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 4 Output Signals • ALM (Servo Alarm Output) signal • /WARN (Warning Signal Output) signal • /BK (Brake) signal • /S-RDY (Servo Ready Output) signal			
subject Subject Interfaces Digital Operator (JUSP-OP05A-1-E) Interface Personal computer (with SigmaWin+) Interface Communications Communications Conforms to USB2.0 standard (12 Mbps).		Digital Operator (JUSP-OP05A-1-E)				
mun	tions (Interface	Personal computer (with SigmaWin+)			
Com	USB Communications (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).			
∑°S	SERVO	PACK	CHARGE and PWR indicators, and one-digit seven-segment display			
Displays/ Indicators	DeviceNet Module		Refer to the following manual for details. ∴ 5-7-Series AC Servo Drive ∑-7S SERVOPACK Command Option Attachable Type with DeviceNet Module Product Manual (Manual No.: SIEP \$800001 70)			
	pc	Operation Specifications	Positioning via DeviceNet communications.			
	Reference Method	Reference Inputs	DeviceNet communications Commands: Movement references (positioning or speed) and origin returns			
	Position Control Functions	Acceleration/Decel- eration Methods	Linear, asymmetrical, exponential, and S-curve acceleration/deceleration			
spo	Position Control -unctions	Operating Methods	Simple positioning, origin returns, continuous operation, and switching to positioning			
ethc		Fully-Closed Loop Control	Supported.			
Operating Methods	Built-in Functions	Position Data Latching	Position data can be latched on phase C, the origin signal, or an external signal.			
Dperat	suc	Communications Methods	DeviceNet I/O communications and explicit messages			
U	DeviceNet Communications	Topology	Multidrop or T-branching ^{*2}			
	vice	Baud Rate	125 kbps, 250 kbps, or 500 kbps (Set on rotary switch (DR).)			
	De	Cables	Special cables (OMRON DCA1-5CN02F1 Cable with Connectors or the equivalent.)			
	ö	Maximum Number of Nodes Node Address Setting	64 nodes (including the master, Maximum number of slaves: 63)			
Ana	Analog Monitor (CN5)		0 to 63 (Set on NA x10 and x1 rotary switches.) Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)			
Dyr	namic Bra	ake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the			
		e Processing	power supply to the main circuit or servo is OFF. Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) Refer to the following section for details. <i>Built-In Regenerative Resistor</i> (page 472)			
			Continued on next name			

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Item		Specification		
Overtravel (OT) Prevention		Stopping with a dynamic brake (DB), coasting to a stop, performing a hard stop, or smooth stop (decelerating to a stop) for a CCW-OT (CCW Drive Prohibit Input) signal or CW-OT (CW Drive Prohibit Input) signal.		
Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.		
y ons	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety Functions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).		
Fur	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3		
Applicable Option Modules		Fully-Closed Module Note: You cannot use a Safety Module if you are using a DeviceNet Module.		

*1. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed} - \text{Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

*2. Externally connected terminating resistance is required.

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

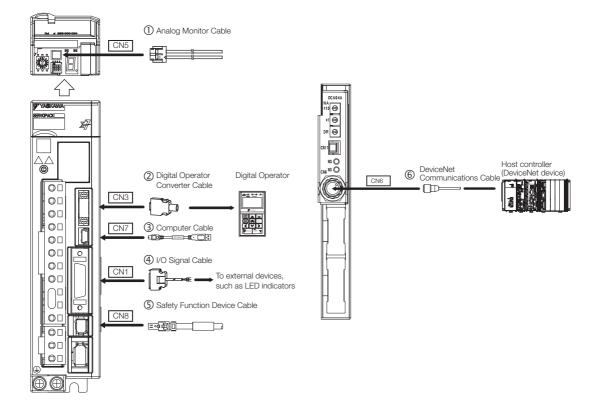
The following table gives the specifications of the DeviceNet Module.

	Item	Specification			
item		SGDV-OCA04A	SGDV-OCA05A		
Mounting Location		Mounted to the side of a Command Option Attachable-Type SER- VOPACK.			
Power Supply Method	Control Section	Supplied from the control power supply of a Command Option Attachable-Type SERVOPACK.	Supplied from the DeviceNet communications cable.		
Metriod	DeviceNet Communi- cations Section	Supplied from the DeviceNet communications cable.			
Current	Control Section	Included in the current consump- tion of the Command Option Attachable-Type SERVOPACK.	For 24-VDC power supply: 100 mA max., for 11-VDC power		
Consumption	DeviceNet Communi- cations Section	25 mA max.	supply: 200 mA max.		

Σ-7S Single-axis DeviceNet Module-Mounted SERVOPACKs

Selecting Cables

- System Configurations
- Σ-7S Single-axis Command Option Attachable-Type SERVOPACKs
- Command Option Module: DeviceNet Module



Selection Table



1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
 - Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Ν	ame	Length (L)	Order Number	Appearance	
0	Analog Monitor Cable		1 m	JZSP-CA01-E		
0	Digital Operator Converter Cable		0.3 m	JZSP-CVS05-A3-E*1		
3	Computer Ca	able	2.5 m	JZSP-CVS06-02-E		
		Soldered Conne		JZSP-CSI9-2-E		
		Connector-	0.5 m	JUSP-TA26P-E		
			1 m	JUSP-TA26P-1-E		
4	I/O Signal Cables		2 m	JUSP-TA26P-2-E		
			1 m	JZSP-CSI02-1-E		
			2 m	JZSP-CSI02-2-E		
			3 m	JZSP-CSI02-3-E		
		Cables with	1 m	JZSP-CVH03-01-E		
	Safety Function	Connectors*2	3 m	JZSP-CVH03-03-E	=∞∰ <u>0</u> 3€	
© Device Cables		e		Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug Con- nector Kit Model number: 2013595-1		
6	DeviceNet Communications Cable			The communications cable must be an ODVA-Compliant DeviceNet communications cable. We recommend the fol- lowing Cable. OMRON DCA1-5CN02F1 Cable with Connectors or the equivalent.		

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

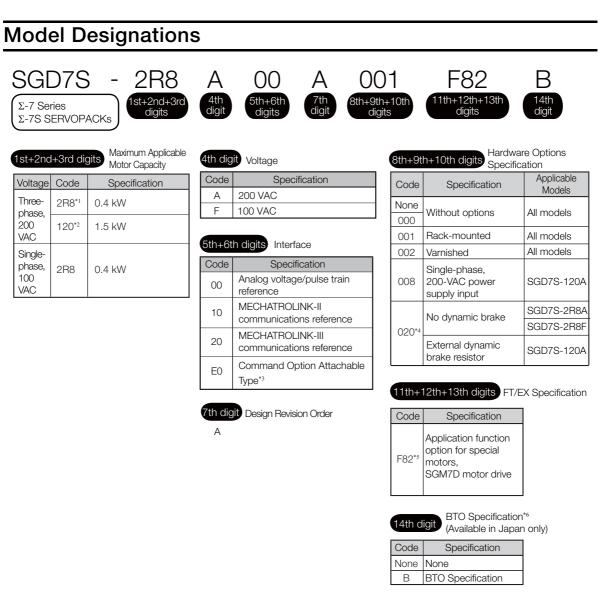
*2. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*3. Use the Connector Kit when you make cables yourself.

Σ-7S DeviceNet

SERVOPACKs

Σ-7S Single-axis FT82 SERVOPACKs SGM7D Motor Drive



- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A□0A008).
- *3. This interface is supported only by an INDEXER Module (model: SGDV-OCA03A).
- *4. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *5. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for SGM7D Motor Product Manual (Manual No.: SIEP S800001 91)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-Phase, 200 VAC

	Model SGD75	2R8A	120A	
Maximum App	licable Motor Capacity	0.4	1.5	
Continuous Ou	utput Current [Arms]		2.8	11.6
Instantaneous	Maximum Output Curre	ent [Arms]	9.3	28
Main Circuit Power Supply		200 VAC to 240 VAC, -15% to +10 50 Hz/60 Hz		
	Input Current [Arms]*		2.5	7.3
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		0.2	0.2
Power Supply	Capacity [kVA]*	1.0	3.2	
	Main Circuit Power Lo	ss [W]	22.5	72.6
Power Loss*	Control Circuit Power	Loss [W]	12	15
Fower Loss.	Built-in Regenerative F	Resistor Power Loss [W]	-	10
	Total Power Loss [W]		34.5	97.6
Decenerative	Built-In Regenerative	Resistance $[\Omega]$	-	20
Regenerative Resistor	Resistor	Capacity [W]	-	60
	Minimum Allowable Ex	α (ternal Resistance [Ω]	40	20
Overvoltage C	ategory			ll

* This is the net value at the rated load.

♦ Single-Phase, 200 VAC

	Model SGD7S	2R8A	120A	
Maximum App	licable Motor Capacity [0.4	1.5	
Continuous Ou	utput Current [Arms]		2.8	11.6
Instantaneous	Maximum Output Curre	nt [Arms]	9.3	28
Main Circuit				AC, -15% to +10%, /60 Hz
	Input Current [Arms]*		5.0	16
Control Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz		
	Input Current [Arms]*		0.2	0.25
Power Supply	Capacity [kVA]*	1.2	4.0	
	Main Circuit Power Lo	ss [W]	23.7	71.8
Power Loss*	Control Circuit Power Loss [W]		12	16
Fower Loss.	Built-in Regenerative Resistor Power Loss [W]		_	16
	Total Power Loss [W]		35.7	103.8
Demonstri	Built-In Regenerative	Resistance [Ω]	_	12
Regenerative Resistor	Resistor	Capacity [W]	_	60
100000	Minimum Allowable Ex	ternal Resistance [Ω]	40	12
Overvoltage Ca	ategory		I	II

* This is the net value at the rated load.

Σ-7S Single-axis FT82 SERVOPACKs SGM7D Motor Drive

◆ Single-phase, 100 VAC

	Model SGD7S-	2R8F
Maximum App	licable Motor Capacity [kW]	0.4
Continuous O	utput Current [Arms]	2.8
Instantaneous	Maximum Output Current [Arms]	9.3
Main Circuit	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
	Input Current [Arms]*	10
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
	Input Current [Arms]*	0.38
Power Supply	Capacity [kVA]*	1.4
	Main Circuit Power Loss [W]	26.2
Power Loss*	Control Circuit Power Loss [W]	12
	Total Power Loss [W]	38.2
$\begin{array}{c c} \mbox{Regenerative} \\ \mbox{Resistor} \end{array} & \mbox{Minimum Allowable External Resistance } [\Omega] \end{array}$		40
Overvoltage C	ategory	III

* This is the net value at the rated load.

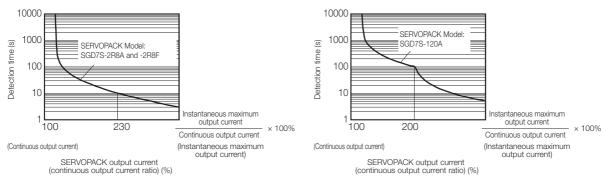
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

◆ FT82 SERVOPACKs with Analog Voltage/Pulse Train References

Item		Specification		
Control Method		IGBT-based PWM control, sine wave current drive		
Feedback		Serial encoder: 24 bits (incremental encoder/absolute encoder)		
	Surrounding Air Temperature*1	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. <i>Derating Specifications</i> (page 397)		
	Storage Temperature	-20°C to	85°C	
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)		
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²		
SUC	Shock Resistance	19.6 m/s ²		
ditic		Degree	SERVOPACK Models	
Environmental Conditions	Degree of Protection	Degree IP20	SGD7S-2R8A, -120A (three-phase, 200-VAC input), and -2R8F	
nen		IP10	SGD7S-120A00A008 (single-phase, 200-VAC input)	
Env	Pollution Degree Altitude ^{*1}	 Must b Must b 1,000 m With dera Refer to 7 <i>General Dera</i> 	ating, usage is possible between 1,000 m and 2,000 m. the following section for derating specifications. <i>ting Specifications</i> (page 397)	
	Others		se the SERVOPACK in the following locations: Locations sub- atic electricity noise, strong electromagnetic/magnetic fields, ctivity	
Applicable Standards		EN 5501 EN 6180 EN 6180	D-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, 1 group 1 class A, EN 61000-6-2, EN 61000-6-4, D-3 (Category C2, Second environment), EN 50178, D-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IO-5-2, and IEC 61326-3-1	
Мс	punting	Base-mounted or rack-mounted		
Performance	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
	Coefficient of Speed	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)		
	Fluctuation ^{*2}	0% of rated speed max. (for a load fluctuation of ±10%)		
		$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C $\pm 25^{\circ}\text{C}$)		
	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10	s (Can be set separately for acceleration and deceleration.)	

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Item			ltem	Specification
	_			Phase A, phase B, phase C: Line-driver output
	En	Encoder Divided Pulse Output		Number of divided output pulses: Any setting is allowed.
I/O Signals		Fixed Input		Allowable voltage range: 5 VDC ±5% Number of input points: 1 SEN (Absolute Data Request) signal
				Allowable voltage range: 24 VDC ±20% Number of input points: 7
	Sequence Input Signals		out Signals That Can Be ocated	 Input method: Sink inputs or source inputs Input Signals /S-ON (Servo ON) signal /P-CON (Proportional Control) Signal P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals /ALM-RST (Alarm Reset) signal /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals /SPD-D (Motor Direction) signal /SPD-A and /SPD-B (Internal Set Speed Selection) signals /C-SEL (Control Selection) signal /ZCLAMP (Zero Clamping) signal /INHIBIT (Reference Pulse Inhibit) signal /P-DET (Polarity Detection) signal /PSEL (Gain Selection) signal /SEN (Absolute Data Request) signal A signal can be allocated and the positive and negative logic can be changed.
		Fixed Output		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: ALM (Servo Alarm) signal
	Sequence Output Signals	Output Signals That Can Be Allocated		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (isolated) is used for three of the outputs.) (An open-collector output (non-isolated) is used for the other three outputs.) Output Signals • /COIN (Positioning Completion) Signal • /V-CMP (Speed Coincidence Detection) Signal • /TGON (Rotation Detection) Signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) Signal • /VLT (Speed Limit Detection) Signal • /WLT (Speed Limit Detection) Signal • /WARN (Warning) Signal • /WARN (Warning) Signal • /PSELA (Reference Pulse Input Multiplication Switching Output) signal • ALO1, ALO2, and ALO3 (Alarm Code) signals A signal can be allocated and the positive and negative logic can be changed.
	4	<u>0</u>	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)
õ	RS-422A	(CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port
Communications	RS-422A		Axis Address Setting	Set with parameters.
Immi	000	٥ ٥	Interface	Personal computer (with SigmaWin+)
Com	USB Communications (CN7)		Communications Standard	Conforms to USB2.0 standard (12 Mbps).
	Displays/Indicators			CHARGE indicator and five-digit seven-segment display
Pa	Panel Operator			Four push switches

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Item				tem	Specification		
Analog Monitor (CN5)					Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)		
Dyi	nami	ic Br	ake	(DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Re	gene	erativ	re Pr	rocessing	Built-in		
			,	Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal		
				tions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Uti	lity F	unct		i	Gain adjustment, alarm history, jogging, origin search, etc.		
≥	SUC	-	uts		/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety	Functions	Output			EDM1: Monitors the status of built-in safety circuit (fixed output).		
S	Fur	Applicable Standards ^{*3}			ISO13849-1 PLe (Category 3) and IEC61508 SIL3		
Ap	plica	able (Opti	on Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.		
		So	t Sta	art Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
	0	Signal	Reference Voltage		 Maximum input voltage: ±12 V (forward motor rotation for positive reference). 6 VDC at rated speed (default setting). Input gain setting can be changed. 		
	onti	rt (Inp	out Impedance	Approx. 14 kΩ		
	Ŭ	Input	Cir	cuit Time Constant	30 µs		
	Speed Control	et Itol	Rot	ation Direction Selection	With Proportional Control signal		
		Internal Set Speed Control	Speed Selection		With Forward/Reverse External Torque Limit signals (speed 1 to 3 selection). Servomotor stops or another control method is used when both signals are OFF.		
		Feedforward Compensation Output Signal Positioning Completed Width Setting		vard Compensation	0% to 100%		
				Signal Positioning	0 to 1,073,741,824 reference units		
ntrols	_			Reference Pulse Form	One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential		
Co	ntro		ses	Input Form	Line driver or open collector		
	Position Control	Input Signals	Reference pulses	Maximum Input Frequency	 Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps 		
			Input Multiplica- tion Switching		1 to 100 times		
			Cle	ear Signal	Position deviation clear Line driver or open collector		
	Forque Control	Reference Voltage		_	 Maximum input voltage: ±12 V (forward torque output for positive reference). 3 VDC at rated torque (default setting). Input gain setting can be changed. 		
	Torque	Input Impedance Circuit Time Constant			Approx. 14 kΩ 16 μs		

*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

◆ FT82 SERVOPACK with MECHATROLINK-II Communications References

Item		Specification		
Со	ntrol Method	IGBT-based PWM control, sine wave current drive		
Fe	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)		
	Surrounding Air Temperature*1	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. <i>□</i> Derating Specifications (page 397)		
	Storage Temperature	-20°C to 85°C		
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)		
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²		
SUC	Shock Resistance	19.6 m/s ²		
nditio		Degree SERVOPACK Models		
tal Cc	Degree of Protection	IP20 SGD7S-2R8A, -120A (three-phase, 200-VAC input), and -2R8F		
nemr		IP10 SGD7S-120A10A008 (single-phase, 200-VAC input)		
Environmental Conditions	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 		
	Altitude ^{*1}	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. <i>Derating Specifications</i> (page 397)		
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity		
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1		
Mc	punting	Base-mounted or rack-mounted		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
ė		±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)		
anc	Coefficient of Speed	0% of rated speed max. (for a voltage fluctuation of ±10%)		
Performance	Fluctuation ^{*2}	$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C ± 25 °C)		
Ре	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
		Continued on payt page		

Σ-7S Single-axis FT82 SERVOPACKs SGM7D Motor Drive

Continued from previous page.

_				Continued from previous page.		
	1		Item	Specification		
	End	code	r Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.		
				Allowable voltage range: 24 VDC ±20%		
	S			Number of input points: 7		
	gnal			Input method: Sink inputs or source inputs		
	Sig			Input Signals		
	put	Inp	ut Signals That Can Be	 /DEC (Origin Return Deceleration Switch) signal 		
	e In		ocated	/EXT1 to /EXT3 (External Latch Input 1 to 3) signals D OT (Converse Drive Drahibit) signals		
	Sequence Input Signals			 P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals /P-CL (Forward External Torque Limit) and /N-CL (Reverse External 		
	anpe			Torque Limit) signals		
	Se			 /P-DET (Polarity Detection) signal 		
(0)				A signal can be allocated and the positive and negative logic can be changed.		
nals			ad Output	Allowable voltage range: 5 VDC to 30 VDC		
I/O Signals		Fixed Output		Number of output points: 1 Output signal: ALM (Servo Alarm) signal		
0/1				Allowable voltage range: 5 VDC to 30 VDC		
	als			Number of output points: 3		
	Sigr			(A photocoupler output (isolated) is used.)		
	ut 9			Output Signals		
	utp	Output Signals That Can		 /COIN (Positioning Completion) signal /V-CMP (Speed Coincidence Detection) signal 		
	C O			 /TGON (Rotation Detection) signal 		
	Sequence Output Signals	Be	Be Allocated	 /S-RDY (Servo Ready) signal 		
				/CLT (Torque Limit Detection) signal		
	Ň			 /VLT (Speed Limit Detection) signal /BK (Brake) signal 		
				/WARN (Warning) signal		
				/NEAR (Near) signal		
				A signal can be allocated and the positive and negative logic can be changed.		
				Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)		
SL	RS-422A	(CN3)	1:N Communications	Up to $N = 15$ stations possible for RS-422A port		
mmunications	RS-422A Communications	0	Axis Address Setting	Set with parameters.		
nica	Č	3	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
nmi	000	2	Interface	Personal computer (with SigmaWin+)		
Corr	USB Communications	(CN7)	Communications			
0	Ú	0	Standard	Conforms to USB2.0 standard (12 Mbps).		
	Č	3				
Dis	splay		licators	CHARGE, PWR, and COM indicators, and one-digit seven-segment display		
=		Coi	mmunications Protocol	MECHATROLINK-II		
- Y	ons	Sta	tion Address Settings	41 to 5F hex (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).		
OLII	cati			10 Mbps, 4 Mbps		
MECHATROLINK-II	Communications	Βαι	ud Rate	A DIP switch (S3) is used to select the baud rate.		
HC	mm	Tra	nsmission Cycle	250 μs or 0.5 ms to 4.0 ms (multiples of 0.5 ms)		
MEC	°0		mber of Transmission	17 or 32 bytes/station		
		Byt	es	A DIP switch (S3) is used to select the number of transmission bytes.		
СG	q	Per	formance	Position, speed, or torque control with MECHATROLINK-II communica-		
iren	Method					
Reference	Me	Ref	erence Input	MECHATROLINK-I or MECHATROLINK-II commands (sequence,		
				motion, data setting, data access, monitoring, adjustment, etc.)		
			LINK-II tions Setting Switches	Rotary switch (S2) positions: 16		
-00	Communications Setting Switches		anona Certing Gwitches	Number of DIP switch (S3) pins: 4		

Continued from previous page.

	Item	Specification		
Analog	Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)		
Dynam	ic Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Regene	erative Processing	Built-in		
Overtra	avel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal		
Protect	ive Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.		
	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety ⁻ unctions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).		
Fur	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3		
Applica	able Option Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.		

*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

◆ FT82 SERVOPACK with MECHATROLINK-III Communications References

Item		Specification		
Dri	ive Method	IGBT-based PWM control, sine wave current drive		
Fe	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)		
	Surrounding Air Temperature ^{*1}	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications.		
	Storage Temperature	-20°C to 85°C		
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)		
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²		
ns	Shock Resistance	19.6 m/s ²		
Environmental Conditions	Degree of Protection	Degree SERVOPACK Models IP20 SGD7S-2R8A, -120A (three-phase, 200-VAC input), and -2R8F		
nmente		IP10 SGD7S-120A20A008 (single-phase, 200-VAC input)		
Enviro	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 		
	Altitude ^{*1}	 1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. <i>Derating Specifications</i> (page 397) 		
	Others	Do not use the SERVOPACK in the following locations: Locations sub- ject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity		
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1		
Mo	punting	Base-mounted or rack-mounted		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
Performance	Coefficient of Speed Fluctuation ^{*2}	 ±0.01% of rated speed max. (for a load fluctuation of 0% to 100%) 0% of rated speed max. (for a load fluctuation of ±10%) ±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C) 		
Ре	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		

SERVOPACKs Σ-7S Single-axis FT82 SERVOPACKs SGM7D Motor Drive

Continued from previous page.

	Item			Specification		
	End	code	r Divided Pulse Output	Phase A, phase B, phase C: Line-driver output		
		Joue		Number of divided output pulses: Any setting is allowed.		
				Allowable voltage range: 24 VDC ±20% Number of input points: 7		
	nals	Input Signals That Can Be				
	Sigı			Input method: Sink inputs or source inputs Input Signals		
	out			/DEC (Origin Return Deceleration Switch) signal		
	Sequence Input Signals		cated	/EXT1 to /EXT3 (External Latch Input 1 to 3) signals		
	en ce	Allocated		 P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals /P-CL (Forward External Torque Limit) and /N-CL (Reverse External 		
	aup			Torque Limit) signals		
	Se			 /P-DET (Polarity Detection) signal 		
(0)				A signal can be allocated and the positive and negative logic can be changed.		
I/O Signals		Eiv	ad Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1		
Sig		Fixed Output		Output signal: ALM (Servo Alarm) signal		
0/1				Allowable voltage range: 5 VDC to 30 VDC		
	nals			Number of output points: 3		
	Sigr	Output Signals That Can Be Allocated		(A photocoupler output (isolated) is used.)		
	out			Output Signals /COIN (Positioning Completion) signal 		
	Dut			· /V-CMP (Speed Coincidence Detection) signal		
	ce (/TGON (Rotation Detection) signal 		
	nen			/S-RDY (Servo Ready) signal /CLT (Targue Limit Detection) signal		
	Sequence Output Signals			 /CLT (Torque Limit Detection) signal /VLT (Speed Limit Detection) signal 		
	0,			 /K (Brake) signal 		
				/WARN (Warning) signal /NFAD (Mass) signal		
				 /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed. 		
	é			Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)		
S	22A Catio	сано 3)	1:N Communications	Up to N = 15 stations possible for RS-422A port		
tion	RS-422A	(CN3)				
nica	L L	3	Axis Address Setting	Set with parameters.		
Communications	USB RS-422A		Interface	Personal computer (with SigmaWin+)		
Con	JSB	(CN7)	Communications	Conforma to LICRO O standard (10 Minna)		
Ũ			Standard	Conforms to USB2.0 standard (12 Mbps).		
				CHARGE, PWR, CN, L1, and L2 indicators, and one-digit seven-seg-		
Dis	splay	s/inc	licators	ment display		
=		Со	mmunications Protocol	MECHATROLINK-III		
Ξ	suc	Sta	tion Address Settings	03 to EF hex (maximum number of slaves: 62)		
OLIN	catio		ud Rate	The rotary switches (S1 and S2) are used to set the station address. 100 Mbps		
TRO D	unio	Bai	ud Rale	125 μs, 250 μs, 500 μs, 750 μs,		
MECHATROLINK-III	Communications	Tra	nsmission Cycle	1.0 ms to 4.0 ms (multiples of 0.5 ms)		
AEC	Co	Nu	mber of Transmission	32 or 48 bytes/station		
2		Byt		A DIP switch (S3) is used to select the number of transmission bytes.		
Ge	q	Per	formance	Position, speed, or torque control with MECHATROLINK-III communications		
iren	Method	Ret	ference Input	MECHATROLINK-III commands (sequence, motion, data setting, data		
Reference	Me	Pro	-	access, monitoring, adjustment, etc.)		
				MECHATROLINK-III standard servo profile Rotary switch (S1 and S2) positions: 16		
			LINK-III Itions Setting Switches	Number of DIP switch (S3) pins: 4		
	Communications Setting Switches		tion to containing owntoines			

$\Sigma\text{-}7S$ Single-axis FT82 SERVOPACKs SGM7D Motor Drive

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	Item	Specification		
	Item	Specification		
Analog	Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)		
Dynam	ic Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Regene	erative Processing	Built-in		
Overtra	avel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal		
Protect	tive Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.		
/ NS	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety Functions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).		
Fun	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3		
Applica	able Option Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.		

*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

Command Option Attachable-type FT82 SERVOPACKs with INDEXER Modules

The specifications when the INDEXER Module is combined with a Command Option Attachabletype SERVOPACK are given in the following table.

	Item	Specification		
Co	ntrol Method	IGBT-based PWM control, sine wave current drive		
Fee	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)		
	Surrounding Air Temperature	0°C to 55°C		
	Storage Temperature	-20°C to 85°C		
	Surrounding Air Humidity	90% relative humidity max. (with no freezing or condensation)		
SU	Storage Humidity	90% relative humidity max. (with no freezing or condensation)		
ditio	Vibration Resistance	4.9 m/s ²		
Song	Shock Resistance	19.6 m/s ²		
al C	Degree of Protection	IP10		
Environmental Conditions	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 		
ш	Altitude	1,000 m or less.		
	Others	Do not use the SERVOPACK in the following locations: Locations sub- ject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity		
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1		
Mc	ounting	Base-mounted or rack-mounted		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
e		±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)		
anc	Coefficient of Speed	0% of rated speed max. (for a voltage fluctuation of ±10%)		
Performance	Fluctuation ^{*1}	\pm 0.1% of rated speed max. (for a temperature fluctuation of 25°C \pm 25°C)		
đ	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
S Encoder Divided Pulse Output Phase A		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.		

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Item			Specification		
			Allowable voltage range: 24 VDC ±20% Number of input points: 6		
als	SERVOPACK		Input method: Sink inputs or source Input signals: • /ALM-RST (Alarm Reset) signal • P-OT (Forward Drive Prohibit) signed • N-OT (Reverse Drive Prohibit) signed • /DEC (Origin Return Deceleration • /RGRT (Registration Input) signal • /S-ON (Servo ON) signal Positive or negative logic can be ch	nal nal) switch	
Signals			Allowable voltage range: 24 VDC ± Number of input points: 11		
put			/MODE 0/1 (Mode Switch Input) sig	nal	
e L		Fixed Inputs	Mode 0	Mode 1	
Sequence Input	INDEXER Module		 /START-STOP (Program Table Operation Start-Stop Input) signal /PGMRES (Program Table Operation Reset Input) signal /SEL0 (Program Step Selection Input 0) signal /SEL1 (Program Step Selection Input 1) signal /SEL2 (Program Step Selection Input 2) signal /SEL3 (Program Step Selection Input 3) signal /SEL4 (Program Step Selection Input 3) signal /SEL5 (Program Step Selection Input 4) signal /SEL5 (Program Step Selection Input 5) signal /SEL6 (Program Step Selection Input 6) signal /SEL7 (Program Step Selection Input 7) signal 	 /HOME (Origin Return Input) signal /JOGP (Forward Jog Input) signal /JOGN (Reverse Jog Input) signal /JOG0 (Jog Speed Table Selection Input 0) signal /JOG1 (Jog Speed Table Selection Input 1) signal /JOG2 (Jog Speed Table Selection Input 2) signal /JOG3 (Jog Speed Table Selection Input 3) signal 	
		Fixed Outputs	Allowable voltage range: 5 VDC to Number of output points: 1 Output signal: ALM (Servo Alarm O		
Sequence Output Signals	SERVOPACK	Output Signals for Which Allocations Can Be Changed	Allowable voltage range: 5 VDC to Number of output points: 3 (A photocoupler output (isolated) is Output signals: • /WARN (Warning Output) signal • /BK (Brake Output) signal • /S-RDY (Servo Ready Output) sig • /ALO1, /ALO2, and /ALO3 (Alarm Signal allocations and positive or ne parameters.	used.)	
Sequence (INDEXER Module	Fixed Outputs	Allowable voltage range: 5 VDC to Number of output points: 9 Output signals: • /INPOSITION (Positioning Comple • /POUT0 (Programmable Output 0 • /POUT1 (Programmable Output 1 • /POUT2 (Programmable Output 2 • /POUT3 (Programmable Output 4 • /POUT5 (Programmable Output 4 • /POUT5 (Programmable Output 5 • /POUT6 (Programmable Output 6 • /POUT7 (Programmable Output 7	etion Output) signal) signal) signal 2) signal 3) signal 4) signal 5) signal 5) signal	

SERVOPACKs Σ -7S Single-axis FT82 SERVOPACKs SGM7D Motor Drive

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		Item	Specification		
	RS-422A Communications	Interfaces	Digital Operator (JUSP-OP05A-1-E), Personal computer (with Sig- maWin+)		
suc	RS-422A nmunicatio	1:N Communications	Up to N = 15 stations possible for RS-422A port		
icatio	Comr	Axis Address Setting	Set with parameters.		
nun	SU	Interface	Personal computer (with SigmaWin+)		
Communications	USB Communications	Communications Standard	Conforms to USB2.0 standard (12 Mbps).		
rs/	SERV	OPACK	CHARGE and PWR indicators, and one-digit seven-segment display		
Displays/ Indicators	INDE>	KER Module	Refer to the following manual for details. Ω Σ-7-Series Σ-7S Command Option Attachable-type SERVOPACK with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)		
spc	Progra	am Table Method	 Program table positioning in which steps are executed sequentially by commands given through contact input or serial communications Positioning in which station numbers are specified by commands given through contact input or serial communications 		
ethc		lax. Number of Steps	256		
Ž	N	lax. Number of Tables	256		
tinç	N	lax. Number of Stations	256		
Operating Methods	Serial Metho	Communications od	Serial command by 1-channel ASCII code Communications specifications:RS-422/485 (50 m max.) Connection topology:Multi-drop connection (16 axes max.) Baud rate:9600, 19200, 38400 bps		
	Other	Functions	Registration (positioning by external signals), origin return		
An	alog Mo	onitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)		
Dy	namic E	Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Re	generat	ive Processing	Built-in		
Ov	Overtravel (OT) Prevention		Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal		
Pro	Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Uti	ility Fun		Gain adjustment, alarm history, jogging, origin search, etc.		
2	ຼ ຍ In	puts	/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety	Functions	utput	EDM1: Monitors the status of built-in safety circuit (fixed output).		
0	A	pplicable Standards ^{*2}	ISO13849-1 PLe (Category 3), IEC61508 SIL3		
Ар	Applicable Option Modules		Fully-Closed Module Note: You cannot use a Safety Module if you are using an INDEXER Module.		

*1. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed × 100%

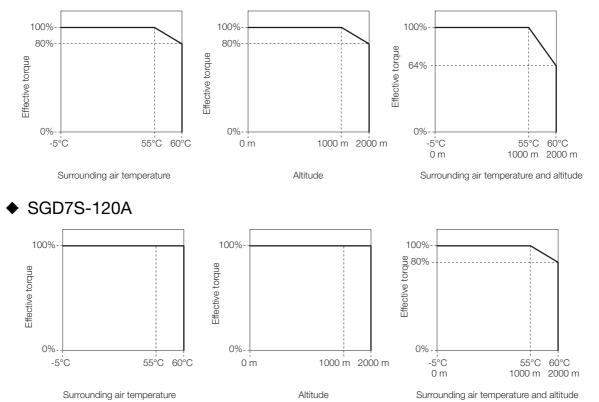
Rated motor speed

*2. Always perform risk assessment for the system and confirm that the safety requirements are met.

Derating Specifications

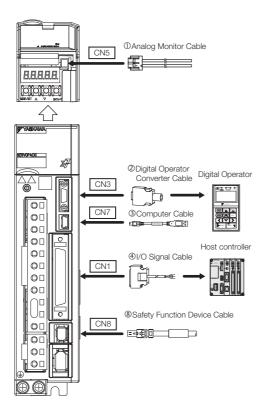
If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

SGD7S-2R8A and -2R8F

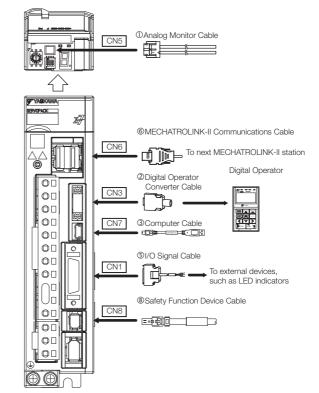


Selecting Cables

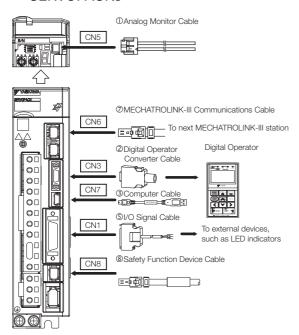
- System Configurations
- Σ-7S Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs



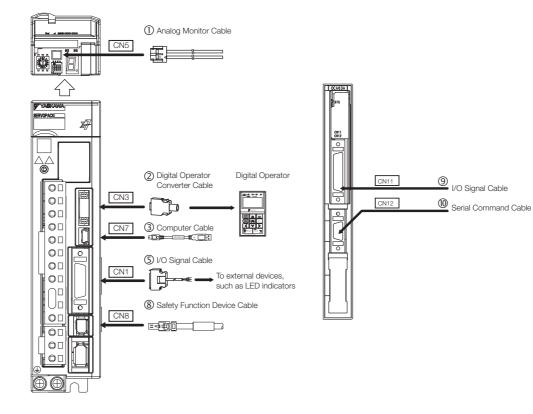
 Σ-7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs



 Σ-7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs



- Σ-7S Single-axis Command Option Attachable-Type SERVOPACKs
- Command Option Module: INDEXER Module



Selection Table

Important

- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
0	Analog Monitor Cable	1 m	JZSP-CA01-E	
2	Digital Operator Converter	0.3 m	JZSP-CVS05-A3-E*1	
C	Cable		JZSP-CVS07-A3-E*2	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

2-7S FT82 Specification

					Continued from previous page.
Code	N	ame	Length (L)	Order Number	Appearance
		Soldered Conn	ector Kit	JZSP-CSI9-1-E	
		Connector- Terminal Block Con- verter Unit (with cable)	0.5 m	JUSP-TA50PG-E	
			1 m	JUSP-TA50PG-1-E	
4	I/O Signal Cables		2 m	JUSP-TA50PG-2-E	
		Cable with Loose Wires	1 m	JZSP-CSI01-1-E	
		at One End (loose wires	2 m	JZSP-CSI01-2-E	
		on peripheral device end)	3 m	JZSP-CSI01-3-E	
		Soldered Conn	ector Kit	JZSP-CSI9-2-E	
		Connector-	0.5 m	JUSP-TA26P-E	
		Terminal Block Con- verter Unit (with cable)	1 m	JUSP-TA26P-1-E	
5	I/O Signal Cables		2 m	JUSP-TA26P-2-E	
		Cable with Loose Wires at One End (loose wires on peripheral device end)	1 m	JZSP-CSI02-1-E	
			2 m	JZSP-CSI02-2-E	
			3 m	JZSP-CSI02-3-E	
			0.5 m	JEPMC-W6002-A5-E	
			1 m	JEPMC-W6002-01-E	
			3 m	JEPMC-W6002-03-E	
		Cables with	5 m	JEPMC-W6002-05-E JEPMC-W6002-10-E	
		Connectors on Both Ends	10 m 20 m	JEPMC-W6002-10-E	
			30 m	JEPMC-W6002-20-E	
			40 m	JEPMC-W6002-40-E	
	MECHATRO		50 m	JEPMC-W6002-50-E	
6	LINK-II Communi-		0.5 m	JEPMC-W6003-A5-E	
0	cations		1 m	JEPMC-W6003-01-E	
	Cables	Cables with	3 m	JEPMC-W6003-03-E	
		Connectors	5 m	JEPMC-W6003-05-E	
		on Both Ends	10 m	JEPMC-W6003-10-E	
		(with ferrite	20 m	JEPMC-W6003-20-E	
		cores)	30 m	JEPMC-W6003-30-E	
			40 m	JEPMC-W6003-40-E	
			50 m	JEPMC-W6003-50-E	
		Terminators		JEPMC-W6022-E	
	I				Continued on next page.

$\Sigma\text{-}7S$ Single-axis FT82 SERVOPACKs SGM7D Motor Drive

			Length		Continued from previous page.
Code	N	ame	(L)	Order Number	Appearance
			0.2 m	JEPMC-W6012-A2-E	
			0.5 m	JEPMC-W6012-A5-E	
			1 m	JEPMC-W6012-01-E	
			2 m	JEPMC-W6012-02-E	
		Cables with	3 m	JEPMC-W6012-03-E	
		Connectors	4 m	JEPMC-W6012-04-E	
		on Both Ends	5 m	JEPMC-W6012-05-E	
			10 m	JEPMC-W6012-10-E	
			20 m	JEPMC-W6012-20-E	
	MECHATRO		30 m	JEPMC-W6012-30-E	
\bigcirc	LINK-III Communi-		50 m	JEPMC-W6012-50-E	
V	cations	Cables with	10 m	JEPMC-W6013-10-E	
	Cables	Connectors	20 m	JEPMC-W6013-20-E	
		on Both Ends	30 m	JEPMC-W6013-30-E	
		(with core)	50 m	JEPMC-W6013-50-E	
		Cable with Loose Wires at One End	0.5 m	JEPMC-W6014-A5-E	
			1 m	JEPMC-W6014-01-E	
			3 m	JEPMC-W6014-03-E	
			5 m	JEPMC-W6014-05-E	
			10 m	JEPMC-W6014-10-E	
			30 m	JEPMC-W6014-30-E	
			50 m	JEPMC-W6014-50-E	
		Cables with	1 m	JZSP-CVH03-01-E	L ,
	Safety Function	Connectors ^{*3}	3 m	JZSP-CVH03-03-E	
8	Device Cables	Connector Kit ^{*4}		Contact Tyco Electronic Product name: Industri nector Kit Model number: 201359	al Mini I/O D-shape Type 1 Plug Con-
		Connector Kit		DP9420007-E	
		Cables with	1 m	JZSP-CVI01-1-E	
	I/O Signal	Loose Wires	2 m	JZSP-CVI01-2-E	
9	Cables	at One End	3 m	JZSP-CVI01-3-E	
		Cables with	0.5 m	JUSP-TA36V-E	٦
		Terminal	1 m	JUSP-TA36V-1-E	
		Block on One End	2 m	JUSP-TA36V-2-E	
0	Serial Com- mand Cable	Connector Kit*	1	JZSP-CHI9-1	Contact Yaskawa Controls Co., Ltd. for the cable.

Continued from previous page.

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

*2. If you use a MECHATROLINK-III Communications Reference SERVOPACK, this Converter Cable is required to prevent the cable from disconnecting from the Digital Operator.

*3. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*4. Use the Connector Kit when you make cables yourself.

SERVOPACKs

Σ-7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

Model Designations SGD7S 2R8 F83 ()()()()1 Σ -7 Series Σ-7S SERVOPACKs Maximum Applicable Hardware Options 1st+2nd+3rd digits 4th digit Voltage 8th+9th+10th digits Motor Capacity Specification Applicable Code Specification Voltage Code Specification Code Specification Models А 200 VAC Three-2R8*1 0.4 kW None F 100 VAC All models phase, Without options 000 200 120*2 1.5 kW 001 Rack-mounted All models VAC 002 Varnished All models Single 5th+6th digits Interface phase, 2R8 0.4 kW Single-phase, 100 200-VAC power SGD7S-120A 008 Code Specification VAC supply input Analog voltage/pulse 00 SGD7S-2R8A train reference No dynamic brake SGD7S-2R8F 020* th digit Design Revision Order External dynamic SGD7S-120A brake resistor А 11th+12th+13th digits FT/EX Specification Code Specification Application function option for special F83*4 motors, SGM7D motor drive,

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A00A008).
- *3. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

indexing

None

14th digit

Code

None

В

BTO Specification*5

Specification

BTO Specification

(Available in Japan only)

- *4. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for SGM7D Motor Product Manual (Manual No.: SIEP S800001 91)
- *5. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-Phase, 200 VAC

	Model SGD7S	3-	2R8A	120A		
Maximum App	licable Motor Capacity [[kW]	0.4	1.5		
Continuous O	utput Current [Arms]	2.8	11.6			
Instantaneous	Maximum Output Curre	9.3	28			
Main Circuit	Power Supply			200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz		
	Input Current [Arms]*		2.5	7.3		
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz			
	Input Current [Arms]*		0.2	0.2		
Power Supply Capacity [kVA]*			1.0	3.2		
	Main Circuit Power Lo	ss [W]	22.5	72.6		
Power Loss*	Input Current [Arms] ² Power Supply Input Current [Arms] ² Poply Capacity [kVA]* Main Circuit Power L Control Circuit Powe Built-in Regenerative Total Power Loss [W Built-In Regenerative Resistor Minimum Allowable E	Loss [W]	12	15		
FOWER LOSS	Built-in Regenerative F	2.8 9.3 200 VAC to 240 VAC, -159 50 Hz/60 Hz 5]* 200 VAC to 240 VAC, -159 50 Hz/60 Hz 200 VAC to 240 VAC, -159 50 Hz/60 Hz 50 Hz/60 Hz 1.0 Loss [W] 22.5 rer Loss [W] 12 Ye Resistor Power Loss [W] 34.5	10			
	Total Power Loss [W]		0.4 2.8 9.3 200 VAC to 240 VAC, -15% 50 Hz/60 Hz 2.5 200 VAC to 240 VAC, -15% 50 Hz/60 Hz 2.5 200 VAC to 240 VAC, -15% 50 Hz/60 Hz 0.2 1.0 22.5 V] 12 Power Loss [W] - 34.5 cance [Ω] - 40	97.6		
Decenerative	Built-In Regenerative	Resistance $[\Omega]$	-	20		
Regenerative Resistor	Resistor	Capacity [W]	-	60		
	Minimum Allowable Ex	α (ternal Resistance [Ω]	40	20		
Overvoltage C	ategory					

* This is the net value at the rated load.

♦ Single-Phase, 200 VAC

	Model SGD7S	}-	2R8A	120A	
Maximum App	licable Motor Capacity [
Continuous Ou	utput Current [Arms]	2.8	11.6		
Instantaneous	Maximum Output Curre	nt [Arms]	9.3	28	
Main Circuit	Power Supply				
	Input Current [Arms]*		5.0	16	
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz		
	Input Current [Arms]*		0.2	0.25	
Power Supply	Power Supply Capacity [kVA]*			4.0	
	Main Circuit Power Lo	ss [W]	23.7	71.8	
Power Loss*	Control Circuit Power	2.8 11.6 nt [Arms] 9.3 28 $200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz50 Hz/60 Hz5.016200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz0.20.251.24.05s [W]23.771.8coss [W]121635.7103.8Resistance [\Omega] 60ternal Resistance [\Omega]404012$	16		
Fower Loss.	Built-in Regenerative F				
	Total Power Loss [W]		35.7	103.8	
Demonstri	Built-In Regenerative	Resistance [Ω]	_	12	
Regenerative Resistor	Resistor	Capacity [W]	_	60	
100000	Minimum Allowable Ex	ternal Resistance [Ω]	40	12	
Overvoltage Ca	ategory		I	II	

* This is the net value at the rated load.

 Σ -7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

Single-phase, 100 VAC

	Model SGD7S-	2R8F
Maximum App	licable Motor Capacity [kW]	0.4
Continuous O	utput Current [Arms]	2.8
Instantaneous	Maximum Output Current [Arms]	9.3
Main Circuit	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
Main Circuit	Input Current [Arms]*	10
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
Control	Input Current [Arms]*	0.38
Power Supply	Capacity [kVA]*	1.4
	Main Circuit Power Loss [W]	26.2
Power Loss*	Control Circuit Power Loss [W]	12
	Total Power Loss [W]	38.2
Regenerative Resistor	Minimum Allowable External Resistance [Ω]	40
Overvoltage C	ategory	III

* This is the net value at the rated load.

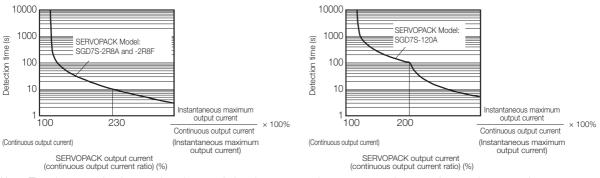
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

◆ FT83 SERVOPACKs with Analog Voltage/Pulse Train References

	Item	Specification
Со	ntrol Method	IGBT-based PWM control, sine wave current drive
Fe	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)
	Surrounding Air Temperature ^{*1}	0°C to 55°C
	Storage Temperature	-20°C to 85°C
	Surrounding Air Humidity	90% relative humidity max. (with no freezing or condensation)
SU	Storage Humidity	90% relative humidity max. (with no freezing or condensation)
ditio	Vibration Resistance	4.9 m/s ²
ouc	Shock Resistance	19.6 m/s ²
al O	Degree of Protection	IP10
Environmental Conditions	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust.
ш	Altitude ^{*1}	1,000 m max.
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electro- magnetic/magnetic fields, or radioactivity
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1
Mo	punting	Base-mounted or rack-mounted
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
lce		$\pm 0.01\%$ of rated speed max. (for a load fluctuation of 0% to 100%)
nar	Coefficient of Speed Fluctuation*2	0% of rated speed max. (for a load fluctuation of $\pm 10\%$)
Performance		$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of $25^{\circ}C \pm 25^{\circ}C$)
-	Torque Control Precision (Repeatability)	±1%
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)
I/O Signals	Encoder Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.
	1	Continued on next page.

Σ-7S FT83 Specification

Specification Item Allowable voltage range: 5 VDC ±5% **Fixed Input** Number of input points: 1 SEN (Absolute Data Request) signal Number of input points: 1 Input method: Line driver or open collector Input Signals /DEC (Origin Return Deceleration Switch) signal • /RGRT (Registration Input) signal • CLR (Clear) signal Allowable voltage range: 24 VDC ±20% Number of input points: 7 Input method: Sink inputs or source inputs Input Signals /S-ON (Servo ON) signal • /P-CON (Proportional Control) Signal • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /ALM-RST (Alarm Reset) signal • /P-CL (Forward External Torque Limit) and /N-CL (Reverse Sequence Input Signals External Torque Limit) signals /SPD-D (Motor Direction) signal SERVOPACKs • /SPD-A and /SPD-B (Internal Set Speed Selection) signals /O Signals /C-SEL (Control Selection) signal • /ZCLAMP (Zero Clamping) signal Input Signals for Which • /INHIBIT (Reference Pulse Inhibit) signal Allocations Can Be Changed • /P-DET (Polarity Detection) signal • /G-SEL (Gain Selection) signal • /PSEL (Reference Pulse Input Multiplication Switch) Signal • SEN (Absolute Data Request) signal • /DEC (Origin Return Deceleration Switch) signal • /MODE 0/1 (Mode Switch Input) signal /START-STOP (Program Table Operation Start-Stop Input) signal • /JOGP (Forward Jog Input) signal /JOGN (Reverse Jog Input) signal • /HOME (Origin Return Input) signal • /PGMRES (Program Table Operation Reset Input) signal • /SEL0 (Program Step Selection Input 0) signal • /SEL1 (Program Step Selection Input 1) signal • /SEL2 (Program Step Selection Input 2) signal • /SEL3 (Program Step Selection Input 3) signal • /SEL4 (Program Step Selection Input 4) signal • /JOG0 (Jog Speed Table Selection Input 0) signal • /JOG1 (Jog Speed Table Selection Input 1) signal /JOG2 (Jog Speed Table Selection Input 2) signal A signal can be allocated and the positive and negative logic can be changed.

Continued from previous page.

Σ-7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

Continued from previous page.

				Continued from previous page.		
_	1	1	Item	Specification		
			Fixed Output	Allowable voltage range: 5 VDC to 30 VDC		
			Fixed Output	Number of output points: 1 Output signal: ALM (Servo Alarm) signal		
				Allowable voltage range: 5 VDC to 30 VDC		
I/O Signals	Sequence Output Signals	SERVOPACKs	Output Signals That Can Be Allocated	 Number of output points: 6 (A photocoupler output (isolated) is used for three of the outputs.) (An open-collector output (non-isolated) is used for the other three outputs.) Output Signals /COIN (Positioning Completion) Signal /V-CMP (Speed Coincidence Detection) Signal /TGON (Rotation Detection) Signal /S-RDY (Servo Ready) signal /CLT (Torque Limit Detection) Signal /VLT (Speed Limit Detection) Signal /WARN (Warning) Signal /NEAR (Near) signal /PSELA (Reference Pulse Input Multiplication Switching Output) signal /ALO1, /ALO2, and /ALO3 (Alarm Code) signals /POUT0 (Programmable Output 1) signal /POUT1 (Programmable Output 2) signal /POUT3 (Programmable Output 3) signal /POUT4 (Programmable Output 4) signal /POSRDY (Origin Return Completed Output) signal /POSRDY (Origin Return Completed Output) signal Aisgnal can be allocated and the positive and negative logic can be changed. 		
	tor	SUC	Interfaces	Digital Operator (JUSP-OP05A-1-E)		
suc	Dpera	UNICATIC CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port		
Communications	Digital Operator	Commu (C	Axis Address Setting	Set with parameters.		
mur	1000	tions	Interface	Personal computer (with SigmaWin+)		
		COMMUNICATIONS (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).		
Displays/ Indicators	SE	RVO	PACK	CHARGE indicator and five-digit seven-segment display		
Pa	inel (Opera	ator	Environmental and the lense		
ş	Panel Operator			Four push switches		
ing Methoc	Pro	ograr		 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands from contact inputs 		
erating Methoc	Pro			 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands 		
Operating Methods		Ма	n Table	 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands from contact inputs 		
	Ot	Ma her F	n Table x. Number of Steps	 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands from contact inputs 256 steps (32 steps max. if input signals are used) 		
An	Oti	Ma her F	m Table x. Number of Steps Functions	 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands from contact inputs 256 steps (32 steps max. if input signals are used) Registration (positioning with external signals) and origin returns. Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ) Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF. 		
An Dy	Oti	Ma her F Mor	n Table x. Number of Steps Functions hitor (CN5)	 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands from contact inputs 256 steps (32 steps max. if input signals are used) Registration (positioning with external signals) and origin returns. Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ) Activated when a servo alarm or overtravel (OT) occurs, or 		
An Dy Re	Oti	Ma her F Mor ic Br	n Table x. Number of Steps Functions hitor (CN5)	 Program table positioning in which steps are executed in sequence with commands from contact inputs Positioning by specifying station numbers with commands from contact inputs 256 steps (32 steps max. if input signals are used) Registration (positioning with external signals) and origin returns. Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ) Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF. Built-in 		

SERVOPACKs Σ-7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

					Continued from previous page.		
				Item	Specification		
Uti	lity F	unct	ions		Gain adjustment, alarm history, jogging, origin search, etc.		
Utility	SUS	Inp	outs		/HWBB1 and /HWBB2: Base block signals for Power Modules		
Safety	lotic	Output			EDM1: Monitors the status of built-in safety circuit (fixed output)		
ഗ	L		plica	able Standards ^{*3}	ISO13849-1 PLe (Category 3) and IEC61508 SIL3		
Ар	plica	able	Optio	on Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.		
		So	ft St	art Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
	Speed Control	Input Signal	Re	ference Voltage	 Maximum input voltage: ±12 V (forward motor rotation for positive reference). 6 VDC at rated speed (default setting). Input gain setting can be changed. 		
	ŏ	Inpl	Inp	out Impedance	Approx. 14 kΩ		
	eeo		Cir	cuit Time Constant	30 µs		
	Sp	<u>9</u> t	Ro	tation Direction Selection	With Proportional Control signal		
		Rotation Direction Selection			With Forward/Reverse External Torque Limit signals (speed 1 to 3 selection). Servomotor stops or another control method is used when both signals are OFF.		
		Fee	edfo	rward Compensation	0% to 100%		
		Output Signal Positioning Completed Width Setting			0 to 1,073,741,824 reference units		
Controls				Reference Pulse Form	One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential		
ö	lo		SS	Input Form	Line driver or open collector		
	Position Control	Input Signals	Reference Pulses	Maximum Input Frequency	 Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps 		
				Input Multiplication Switching	1 to 100 times		
			Cle	ear Signal	Position deviation clear Line driver or open collector		
	Torque Control	Input Signal	Re	ference Voltage	 Maximum input voltage: ±12 V (forward torque output for positive reference). 3 VDC at rated torque (default setting). Input gain setting can be changed. 		
	ordu	Inpl	Inp	out Impedance	Approx. 14 kΩ		
	Ĭ		Cir	cuit Time Constant	16 μs		

*1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

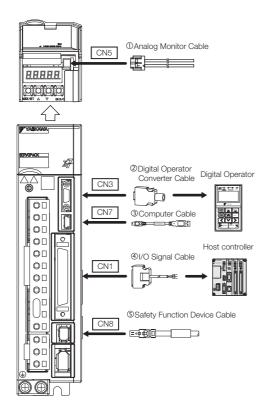
*2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = <u>No-load motor speed - Total-load motor speed</u> × 100% Rated motor speed

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

Selecting Cables

System Configurations



 Σ -7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

Selection Table



1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	N	ame	Length (L)	Order Number	Appearance
0	Analog Moni	tor Cable	1 m	JZSP-CA01-E	
0	Digital Opera Cable	Digital Operator Converter Cable		JZSP-CVS05-A3-E*1	
3	Computer Cable		2.5 m	JZSP-CVS06-02-E	
		Soldered Conn	ector Kit	JZSP-CSI9-1-E	
	I/O Signal Cables	Connector- Terminal Block Con- verter Unit (with cable)	0.5 m	JUSP-TA50PG-E	
			1 m	JUSP-TA50PG-1-E	
4			2 m	JUSP-TA50PG-2-E	
		Cable with Loose Wires at One End (loose wires on peripheral device end)	1 m	JZSP-CSI01-1-E	
			2 m	JZSP-CSI01-2-E	
			3 m	JZSP-CSI01-3-E	
		Cables with	1 m	JZSP-CVH03-01-E	
	Safety Function	Connectors*2	3 m	JZSP-CVH03-03-E	⊑
5	Device Cables	Connector Kit*3		Contact Tyco Electronic Product name: Industria nector Kit Model number: 201359	al Mini I/O D-shape Type 1 Plug Con-

*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

*2. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

*3. Use the Connector Kit when you make cables yourself.

MEMO

SERVOPACKs

Σ -7W Two-axis MECHATROLINK-III Communications Reference SERVOPACKs

Model Designation	s						
SGD7W - 1R6 Σ-7 Series Σ-7W SERVOPACKS	A 4th digit	20 5th+6th digits	A 7th digit	8th+9th dig		000 11th+12th+13th digits	B 14th digit
Ist+2nd+3rd digits Maximum Applicable Motor Capacity per Axis Voltage Code Specification	4th dig Code	Specifi	ication		8th+9t Code		ware Options ification Applicable Models
Three-phase, 1R6*1 0.2 kW 200 2R8*1 0.4 kW 200 5R5*1*2 0.75 kW VAC 7R6 1.0 kW	A 5th+6t Code	200 VAC h digits Interfa			None 000 001 002	Without options Rack-mounted Varnished	All models
	20	MECHATROLI communicatio	ins referer	ice	020*4	No dynamic brake	SGD7W-1R6A to -2R8A
	/th dig A	it Design Revision	on Order			External dynamic brake resistor	SGD7W-5R5A to -7R6A
					700*5 11th+ Code None 000 14th d None B	HWBB option 12th+13th digits F Specification None BTO Specificat (Available in Jap Specification None BTO Specification	ion*6

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. If you use the Servomotor with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65%. ((90% + 40%)/2 = 65%)
- *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *4. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *5. Refer to the following manual for details. Ω Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

	Model SGD7W-		1R6A	2R8A	5R5A	7R6A	
Maximum App	licable Motor Capacity p	oer Axis [kW]	0.2	0.4	0.75	1.0	
Continuous Ou	utput Current per Axis [A	rms]	1.6	2.8	5.5	7.6	
Instantaneous N	Naximum Output Current p	rrent per Axis [Arms] 5.9 9.3 16.9			17.0		
Main Circuit	Power Supply		200 VAC to	240 VAC, -15	5% to +10%, 5	0 Hz/60 Hz	
Main Circuit	Input Current [Arms]*		2.5	4.7	7.8	11	
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz	
Control	Input Current [Arms]*	0.25	0.25	0.25	0.25		
Power Supply	Capacity [kVA]*		1.0	1.9	3.2 4.5		
	Main Circuit Power Lo	24.0	43.3	78.9	94.2		
	Control Circuit Power	17	17	17	17		
Power Loss*	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	16					
	Total Power Loss [W]		49	68	0.75 5.5 16.9 % to +10%, 5 7.8 % to +10%, 5 0.25 3.2 78.9 17 16 112 12 60 12	127	
	Built-In Regenerative		40	40	12	12	
Regenerative Resistor	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	60	60				
		12	12				
Overvoltage C	ategory			l	11		

* This is the net value at the rated load.

♦ Single-phase, 200 VAC

	Model SGD7W-		1R6A	2R8A	5R5A*1
Maximum Appl	icable Motor Capacity p	er Axis [kW]	0.2	0.4	0.75
Continuous Output Current per Axis [Arms]			1.6	2.8	5.5
Instantaneous Maximum Output Current per Axis [Arms]			5.9	9.3	16.9
Main Cinevit	Power Supply		200 VAC to 240	VAC, -15% to +10)%, 50 Hz/60 Hz
Main Circuit	Input Current [Arms]*2	2	5.5	11	12
Operatural	Power Supply		200 VAC to 240	VAC, -15% to +10	%, 50 Hz/60 Hz
Control	Input Current [Arms]*2	2	0.25	0.25	0.25
Power Supply	Capacity [kVA] ^{*2}		1.3	2.4	2.7
	Main Circuit Power Lo	oss [W]	24.1	43.6	54.1
	Control Circuit Power	Loss [W]	17	17	17
Power Loss ^{*2}	Built-in Regenerative Power Loss [W]	Resistor	[kW] 0.2 0.4 1.6 2.8 Arms] 5.9 9.3 200 VAC to 240 VAC, -15% to +10% 5.5 11 200 VAC to 240 VAC, -15% to +10% 0.25 0.25 1.3 2.4 24.1 43.6 V] 17 17 17 8 8 49 69 ance 40	16	
	Total Power Loss [W]		49	69	87
	Built-In Regenerative	Resistance $[\Omega]$	40	40	12
Regenerative Resistor	Resistor	Capacity [W]	40	40	60
	Minimum Allowable External Resistance $[\Omega]$		40	40	12
Overvoltage Ca	vervoltage Category				

*1. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

*2. This is the net value at the rated load. However, a load ratio of 65% was used for the SGD7W-5R5A.

Σ-7W Two-axis MECHATROLINK-III Communications Reference SERVOPACKs

◆ 270 VDC

	Model SGD7W-	1R6A	2R8A	5R5A	7R6A	
Maximum A	Applicable Motor Capacity [kW]	0.2	0.4	0.75	1.0	
Continuous	Output Current [Arms]	1.6	2.8	5.5	7.6	
Instantaneo	ous Maximum Output Current [Arms]	5.9	9.3	16.9	17.0	
Main Circuit	Power Supply	270	270 VDC to 324 VDC, -15% to +10%			
Iviali i Oli Cuit	Input Current [Arms]*	3.0	5.8	9.7	14	
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%				
CONTROL	Input Current [Arms]*	0.25	0.25	0.25	0.25	
Power Sup	ply Capacity [kVA]*	1.2	2	3.2	4.6	
Davidar	Main Circuit Power Loss [W]	18.7	33.3	58.4	73.7	
Power Loss*	Control Circuit Power Loss [W]	17	17	17	17	
2000	Total Power Loss [W]	36	50	75	91	
Overvoltage	e Category		I	II		

* This is the net value at the rated load.

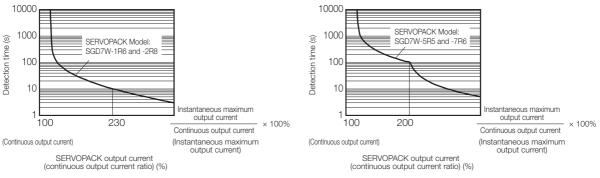
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

Item		Specification			
Со	ntrol Method	IGBT-based PWM control, sine wave current drive			
ack	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)			
Feedback	With Linear Servomotor	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 			
	Surrounding Air Temperature	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. <i>Derating Specifications</i> (page 417)			
	Storage Temperature	-20°C to 85°C			
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)			
ns	Storage Humidity	95% relative humidity max. (with no freezing or condensation)			
ditio	Vibration Resistance	4.9 m/s ²			
Song	Shock Resistance	19.6 m/s ²			
al C	Degree of Protection	IP20			
Environmental Conditions	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 			
ш	Altitude	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications.			
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity			
Applicable Standards		UL 61800-5-1 (E147823), CSA C22.2 No.274, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, and EN 61800-5-1			
Mc	punting	Base-mounted or rack-mounted			
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)			
e	Coefficient of Speed	$\pm 0.01\%$ of rated speed max. (for a load fluctuation of 0% to 100%)			
lanc		0% of rated speed max. (for a voltage fluctuation of ±10%)			
Performance	Fluctuation*	$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C ± 25 °C)			
Ē	Torque Control Precision (Repeatability)	±1%			
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)			
	•	Continued on next name			

SERVOPACKs Σ-7W Two-axis MECHATROLINK-III Communications Reference SERVOPACKs

				Continued from previous page.		
	Item			Specification		
	Ove	erhea	at Protection Input	Number of input points: 2 Input voltage range: 0 V to +5 V		
	als			Allowable voltage range: 24 VDC ±20% Number of input points: 12		
	Sequence Input Signals	Input Signals That Can Be Allocated		 Input method: Sink inputs or source inputs Input Signals P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals /DEC (Origin Return Deceleration Switch) signal /EXT1 to /EXT3 (External Latch Input 1 to 3) signals FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed. 		
I/O Signals		Fixe	ed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 2		
SO				Output signal: Servo Alarm (ALM)		
2/	gnals			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 5 (A photocoupler output (isolated) is used.)		
	Sequence Output Signals	Output Signals That Can Be Allocated		Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /WLT (Speed Limit Detection) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.		
	auc	Interfaces		Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)		
S	122A	13) 13)	1:N Communications	Up to N = 15 stations possible for RS-422A port		
unications	RS-422A Communicatione	(CN3)	Axis Address Settings	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.		
nur	000	2	Interface	Personal computer (with SigmaWin+)		
Comm	USB Comminicatione	(CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).		
Dis	splay	s/Inc	licators	CHARGE, PWR, CN, L1, and L2 indicators, and two, one-digit seven- segment displays		
=		Co	mmunications Protocol	MECHATROLINK-III		
-NK-I	Station Address Settings Extended Address Setting Baud Rate Transmission Cycle		tion Address Settings	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.		
MECHATROLINK-III	nic		ended Address Setting	Axis 1: 00 hex, Axis 2: 01 hex		
	nmu		ud Rate	100 Mbps		
Ц. Ч	Corr		nsmission Cycle	250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)		
Ň	0	Byt		32 or 48 bytes/station A DIP switch (S3) is used to select the baud rate.		
0e	σ	Per	formance	Position, speed, or torque control with MECHATROLINK-III communications		
Reference	Method	Ref	erence Input	MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)		
ř	≥ Profile		file	MECHATROLINK-III standard servo profile		
	MECHATROLINK-III Communications Setting Switches			Rotary switch (S1 and S2) positions: 16 Number of DIP switch (S3) pins: 4		
Communications Cetting Switches						

Continued from previous page.

Item	Specification				
Analog Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)				
Dynamic Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.				
Regenerative Processing	Built-in				
Overtravel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal				
Protective Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.				
Utility Functions	Gain adjustment, alarm history, jogging, origin search, etc.				
Option Module	Option Module cannot be attached.				
* The coefficient of speed fluctuation for load fluctuation is defined as follows:					

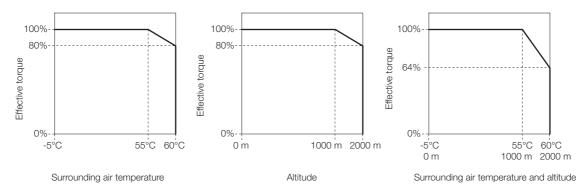
* The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed} - \text{Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

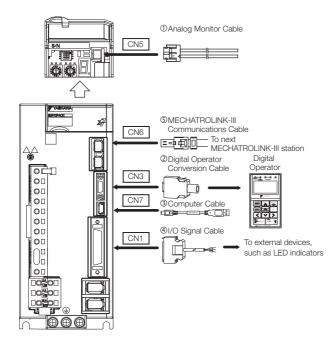
◆ SGD7W-1R6A, -2R8A, -5R5A, and -7R6A



Σ-7W Two-axis MECHATROLINK-III Communications Reference SERVOPACKs

Selecting Cables

System Configurations



Selection Table

0

Important

1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	me Length O		Appearance
0	Analog Monitor Cable	1 m	JZSP-CA01-E	
0	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E ^{*1}	
			JZSP-CVS07-A3-E*2	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

SERVOPACKs

Σ-7W Two-axis MECHATROLINK-III Communications Reference SERVOPACKs

Code	e Name ^L		Length (L)	Order Number	Appearance	
			(L)			
	I/O Signal Cables	Soldered Connector Kit		DP9420007-E		
		Connector- Terminal Block Con- verter Unit (with cable)	0.5 m	JUSP-TA36P-E		
			1 m	JUSP-TA36P-1-E		
4			2 m	JUSP-TA36P-2-E		
		Cable with	1 m	JZSP-CSI03-1-E		
		Loose Wires	2 m	JZSP-CSI03-2-E		
		at One End (loose wires on peripheral device end)	3 m	JZSP-CSI03-3-E		
		Cables with Connectors on Both Ends	0.2 m	JEPMC-W6012-A2-E		
	MECHATRO LINK-III Communi- cations Cables		0.5 m	JEPMC-W6012-A5-E		
			1 m	JEPMC-W6012-01-E		
			2 m	JEPMC-W6012-02-E		
			3 m	JEPMC-W6012-03-E		
			4 m	JEPMC-W6012-04-E		
			5 m	JEPMC-W6012-05-E	[=•••••••][][[]@••=]	
			10 m	JEPMC-W6012-10-E		
			20 m	JEPMC-W6012-20-E		
			30 m	JEPMC-W6012-30-E		
5			50 m	JEPMC-W6012-50-E		
e		Cables with Connectors on Both Ends (with core)	10 m	JEPMC-W6013-10-E		
			20 m	JEPMC-W6013-20-E		
			30 m	JEPMC-W6013-30-E		
			50 m	JEPMC-W6013-50-E		
		Cable with Loose Wires at One End	0.5 m	JEPMC-W6014-A5-E		
			1 m	JEPMC-W6014-01-E		
			3 m	JEPMC-W6014-03-E		
			5 m	JEPMC-W6014-05-E		
			10 m	JEPMC-W6014-10-E		
			30 m	JEPMC-W6014-30-E		
			50 m	JEPMC-W6014-50-E		

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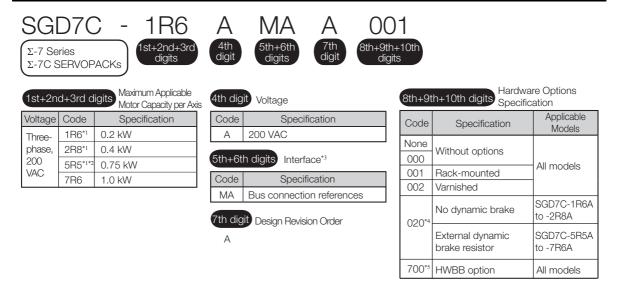
*1. This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

*2. If you use a MECHATROLINK-III Communications Reference SERVOPACK, this Converter Cable is required to prevent the cable from disconnecting from the Digital Operator.

SERVOPACKs

Σ -7C Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

Model Designations



- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. If you use the Servomotor with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65%.
 ((90% + 40%)/2 = 65%)
- *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *4. Refer to the following manual for details. Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *5. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)

Ratings and Specifications

Ratings

Three-phase, 200 VAC

	Model SGD7C-	1R6A	2R8A	5R5A	7R6A	
Maximum App	licable Motor Capacity p	0.2	0.4	0.75	1.0	
Continuous Ou	utput Current per Axis [A	1.6	2.8	5.5	7.6	
Instantaneous N	Maximum Output Current p	per Axis [Arms]	5.9	9.3	16.9	17.0
Main Circuit	Power Supply	200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz				
Main Circuit	Input Current [Arms]*	2.5	4.7	7.8	11	
Control	Power Supply	200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz				
Control	Input Current [Arms]*	0.25	0.25	0.25	0.25	
Power Supply	Capacity [kVA]*		1.0	1.9	3.2	4.5
	Main Circuit Power Lo	24.0	43.3	78.9	94.2	
	Control Circuit Power	17	17	17	17	
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		8	8	16	16
	Total Power Loss [W]		49	68	112	127
	Built-In Regenerative Resistor	Resistance $[\Omega]$	40	40	12	12
Regenerative Resistor		Capacity [W]	40	40	60	60
	Minimum Allowable Extance $[\Omega]$	40	40	12	12	
Overvoltage Category				l	II	

* This is the net value at the rated load.

♦ Single-phase, 200 VAC

	Model SGD7C-		1R6A	2R8A	5R5A ^{*1}	
Maximum Appl	icable Motor Capacity p	er Axis [kW]	0.2	0.4	0.75	
Continuous Ou	tput Current per Axis [A	rms]	1.6	2.8	5.5	
Instantaneous N	laximum Output Current p	er Axis [Arms]	5.9	9.3	16.9	
Main Cinquit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz			
Main Circuit	Input Current [Arms]*2	2	5.5	11	12	
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz			
Control	Input Current [Arms]*2	2	0.25	0.25	0.25	
Power Supply (Capacity [kVA] ^{*2}		1.3	2.4	2.7	
	Main Circuit Power Lo	oss [W]	24.1	43.6	54.1	
	Control Circuit Power	Loss [W]	17	17	17	
Power Loss ^{*2}	Built-in Regenerative Power Loss [W]	Resistor	8	8	16	
	Total Power Loss [W]		49	69	87	
	Built-In Regenerative Resistor	Resistance $[\Omega]$	40	40	12	
Regenerative Resistor		Capacity [W]	40	40	60	
	Minimum Allowable E Resistance [Ω]	xternal	40	40	12	
Overvoltage Category				III		

*1. If you use the SGD7C-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

*2. This is the net value at the rated load. However, a load ratio of 65% was used for the SGD7W-5R5A.

 Σ -7C Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

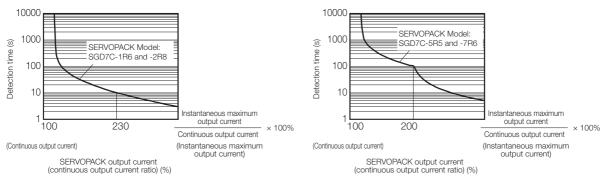
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

General Specifications

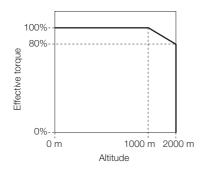
Item		Specification
Control Met	nod	IGBT-based PWM control, sine wave current drive
Feedback	With Rotary Servo- motor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)
Feedback	With Linear Servo- motor	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)
	Surrounding Air Tem- perature	0°C to 55°C
	Storage Temperature	-20°C to 85°C
	Surrounding Air Humidity	10% to 95% relative humidity (with no freezing or condensation)
	Storage Humidity	10% to 95% relative humidity (with no freezing or condensation)
	Vibration Resistance	4.9 m/s ²
	Shock Resistance	19.6 m/s ²
Environ-	Protection Class	IP20
mental Conditions	Pollution Degree	 2 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no excessive dust, salts, or iron dust.
	Altitude	 1,000 m max. Note: With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for the derating specifications. <i>Derating Specifications</i> (page 424)
	Power Frequency Magnetic Field	30 A/m (50 Hz/60 Hz), IEC 61000-4-8, Level 4
	Others	Must be no exposure to electrostatic noise or radiation.
Applicable S	tandards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, and EN 61800-5-1
Mounting		Base-mounted or rack-mounted

 $\Sigma\text{-7C}$ Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

Derating Specifications

If you use the SERVOPACK at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graph.

◆ SGD7C-1R6A, -2R8A, -5R5A, and -7R6A



Servo Section Specifications

	Item		Specification
	Speed Con	trol Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
-			±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
Perfor-	Coefficient Fluctuation	of Speed	0% of rated speed max. (for a load fluctuation of ±10%)
mance	Πασταατίση		$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C ± 25 °C)
-	Torque Con sion (Repea		±1%
	Soft Start Ti	me Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)
	Overheat Pl Input	rotection	Number of input points: 2 Input voltage range (0 V to 5 V)
-			Allowable voltage range: 24 VDC ±20% Number of input points: 12
	Sequence Input Signals	Input Signals That Can Be Allo- cated	 Input method: Sink inputs or source inputs Input Signals: P-OT (Forward Drive Prohibit Input) and N-OT (Reverse Drive Prohibit Input) signals /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals /DEC (Origin Return Deceleration Switch) signal /EXT1 to /EXT3 (External Latch Input 1 to 3) signals FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.
I/O Signals	Sequence Output Signals	Fixed Outputs	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 2 Output signal: ALM (Servo Alarm Output) signal
		Output Signals That Can Be Allo- cated	Allowable voltage range: 5 VDC to 30 VDC Number of outputs points: 5 (Photocoupler outputs (isolated) are used.) Output Signals: • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /VLT (Speed Limit Detection) signal • /WARN (Warning) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.
Communi- cations	USB Communi- cations (CN7)	Interface Commu- nica- tions Standard	Personal computer (with SigmaWin+) Conforms to USB2.0 standard (12 Mbps).
Displays/Indicators		I	CHARGE and PWR indicators, and two, one-digit seven-segment displays
Reference Method			Reference with built-in controller
Dynamic Brake (DB)			Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.
Regenerative Processing			Built-in
Overtravel (OT) Prevention		n	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit Input) or N-OT (Reverse Drive Prohibit Input) signal
Protective Functions			Overcurrent, overvoltage, undervoltage, overload, regeneration error, etc.
Protective Fu	Inctions		evenediterit, eventedage, anderverlage, evenedad, regeneration ener, etc.
Protective Fu Utility Function			Gain adjustment, alarm history, jogging, origin search, etc.

* The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed} - \text{Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

 $\Sigma\text{-7C}$ Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

Controller Section Specifications

This section provides the specifications of the Controller Section.

♦ Hardware Specifications

Item	Specification		
Flash Memory	Capacity: 24 MB (15 MB of user memory)		
SDRAM	Capacity: 256 MB		
MRAM	Capacity: 4 MB		
Calendar	Seconds, minutes, hour, day, week, month, year, day of week, and timing		
Ethernet	One port, 10Base-T or 100Base-TX		
MECHATROLINK	MECHATROLINK-III, 1 circuit with 1 portMaster		
USB	USB 2.0, Type A host, 1 portCompatible devices: USB storage		
Indicators and Displays	 Seven-segment display Status indicators USB Status Indicator Ethernet status indicators 		
Switches	DIP switches: Mode switchesSTOP/SAVE switch		
Connectors	 MECHATROLINK-III connector (CN6) USB connector (CN10) Ethernet connector (CN12) Controller Section I/O connector (CN13) 		

◆ Performance Specifications

	Item	Specification	Remarks
(0	SVC4	4 axes	Circuit number selected from 1 to 16.
of Axe:	SVD	1 circuit 2 axes	Circuit number selected from 1 to 16.
oer ed /		4 axes	
Number of Controlled Axes	SVR4	1 circuit	Circuit number selected from 1 to 16.
Cor	Maximum Number of Controlled Axes	6 axes	-
Scan Time Settings	H Scan	0.5 ms to 32.0 ms (in 0.25-ms increments)	Refer to the following manual for details. Ω Σ-7-Series Σ-7C SERVOPACK Product Manual (Manual No.: SIEP S800002 04)
Lime	L Scan	2.0 ms to 300 ms (in 0.5-ms increments)	-
an	H Scan Default	4 ms	-
SC	L Scan Default	200 ms	-
m m	Calendar	Supported.	-
hera	Communications Interface	Ethernet	-
Peripheral Devices	USB	Supported.	_
	DRAM	256 MB with ECC	-
Memory Capacity	MRAM	4 MB	Up to 1 MB can be used to back up table data.
Mer Cap	Program Capacity	15 MB	Total capacity including definition data, ladder programs, table data, etc.
	Number of Startup Drawings (DWG.A)	64	
Jrams	Number of Interrupt Drawings (DWG.I)	64	
Ladder Programs	Number of High-Speed Scan Drawings (DWG.H)	1000	Number of steps per drawing: 4,000
Ladde	Number of Low-Speed Scan Drawings (DWG.L)	2000	
	Number of User Function Drawings	2000	
	Number of Programs	512	Total of all programs listed below: • Motion main programs • Motion subprograms • Sequence main programs • Sequence subprograms
	Number of Groups	16	-
sm	Number of Tasks	32	-
rogra	Number of Nesting Levels for IF Instructions	8	-
Motion Programs	Number of Nesting Levels for MSEE Instructions	8	-
Mc	Number of Parallel Forks Per Task	8	Select from the following four options: • Main: 4 forks, Sub: 2 forks • Main: 8 forks • Main: 2 forks, Sub: 4 forks • Sub: 8 forks
	Number of Simultaneously Controlled Axes Per Task	10 axes	-

Continued on next page.

 $\frac{\mbox{SERVOPACKs}}{\mbox{Σ-7C$ Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers}}$

Item		Specification	Continued from previous page. Remarks		
	S Registers		64 Kwords	-	
	M Registers		1 Mword	_	
	G Registers		2 Mwords	_	
Registers	I/O Registers		64 Kwords	_	
gist	Motion Regist	ers	32 Kwords	_	
Be	C Registers		16 Kwords	_	
	# Registers		16 Kwords	_	
	D Registers		16 Kwords	_	
	Bit (B)		Supported.	0 or 1	
	Integer (W)		Supported.	-32,768 to 32,767	
	Double-Lengt	h Integer (L)	Supported.	-2,147,483,648 to 2,147,483,647	
Data Types		ngth Integer (Q)	Supported.	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807	
ata	Single-Precisio	on Real Number (F)	Supported.	± (1.175E-38 to 3.402E+38) or 0	
Ω		sion Real Num-	Supported.	±(2.225E-308 to 1.798E+308) or 0	
	Addresses (A)		Supported.	0 to 16,777,214	
ers			Supported.	Special registers for offsetting addresses.	
egist	Subscript j		Supported.	Subscripts i and j function identically.	
Index Registers	Array Registers		Supported.	Used to handle registers as arrays.	
	Number of Gr	oups	4	-	
			256 Kwords total in 4		
ing	Trace Memory	/	groups	-	
rac	Traceable Data Points		16 points per group	-	
Data Tracing	Trigger Types		>, <, =, <>, >=, <= and differential detec- tion of the above con- ditions	_	
	Number of Gr	oups	4	-	
	Log Storage I	₋ocation	Built-in RAM disk or USB memory device	-	
ging	Log File Formats		CSV file format or binary file format	-	
Lo	Data Logging	Points	64 points per group	-	
Data Logg	Number of	Built-in RAM Disk	1 to 4,000	-	
	Log Files	USB Memory	1 to 32,767 or unlim- ited	The ultimate upper limit is 10,000 files even if unlimited is selected.	
	Trigger Types		>, <, =, <>, >=, <=	-	

Communications Function Module Specifications

		Item	Specification	Remarks
Abbrev	viation		218IFD	
	Transm	nission Interface	10Base-T/100Base-TX	-
nor ns	Numbe	r of Communications Ports (Connectors)	1	-
Common Items			TCP/UDP/IP/ARP/ICMP/ IGMP	-
	Conne		20 + 2 (I/O message communications)	_
	Maxim Chann	um Number of Communications els	10 + 2 (I/O message communications)	_
		atic Reception	Supported.	Not supported for no- protocol communications.
	Maxim Conne	um Number of Automatic Reception ctions	10	_
	Autom	atic Reception Status Monitor	Supported.	-
	suc	MEMOBUS	Write: 100 words	_
	atic		Read: 125 words	
	unia	Extended MEMOBUS	Write: 2,043 words Read: 2,044 words	-
	ШШ		Write: 256 words	
	Cor	MELSEC (A-Compatible 1E)	Read: 256 words	-
	ge	MELSEC (QnA-Compatible 3E)	Write: 960 words	_
	ssa		Read: 960 words	
	Me	MODBUS/TCP	Write: 100 words Read: 125 words	-
	e of		Write: 996 words	
	Siz	OMRON	Read: 999 words	-
suc	ШШ	TOYOPUC	Write: 1,022 words	-
Ethernet Communications	Maximum Size of Message Communications	No-protocol	Write: 2,046 words	-
Comm		MEMOBUS	Write: 100 words Read: 125 words	-
ernet	ige	Extended MEMOBUS	Write: 1,024 words Read: 1,024 words	_
Eth	Message าs	MELSEC (A-Compatible 1E)	Write: 256 words Read: 256 words	_
	of I/O lication	MELSEC (QnA-Compatible 3E)	Write: 256 words Read: 256 words	_
	Maximum Size of I/O M Communications	MODBUS/TCP	Write: 100 words Read: 125 words	_
	ximum Oc	OMRON	Write: 996 words Read: 999 words	-
	Ma	Execution Conditions	You can select controls (start/ stop) from a ladder program.	-
		Execution Status Monitor	Supported.	_
		nanSync-MP	Supported.	-
	FTP Server		Supported.	-
			Supported.	
	protoc	e Buffer Mode Selection for No- ol Communications	Supported.	-
	ing	Communications Platform	Ethernet	-
	gineeri Tools	Controller Searches	Supported.	-
	Engineering Tools	Supported Engineering Tools	MPE720 Ver.7 and SigmaWin+ Ver.7	-

 Σ -7C Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

Motion Control Function Module Specifications

Module		Item	Specification
	Number of Controlled Axes ^{*1}		2
SVD	Reference Update Cycle (High- Speed Scan Cycle Performed by the CPU)		500 μs to 32.0 ms
	Register Ranges		Registers for two axes are assigned from the registers for each circuit. Refer to the following manual for details. Ω Σ-7-Series Σ-7C SERVOPACK Motion Control User's Manual (Manual No.: SIEP S800002 03)
	Numb	er of Controlled Axes ^{*1}	4
	Reference Update Cycle (High- Speed Scan Cycle Performed by the CPU)		500 μs to 32.0 ms
	Register Ranges		Registers for four axes are assigned from the registers for each circuit. Refer to the following manuals for details.ΩΣ-7-Series Σ-7C SERVOPACK Motion Control User's Manual (Manual No.: SIEP S800002 03)
		Communications Inter- face	Master
	MECHATROLINK-III communications	Communications Cycle (Reference Update Cycle)	500 μs to 32.0 ms
SVC4		Transmission Cycle ^{*2}	125 μs, 250 μs, 500 μs, or 1 ms
		Communications Cable	MECHATROLINK-III Communications Cable
		Maximum Number of Connectable Stations	8
		Topology	Cascade connections, star connections, or mixed star-cascade connections
	ВО	Terminating Resistance	Not required.
	ECHAT	Connectable Slave Devices	SERVOPACKs, Stepping Motor Drivers, Inverters, I/O Modules, and Machine Controllers that support MECHATROLINK-III com- munications
	2	Supported Profiles	MECHATROLINK-III Servo Standard, MECHATROLINK-III I/O Standard, MECHATROLINK-III Inverter Standard, and MECHATROLINK-III Stepping Motor Standard
	Numb	er of Controlled Axes ^{*1}	4
SVR4	Refere	ence Update Cycle (High- I Scan Cycle Performed	500 μs to 32.0 ms
	Regist	er Ranges	Registers for four axes are assigned from the registers for each circuit. Refer to the following manuals for details.

*1. A maximum of six axes can be controlled with the Motion Control Function Module in a Σ-7C SERVOPACK. Do not control more than a total of six axes with one Motion Control Function Module.

*2. The transmission cycle is the cycle in which the SVC4 and the slave devices perform communications on the MECHATROLINIK-III transmission path.

M-EXECUTOR Specifications

Registerable Programs

Program Ty	ре	Number of Registered Programs
Motion Programs		32*
	Startup	1
Saguanaa Dragrama	Interrupt	Not possible.
Sequence Programs	H scan	32*
	L scan	32*

* The combined total of motion programs and sequence programs must not exceed 32.

Program Control Methods

You can use the following control methods for the programs that are registered in the M-EXECU-TOR:

Item	Motion Pro	grams	Sequence Programs
Execution Method	Sequential execution		Startup: Event execution H scan: Scan execution L scan: Scan execution
	The same number is number.	s used for the d	efinition number and system work
Custom Walls	No.1		Number
System Work	No.2	2	
	:	:	
	No.32	32	
Program Designation Method	Direct designation or indirect des- ignation		Direct designation
Program Execution Method	Register the program in the defini- tions and start execution by turn- ing ON the start signal.		Execution is started when the pro- gram is registered in the defini- tions.
Interpolation Override Setting	Supported.		Not supported.
I/O Link Definitions	Supported.		Not supported.
Motion Program Status Reporting in S Registers	Supported.		
Number of Parallel Forks	Number of Parallel Forks Number of Parallel Forks Main: 4 forks, Sub: 2 Main: 8 forks Main: 2 forks, Sub:4 Sub: 8 forks		No forks
Error Diagram Execution When an Operation Error Occurs	Supported.		

USB Memory Specifications

Item	Specification	Remarks
Supported Media	USB memory device	Refer to the following section for details.
Applicable FAT	FAT16/32	-
Maximum Number of Nested Directories	10	-
File Information	Last update time- stamp supported.	Uses the calendar in the Controller Section. Refer to the following manual for details. Ω <i>Σ</i> -7-Series <i>Σ</i> -7C SERVOPACK Product Manual (Manual No.: SIEP S800002 04)
Maximum Length for File Name and Directory Names	256 characters	-
Current Directory Function	16	-
Maximum Number of Simulta- neously Open Files	16	_
Formatting	Not supported.	Use a formatted USB memory device.

Recommended USB Memory Device

The following USB memory device is recommended. It can be purchased from Yaskawa.

Model	Specification	Manufacturer
SFU24096D1BP1TO-C-QT-111-CAP	4-GB USB memory	Swissbit Japan Inc.

 Σ -7C Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

IO16 Function Module Specifications

The following table gives the specifications of the IO16 Function Module. There are 16 digital inputs and 16 digital outputs in the IO16 Function Module.

Item	Specification	
	Number of Inputs	16
	Input Method	Sink/source
	Isolation Method	Photocouplers
	Input Voltage	24 VDC ±20%
	Input Current	5 mA (typical)
Digital Inputs	ON Voltage/Current	15 V min./2 mA min.
Digital inputs	OFF Voltage/Current	5 V max./1 mA max.
	ON/OFF Time	0.01 ms + Digital filter setting
	Digital Filter Setting	0 to 65,535 µs
	Number of Commons	2 (8 points per common)
	Others	DI_00 is also used for interrupt signals.
	Others	DI_01 is also used as the pulse latch input.
	Number of Outputs	16
	Output Method	Transistor open-collector sink outputs
	Isolation Method	Photocouplers
	Output Voltage	24 VDC (20 V to 30 V)
	Output Current	50 mA max.
Digital Outputs	Leakage Current When OFF	0.1 mA max.
	ON/OFF Time	0.01 µs (for output current of 85 mA)
	Number of Commons	2 (8 points per common)
	Output Protection	Thermistor (automatic recovery after blow out)
	Others	DO_00 is also used as the Match Output.

◆ Counter Specifications

The following table gives the specifications of counter. The counter uses a pulse input on one channel.

Item	Specification					
	Number of Inputs	1 (phase A, B, or Z input)				
	Input Circuits	Phases A and B: 5-V differential input, not isolated, maxi- mum frequency: 4 MHz Phase Z: 5-V, 12-V, or 24-V photocoupler input, maximum frequency: 500 kHz				
Pulse Input	Input Modes	Phases A and B, sign, and incrementing/decrementing				
	Latch Input	 Pulses are latched for phase Z or DI_01. Response Times for Phase-Z Input ON: 1 μs max. OFF: 1 μs max. Response Times for DI_01 Input ON: 60 μs max. OFF: 0.5 ms max. 				
	Other Functions	Match detection, counter preset and clear, electronic gear conversion, phase-C (phase-Z), and digital filter				

System Register Specifications

This section shows the overall structure of the system registers. Refer to the following manuals for details.

Ω Σ-7-Series Σ-7C SERVOPACK Product Manual (Manual No.: SIEP S800002 04)

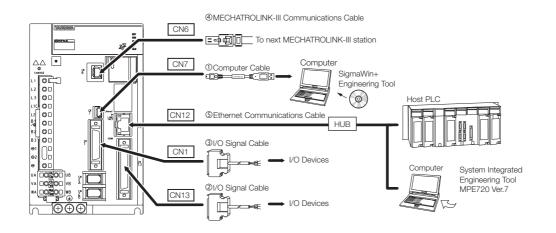
Ω Σ-7-Series Σ-7C SERVOPACK Troubleshooting Manual (Manual No.: SIEP S800002 07)

Register Addresses	Contents			
SW00000 to SW00029	System Service Registers			
SW00030 to SW00049	System Status			
SW00050 to SW00079	System Error Status			
SW00080 to SW00089	User Operation Error Status			
SW00090 to SW00103	System Service Execution Status			
SW00104 to SW00109	Reserved.			
SW00110 to SW00189	Detailed User Operation Error Status			
SW00190 to SW00199	Reserved.			
SW00200 to SW00503	System I/O Error Status			
SW00504 and SW00505	Reserved.			
SW00506 and SW00507	Security Status			
SW00508 to SW00649	Reserved.			
SW00650 to SW00667	USB-Related System Status			
SW00668 to SW00693	Reserved.			
SW00694 to SW00697	Message Relaying Status			
SW00698 to SW00789	Interrupt Status			
SW00790 to SW00799	Reserved.			
SW00800 to SW01095	Module Information			
SW01096 to SW02687	Reserved.			
SW02688 to SW03199	PROFINET Controller (266IF-01) IOPS Status			
SW03200 to SW05119	Motion Program Information			
SW05120 to SW05247	Used by the system (system memory read).			
SW05248 to SW08191	Reserved.			
SW08192 to SW09215	Expansion Motion Program Information			
SW09216 to SW09559	Reserved.			
SW09560 to SW10627	Expansion System I/O Error Status			
SW10628 to SW13699	Reserved.			
SW13700 to SW14259	Expanded Unit and Module Information			
SW14260 to SW15997	Reserved.			
SW15998 to SW16011	Expansion System Service Execution Status			
SW16012 to SW16199	Reserved.			
SW16200 to SW17999	Alarm History Information			
SW18000 to SW19999	Reserved.			
SW20000 to SW22063	Product Information			
SW22064 to SW23999	Reserved.			
SW24000 to SW24321	Data Logging Execution Status			
SW24322 to SW24999	Reserved.			
SW24400 to SW24719	FTP Client Status and Controls			
SW25000 to SW25671	Automatic Reception Status for Ethernet Communications			
SW25672 to SW27599	Reserved.			
SW27600 to SW29775	Maintenance Monitor			
SW29776 to SW65534	Reserved.			

 Σ -7C Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

Selecting Cables

System Configurations



Selection Table

Important

1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.

2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: Refer to the following manual for the following information.

- Cable dimensional drawings and cable connection specifications
- Order numbers and specifications of individual connectors for cables
- Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name		Name Length (L)		Appearance	
0	Computer Cable		2.5 m	JZSP-CVS06-02-E		
		Soldered Conn		DP9420007-E		
		Connector-	0.5 m	JUSP-TA36P-E		
		Terminal Block Con-	1 m	JUSP-TA36P-1-E		
2	I/O Signal Cables	Cables (with cable) 2 r Cable with 1 r Loose Wires 2 r at One End (loose wires		2 m	JUSP-TA36P-2-E	
			1 m	JZSP-CSI03-1-E		
			2 m	JZSP-CSI03-2-E		
			3 m	JZSP-CSI03-3-E		

Continued on next page.

Code	Name Lengtl			Order Number	Appearance
		Soldered Conn	ector Kit	JZSP-CSI9-1-E	
		Connector-	0.5 m	JUSP-TA50PG-E	
		Terminal Block Con-	1 m	JUSP-TA50PG-1-E	
3	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA50PG-2-E	
		Cable with Loose Wires	1 m	JZSP-CSI01-1-E	
		at One End (loose wires	2 m	JZSP-CSI01-2-E	
		on peripheral device end)	3 m	JZSP-CSI01-3-E	
			0.2 m	JEPMC-W6012-A2-E	
			0.5 m	JEPMC-W6012-A5-E	
			1 m	JEPMC-W6012-01-E	
		Cables with Connectors on Both Ends	2 m	JEPMC-W6012-02-E	
			3 m	JEPMC-W6012-03-E	
			4 m	JEPMC-W6012-04-E	
			5 m	JEPMC-W6012-05-E	
			10 m	JEPMC-W6012-10-E	
			20 m	JEPMC-W6012-20-E	
	MECHATRO		30 m	JEPMC-W6012-30-E	
4	LINK-III Communi-		50 m	JEPMC-W6012-50-E	
4	cations	Cables with	10 m	JEPMC-W6013-10-E	
	Cables		20 m	JEPMC-W6013-20-E	
			30 m	JEPMC-W6013-30-E	
		(with core)	50 m	JEPMC-W6013-50-E	
			0.5 m	JEPMC-W6014-A5-E	
			1 m	JEPMC-W6014-01-E	
		Cable with	3 m	JEPMC-W6014-03-E	, L ,
		Loose Wires	5 m	JEPMC-W6014-05-E	
		at One End	10 m	JEPMC-W6014-10-E	
			30 m	JEPMC-W6014-30-E	
	50 m			JEPMC-W6014-50-E	
5	S Ethernet communications cables		Use a commercially ava conditions: • Ethernet specification • Category 5 or higher • Twisted-pair cable wit		

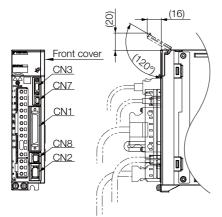
SERVOPACK External Dimensions

Front Cover Dimensions and Connector Specifications

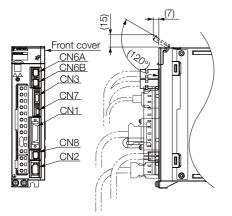
The front cover dimensions and panel connectors depend on the SERVOPACK interface. Refer to the following figures.

Front Cover Dimensions

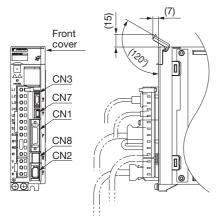
 Σ-7S Analog Voltage/Pulse Train Reference SERVOPACKs



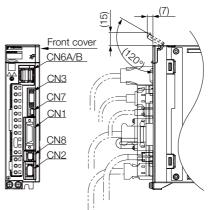
 Σ-7S MECHATROLINK-III Communications Reference SERVOPACKs



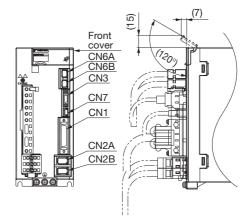
 Σ-7S Command Option Attachable-Type SERVOPACKs*



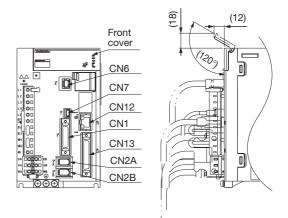
 Σ-7S MECHATROLINK-II Communications Reference SERVOPACKs



 Σ-7W MECHATROLINK-III Communications Reference SERVOPACKs



 Σ-7C Bus Connection Reference SERVOPACKs



* A Command Option Module must be attached to the Command Option Attachable-Type SERVOPACK. To find the dimensions of the SERVOPACK with a Command Option Module attached, add the dimensions of the Command Option Module (refer to page 447 and following pages).

Connector Specifications

SERVOPACK	Connector No.	Model	Number of Pins	Manufacturer	
	CN1	10250-59A3MB	50	3M Japan Ltd.	
Σ- 7S	CN2	3E106-0220KV	6	3M Japan Ltd.	
Analog Voltage/Pulse Train Reference	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.	
SERVOPACK	CN7	2172034-1	5	Tyco Electronics Japan G.K.	
	CN8			Tyco Electronics Japan G.K.	
	CN1	10226-59A3MB	26	3M Japan Ltd.	
5 70	CN2	3E106-0220KV	6	3M Japan Ltd.	
Σ-7S MECHATROLINK-II Communications	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.	
Reference SERVOPACK	CN6A/B	1903815-1	8	Tyco Electronics Japan G.K.	
	CN7	2172034-1	5	Tyco Electronics Japan G.K.	
	CN8	1981080-1	8	Tyco Electronics Japan G.K.	
	CN1	10226-59A3MB	26	3M Japan Ltd.	
	CN2	3E106-0220KV	6	3M Japan Ltd.	
Σ-7S MECHATROLINK-III	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.	
Communications Reference SERVOPACK	CN6A, CN6B	1981386-1	8	Tyco Electronics Japan G.K.	
	CN7	2172034-1	5	Tyco Electronics Japan G.K.	
	CN8	1981080-1	8	Tyco Electronics Japan G.K.	
	CN1	10226-59A3MB	26	3M Japan Ltd.	
N 70 October of Oction	CN2	3E106-0220KV	6	3M Japan Ltd.	
Σ-7S Command Option Attachable-Type SERVO- PACK	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.	
	CN7	2172034-1	5	Tyco Electronics Japan G.K.	
	CN8	1981080-1	8	Tyco Electronics Japan G.K.	
	CN1	10236-59A3MB	36	3M Japan Ltd.	
Σ-7W	CN2A, CN2B	3E106-2230KV	6	3M Japan Ltd.	
MECHATROLINK-III Communications Reference SERVOPACK	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.	
	CN6A, CN6B	1981386-1	8	Tyco Electronics Japan G.K.	
	CN7	2172034-1	5	Tyco Electronics Japan G.K.	
	CN1	10236-59A3MB	36	3M Japan Ltd.	
	CN2A, CN2B	3E106-2230KV	6	3M Japan Ltd.	
Σ -7C Bus Connection	CN6	1981386-1	8	Tyco Electronics Japan G.K.	
Reference SERVOPACK	CN7	2172034-1	5	Tyco Electronics Japan G.K.	
	CN12	26-51024KB13-1	8	UDE Corp.	
	CN13	10250-52A3PL	50	3M Japan Ltd.	

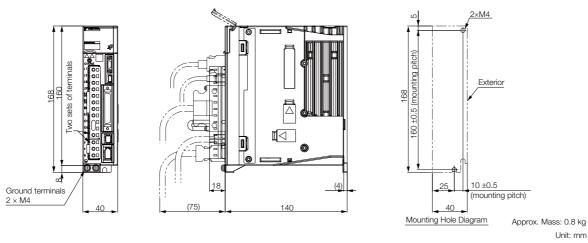
Note: The above connectors or their equivalents are used for the SERVOPACKs.

SERVOPACK External Dimensions

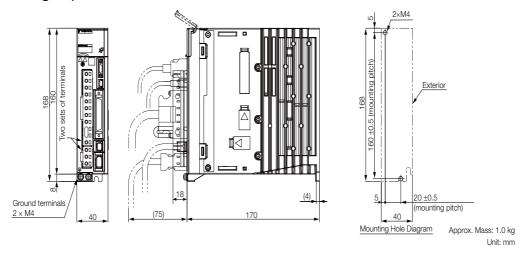
Σ -7S SERVOPACKs: Base-mounted

All of the dimensional drawings show Analog Voltage/Pulse Train Reference SERVOPACKs as typical examples.

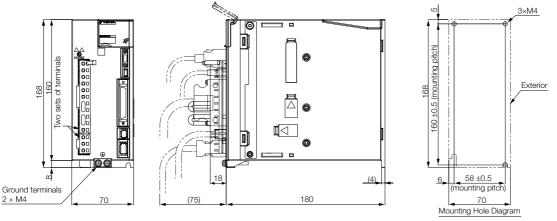
◆ Three-phase, 200 VAC: SGD7S-R70A, -R90A, and -1R6A



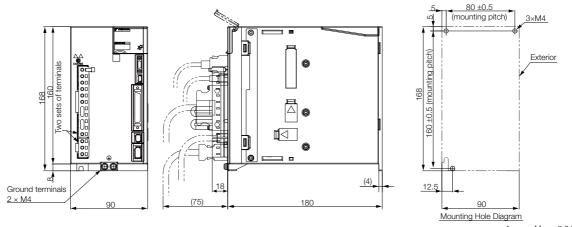
Three-phase, 200 VAC: SGD7S-2R8A
 Single-phase, 100 VAC: SGD7S-R70F, -R90F, and -2R1F



 Three-phase, 200 VAC: SGD7S-3R8A, -5R5A, and -7R6A Single-phase, 100 VAC: SGD7S-2R8F

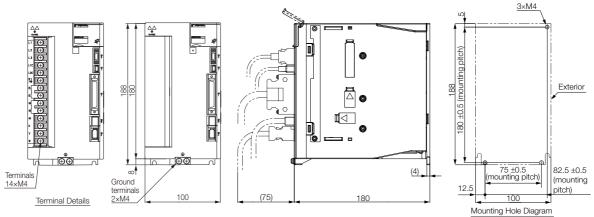


Three-phase, 200 VAC: SGD7S-120A



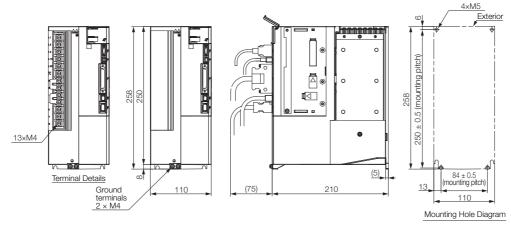
Approx. Mass: 2.2 kg Unit: mm

◆ Three-phase, 200 VAC: SGD7S-180A and -200A Single-phase, 200 VAC: SGD7S-120A□□A008



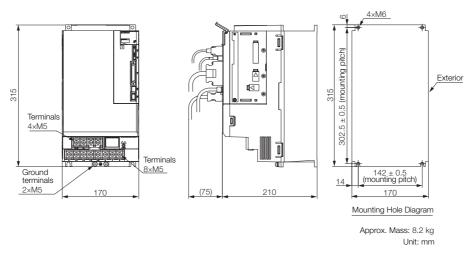
Approx. Mass: 2.7 kg Unit: mm

◆ Three-phase, 200 VAC: SGD7S-330A

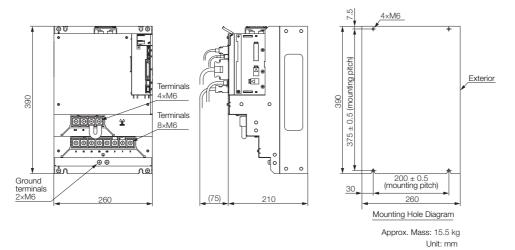


Approx. Mass: 4.4 kg Unit: mm

◆ Three-phase, 200 VAC: SGD7S-470A and -550A



Three-phase, 200 VAC: SGD7S-590A and -780A

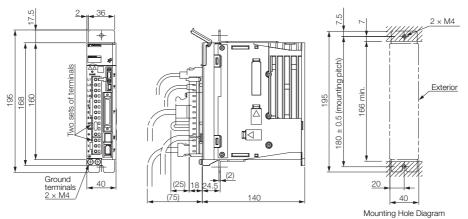


Σ-7S SERVOPACKs: Rack-mounted

Hardware Option Code: 001

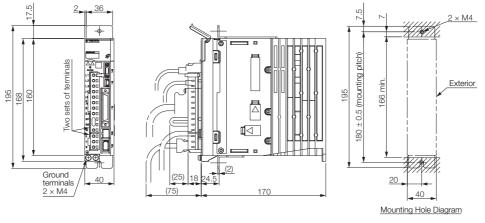
All of the dimensional drawings show Analog Voltage/Pulse Train Reference SERVOPACKs as typical examples.

◆ Three-phase, 200 VAC: SGD7S-R70A, -R90A, and -1R6A



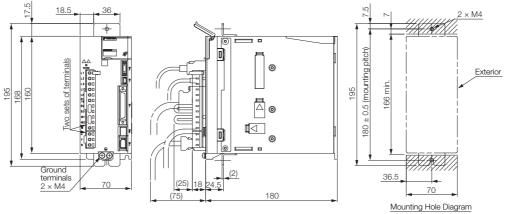
Approx. mass: 0.8 kg Unit: mm

Three-phase, 200 VAC: SGD7S-2R8A
 Single-phase, 100 VAC: SGD7S-R70F, -R90F, and -2R1F



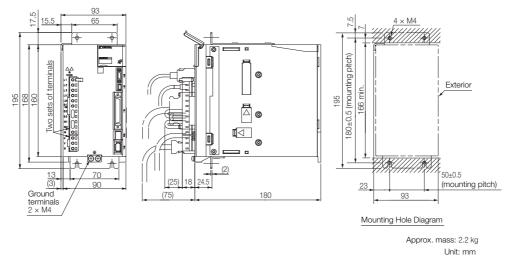
Approx. mass: 1.0 kg Unit: mm

 Three-phase, 200 VAC: SGD7S-3R8A, -5R5A, and -7R6A Single-phase, 100 VAC: SGD7S-2R8F

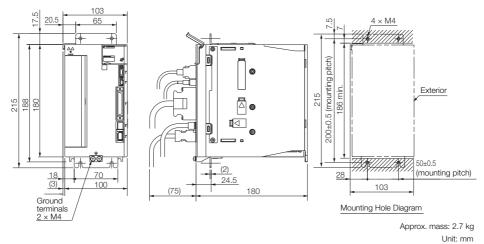


Approx. mass:1.6 kg Unit: mm

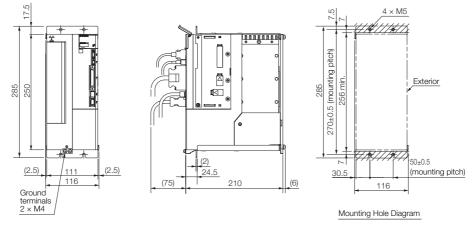
◆ Three-phase, 200 VAC: SGD7S-120A



Three-phase, 200 VAC: SGD7S-180A and -200A



◆ Three-phase, 200 VAC: SGD7S-330A



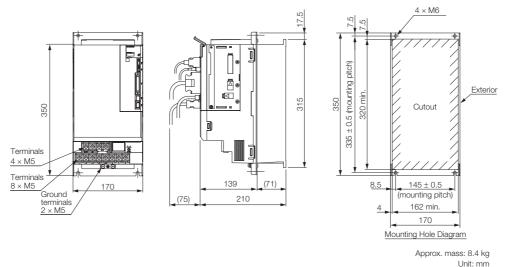
Approx. mass: 4.9 kg Unit: mm

Σ-7S SERVOPACKs: Duct-ventilated

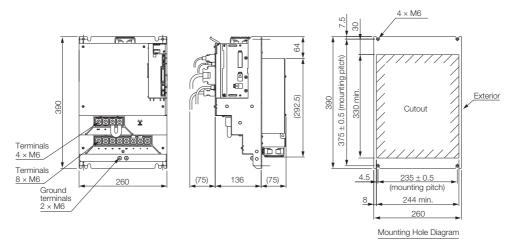
Hardware Option Code: 001

All of the dimensional drawings show Analog Voltage/Pulse Train Reference SERVOPACKs as typical examples.

◆ Three-phase, 200 VAC: SGD7S-470A and -550A



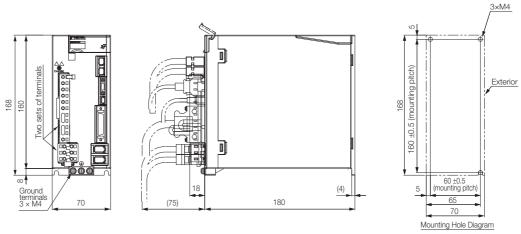
Three-phase, 200 VAC: SGD7S-590A and -780A



Approx. mass: 13.8 kg Unit: mm

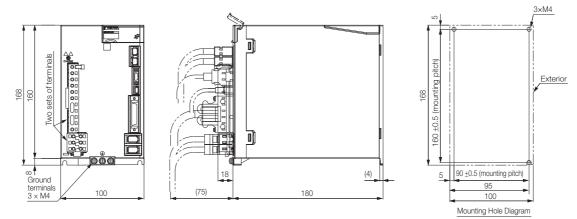
$\Sigma\textsc{-7W}$ SERVOPACKs: Base-mounted

◆ Three-phase, 200 VAC: SGD7W-1R6A and -2R8A



Approx. mass: 1.6 kg Unit: mm

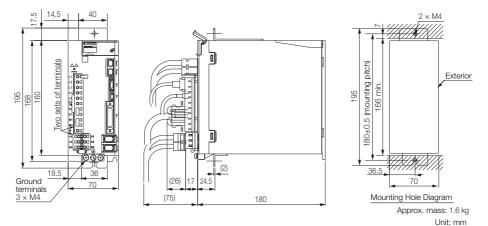
Three-phase, 200 VAC: SGD7W-5R5A and -7R6A



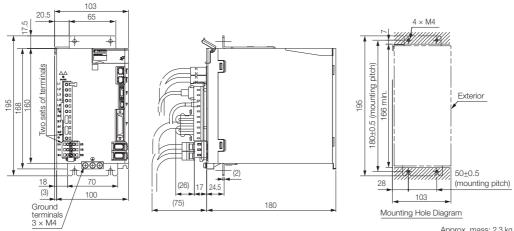
Approx. mass: 2.3 kg Unit: mm

Σ -7W SERVOPACKs: Rack-mounted

◆ Three-phase, 200 VAC: SGD7W-1R6A and -2R8A



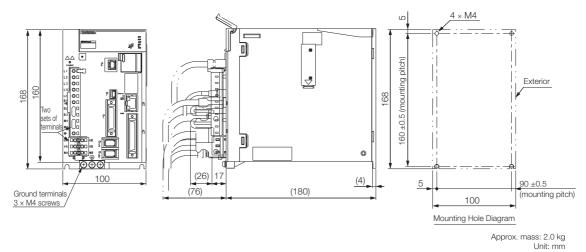
Three-phase, 200 VAC: SGD7W-5R5A and -7R6A

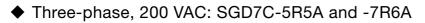


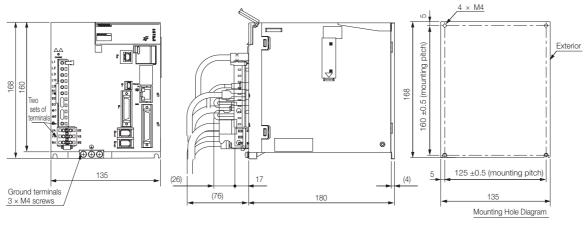
Approx. mass: 2.3 kg Unit: mm

Σ -7C SERVOPACKs: Base-Mounted

◆ Three-phase, 200 VAC: SGD7C-1R6A and -2R8A





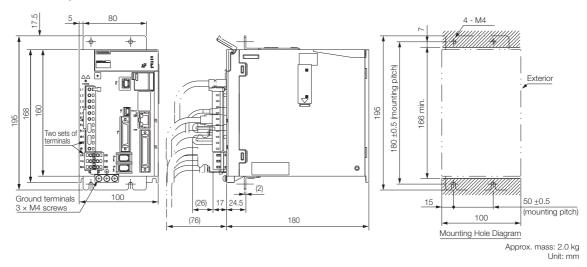


Approx. mass: 2.8 kg Unit: mm

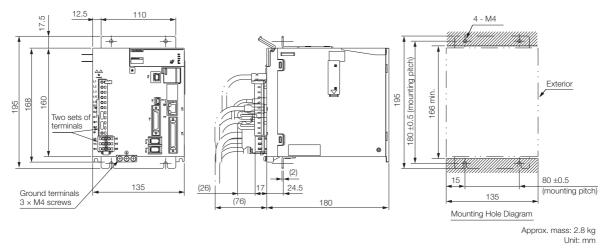
Σ-7C SERVOPACKs: Rack-Mounted

Hardware Option Code: 001

◆ Three-phase, 200 VAC: SGD7C-1R6A and -2R8A

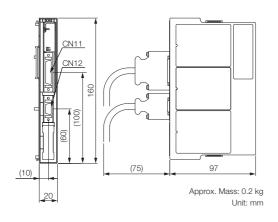


Three-phase, 200 VAC: SGD7C-5R5A and -7R6A

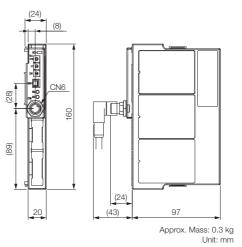


Command Option Module External Dimensions

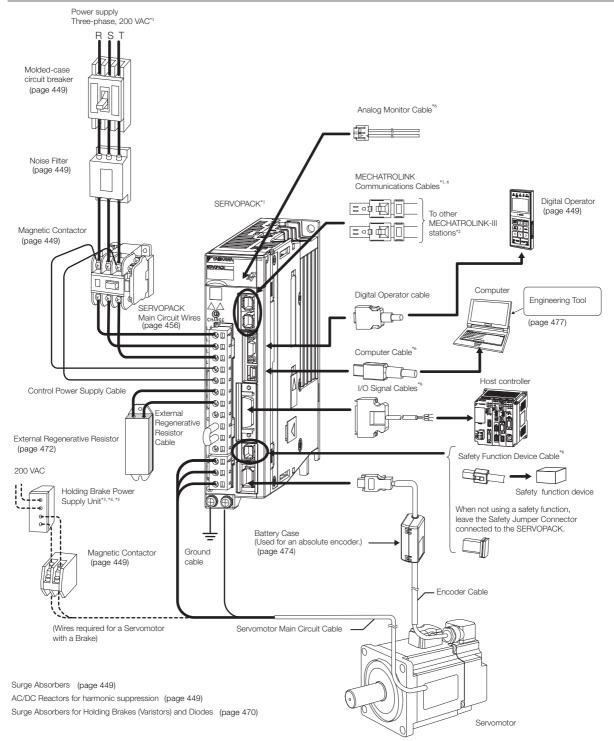
◆ INDEXER Module



DeviceNet Module



Peripheral Devices



- *1. The peripheral devices are described using a MECHATROLINK-III Communications Reference, Three-phase 200 VAC SERVOPACK as an example. The shapes of the connectors may be different for other interfaces.
- *2. The connected devices depend on the interface. For MECHATROLINK-II communications references: Other MECHATROLINK-II stations For analog voltage/pulse train references: There is no CN6 connector.
- *3. A Holding Brake Power Supply Unit is required to use a Servomotor with a Holding Brake. Holding Brake Power Supply Units for 24 VDC are not provided by Yaskawa. Obtain these from other manufacturers. Never connect Holding Brake Power Supply Units with different output voltages to a SERVOPACK. Overcurrent may result in burning in the brake.
- *4. If you use a Servomotor with a Holding Brake, select a brake relay according to the power supply voltage and current of the brake. Yaskawa does not recommend any particular brake relays. Select an appropriate brake relay using the selection method of the brake relay manufacturer.
- *5. The power supply for the holding brake is not provided by Yaskawa. Select a power supply based on the holding brake specifications. If you use a 24-V brake, install a separate power supply for the 24-VDC power supply from other power supplies, such as the one for the I/O signals of the CN1 connector. If the power supply is shared, the I/O signals may malfunction.
- *6. For SERVOPACK cables, refer to the selection table for each type of SERVOPACK.

Peripheral Device Selection Table

• Σ -7S SERVOPACKs

7.5 550A HF3060C-S2C X008026 SC-N2 OF 11 590A HF3100C-SZC X008027 SC-N2S X008028 SC-N3 1- 15 780A HF3100C-SZC X008027 SC-N2S X008028 SC-N3 1- 0.05 R70A X5071 X5071 1- 0.1 R90A HF2010A-UPF X5070 SC-03 X5070 SC-03 X5070 SC-03 X5079 SC-4-1 LT-C12G801WS C12G801WS LT-C12G801WS Single- 0.05 R70F X5073 SC-5-1 LT-C12G801WS SC-5-1 LT-C12G801WS SC-5-1 LT-C12G801WS SC-5-1 LT-C12G801WS SC-5-1 LT-C12G801WS SC-5-1 SC-5-1 LT-C12G801WS SC-5-1 SC-5-1 <th>Main Circuit Power Supply</th> <th>Maximum Applicable Motor Capacity [kW]</th> <th>SERVO- PACK Model: SGD7S-</th> <th>Noise Filter^{*1}</th> <th>AC Reactor^{*2}</th> <th>DC Reactor^{*2}</th> <th>Magnetic Contactor</th> <th>Surge Absorber</th> <th>Digital Opera- tor</th>	Main Circuit Power Supply	Maximum Applicable Motor Capacity [kW]	SERVO- PACK Model: SGD7S-	Noise Filter ^{*1}	AC Reactor ^{*2}	DC Reactor ^{*2}	Magnetic Contactor	Surge Absorber	Digital Opera- tor
0.2 1R6A HF3010C-SZC 0.4 2R8A 0.5 3R8A 0.75 5R5A 0.75 5R5A 1.0 7R6A 1.5 120A VAC 2.0 1.5 120A VAC 2.0 3.0 200A 180A - 3.0 200A 11 590A 15 780A 7.5 550A 11 590A 15 780A 0.05 R70A 0.1 R90A 0.1 R90A 0.1 R90A 0.1 R90A 0.2 1R6A 0.1 R90A 0.2 1R6A 0.1 R90A 0.2 1R6A 0.1 R90A 0.2 1R6A 0.1 R90A 0.1 R90A 0.1		0.05	R70A						
0.4 2R8A 0.5 3R8A 0.75 5R5A 1.0 7R6A 1.5 120A VAC 2.0 1.5 120A VAC 2.0 3.0 200A 180A HF3030C-SZC 5.0 330A HF3050C-SZC 6.0 470A -47EDD 7.5 550A 11 590A HF3100C-SZC 11 590A HF3100C-SZC 11 590A HF3100C-SZC 11 590A HF3100C-SZC 15 780A HF2010A-UPF X5071 SC-03 X5070 SC-03 X5070 SC-4-1 X5070 SC-4-1 X5070 SC-4-1 X5070 SC-4-1 X5070 SC-4-1 X5070 SC-4-1 X5079 SC-4-1		0.1	R90A						
Image: D.5 3R8A Image: D.75 SR5A Image: D.75 SR5A Image: D.75 SR5A Image: D.75 SR6A Image: D.75 SC-4-1 Image: D.75 Image: D.75 SC-5-1 Image: D.75 SC-5-1 Image: D.75 SC-6-1 Image:		0.2	1R6A	HF3010C-SZC			SC-03		
0.75 5R5A A </td <td></td> <td>0.4</td> <td>2R8A</td> <td></td> <td></td> <td>X5061</td> <td></td> <td></td> <td></td>		0.4	2R8A			X5061			
Ince- phase, 200 I.0 7R6A HF3020C-SZC SC-4-1 LT- C32G801WS I.5 120A HF3030C-SZC X5060 SC-5-1 SC-5-1 SC-5-1 I.5 330A HF3050C-SZC X5068 SC-N1 SC-N1 SC-80 SC-80 <t< td=""><td></td><td>0.5</td><td>3R8A</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		0.5	3R8A						
Image Image HF3020C-SZC Image		0.75	5R5A		-				
Index, 200 1.5 120A X5060 C32G801WS VAC 2.0 180A X5060 SC-5-1 C32G801WS 3.0 200A HF3030C-SZC X5059 SC-5-1 C32G801WS 5.0 330A HF3050C-SZC - X5068 SC-N1 C32G801WS 6.0 470A -47EDD - X5068 SC-N1 C32G801WS 7.5 550A HF3060C-SZC - X008025 SC-N1 X008026 SC-N2 11 590A HF3100C-SZC X008027 SC-N2S X008028 SC-N3 1- 0.05 R70A HF2010A-UPF X5071 SC-03 X5071 Single- 0.4 2R8A HF2020A-UPF- X5079 SC-4-1 LF X5079 SC-4-1 LF L12G801WS LF C12G801WS VAC 0.05 R70F X5078 SC-5-1 LF C12G801WS		1.0	7R6A				SC-4-1		
VAC 2.0 180A NS000 SC-5-1 3.0 200A HF3030C-SZC X5059 SC-5-1 5.0 330A HF3050C-SZC X5068 SC-N1 6.0 470A -47EDD X008025 SC-N1 7.5 550A HF3060C-SZC X008026 SC-N2 11 590A HF3100C-SZC X008027 SC-N2 11 590A HF3100C-SZC X008028 SC-N3 15 780A HF2100A-UPF X5071 SC-03 0.05 R70A HF2010A-UPF X5079 SC-03 VAC 0.75 5R5A HF2020A-UPF- 2BB X5079 SC-4-1 1.5 120AD HF2030A-UPF- 2BB X5078 SC-5-1 C12G801WS Single- 0.05 R70F X5053 X5078 SC-5-1		1.5	120A	HF30200-320		VEOGO			
3.0 200A HF3030C-SZC 5.0 330A HF3050C-SZC 6.0 470A -47EDD 7.5 550A HF3060C-SZC 11 590A HF3100C-SZC 11 590A HF3100C-SZC 15 780A HF3100C-SZC 15 780A HF3100C-SZC 0.05 R70A 0.1 R90A 0.2 1R6A 0.4 2R8A 0.05 SC-03 X5070 SC-03 X5079 SC-4-1 LT- C12G801WS Single- 0.05 0.4 2R8A 200 VAC 1.5 120AD HF2030A-UPF- 2B X5078 Scor9 Sc-4-1 LT- C12G801WS Single- 0.05 0.05 R70F		2.0	180A			X5060	SC 5 1	0020001110	
Image: Single-phase, 200 0.0 470A -47EDD X008025 SC-N1 JU JU OP OP <td></td> <td>3.0</td> <td>200A</td> <td>HF3030C-SZC</td> <td colspan="2">030C-SZC</td> <td>50-5-1</td> <td colspan="2">1-0-1</td>		3.0	200A	HF3030C-SZC	030C-SZC		50-5-1	1-0-1	
6.0 470A -47EDD X008025 X008025 X008026 SC-N2 11 590A HF3060C-SZC X008027 SC-N2S X008028 SC-N2S X008028 SC-N3 X008028 SC-N3 X008028 SC-N3 X5071 SC-03 X5070 X5069 X5069 X5079 SC-4-1 LT-C12G801WS LT-C12G801WS LT-C12G801WS Stoppen Single- 0.05 R70F X5073 SC-5-1 LT-C12G801WS LT-C		5.0	330A	HF3050C-SZC		X5068			
7.5 550A HF3060C-S2C X008026 SC-N2 OF 11 590A HF3100C-SZC X008027 SC-N2S X008028 SC-N3 1- 15 780A HF3100C-SZC X008027 SC-N2S X008028 SC-N3 1- 0.05 R70A X5071 X5071 1- 0.1 R90A HF2010A-UPF X5070 SC-03 X5070 0.1 R90A HF2020A-UPF X5079 SC-4-1 LT- C12G801WS 200 VAC 0.75 SR5A HF2030A-UPF- X5078 SC-5-1 LT- 1.5 120AD HF2030A-UPF- X5078 SC-5-1 LT- C12G801WS Single- 0.05 R70F X5053 I I I I		6.0	470A	-47EDD	-	X008025	30-111		
11 590A HF3100C-SZC X008027 SC-N2S 1- 15 780A HF3100C-SZC X008028 SC-N3 1- 0.05 R70A X008028 SC-N3 X008028 SC-N3 1- 0.05 R70A X5071 X5071 SC-03 X5070 SC-03 X5070 SC-03 X5079 SC-4-1 LT-C12G801WS LT-C12G801WS Single- Single- 0.05 R70F X5073 SC-5-1 LT-C12G801WS		7.5	550A	HF3060C-SZC	-	X008026	SC-N2		JUSP- OP05A-
15 780A X008028 SC-N3 0.05 R70A X5071 X5071 0.1 R90A HF2010A-UPF X5070 0.2 1R6A HF2020A-UPF- X5069 0.4 2R8A X5079 SC-4-1 1.5 120AD HF2030A-UPF- X5078 SC-5-1 Single- 0.05 R70F X5053 X5053		11	590A			X008027	SC-N2S	-	1-E
Single- phase, 200 VAC 0.1 R90A 1.5 HF2010A-UPF 2R8A X5071 SC-03 1.5 120AD D HF2020A-UPF- 2BB X5079 SC-4-1 LT- C12G801WS Single- 0.05 R70F X5053 SC-5-1 LT- C12G801WS		15	780A	HF31000-520		X008028	SC-N3		
0.1 R90A HF2010A-UPF X5070 SC-03 Single- phase, 200 0.4 2R8A HF2020A-UPF- 2BB X5079 SC-4-1 LT- C12G801WS 1.5 120AD HF2030A-UPF- 2BB X5078 SC-5-1 LT- C12G801WS Single- 0.05 R70F X5053 SC-5-1 SC-63	-	0.05	R70A		-	X5071			
Single- phase, 200 VAC 0.2 1R6A X5070 X5079 X5069 1.5 5R5A HF2020A-UPF- 2BB X5079 SC-4-1 LT- C12G801WS 1.5 120AD D<008		0.1	R90A	HE2010A-UPE		×3071	SC-03		
200 VAC 0.75 5R5A HF2020A-UPF- 2BB X5079 SC-4-1 LT- C12G801WS 1.5 120AD HF2030A-UPF- 2BB X5078 SC-5-1 LT- C12G801WS Single- 0.05 R70F X5053 LT- LT-				HF2010A-UFF					
VAC 0.75 5R5A HF2020A-OFF- 2BB X5079 SC-4-1 LT- C12G801WS 1.5 120AD HF2030A-UPF- DD008 X5078 SC-5-1 LT- C12G801WS Single- 0.05 R70F X5053 LT- LT-		0.4	2R8A		_	X5069			
1.5 Image: Constraint of the constraint of t		0.75	5R5A			X5079	SC-4-1	LT-	
Single- X5053		1.5				X5078	SC-5-1	C12G801WS	
	Sinale-	0.05	R70F		V5052				
	phase,	0.1	R90F	HF2010A-UPF	A0000	_	SC-03		
100 0.2 2R1F X5054		-							
VAC 0.4 2R8F HF2020A-UPF X5056 SC-4-1	VAC	0.4	2R8F	HF2020A-UPF	X5056		SC-4-1		

Device	Inquiries		
Noise Filters			
Surge Absorbers	Yaskawa Controls Co., Ltd.		
AC/DC Reactors for harmonic suppression			
Magnetic Contactors	Fuji Electric FA Components & Systems Co., Ltd.		

*1. Some Noise Filters have large leakage currents. The grounding conditions also affect the size of the leakage current. If necessary, select an appropriate leakage detector or leakage breaker taking into account the ground-ing conditions and the leakage current from the Noise Filter.

*2. The last digit of an RoHS-compliant serial number is R. Consult with Yaskawa Controls Co., Ltd. for RoHS-compliant reactors.

Note: 1. Consult the manufacturer for details on peripheral devices.

2. For Digital Operator Converter cables, refer to the selection table for each type of SERVOPACK.

3. Refer to the following manual for the following information.

• Dimensional drawings, ratings, and specifications of peripheral devices

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Peripheral Devices

Σ-7W SERVOPACKs

Main Circuit Power Supply	Maximum Appli- cable Motor Capacity per Axis [kW]	SERVO- PACK Model: SGD7W-	Noise Filter ^{*1}	AC Reactor ^{*2}	DC Reactor ^{*2}	Magnetic Contactor	Surge Absorber	Digital Opera- tor
Three-	0.2	1R6A	HF3010C-SZC		X5061	SC-03		
phase,	0.4	2R8A			X3001	SC-4-1	LT-	
200	0.75	5R5A	HF3020C-SZC		X5060	30-4-1	C32G801WS	JUSP-
VAC	1.0	7R6A				SC-5-1		
Oincela	0.2	1R6A	HF2010A-UPF	-	X5069	SC-03		OP05A- 1-E
Single- phase, 200	0.4	2R8A	HF2020A-UPF- 2BB	*	X5079	SC-4-1	LT- C12G801WS	
VAC	0.75	5R5A	HF2030A-UPF- 2BB	* 	X5078	SC-5-1		

Device	Inquiries			
Noise Filters				
Surge Absorbers	Yaskawa Controls Co., Ltd.			
AC/DC Reactors for harmonic suppression				
Magnetic Contactors	Fuji Electric FA Components & Systems Co., Ltd.			

*1. Some Noise Filters have large leakage currents. The grounding conditions also affect the size of the leakage current. If necessary, select an appropriate leakage detector or leakage breaker taking into account the grounding conditions and the leakage current from the Noise Filter.

*2. The last digit of an RoHS-compliant serial number is R. Consult with Yaskawa Controls Co., Ltd. for RoHS-compliant reactors.

Note: 1. Consult the manufacturer for details on peripheral devices.

2. Refer to the following section for information on Digital Operator Converter Cables.

Selection Table (page 418)

3. Refer to the following manual for the following information.

Dimensional drawings, ratings, and specifications of peripheral devices

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Main Circuit Power Supply	Maximum Appli- cable Motor Capacity per Axis [kW]	SERVO- PACK Model: SGM7C-	Noise Filter ^{*1}	AC Reactor ^{*2}	DC Reactor ^{*2}	Magnetic Contactor	Surge Absorber
Three-	0.2	1R6A	HF3010C-SZC		X5061	SC-03	
phase,	0.4	2R8A			X3001	SC-4-1	LT- C32G801WS
200	0.75	5R5A	HF3020C-SZC		X5060	00-4-1	
VAC	1.0	7R6A				SC-5-1	
Oire elle	0.2	1R6A	HF2010A-UPF	-	X5069	SC-03	
Single- phase, 200	0.4	2R8A	HF2020A-UPF- 2BB		X5079	SC-4-1	LT- C12G801WS
VAC	0.75	5R5A	HF2030A-UPF- 2BB		X5078	SC-5-1	0120001110

Σ-7C SERVOPACKs

Device	Inquiries		
Noise Filters			
Surge Absorbers	Yaskawa Controls Co., Ltd.		
AC/DC Reactors for harmonic suppression			
Magnetic Contactors	Fuji Electric FA Components & Systems Co., Ltd.		

*1. Some Noise Filters have large leakage currents. The grounding conditions also affect the size of the leakage current. If necessary, select an appropriate leakage detector or leakage breaker taking into account the ground-ing conditions and the leakage current from the Noise Filter.

*2. The last digit of an RoHS-compliant serial number is R. Consult with Yaskawa Controls Co., Ltd. for RoHS-compliant reactors.

Note: 1. Consult the manufacturer for details on peripheral devices.

2. Refer to the following manual for the following information.

• Dimensional drawings, ratings, and specifications of peripheral devices

Ω Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Molded-case Circuit Breakers and Fuses

Using an AC Power Supply

Use a molded-case circuit breaker and fuse to protect the power supply line. They protect the power line by shutting OFF the circuit when overcurrent is detected. Select these devices based on the information in the following tables.

Note: The following tables also provide the net values of the current capacity and inrush current. Select a fuse and a molded-case circuit breaker that meet the following conditions.

• Main circuit and control circuit: No breaking at three times the current value given in the table for 5 s.

• Inrush current: No breaking at the current value given in the table for 20 ms.

Σ-7S SERVOPACKs

	Maximum		Power Supply	Current	Capacity	Inrush Current		Rated Voltage	
Main Circuit Power Supply	Applicable Motor Capacity [kW]	SERVOPACK Model: SGD7S-	Capacity per SERVOPACK [kVA]*	Main Circuit [Arms]*	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Fuse [V]	MCCB [V]
	0.05	R70A	0.2	0.4					
	0.1	R90A	0.3	0.8					
	0.2	1R6A	0.5	1.3					
	0.4	2R8A	1.0	2.5	0.2				
	0.5	3R8A	1.3	3.0	0.2	34			
	0.75	5R5A	1.6	4.1		04	- 34	250	
	1.0	7R6A	2.3	5.7		_			
Three-phase, 200 VAC	1.5	120A	3.2	7.3					
200 110	2.0	180A	4.0	10	0.25				
	3.0	200A	5.9	15	0.20				
	5.0	330A	7.5	25	0.3	68			
	6.0	470A	10.7	29					
	7.5	550A	14.6	37					240
	11	590A	21.7	54	0.4	114			240
	15	780A	29.6	73	0.4				
	0.05	R70A	0.2	0.8			1		
	0.1	R90A	0.3	1.6					
Single-phase,	0.2	1R6A	0.6	2.4	0.2				
200 VAC	0.4	2R8A	1.2	5.0					
	0.75	5R5A	1.9	8.7					
	1.5	120A□□0 08	4.0	16	0.25	34			
	0.05	R70F	0.2	1.5					
Single-phase,	0.1	R90F	0.3	2.5	0.38				
100 VAC	0.2	2R1F	0.6	5	0.30				
	0.4	2R8F	1.4	10					

* This is the net value at the rated load.

Σ-7W SERVOPACKs

	Maximum		Power Supply	Current Capacity		Inrush Current		Rated Voltage	
Main Circuit Power Supply	Applicable Motor Capacity per Axis [kW]	SERVOPACK Model: SGD7W-	DPACK Capacity per del: SERVOPACK		Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Fuse [V]	MCCB [V]
	0.2	1R6A	1.0	2.5	0.25	34		250	
Three-phase,	0.4	2R8A	1.9	4.7					
200 VAC	0.75	5R5A	3.2	7.8					
	1.0	7R6A	4.5	11			34		240
Single-phase, 200 VAC	0.2	1R6A	1.3	5.5					
	0.4	2R8A	2.4	11					
	0.75	5R5A ^{*2}	2.7	12					

 $\ast 1.$ This is the net value at the rated load.

*2. If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

Σ-7C SERVOPACKs

	Maximum		Power Supply	Current Capacity		Inrush Current		Rated Voltage	
Main Circuit Power Supply	Applicable Motor Capacity per Axis [kW]	SERVOPACK Model: SGM7C- [kVA]*1		Main Circuit [Arms] ^{*1}	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Fuse [V]	MCCB [V]
	0.2	1R6A	1.0	2.5		34	34	250	
Three-phase,	0.4	2R8A	1.9	4.7	0.25				
200 VAC	0.75	5R5A	3.2	7.8					
	1.0	7R6A	4.5	11					240
	0.2	1R6A	1.3	5.5					
Single-phase, 200 VAC	0.4	2R8A	2.4	11					
	0.75	5R5A ^{*2}	2.7	12					

 $\ast 1.$ This is the net value at the rated load.

*2. If you use the SGM7C-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

Using a DC Power Supply

This section gives the power supply specifications for using a DC power supply input. Use the Fuses given in the following tables to protect the power supply line and SERVOPACK. They protect the power line by shutting OFF the circuit when overcurrent is detected.

Note: The following tables provide the net values of the current capacity and inrush current.

Σ-7S SERVOPACKs

Main			Power Supply		Inrush Current		External Fuse			
Circuit Power Supply	SERVOPACK Model: SGD7S-	Capacity per SERVOPACK [kVA] ^{*1}	Main Circuit [Arms] ^{*1}	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Order Number ^{*2}	Current Rating [A]	Voltage Rating [Vdc]	
	R70A	0.2	0.5							
	R90A	0.3	1.0	0.2			3,5URGJ17/16UL	16		
	1R6A	0.5	1.5	0.2						
	2R8A	1.0	3.0				3,5URGJ17/20UL	20		
	3R8A	1.3	3.8		34		3,5URGJ17/40UL	40		
	5R5A	1.6	4.9	0.2						
	7R6A	2.3	6.9		01					
	120A			0.2						
270 VDC	120A□□□ 008	3.2	11	0.05		34	3,5URGJ17/63UL	63	400	
	180A	4.0	14	0.25						
	200A	5.9	20							
	330A	7.5	34		68 ^{*3}		3,5URGJ17/100UL	100		
	470A	10.7	36	0.3	(5 Ω		3,5URGJ23/160UL	160		
	550A	14.6	48		external)		3,30hGJ23/1000L	100		
	590A	21.7	68		114 ^{*3}					
	780A	29.6	92	0.4	$(3 \Omega$ external)		3,5URGJ23/200UL	200		

*1. This is the net value at the rated load.

*2. These Fuses are manufactured by MERSEN Japan.

*3. If you use a DC power supply input with any of the following SERVOPACKs, externally connect an inrush current limiting circuit and use the power ON and OFF sequences recommended by Yaskawa: SGD7S-330A, -470A, -550A, -590A, or -780A.

There is a risk of equipment damage.

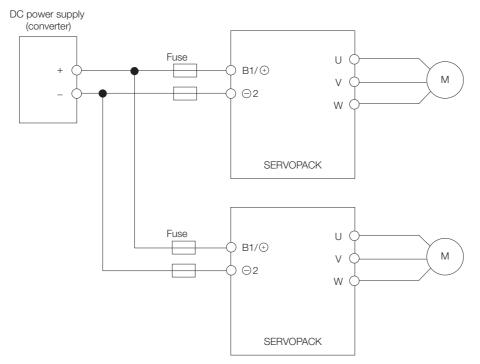
For information on the power ON and OFF sequences, refer to the product manual for the type of references used by your SERVOPACK.

Σ-7W SERVOPACKs

Main		Power Supply	Current Capacity		Inrush Current		External Fuse		
Main Circuit Power Supply Supply		Capacity per SERVOPACK [kVA] ^{*1}	Main Circuit [Arms] ^{*1}	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Order Number*2	Current Rating [A]	Voltage Rating [Vdc]
	1R6A	1	3.0			3,5URGJ17/40UL	40		
270	2R8A	1.9	5.8	0.25	34	34	3,30hGJ1/400L	40	400
VDC	5R5A	3.2	9.7			-04	3,5URGJ17/63UL	63	400
	7R6A	4.5	14				0,001100177000L	00	

*1. This is the net value at the rated load.

*2. These Fuses are manufactured by MERSEN Japan.



Note: If you connect more than one SERVOPACK to the same DC power supply, connect Fuses for each SERVO-PACK.

SERVOPACK Main Circuit Wires

This section describes the main circuit wires for SERVOPACKs.



These specifications are based on IEC/EN 61800-5-1, UL 61800-5-1, and CSA C22.2 No.274. 1. To comply with UL standards, use UL-compliant wires.

2. Use copper wires with a rated temperature of 75° or higher.

3. Use copper wires with a rated withstand voltage of 300 V or higher.

Note: To use 600-V heat-resistant polyvinyl chloride-insulated wire (HIV), use the following table as reference for the applicable wires.

• The specified wire sizes are for three bundled leads when the rated current is applied with a surrounding air temperature of 40°C.

• Select the wires according to the surrounding air temperature.

Three-phase, 200-VAC Wires for Σ -7S SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals	Wire Size	Screw Size	Tightening Torque [N∙m]		
	Main Circuit Power Supply Cable	L1, L2, L3				
	Servomotor Main Circuit Cable*	U, V, W	A) A/O 1 O (1 O 5 mm ²)			
R70A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3				
	Servomotor Main Circuit Cable*	U, V, W				
R90A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3				
	Servomotor Main Circuit Cable*	U, V, W	$\Delta \Delta A = 0.000$			
1R6A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3		_		
	Servomotor Main Circuit Cable*	U, V, W	$\Delta \Delta \Delta (0.10) (1.05 mm^2)$			
2R8A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3				
	Servomotor Main Circuit Cable*	U, V, W				
3R8A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3				
	Servomotor Main Circuit Cable*	U, V, W				
5R5A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	

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SERVOPACK Model: SGD7S-	Terminals	Wire Size	Screw Size	Tightening Torque [N·m]	
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	ANA/010 (1 05 ²)		
7R6A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W		_	_
120A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2		N4.4	
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
180A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	. ,		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG12 (3.5 mm ²)	-	
	Servomotor Main Circuit Cable*	U, V, W	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
200A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG8 (8.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W		M4	1.0 to 1.2
330A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG8 (8.0 mm ²)	-	
	Servomotor Main Circuit Cable*	U, V, W	AWG6 (14 mm ²)		
470A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M5	2.2 to 2.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG8 (8.0 mm ²)		212 10 211
	Servomotor Main Circuit Cable*	U, V, W	AWG4 (22 mm ²)		
550A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG10 (5.5 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.		
	Main Circuit Power Supply Cable	L1, L2, L3	AWG4 (22 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W	AVVG4 (22 MM))		
590A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG10 (5.5 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M6	2.7 to 3.0
	Main Circuit Power Supply Cable	L1, L2, L3	AWG3 (30 mm ²)	UVI	2.1 10 3.0
	Servomotor Main Circuit Cable*	U, V, W	, , , , , , , , , , , , , , , , , , ,		
780A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG8 (8.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.		

Peripheral Devices

* If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 200-VAC Wires for $\Sigma\textsc{-7S}$ SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals	Wire Size	Screw Size	Tightening Torque [N⋅m]		
	Main Circuit Power Supply Cable	L1, L2				
	Servomotor Main Circuit Cable* U, V, W		$\Delta \Delta (0.10) (1.05 mm^2)$			
R70A	Control Power Supply Cable L1C, L2C		AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2				
	Servomotor Main Circuit Cable*	U, V, W				
R90A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3				
	Servomotor Main Circuit Cable* U, V, W		$\Delta \Delta (0.10) (1.05 mm^2)$			
1R6A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3		_		
	Servomotor Main Circuit Cable*	U, V, W	A) A/O 1 O (1 O 5 mm ²)			
2R8A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)			
	Servomotor Main Circuit Cable*	U, V, W				
5R5A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cables	L1, L2	A)A(O14 (0.0 mm ²)			
	Servomotor Main Circuit Cables*	U, V, W	AWG14 (2.0 mm ²)		1.0 += 1.0	
120A DD 008	Control Power Supply Cables	L1C, L2C	ANA/016 (1.05 mm ²)	M4	1.0 to 1.2	
	External Regenerative Resistor Cables	B1/⊕, B2	AWG16 (1.25 mm ²)			
	Ground cable		AWG14 (2.0 mm ²) min.		1.2 to 1.4	

* If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 100-VAC Wires for $\Sigma\textsc{-7S}$ SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals	Wire Size	Screw Size	Tightening Torque [N⋅m]	
	Main Circuit Power Supply Cable	L1, L2			
	Servomotor Main Circuit Cable*	U, V, W	AWG16 (1.25 mm ²)	_	_
R70F	Control Power Supply Cable	L1C, L2C	AWG10 (1.25 mm)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2			
	Servomotor Main Circuit Cable*	U, V, W		-	1
R90F	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		—
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2			
	Servomotor Main Circuit Cable*	U, V, W			
2R1F	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2	AWG14 (2.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W			
2R8F	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

* If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

DC Power Supply Wires for $\Sigma\textsc{-7S}$ SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals ^{*1}		Wire Size	Screw Size	Tightening Torque [N·m]
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	-	-
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
R70A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG16 (1.25 mm ²)	-	_
R90A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	-
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG16 (1.25 mm ²)	-	_
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
1R6A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG16 (1.25 mm ²)	-	_
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
2R8A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG16 (1.25 mm ²)	-	_
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
3R8A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
SRSA	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
3R8A 5R5A	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG16 (1.25 mm ²)	-	_
7004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
7R6A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	_	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG14 (2.0 mm ²)	-	_
120A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
(three-phase, 200-VAC input)	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG14 (2.0 mm ²)	-	-
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG14 (2.0 mm ²)	M4	1.0 to 1.2
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
(single-phase, 200-VAC input)	Main Circuit Power Supply Cables	B1/ _⊕ , ⊝2	AWG14 (2.0 mm ²)	M4	1.0 to 1.2
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W ^{*2}	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
1004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
180A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

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SERVOPACK Model: SGD7S-	Terminals ^{*1}		Wire Size	Screw Size	Tightening Torque [N·m]
	Servomotor Main Circuit Cables	U, V, W*2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
2004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
200A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W	IC, L2C AWG16 (1.25 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG10 (5.5 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG14 (2.0 mm²) min. M4 0 AWG14 (2.0 mm²) min. M4 0 AWG16 (1.25 mm²) M4 0 AWG16 (1.25 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG16 (2.0 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG8 (8.0 mm²) M4 0 AWG14 (2.0 mm²) min. M4 0 AWG16 (1.25 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG8 (8.0 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG16 (1.25 mm²) M4 $1/_{\oplus}$, \ominus 2 AWG16 (1.25 mm²) M4 0 AWG14 (2.0 mm²) min. M4 0 AWG14 (2.0 mm²) min. M4 0 AWG14 (2.1 mm²) M4 0 AWG16 (1.25 mm²) M4		1.0 to 1.2
0004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
330A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG8 (8.0 mm ²)	M4	1.0 to 1.2
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W	AWG6 (14 mm ²)	M5	2.2 to 2.4
4704	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M5	2.2 to 2.4
470A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG8 (8.0 mm ²)	M5	2.2 to 2.4
	Ground Cable		AWG14 (2.0 mm ²) min.	M5	2.2 to 2.4
	Servomotor Main Circuit Cables	U, V, W	AWG4 (22 mm ²)	M5	2.2 to 2.4
550A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M5	2.2 to 2.4
550A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG6 (14 mm ²)	M5	2.2 to 2.4
	Ground Cable		AWG14 (2.0 mm ²) min.	M5	2.2 to 2.4
	Servomotor Main Circuit Cables	U, V, W	AWG4 (22 mm ²)	M6	2.7 to 3.0
500 A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M6	2.7 to 3.0
590A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG3 (30 mm ²)	M6	2.7 to 3.0
	Ground Cable		AWG14 (2.0 mm ²) min.	M6	2.7 to 3.0
	Servomotor Main Circuit Cables	U, V, W	AWG3 (30 mm ²)	M6	2.7 to 3.0
7004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M6	2.7 to 3.0
780A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG3 (30 mm ²)	M6	2.7 to 3.0
	Ground Cable		AWG14 (2.0 mm ²) min.	M6	2.7 to 3.0

*1. Do not wire the following terminals: L1, L2, L3, B2, B3, \ominus 1, and \ominus terminals.

*2. If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Three-phase, 200-VAC Wires for $\Sigma\text{-}7W$ SERVOPACKs

SERVOPACK Model: SGD7W-	Terminals		Wire Size	Screw Size	Tightening Torque [N∙m]
	Main Circuit Power Supply Cable	L1, L2, L3			
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	-	_
21.07.1	Control Power Supply Cable	L1C, L2C	/ WOTO (1.20 mm)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
7R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
-	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

 \ast If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase	, 200-VAC	Wires fo	or Σ -7W	SERVOPACKs
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SERVOPACK Model: SGD7W-	Terminals		Wire Size	Screw Size	Tightening Torque [N∙m]
	Main Circuit Power Supply Cable	L1, L2, L3			
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	-	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable	AWG1		M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

* If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

DC Power Supply Wires for Σ -7W SERVOPACKs

SERVOPACK Model: SGD7W-	Terminal*1		Wire Size	Screw Size	Tightening Torque [N·m]
	Servomotor Main Circuit Cables UA, VA, WA, UB, VB, WB ^{*2} AWG16		AWG16 (1.25 mm ²)	_	_
1R6A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB ^{*2}	AWG16 (1.25 mm ²)	_	_
2R8A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB ^{*2}	AWG16 (1.25 mm ²)	_	_
5R5A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG14 (2.0 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB ^{*2}	AWG16 (1.25 mm ²)	-	_
7R6A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG14 (2.0mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

*1. Do not wire the following terminals: L1, L2, L3, B2, B3, \ominus 1, and \ominus terminals.

*2. If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Three-phase, 200-VAC Wires for $\Sigma\text{-7C}$ SERVOPACKs

SERVOPACK Model: SGM7C-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]
	Main Circuit Power Supply Cable	L1, L2, L3			
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	-	_
	Control Power Supply Cable	L1C, L2C	,		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
7R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

* If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 200-VAC Wires for Σ -7C SERVOPACKs

SERVOPACK Model: SGM7C-	Terminals		Wire Size	Screw Size	Tightening Torque [N∙m]	
	Main Circuit Power Supply Cable	L1, L2, L3				
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_	
	Control Power Supply Cable	L1C, L2C				
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)			
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	-	_	
	Control Power Supply Cable	L1C, L2C	,			
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)			
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_	
	Control Power Supply Cable	L1C, L2C				
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	

* If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Wire Types

The following table shows the wire sizes and allowable currents for three bundled leads.

HIV Specificat	Allowable Current at Surrounding Air Temperatures [Arms]				
Nominal Cross-sectional Area [mm ²]	Configuration [Wires/mm]	30°C	40°C	50°C	
0.9	7/0.4	15	13	11	
1.25	7/0.45	16	14	12	
2.0	7/0.6	23	20	17	
3.5	7/0.8	32	28	24	
5.5	7/1.0	42	37	31	
8.0	7/1.2	52	46	39	
14.0	7/1.6	75	67	56	
22.0	7/2.0	98	87	73	
38.0	7/2.6	138	122	103	

* This is reference data based on JIS C3317 600-V-grade heat-resistant polyvinyl chloride-insulated wires (HIV).

Crimp Terminals and Insulating Sleeves

If you use crimp terminals for wiring, use insulating sleeves. Do not allow the crimp terminals to come close to adjacent terminals or the case.

To comply with UL standards, you must use UL-compliant closed-loop crimp terminals and insulating sleeves for the main circuit terminals. Use the tool recommended by the crimp terminal manufacturer to attach the crimp terminals.

The following tables give the recommended tightening torques, closed-loop crimp terminals, and insulating sleeves in sets. Use the set that is suitable for your model and wire size.

$\Sigma\text{-7S}$ SERVOPACKs with Three-Phase, 200-VAC and DC Power Supply

SERVOPACK Model: SGD7S-	Main Circuit	Screw Size	Tightening Torque	Crimp Terminal Horizontal	Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals	0126	[N∙m]	Width	Size	(From J.	S.T. Mfg. (Co., Ltd.)	(Tokyo Dip Co., Ltd.)
R70A, R90A,	Connector					_			
1R6A, 2R8A, 3R8A, 5R5A, 7R6A, or 120A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	-	_
	Torroi				AWG10 (5.5 mm ²)	5.5-S4		_	TP-005
180A or 200A	Termi- nal block	M4	1.0 to 1.2	7.7 mm max.	AWG14 (2.0 mm ²)	2-M4	YHT- 2210	-	TP-003
					AWG16 (1.25 mm ²)			-	
		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	-	_
330A	- ·	~i			AWG8 (8.0 mm ²)	8-4NS	YPT- 60N	TD-121 TD-111	TP-008
	Termi- nal M4 block	4 1.0 to 1.2	9.9 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT-	-	TP-003	
000A					AWG16 (1.25 mm ²)	112-4	2210	-	
		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	-	_
					AWG4 (22 mm ²)	22-S5		TD-123 TD-112	TP-022
					AWG6 (14 mm ²)	R14-5	YPT- 60N	TD-122 TD-111	TP-014
	Termi- nal	M5	2.2 to	13 mm	AWG8 (8.0 mm ²)	R8-5		TD-121 TD-111	TP-008
470A or 550A	block	IVIO	2.4	max.	AWG10 (5.5 mm ²)	R5.5-5		Ι	TP-005
					AWG14 (2.0 mm ²)	R2-5	YHT- 2210	_	
						AWG16 (1.25 mm ²)	112-0		-
		M5	2.2 to 2.4	12 mm max.	AWG14 (2.0 mm ²)	R2-5	YHT- 2210	-	_

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SERVOPACK Model: SGD7S-	Circuit Screw Torque		Tightening Torque	Crimp Terminal Horizontal	Recom- mended Model		Crimping Tool	Die	Insulating Sleeve Model
	Terminals	Size	[N∙m]	Width	Wire Size	(From J.	S.T. Mfg. (Co., Ltd.)	(Tokyo Dip Co., Ltd.)
					AWG3 (30 mm ²)	38-S6		TD-124 TD-112	TP-038
	Termi-				AWG4 (22 mm ²)	R22-6	YPT- 60N	TD-123 TD-112	TP-022
		M6	2.7 to	18 mm	AWG8 (8.0 mm ²)	R8-6		TD-121 TD-111	TP-008
590A or 780A	nal block	IVIO	3.0	max.	AWG10 (5.5 mm ²)	R5.5-6		-	TP-005
					AWG14 (2.0 mm ²)	R2-6	YHT- 2210	-	
					AWG16 (1.25 mm ²)	Π2-0		-	11-003
		M6	2.7 to 3.0	12 mm max.	AWG14 (2.0 mm ²)	R2-6	YHT- 2210	_	_

$\Sigma\textsc{-7S}$ SERVOPACKs with Single-Phase, 200-VAC Power Supply

SERVOPACK Model: SGD7S-	Main Circuit	Screw Size	Tightening Torque	Crimp Terminal Horizontal	Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals	5126	[N∙m]	Width	Size	(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
R70A, R90A,	Connector					-			
1R6A, 2R8A, or 5R5A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	-	-
120A□□008	Terminal block	M4	1.0 to 1.2	7.7 mm max.	AWG14 (2.0 mm ²)	2-M4	YHT- 2210	-	TP-003
		IVI4			AWG16 (1.25 mm ²)			-	11-003
		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

$\Sigma\textsc{-7S}$ SERVOPACKs with Single-Phase, 100-VAC Power Supply

SERVOPACK Model: SGD7S-	Main Screw Tightening Terminal Mended Mode Terminal Size IN.ml	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model				
Model: SGD75-		0126	[N∙m]			(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
R70F, R90F,	Connector					-			
2R1F, or 2R8F		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

$\Sigma\text{-}7W$ SERVOPACKs with Three-Phase, 200-VAC and DC Power Supply

SERVOPACK Model: SGD7W-	Main Circuit Terminals	Screw Size	Tightening Torque [N∙m]	Crimp Terminal Horizontal Width	Recom- mended Wire Size	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
		50				(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
	Connector					-			
1R6A, 2R8A, 5R5A, or 7R6A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

$\Sigma\textsc{-7W}$ SERVOPACKs with Single-Phase, 200-VAC Power Supply

SERVOPACK Model: SGD7W-	Main Circuit Terminals	Screw Size	Tightening Torque [N∙m]	Crimp Terminal Horizontal Width	Recom- mended Wire Size	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
		50				(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
1R6A, 2R8A, or	Connector					-			
5R5A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

$\Sigma\text{-7C}$ SERVOPACKs with Three-Phase, 200-VAC and DC Power Supply

SERVOPACK Model: SGM7C-	Circuit Size Torque Horizontal Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model				
Model: SGM7C-		s	[N∙m]		_	(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
1R6A, 2R8A,	Connector					-			
5R5A, or 7R6A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

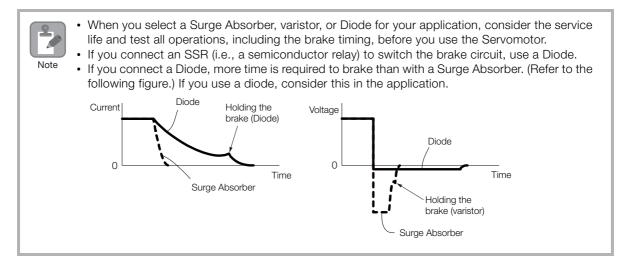
$\Sigma\text{-7C}$ SERVOPACKs with Single-Phase, 200-VAC Power Supply

SERVOPACK Model: SGM7C-	Main Circuit	Main Screw Tightening Crimp Recom- Terminal mended	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model			
Model: SGM7C-	Terminals	0126	[N∙m]	Width	Size	(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
1R6A, 2R8A, or	Connector					-			
5R5A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

Surge Absorbers (Varistors) and Diodes for Holding Brake Power Supplies

Surge Absorbers (varistors) and Diodes for holding brake power supplies help prevent damage to brake coils caused by voltage surges.

If you use a Servomotor with a Holding Brake and switch the brake power supply circuit on the DC side, connect a Surge Absorber (varistor) or Diode that is suitable for the brake power supply voltage and current.



Surge Absorbers (Varistors) for Holding Brake Power Supplies

Use the following table as reference in selecting a Surge Absorber. Elements were selected for a Surge Absorber surrounding air temperature range of -20°C to 60°C and an ON/OFF switching frequency of 10 times or less per minute. The information in this table is for reference only, and does not ensure operation in combination with the holding brake.

Holding Brake Power Supply Voltage		24 VDC			
Manufacturer		Nippon Chemi-Con Corporation	Semitec Corporation		
		Order Number			
	1 A max.	TNR5V121K	Z5D121		
Brake Rated Current	2 A max.	TNR7V121K	Z7D121		
Drake hated Ourent	4 A max.	TNR10V121K	Z10D121		
	8 A max.	TNR14V121K	Z15D121		

Diodes for Holding Brake Power Supplies

Select a Diode for the holding brake power supply with a rated current that is greater than that of the holding brake and with the recommended withstand voltage given in the following table. Diodes are not provided by Yaskawa.

Holding Brake Power Su	pply Unit Specifications	Withstand Voltage
Rated Output Voltage	withstand voltage	
24 VDC	200 V	100 V to 200 V

Regenerative Resistors

Types of Regenerative Resistors

The following regenerative resistors can be used.

- Built-in regenerative resistors: Some models of SERVOPACKs have regenerative resistors built into them.
- External regenerative resistors: These resistors are used when the smoothing capacitor and builtin regenerative resistor in the SERVOPACK cannot consume all of the regenerative power. Use Yaskawa's SigmaSize+, an AC Servo drive capacity selection program, to determine if a regenerative resistor is required.

Note: If you use an External Regenerative Resistor, you must change the setting of the Pn600 (Regenerative Resistor Capacity) or Pn603 (Regenerative Resistance) parameters.

SE	SERVOPACK Model		Built-In Regener-	External Regener-	Contents
SGD7S-	SGD7W-	SGD7C-	ative Resistor	ative Resistor	Contenta
R70A, R90A, 1R6A, 2R8A, R70F, R90F, 2R1F, 2R8F	_	_	None	Basically not required	There is no built-in regenerative resistor, but nor- mally an external regenerative resistor is not required. Install an external regenerative resistor when the smoothing capacitor in the SERVOPACK cannot process all the regenerative power.*1
3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A	1R6A, 2R8A, 5R5A, 7R6A	1R6A, 2R8A, 5R5A, 7R6A	Standard fea- ture ^{*2}	Basically not required	A built-in regenerative resistor is provided as a standard feature. Install an external regenerative resistor when the built-in regenerative resistor cannot process all the regenerative power.*1
470A, 550A, 590A, 780A	_	_	None	Required.*3	A built-in regenerative resistor is not provided. An External Regenerative Resistor is required. If the External Regenerative Resistor is not con- nected to the SERVOPACK, a Regeneration Alarm (A.300) will occur.

Selection Table

*1. Use Yaskawa's SigmaSize+, an AC Servo drive capacity selection program, to select an external regenerative resistor.

*2. Refer to the following section for the specifications of built-in regenerative resistors.

*3. Regenerative Resistor Units are available. Refer to the following sections for details.

Built-In Regenerative Resistor

The following table gives the specifications of the built-in regenerative resistors in the SERVOPACKs and the amount of regenerative power (average values) that they can process.

SER	SERVOPACK Model				Regenerative Power Processing Capacity of	Minimum Allowable
SGD7S-	SGD7W-	SGD7C-	Besistance Canacity		Built-In Regenerative Resistor [W]	Resistance [Ω]
R70A, R90A, 1R6A, 2R8A, R70F, R90F, 2R1F, 2R8F	_	_	_	_	_	40
3R8A, 5R5A, 7R6A	1R6A, 2R8A	1R6A, 2R8A	40	40	8	40
120A	-	-	20	60	10	20
120A□□□008, 180A, 200A	5R5A, 7R6A	5R5A, 7R6A	12	60	16	12
330A	-	_	8	180	36	8
470A	-	-	(6.25) ^{*1}	(880)*1	(180)*1	5.8
550A, 590A, 780A	_	_	(3.13) ^{*2}	(1760)*2	(350) ^{*2}	2.9

*1. Values in parentheses are for the optional JUSP-RA04-E Regenerative Resistor Unit.

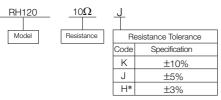
*2. Values in parentheses are for the optional JUSP-RA05-E Regenerative Resistor Unit.

External Regenerative Resistors

Model	Specification	Mass	Wire Size	Manufacturer	Inquiries	
RH120	70 W, 1 Ω to 100 Ω	282 g	AWG16 (1.25 mm ²)			
RH150	90 W, 1 Ω to 100 Ω	412 g	AWG16 (1.25 mm ²)	*		
RH220	120 W, 1 Ω to 100 Ω	500 g	AWG16 (1.25 mm ²)	*		
RH220B	120 W, 1 Ω to 100 Ω	495 g	AWG14 (2.0 mm ²)	lwaki Musen Kenkyusho	Yaskawa Controls Co., Ltd.	
RH300C	200 W, 1 Ω to 10 k Ω	850 g	AWG14 (2.0 mm ²)	Co., Ltd.		
RH450	150 W, 1 Ω to 100 Ω	880 g	AWG14 (2.0 mm ²)	-		
RH450FY	150 W, 2 Ω to 100 Ω	1.3 kg	AWG14 (2.0 mm ²)			
RH500	300 W, 2 Ω to 50 Ω	1.4 kg	AWG14 (2.0 mm ²)			

Note: 1. Consult Yaskawa Controls Co., Ltd. if you require a RoHS-compliant resistor.

2. Consult Yaskawa Controls Co., Ltd. for the model numbers and specifications of resistors with Thermal Protector.



* There is no RH450FY model that has a resistance tolerance of H (±3%).

Regenerative Resistor Units

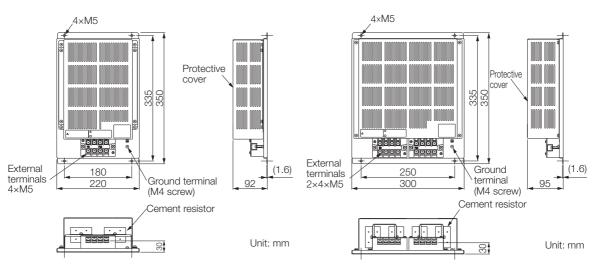
SERVOPACK Model: SGD7S-	Regenerative Resistor Unit Model	Specifications	Allowable Power Loss
470A	JUSP-RA04-E	6.25 Ω, 880 W	180 W
550A, 590A, or 780A	JUSP-RA05-E	3.13 Ω, 1,760 W	350 W

■ JUSP-RA05-E

Note: If you use only the above Regenerative Resistor Units, you do not need to change the setting of the Pn600 (Regenerative Resistor Capacity) or Pn603 (Regenerative Resistance) parameters.

External Dimensions

■ JUSP-RA04-E



Peripheral Devices

Batteries for Servomotors with Absolute Encoders

If you use an absolute encoder, you can use an Encoder Cable with a Battery Case connected to it to supply power and retain the absolute position data.

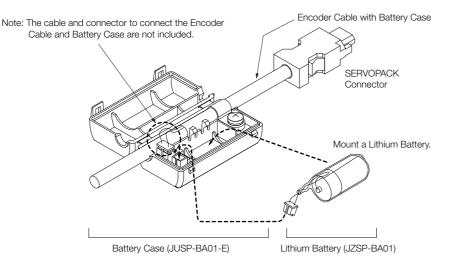
You can also retain the absolute position data by supplying power from a battery on the host controller.

Note: A Battery Case is not required if you use a Servomotor with a Batteryless Absolute Encoder and connect a battery to the host controller.

Using Encoder Cables with Battery Cases

A Battery Case is attached to an Encoder Cable with a Battery Case. To replace the battery, obtain a Lithium Battery (JZSP-BA01) and mount it in the Battery Case.

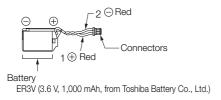
You cannot attach the Battery Case to an Incremental Encoder Cable.
 Install the Battery Case where the surrounding air temperature is between -5°C and 60°C.



Selection Table

Name	Order Number	Remarks
Battery Case (case only)	JUSP-BA01-E	The Encoder Cable and Battery are not included. (This is a replacement part for a damaged Battery Case.)
Lithium Battery	JZSP-BA01	This is a special battery that is mounted into the Battery Case.

Lithium Battery Dimensional Drawing



When Installing a Battery on the Host Controller

Use a battery that meets the specifications of the host controller. Use the recommended Battery given in the following table or the equivalent.



Inrush Current Suppression Devices

Inrush current suppression devices prevent equipment from being damaged by inrush current.

They are used only when using a SERVOPACK of 5 kW or higher (SGD7S-330A, -470A, -550A, - 590A, or -780A) with a DC power supply input.

Selection Table

External Inrush Current Suppression Resistors

Main Circuit	SERVO- PACK		I Inrush Cu ession Resi			
Power Supply	Model: SGD7S-	Order Num- ber	Resis- tance [Ω]	Rated Power [W]	Manufacturer	Inquiries
	330A					
	470A	RH120-5ΩJ	5		lwaki Musen	Yaskawa
270 VDC	550A			70	Kenkyusho	Controls
	590A	RH120-3ΩJ	3		Co., Ltd.	Co., Ltd.
	780A	111120-0520	0			

Inrush Current Suppression Resistor Short Relays

Main	SERVO-	Main Cir-	Contact	Recommende Suppression Re			
Circuit Power Supply	PACK Model: SGD7S-	cuit DC Current [Arms]	Specifica- tion	Model	Volt- age Rating [Vdc]	Current Rating [A]	Manufac- turer
	330A	34		G9EA-1-B		60	
	470A	36		USLA-1-D		00	
270 VDC	550A	48	NO	G9EA-1-B-CA	400	100	OMRON Corporation
	590A	68		G9EA-1-B-CA*1		200	Corporation
	780A	92		G9EC-1-B*2		200	

*1. Connect two Relays in parallel. Also, maintain the same resistance between the DC power supply and SERVO-PACK for the wiring for each Relay.

*2. This Relay is applicable only when the temperature of the Relay installation environment is 50°C or less.

Software

SigmaSize+: AC Servo Capacity Selection Program

You can use the SigmaSize+ to select Servomotors and SERVOPACKs. There are two versions of the software: A cloud version* and a stand-alone version.

The software supports all standard servo products sold by Yaskawa.

* SigmaSize+ is available in Japan only. Contact your Yaskawa representative for information on this program.

Features

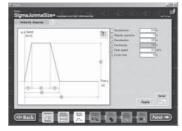
- Provides a vast amount of new product information.
- Lets you select servo products with a wizard.
- You can access and reuse previously entered data.

Examples of the Servo Selection Interface

Mechanism Selection View



Speed Diagram Entry View



Servomotor Selection View

	100 202	Robert Street		Particul speed.	Pass Sugar	-	•	References
•	30K0/ (044	1.80+101	1904-00	150+101	45134-581	(225-00)		Formula
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•	30802-44048	(106+8t)	(4 KEe-000)	(188+00)	(1112-01)	(100est)		1385+300 Mar
•	33402-00446	10004-021	8808-000	(188-00)	(\$30-01	(1186-01)		[1211a-001] +or
	10407-0248	(100+01)	1005-000	1100-001	(ENG-OF)	[136eatt]		Contractory of
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	30807-7014	100-01	(105-00)	(180+90)	(1998-002	INTERNE		INU-to bran
•	3080714444	(7006-022)	(110+01)	(180e-007	(170+02	(4210+000		3.00797000 000
9	00H0V-140+8	1004-01	(1106-001)	(1006-000)	1704-002	(4216-002		
		141		-	-]		Apple I willing



Item	System Requirement
Browser	Internet Explorer version 10 or later
OS	Windows Vista or Windows 7 (32-bit or 64-bit edition)*
CPU	Pentium 200 MHz min.
Memory	64 MB min. (96 MB or greater recommended)
Available Hard Disk Space	20 MB min.

* 64-bit OS is applicable only for the stand-alone version.

Machine Specification Entry View



Operating Conditions Selection View

Common	Serve amplifors	April press trapp
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SERVOPACK Selection View

		amplifier asherian	Peterson	Personal		m	Reference.
	Ð	ROY-DOWNA	1284-021	1402-02	1129-102	61	T205412)2
	D	BIRS-BEATS	1289-021	0.00+00	110+02		
Control of the second s	D	NUM-DEATS	1205-01	0.006-011	1126-002		

SigmaWin+: AC Servo Drive Engineering Tool

The SigmaWin+ Engineering Tool is used to set up and optimally tune Yaskawa $\Sigma\text{-}series$ Servo Drives.

Features

- Set parameters with a wizard.
- Display SERVOPACK data on a computer just like you would on a oscilloscope.
- Estimate moments of inertia and measure vibration frequencies.
- Display alarms and alarm diagnostics.

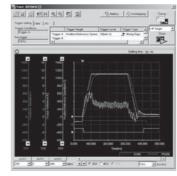
Setting Parameters with a Wizard

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Estimating Moments of Inertia and Measuring Vibration Frequencies

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Displaying SERVOPACK Data on a Computer Just Like You Would on a Oscilloscope



Displaying Alarms and Alarm Diagnostics

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System Requirements

Item	System Re	equirement
Item	Ver.5	Ver.7
Supported Languages	English and Japanese	Japanese, English, and Chinese (simpli- fied)
OS	Windows XP, Windows Vista, or Win- dows 7 (32-bit or 64-bit edition)	Windows 10, Windows 8, Windows 8.1, or Windows 7 (32-bit or 64-bit edition)
Software Environment	-	.NET Framework 4.5, .NET Framework 4.6
CPU	Pentium 200 MHz min.	1 GHz min. (recommended)
Memory	64 MB min. (96 MB or greater recommended)	1 GB min. (recommended)
Available Hard Disk Space	For Standard Setup: 350 MB min. (400 MB or greater recom- mended for installation)	500 MB min.
Browser used to dis- play Help	-	Internet Explorer 9 or higher

MPE720 System Integrated Engineering Tool

MPE720 Ver.7 is a system integrated Engineering Tool that provides the complete development functionality to set up, adjust, program, maintain, and inspect not only Controller programs but also all of the devices necessary to design machine installations, including Servo Drives, AC Drives, and Distributed I/O Devices.

It is installed in a PC and operated on a PC interface through a connection between the PC and Machine Controller.

♦ Features

■ Complete Adjustment and Maintenance of Equipment Drive Devices

MPE720 Ver.7 connected to the Σ -7C or MP series machine controllers can be used to set up, adjust, and maintain Servo Drives, AC Drives, and I/O Devices connected to a network. There is no need to change connections, which increases efficiency.

■ Greater Efficiency with the Best Programming Method

Ladder Programming

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- The new user interface lets just about anyone easily use the MPE720.
- An improved EXPRESSION instruction simplifies programming calculation in ladder diagrams.
- Support is provided for all types of control, including position, speed, torque, and phase control.

Motion Programming



- Positioning and interpolation can be programmed with one instruction.
- Programs can be very easily edited using expressions in a text format.
- New variable programming can provide PC-like programming.

Item	Specification
CPU	1 GHz or more recommended (manufactured by Intel or other companies)
Memory Capacity	1 GB or more recommended*
Available Hard Disk Space	700 MB or more (includes standard workspace memory after installation of MPE720)
Display Resolution	1280 × 800 pixels or more recommended
CD Drive	1 (only for installation)
Communications Ports	RS-232C, Ethernet, MP2100 bus, and USB
OS	Windows 10, Windows 8, Windows 8.1, or Windows 7 (32-bit or 64-bit)
.NET Environment	.NET Framework 4.5
Supported Languages	English and Japanese

System Requirements

* Expand memory if other application programs are run simultaneously with MPE720 on the same computer. Performance may be slow due to the use of memory by multiple application programs that are run simultaneously.

Option Modules

Features

Feedback Option Module



Fully-Closed Module 480

- High-precision and high-response positioning by using feedback from detector (such as an external encoder) installed on the machine.
- High resolution with external encoders (linear scales).

Safety Option Module



Safety Module 486

- Safety functions equivalent to these stipulated in international standard: IEC Safe Torque Off (STO), Safe Stop 1 (SS1), Safe Stop 2 (SS2), Safely-Limited Speed (SLS)
- Two safety functions (A and B) provided. Stopping functions can be allocated individually to these safety functions.
- Monitoring times can be changed using parameters.

Fully-Closed Module Safety Module

Feedback Option Module

Fully-Closed Module

With a Fully-Closed Module, an externally installed encoder is used to detect the position of the controlled machine and the machine's position information is fed back to the SERVOPACK to implement controls. High-precision positioning is possible because the actual machine position is fed back directly. To perform fully-closed loop control, a Fully-Closed Module and SERVOPACK are required.

Model Designations

Purchasing a Module in a Set with the SERVOPACK

To order SERVOPACKs with a Fully-Closed Module attached, use the following model numbers.

Hardware Ontions



Voltage	Code	Specification	Code	Specification	Code	Specification	Applicable Models
	R70*2	0.05 kW	A	200 VAC	- 000	Without options	All models
	R90*2	0.1 kW	F	100 VAC			SGD7S-R70A
	1R6*2	0.2 kW				Rack-mounted	to -330A
	2R8*2	0.4 kW	5th+6th	n digits Interface	001	nack-mounteu	SGD7S-R70F
	3R8	0.5 kW					to -2R8F
	5R5*2	0.75 kW	Code	Specification		Duct-ventilated	SGD7S-470A
Three-	7R6	1.0 kW	00	Analog voltage/pulse			to -780A
phase,	120	1.5 kW		train reference	002	Varnished	All models
200 VAC	180	2.0 kW	10	MECHATROLINK-II		power supply input	
VAC	200	3.0 kW		communications reference	008		SGD7S-120A
	330	5.0 kW	20	MECHATROLINK-III communications reference			
	470	6.0 kW					SGD7S-R70A to -2R8A
	550	7.5 kW				No dynamic brake	SGD7S-B70F
	590	11 kW	7th dig	git Design Revision Order	020*3		to -2R8F
	780	15 kW	А			External dynamic	SGD7S-3B8A
Single-	R70	0.05 kW				brake resistor	to -780A
phase,	R90	0.1 kW					-
100	2R1	0.2 kW			11th+	12th+13th digits 0	ption Module
VAC	2R8	0.4 kW			Code	Specification	1
					001	Fully-Closed Module	

*1. The model number of a SERVOPACK with an Option Module is not hyphenated after SGD7S.

*2. You can use these models with either a single-phase or three-phase power supply input.

*3. Refer to the following manual for details.

Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

Note: Contact your Yaskawa representative for information on combining options.

1. One Option Case Kit is required for each SERVOPACK.

Purchasing a Module Separately

When ordering a SERVOPACK and a Fully-Closed Module separately, use the following Fully-Closed Module model number.

SGDV-OFA01A

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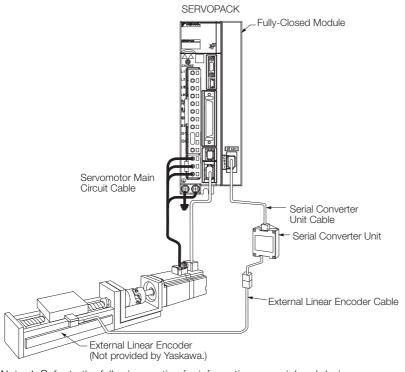
Important

- Option Case Kit model: SGDV-OZA01A2. Refer to the following pages when using these Command Option Modules with Fully-Closed Module.
 - INDEXER Module: Page 356
 - DeviceNet Module: Page 370

System Configuration

Refer to the section for the relevant Servomotor for information on Servomotor Main Circuit Cables.

To select an External Linear Encoder, refer to *Recommended Linear Encoders* (page 308). The connection devices and cables for each type of encoder are also given. Prepare the required items.



Note: 1. Refer to the following section for information on peripheral devices.

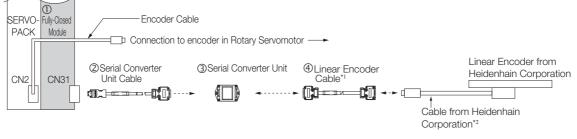
🕼 Peripheral Devices (page 448)

- 2. If you purchase a Fully-Closed Module by itself, refer to the following manual for the method to mount it to the SERVOPACK.
 - Ω Σ-V Series/Σ-V Series for Large-Capacity Models/Σ-7 Series Installation Guide Fully-Closed Module (Manual No.: TOBP C720829 03)

Connections to Linear Encoder from Heidenhain Corporation

Connections for a 1 Vp-p Analog Voltage Output Signal

You must make the connections through a Yaskawa Serial Converter Unit. The output signal will be multiplied by 8 bits (256 divisions) in the Serial Converter Unit.



- *1. When using a JZDP-J00D-DDD Serial Converter Unit, do not use a Yaskawa Linear Encoder Cable that is longer than 3 m.
- *2. Contact Heidenhain Corporation for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Heidenhain Corporation.

No.	Item	Model
0	Fully-Closed Module (Purchased as a set with the SERVOPACK)	Without options: SGD7S□□□□0A000□□1 With options:SGD7S□□□□0A■■■□□1 Note: When a hardware option is mounted, ■■■ is replaced with a three-digit number that specifies the type of option.
	Fully-Closed Module (Purchased alone)	Fully-Closed Module SGDV-OFA01A
		Option Case Kit ^{*1} SGDV-OZA01A
2	Serial Converter Unit Cable	JZSP-CLP70-DD-E*3
3	Serial Converter Unit ^{*2}	JZDP-H003-000
4	Linear Encoder Cable	JZSP-CLL30-DD-E*3

*1. One Option Case Kit is required for each SERVOPACK. The set includes the module cover, PCB mounting plate, and two mounting screws.

*2. Refer to the following manual for the specifications of the Serial Converter Units.

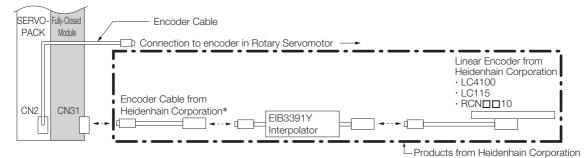
 Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*3. The boxes (□□) in the model number are replaced with the cable length when ordering.
(1 m = 01, 3 m = 03, 5 m = 05, 10 m = 10, 15 m = 15, and 20 m = 20)

Connections When Using a Yaskawa Serial Interface for the Output Signals

LIC4100 and LC115 Linear Encoder with EIB3391Y Interpolator or

RCN2D10, 5D10, and 8D10 Rotary Encoder with EIB3391Y Interpolator



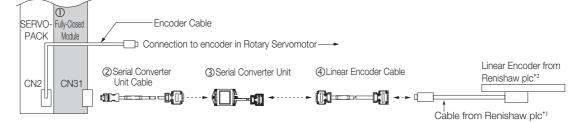
Note: The RCN $\square\square\square\square$ is a single-turn absolute rotary encoder.

* Use an Encoder Cable from Heidenhain Corporation. Contact Heidenhain Corporation for detailed Encoder Cable specifications.

Connections to Linear Encoder from Renishaw Plc

Connections for a 1 Vp-p Analog Voltage Output Signal

You must make the connections through a Yaskawa Serial Converter Unit. The output signal will be multiplied by 8 bits (256 divisions) in the Serial Converter Unit.



- *1. Contact Renishaw plc for details on cables (analog 1 Vp-p output, D-sub 15-pin, male) from Renishaw plc. However, the BID and DIR signals are not connected.
- *2. If you use the origin signals with a Linear Encoder from Renishaw plc, the origin may sometimes be falsely detected.

If that occurs, use the BID/DIR signal to output the origin signal only in one direction.

No.	Item	Model
0	Fully-Closed Module (Purchased as a set with the SERVOPACK)	Without options: SGD7SDDDD0A000D1 With options:SGD7SDDD0A000D1 Note: When a hardware option is mounted, III is replaced with a three-digit number that specifies the type of option.
	Fully-Closed Module	Fully-Closed Module SGDV-OFA01A
	(Purchased alone)	Option Case Kit ^{*1} SGDV-OZA01A
2	Serial Converter Unit Cable	JZSP-CLP70-DD-E*3
3	Serial Converter Unit ^{*2}	JZDP-H005-000
4	Linear Encoder Cable	JZSP-CLL00-DD-E*3

*1. When ordering a SERVOPACK and a Fully-Closed Module separately, use this Fully-Closed Module model number.

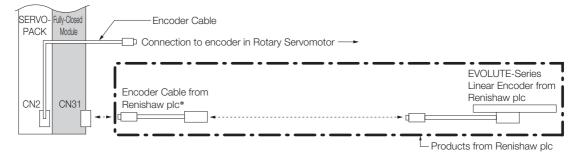
*2. Refer to the following manual for the specifications of the Serial Converter Units.

 Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

*3. The boxes (□□) in the model number are replaced with the cable length when ordering. (1 m = 01, 3 m = 03, 5 m = 05, 10 m = 10, 15 m = 15, and 20 m = 20)

Connections When Using a Yaskawa Serial Interface for the Output Signals

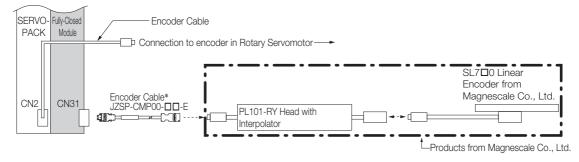
• EVOLUTE Series Linear Encoder (model: EL36Y-DDDDDDDD)



* Use an Encoder Cable from Renishaw plc. Contact Renishaw plc for detailed Encoder Cable specifications.

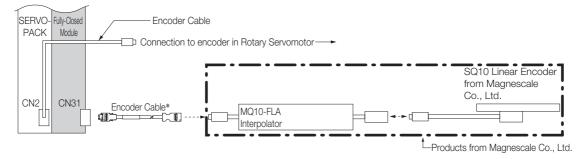
Connections to Linear Encoder from Magnescale Co., Ltd.

■ SL7□0 Linear Encoder and PL101-RY Sensor Head with Interpolator



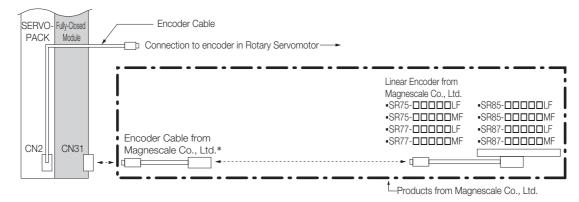
* The boxes ($\square\square$) in the model number are replaced with the cable length when ordering. (3 m = 03, 5 m = 05, 10 m = 10, 15 m = 15, and 20 m = 20)

■ SmartSCALE Linear Encoder (SQ10 Scale + MQ10-FLA Interpolator)



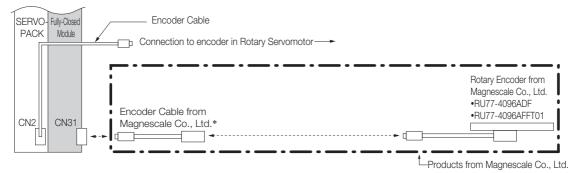
* The maximum cable length in this case is 15 m. Contact Magnescale Co., Ltd. for detail Encoder Cable specifications.

■ SR-75, SR-77, SR-85, and SR-87 Linear Encoders



* To connect the SERVOPACK and Linear Encoder, use a CH33-xxDDG Cable from Magnescale Co., Ltd. (This Cable has connectors designed for use with Yaskawa products.)

RU77-4096ADF/RU77-4096AFFT01 Absolute Rotary Encoders



* To connect the SERVOPACK and Rotary Encoder, use a CE28-Series Extension Cable for RU77 from Magnescale Co., Ltd. Note: The RU77 is a single-turn absolute rotary encoder.

• Connections to Linear Encoders from Mitutoyo Corporation

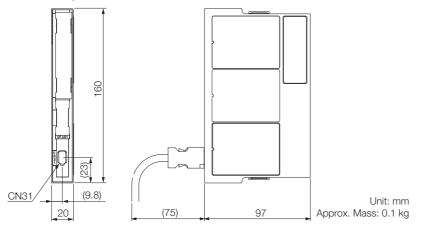
■ ST78□A/ST13□□ Linear Encoders



* The boxes ($\square\square$) in the model number are replaced with the cable length when ordering. (1 m = 01, 3 m = 03, 5 m = 05, 10 m = 10, 15 m = 15, and 20 m = 20)

External Dimensions

Refer to pages 436 to 447 for the external dimensions of the individual SERVOPACKs.



Connectors

Device Label	Model	Number of Pins	Manufacturer
CN31	3E106-0220KV	6	3M Japan Ltd.

Note: The above connectors or their equivalents are used for the Fully-Closed Module.

Safety Option Module

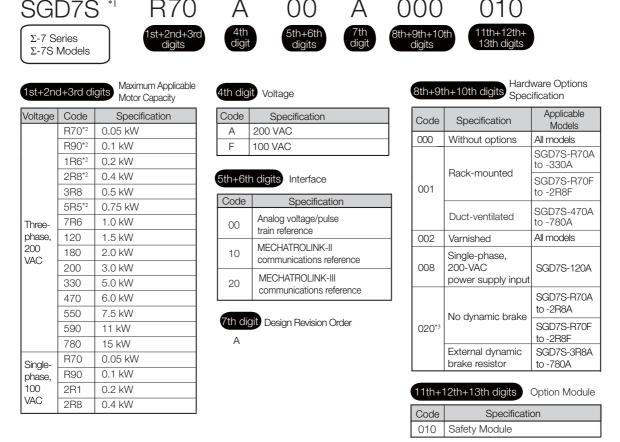
Safety Module

This Safety Module implements safety functions that conform to EN ISO 13849-1 (the harmonized EU Machinery Directive) and are specified in the individual IEC 61800-5-2 standard. You can combine it with an SGD7S SERVOPACK to design optimum safety in a machine system according to industry needs.

Model Designations

Purchasing a Module in a Set with the SERVOPACK

To order SERVOPACKs with a Safety Module attached, use the following model numbers.



*1. The model number of a SERVOPACK with an Option Module is not hyphenated after SGD7S.

*2. You can use these models with either a single-phase or three-phase power supply input.

- *3. Refer to the following manual for details.
 - Ω Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

Note: Contact your Yaskawa representative for information on combining options.

Purchasing a Module Separately

When ordering SERVOPACKs and Safety Modules separately, use the following Safety Module model number.

SGDV-OSA01A



1. One Option Case Kit is required for each SERVOPACK.

Option Case Kit model: SGDV-OZA01A

Important 2. INDEXER Modules and DeviceNet Modules cannot be used with Safety Modules.

Applicable Standards and Functions

Applicable Safety Standards

		Applicable Products		
Safety Standard	Applicable Standard	SERVOPACK	SERVOPACK + Safety Module	
Safety of Machinery	EN ISO13849-1: 2015 IEC 60204-1	√	✓	
Functional Safety	IEC 61508 Series IEC 62061 IEC 61800-5-2	~	~	
EMC	IEC 61326-3-1	\checkmark	\checkmark	

✓: Applicable

Support for Functions Defined in IEC61800-5-2

Safety functions are implemented by using the hard wire base block (HWBB) in the SERVOPACK.

		Applicable	e Products
Safety Function	Safety Function Description		SERVOPACK + Safety Module
Safe BaseBlock Function (SBB function)	This safety function is equivalent to an STO function. (It shuts OFF the power supply from the SER- VOPACK to the motor.)	\checkmark	~
Safe BaseBlock with Delay Function (SBB-D function)	This safety function is equivalent to an SS1 function. (It monitors the deceleration operation of the motor for the specified time and then shuts OFF the power supply from the SERVOPACK to the motor.)	_	~
Safe Position Monitor with Delay Function (SPM-D function)	This safety function is equivalent to an SS2 function. (It monitors the deceleration operation of the motor for the specified time and then monitors the position after the motor stops.)	_	✓
Safely-Limit Speed with Delay Function (SLS-D function)	This safety function is equivalent to an SLS function. (It monitors the deceleration operation of the motor for the specified time and then monitors the speed of the motor to confirm that it remains in the allowable range.)	_	~

✓: Applicable

Specifications

♦ Basic Specifications

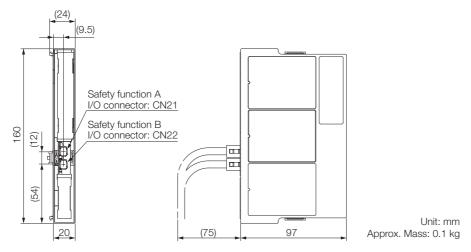
	Item	Specification		
	Surrounding Air Temperature	0°C to +55℃		
	Storage Temperature	−20°C to +85°C		
	Surrounding Air Humidity	90% relative humidity max.	There must be no freezing or condensation.	
suo	Storage Humidity	90% relative humidity max.	There must be no neezing or condensation.	
Conditions	Vibration Resistance	4.9 m/s ²		
Con	Shock Resistance	19.6 m/s ²		
bu	Degree of Protection	IP10	Must be no corrosive or flammable gases.	
Dperating	Pollution Degree	2	Must be no exposure to water, oil, or chemicals.Must be no dust, salts, or iron dust.	
õ	Altitude	1000 m max.		
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magneti fields, or radioactivity		

Compliance with UL Standards, EU Directives, and Other Safety Standards (in Combination with SERVOPACK)

	Item		Specification	
North dards		UL61800-5-1 CSA C22.2 No.274		
tives	Machinery Directive (2006/42/EC)	EN ISO 13849-1: 2015		
European Directives	EMC Directive (2004/108/EC)	EN 55011/A2 group 1, class EN 61000-6-2 EN 61000-6-4 EN 61800-3	A	
Euro	Low Voltage Directive (2006/95/EC)	EN 50178 EN 61800-5-1		
sp	Safety of Machinery	EN ISO 13849-1: 2015 IEC 60204-1		
Safety Standards	Functional Safety	IEC 61508 series IEC 62061 IEC 61800-5-2		
	EMC	IEC 61326-3-1		
		IEC 61800-5-2	IEC 60204-1	
		Safe Torque Off (STO)	Stop Category 0	
Safet	y Function	Safe Stop 1 (SS1)	Stop Category 1	
		Safe Stop 2 (SS2)	Stop Category 2	
		Safely-Limited Speed (SLS)		
	Number of Blocks	2		
	Safety Function A	Input signals: 2 channels (rec	dundant signals), output signals: 1 channel	
	Safety Function B	Input signals: 2 channels (redundant signals), output signals: 1 channel		
Safe	Performance			
	Safety Integrity Level	SIL2, SILCL2		
	Probability of Dangerous	PFH = 8.0×10 ⁻⁹ [1/h] (SBB)		
	Failure per Hour	PFH = 3.4×10 ⁻⁸ [1/h] (SBB-D, SPM-D, SLS-D)		
	Performance Level	PLd (Category 2)		
	Mean Time to Dangerous Failure of Each Channel	MTTFd: High		
	Average Diagnostic Coverage	DCave: Medium		
	Proof Test Interval	10 years		

External Dimensions

Refer to pages 436 to 447 for the external dimensions of the individual SERVOPACKs.



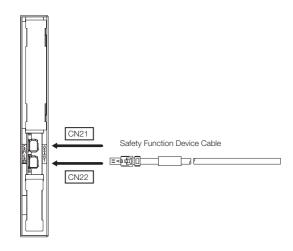
Connectors

Device Label	Model	Number of Pins	Manufacturer
CN21	1981080-1	8	Tyco Electronics Japan G.K.
CN22	1981080-1	8	Tyco Electronics Japan G.K.

Note: 1. The above connectors or their equivalents are used for SERVOPACKs.

2. Refer to the user's manual of the Safety Module for installation standards.

Cables for Safety Module



◆ Safety Function Device Cable

Order Number	Length (L)	Inquires
JZSP-CVH03-01-E	1 m	Yaskawa Controls Co., Ltd.
JZSP-CVH03-03-E	3 m	Taskawa Controls CO., Etd.

Note: 1. When using safety functions, connect this Cable to the safety function devices. When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SERVOPACK.

2. If you make your own cable, use the following Connector Kit. Contact Tyco Electronics Japan G.K. for details.

Connector Kit

If you make your own cable, use the Connector Kit.

Order Number	Product Name	Inquires
2013595-1	INDUSTRIAL MINI I/O D-SHAPE TYPE1 PLUG CONNECTOR KIT	Tyco Electronics Japan G.K.

Appendices

Capacity Selection for Servomotors	492
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Capacity Selection for Servomotors Capacity Selection for Regenerative Resistors International Standards

Warranty

Capacity Selection for Servomotors

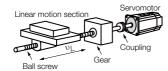
Selecting the Servomotor Capacity

Use Yaskawa's SigmaSize+, an AC servo drive capacity selection program, to select the Servomotor capacity. With the SigmaSize+, you can find the optimum Servomotor capacity by simply selecting and entering information according to instructions from a wizard.

Refer to the following selection examples to select Servomotor capacities with manual calculations rather than with the above software.

Capacity Selection Example for a Rotary Servomotor: For Speed Control

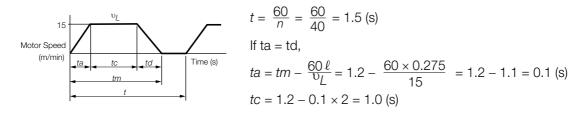
1. Mechanical Specifications



Item	Code	Value	
Load Speed	v_{L}	15 m/min	
Linear Motion Section Mass	т	250 kg	
Ball Screw Length	ℓ_B	1.0 m	
Ball Screw Diameter	d _B	0.02 m	
Ball Screw Lead	P_B	0.01 m	
Ball Screw Material Density	ρ	$7.87 \times 10^3 \text{ kg/m}^3$	
Gear Ratio	R	2 (gear ratio: 1/2)	
External Force on Linear Motion Section	F	0 N	

Item	Code	Value	
Gear and Coupling Moment of Inertia	J _G	$0.40 \times 10^{-4} \text{kg} \cdot \text{m}^2$	
Number of Feeding Operations	n	40 operations/min	
Feeding Distance	l	0.275 m	
Feeding Time	tm	1.2 s max.	
Friction Coefficient	μ	0.2	
Mechanical Efficiency	η	0.9 (90%)	

2. Operation Pattern



3. Motor Speed

• Load shaft speed $n_L = \frac{v_L}{P_B} = \frac{15}{0.01} = 1,500 \text{ (min}^{-1})$

• Motor shaft speed
$$n_M = n_L \cdot R = 1,500 \times 2 = 3,000 \text{ (min}^{-1})$$

4. Load Torque

$$T_L = \frac{(9.8 \cdot \mu \cdot m + F) \cdot P_B}{2\pi R \cdot \eta} = \frac{(9.8 \times 0.2 \times 250 + 0) \times 0.01}{2\pi \times 2 \times 0.9} = 0.43 \text{ (N·m)}$$

5. Load Moment of Inertia

Linear motion section

$$J_{L1} = m \left(\frac{P_B}{2\pi R}\right)^2 = 250 \times \left(\frac{0.01}{2\pi \times 2}\right)^2 = 1.58 \times 10^{-4} \text{ (kg·m}^2\text{)}$$

· Ball screw

$$J_B = \frac{\pi}{32} \rho \cdot \ell_B \cdot d_B^4 \cdot \frac{1}{R^2} = \frac{\pi}{32} \times 7.87 \times 10^3 \times 1.0 \times (0.02)^4 \cdot \frac{1}{2^2} = 0.31 \times 10^{-4} \, (\text{kg} \cdot \text{m}^2)$$

- Coupling $J_G = 0.40 \times 10^{-4} (\text{kg} \cdot \text{m}^2)$
- Load moment of inertia at motor shaft $J_L = J_{L1} + J_B + J_G = (1.58 + 0.31 + 0.40) \times 10^{-4} = 2.29 \times 10^{-4} \text{ (kg·m}^2)$

6. Load Moving Power

$$P_O = \frac{2\pi n_M \cdot T_L}{60} = \frac{2\pi \times 3,000 \times 0.43}{60} = 135 \text{ (W)}$$

7. Load Acceleration Power

$$Pa = \left(\frac{2\pi}{60}n_{M}\right)^{2}\frac{J_{L}}{ta} = \left(\frac{2\pi}{60} \times 3,000\right)^{2} \times \frac{2.29 \times 10^{-4}}{0.1} = 226 \text{ (W)}$$

8. Servomotor Provisional Selection

① Selection Conditions

- $T_L \leq$ Motor rated torque
- $\frac{(Po + Pa)}{2}$ < Provisionally selected Servomotor rated output < (Po + Pa)
- $n_M \leq$ Rated motor speed
- $J_L \leq$ Allowable load moment of inertia

The following Servomotor meets the selection conditions.

SGM7J-02A Servomotor

② Specifications of the Provisionally Selected Servomotor

Item	Value
Rated Output	200 (W)
Rated Motor Speed	3,000 (min ⁻¹)
Rated Torque	0.637 (N·m)
Instantaneous Maximum Torque	2.23 (N·m)
Motor Moment of Inertia	0.263 × 10 ⁻⁴ (kg⋅m²)
Allowable Load Moment of Inertia	$0.263 \times 10^{-4} \times 15 = 3.94 \times 10^{-4} (\text{kg} \cdot \text{m}^2)$

9. Verification of the Provisionally Selected Servomotor

Verification of required acceleration torque:

$$T_P = \frac{2\pi n_M (J_M + J_L)}{60ta} + T_L = \frac{2\pi \times 3,000 \times (0.263 + 2.29) \times 10^{-4}}{60 \times 0.1} + 0.43$$

≈ 1.23 (N·m) < Maximum instantaneous torque...Satisfactory

• Verification of required deceleration torque:

$$T_{S} = \frac{2\pi n_{M} (J_{M} + J_{L})}{60td} - T_{L} = \frac{2\pi \times 3,000 \times (0.263 + 2.29) \times 10^{-4}}{60 \times 0.1} - 0.43$$

 \approx 0.37 (N·m) < Maximum instantaneous torque...Satisfactory

Appendices

Capacity Selection for Servomotors

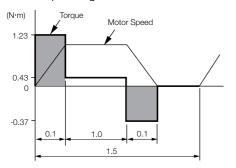
• Verification of effective torque value:

$$Trms = \sqrt{\frac{T_P^2 \cdot ta + T_L^2 \cdot tc + Ts^2 \cdot td}{t}} = \sqrt{\frac{(1.23)^2 \times 0.1 + (0.43)^2 \times 1.0 + (0.37)^2 \times 0.1}{1.5}}$$

 \approx 0.483 (N·m) < Rated torque...Satisfactory

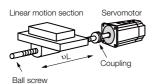
10.Result

It has been verified that the provisionally selected Servomotor is applicable. The torque diagram is shown below.



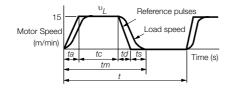
Capacity Selection Example for a Rotary Servomotor: For Position Control

1. Mechanical Specifications



Item	Code	Value	Item	Code	Value
Load Speed	v_{L}	15 m/min	Coupling Outer Diameter	d _C	0.03 m
Linear Motion Section Mass	т	80 kg	Number of Feeding Operations	n	40 rotation/min
Ball Screw Length	ℓ_B	0.8 m	Feeding Distance	l	0.25 m
Ball Screw Diameter	d _B	0.016 m	Feeding Time	tm	1.2 s max.
Ball Screw Lead	P _B	0.005 m	Electrical Stopping Precision	δ	±0.01 mm
Ball Screw Material Density	ρ	$7.87 \times 10^3 \text{ kg/m}^3$	Friction Coefficient	μ	0.2
External Force on Linear Motion Section	F	0 N	Mechanical Efficiency	η	0.9 (90%)
Coupling Mass	m _C	0.3 kg			

2. Speed Diagram



$$t = \frac{60}{n} = \frac{60}{40} = 1.5 \text{ (s)}$$

If ta = td and ts = 0.1 (s),
$$ta = tm - ts - \frac{60\ell}{\nu_L} = 1.2 - 0.1 - \frac{60 \times 0.25}{15} = 0.1 \text{ (s)}$$
$$tc = 1.2 - 0.1 - 0.1 \times 2 = 0.9 \text{ (s)}$$

3. Motor Speed

Load shaft speed

$$n_L = \frac{v_L}{P_B} = \frac{15}{0.005} = 3,000 \text{ (min}^{-1}\text{)}$$

- Motor shaft speed Direct coupling gear ratio 1/R = 1/1
 - Therefore, $n_M = n_L \cdot R = 3,000 \times 1 = 3,000 \text{ (min}^{-1})$

4. Load Torque

$$T_L = \frac{(9.8 \ \mu \cdot m + F) \cdot P_B}{2\pi R \cdot \eta} = \frac{(9.8 \times 0.2 \times 80 + 0) \times 0.005}{2\pi \times 1 \times 0.9} = 0.139 \text{ (N·m)}$$

5. Load Moment of Inertia

• Linear motion section

$$J_{L1} = m \left(\frac{P_B}{2\pi R}\right)^2 = 80 \times \left(\frac{0.005}{2\pi \times 1}\right)^2 = 0.507 \times 10^{-4} \, (\text{kg} \cdot \text{m}^2)$$

• Ball screw $J_B = \frac{\pi}{32} \rho \cdot \ell_B \cdot d_B^4 = \frac{\pi}{32} \times 7.87 \times 10^3 \times 0.8 \times (0.016)^4 = 0.405 \times 10^{-4} \text{ (kg·m}^2)$

• Coupling
$$Jc = \frac{1}{8}m_C \cdot d_C^2 = \frac{1}{8} \times 0.3 \times (0.03)^2 = 0.338 \times 10^{-4} \text{ (kg·m}^2)$$

- Load moment of inertia at motor shaft $J_L = J_{L1} + J_B + Jc = 1.25 \times 10^{-4} \; (\rm kg \cdot m^2)$
- 6. Load Moving Power

$$P_{O} = \frac{2\pi n_{M} \cdot T_{L}}{60} = \frac{2\pi \times 3,000 \times 0.139}{60} = 43.7 \text{ (W)}$$

7. Load Acceleration Power

$$Pa = \left(\frac{2\pi}{60}n_{M}\right)^{2} \frac{J_{L}}{ta} = \left(\frac{2\pi}{60} \times 3,000\right)^{2} \times \frac{1.25 \times 10^{-4}}{0.1} = 123.4 \text{ (W)}$$

8. Servomotor Provisional Selection

① Selection Conditions

- $T_L \leq Motor rated torque$
- $\frac{(Po + Pa)}{2}$ < Provisionally selected Servomotor rated output < (Po + Pa)
- $n_M \leq$ Rated motor speed
- $J_L \leq$ Allowable load moment of inertia

The following Servomotor meets the selection conditions.

SGM7J-01A Servomotor

② Specifications of the Provisionally Selected Servomotor

Item	Value
Rated Output	100 (W)
Rated Motor Speed	3,000 (min ⁻¹)
Rated Torque	0.318 (N·m)
Instantaneous Maximum Torque	1.11 (N·m)
Motor Moment of Inertia	0.0659 × 10 ⁻⁴ (kg·m ²)
Allowable Load Moment of Inertia	$0.0659 \times 10^{-4} \times 35 = 2.31 \times 10^{-4} \text{ (kg·m}^2\text{)}$
Encoder Resolution	16,777,216 pulses/rev [24 bits]

Capacity Selection for Servomotors

9. Verification of the Provisionally Selected Servomotor

• Verification of required acceleration torque:

$$T_P = \frac{2\pi n_M (J_M + J_L)}{60ta} + T_L = \frac{2\pi \times 3,000 \times (0.0659 + 1.25) \times 10^{-4}}{60 \times 0.1} + 0.139$$

 \approx 0.552 (N·m) < Maximum instantaneous torque...Satisfactory

• Verification of required deceleration torque:

$$T_{S} = \frac{2\pi n_{M} (J_{M} + J_{L})}{60td} - T_{L} = \frac{2\pi \times 3,000 \times (0.0659 + 1.25) \times 10^{-4}}{60 \times 0.1} - 0.139$$

≈ 0.274 (N·m) < Maximum instantaneous torque...Satisfactory

• Verification of effective torque value:

$$Trms = \sqrt{\frac{T_P^2 \cdot ta + T_L^2 \cdot tc + Ts^2 \cdot td}{t}} = \sqrt{\frac{(0.552)^2 \times 0.1 + (0.139)^2 \times 0.9 + (0.274)^2 \times 0.1}{1.5}}$$

 \approx 0.192 (N·m) < Rated torque...Satisfactory

It has been verified that the provisionally selected Servomotor is applicable in terms of capacity. Position control is considered next.

10. Positioning Resolution

The electrical stopping precision δ is ±0.01 mm, so the positioning resolution Δ_{ℓ} is 0.01 mm. The ball screw lead P_B is 0.005 m, so the number of pulses per motor rotation is calculated with the following formula.

The number of pulses per revolution (pulses) = $\frac{P_B}{\Delta_\ell} = \frac{5 \text{ mm/rev}}{0.01 \text{ mm}} = 500 \text{ (pulses/rev)} < \text{Encoder resolution [16777216 (pulses/rev)]}$

The number of pulses per motor rotation is less than the encoder resolution (pulses/rev), so the provisionally selected Servomotor can be used.

11. Reference Pulse Frequency

The load speed υ_L is 15 m/min, or 1,000 × 15/60 mm/s and the positioning resolution (travel distance per pulse) is 0.01 mm/pulse, so the reference pulse frequency is calculated with the following formula.

 $vs = \frac{1,000 \,^{\circ}L}{60 \times \Delta_{\ell}} = \frac{1,000 \times 15}{60 \times 0.01} = 25,000 \text{ (pps)}$

The reference pulse frequency is less than the maximum input pulse frequency,* so the provisionally selected Servomotor can be used.

*Refer to the specifications in the SERVOPACK manual for the maximum input pulse frequency.

It has been verified that the provisionally selected Servomotor is applicable for position control.

Capacity Selection Example for Direct Drive Servomotors

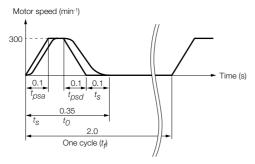
1. Mechanical Specifications

D _T	Item	Code	Value	Item	Code	Value
	Turntable Mass	W	12 kg	Acceleration/ Deceleration Time	t _p = t _{psa} = t _{psd}	0.1 s
Turntable	Turntable Diameter	D _T	300 mm	Operating Frequency	t _f	2 s
Servomotor	Rotational Angle per Cycle	θ	270 deg	Load Torque	TL	0 N∙m
	Positioning Time	t ₀	0.35 s	Settling Time	ts	0.1 s

2. Motor Speed of Direct Drive Servomotor

$$N_O = \frac{\theta}{360} \times \frac{60}{(t_O - t_p - t_s)} = \frac{270}{360} \times \frac{60}{(0.35 - 0.1 - 0.1)} = 300 \text{ (min}^{-1}\text{)}$$

3. Operation Pattern



4. Load Moment of Inertia

$$J_L = \frac{1}{8} \times D_T^2 \times W = \frac{1}{8} \times (300 \times 10^{-3})^2 \times 12 = 0.135 \text{ (kg·m}^2)$$

5. Load Acceleration/Deceleration Torque

$$T_a = J_L \times 2\pi \times \frac{N_O/60}{t_p} = 0.135 \times 2\pi \times \frac{300/60}{0.1} = 42.4 \text{ (N·m)}$$

6. Provisional Selection of Direct Drive Servomotor

① Selection Conditions

- Load acceleration/deceleration torque < Instantaneous maximum torque of Direct Drive Servomotor
- Load moment of inertia < Allowable load moment of inertia ratio (*J_R*) × Moment of inertia of Direct Drive Servomotor (*J_M*)

The following Servomotor meets the selection conditions.

• SGMCV-17CEA11

$\ensuremath{\mathbb Q}$ Specifications of the Provisionally Selected Servomotor

Item	Value
Rated Torque	17 (N∙m)
Instantaneous Maximum Torque	51 (N∙m)
Moment of Inertia (J _M)	0.00785 (kg·m²)
Allowable Load Moment of Inertia Ratio (J_R)	25

Capacity Selection for Servomotors

7. Verification of the Provisionally Selected Servomotor

• Verification of required acceleration torque:

$$T_{Ma} = \frac{(J_L + J_M) \times N_O}{9.55 \times t_{psa}} = \frac{(0.135 + 0.00785) \times 300}{9.55 \times 0.1}$$

 \approx 44.9 (N·m) < Maximum instantaneous torque...Satisfactory

• Verification of required deceleration torque:

$$T_{Md} = -\frac{(J_L + J_M) \times N_O}{9.55 \times t_{psd}} = -\frac{(0.135 + 0.00785) \times 300}{9.55 \times 0.1}$$

- ≈ -44.9 (N·m) < Maximum instantaneous torque...Satisfactory
- Verification of effective torque value:

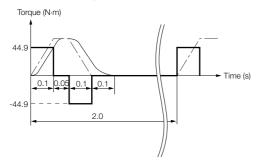
Trms =
$$\int \frac{T_{Ma^2 \times t_{psa} + T_L^2 \times t_C + T_{Md^2 \times t_psd}}{tf} = \sqrt{\frac{44.9^2 \times 0.1 + 0^2 \times 0.05 + (-44.9)^2 \times 0.1}{2}}$$

≈ 14.2 (N·m) < Rated torque...Satisfactory

 t_c =Time of constant motor speed = $t_0 - t_s - t_{psa} - t_{psd}$

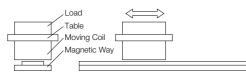
8. Result

It has been verified that the provisionally selected Servomotor is applicable. The torque diagram is shown below.



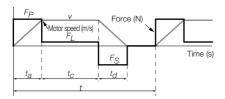
Servomotor Capacity Selection Example for Linear Servomotors

1. Mechanical Specifications



Item	Code	Value	Item	Code	Value
Load Mass	m_W	1 kg	Acceleration Time	t _a	0.02 s
Table Mass	m _T	2 kg	Constant-speed Time	t _c	0.36 s
Motor Speed	V	2 m/s	Deceleration Time	t _d	0.02 s
Feeding Distance	1	0.76 m	Cycle Time	t	0.5 s
Friction Coefficient	μ	0.2	External Force on Linear Motion Section	F	0 N

2. Operation Pattern



- **3.** Steady-State Force (Excluding Servomotor Moving Coil) $F_L = \{9.8 \times \mu \times (m_W + m_T)\} + F = 9.8 \times 0.2 \times (1 + 2) + 0 = 5.88 \text{ (N)}$
- 4. Acceleration Force (Excluding Servomotor Moving Coil)

$$F_P = (m_W + m_T) \times \frac{v}{t_a} + F_L = (1 + 2) \times \frac{2}{0.02} + 5.88 = 305.88$$
 (N)

5. Provisional Selection of Linear Servomotor

① Selection Conditions

- $F_P \leq Maximum$ force $\times 0.9$
- $F_{s} \leq Maximum \text{ force } \times 0.9$
- $F_{rms} \leq$ Rated force $\times 0.9$

The following Servomotor Moving Coil and Magnetic Way meet the selection conditions.

- SGLGW-60A253CP Linear Servomotor Moving Coil
- SGLGM-60 C Linear Servomotor Magnetic Way
- 2 Specifications of the Provisionally Selected Servomotor

Item	Value
Maximum Force	440 (N)
Rated Force	140 (N)
Moving Coil Mass (m _M)	0.82 (kg)
Servomotor Magnetic Attraction (F _{att})	0 (N)

6. Verification of the Provisionally Selected Servomotor

• Steady-State Force

 $F_L = \mu \{9.8 \times (m_W + m_T + m_M) + F_{att}\} = 0.2 \{9.8 \times (1 + 2 + 0.82) + 0\} = 7.5 (N)$ • Verification of Acceleration Force

$$F_P = (m_W + m_T + m_M) \times \frac{v}{t_a} + F_L = (1 + 2 + 0.82) \times \frac{2}{0.02} + 7.5$$

= 389.5 (N) \leq Maximum force \times 0.9 (= 396 N)... Satisfactory

• Verification of Deceleration Force

$$F_S = (m_W + m_T + m_M) \times \frac{v}{t_a} - F_L = (1 + 2 + 0.82) \times \frac{2}{0.02} - 7.5$$

= 374.5 (N) \leq Maximum force $\,\times$ 0.9 (= 396 N)... Satisfactory

• Verification of Effective Force

$$F_{rms} = \sqrt{\frac{F_P^2 \cdot t_a + F_L^2 \cdot t_c + F_s^2 \cdot t_d}{t}} = \sqrt{\frac{389.5^2 \times 0.02 + 7.5^2 \times 0.36 + 374.5^2 \times 0.02}{0.5}}$$

= 108.3 (N) \leq Rated force \times 0.9 (= 132.3 N)... Satisfactory

7. Result

It has been verified that the provisionally selected Servomotor is applicable.

Capacity Selection for Regenerative Resistors

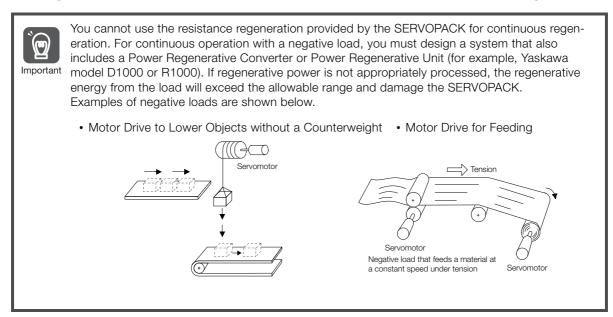
If the regenerative power exceeds the amount that can be absorbed by charging the smoothing capacitor, a regenerative resistor is used.

Regenerative Power and Regenerative Resistance

The rotational energy of a driven machine such as a Servomotor that is returned to the SERVOPACK is called regenerative power. The regenerative power is absorbed by charging a smoothing capacitor. When the regenerative power exceeds the capacity of the capacitor, it is consumed by a regenerative resistor. (This is called resistance regeneration.)

The Servomotor is driven in a regeneration state in the following circumstances:

- While decelerating to a stop during acceleration/deceleration operation.
- While performing continuous downward operation on a vertical axis.
- During continuous operation in which the Servomotor is rotated by the load (i.e., a negative load).



Types of Regenerative Resistors

The following regenerative resistors can be used.

- Built-in regenerative resistor: A regenerative resistor that is built into the SERVOPACK. Not all SERVOPACKs have built-in regenerative resistors.
- External Regenerative Resistor: A regenerative resistor that is connected externally to a SERVO-PACK. These resistors are used when the smoothing capacitor and built-in regenerative resistor in the SERVOPACK cannot consume all of the regenerative power.

S	ERVOPACK Model	RVOPACK Model Built-In Regenerative Resistor	
	R70A, R90A, 1R6A, 2R8A, R70F, R90F, 2R1F, 2R8F	None	Basically not required
SGD7S-	3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A	Standard feature *1	Basically not required
	470A, 550A, 590A, 780A	None	Required *2
SGD7W-	1R6A, 2R8A, 5R5A, 7R6A	Standard feature *1	Basically not required
SGD7C-	1R6A, 2R8A, 5R5A, 7R6A	Standard feature *1	Basically not required

*1. Refer to the following section for the specifications of the regenerative resistors built into SERVOPACKs. Built-In Regenerative Resistor (page 472)

*2. An optional external Regenerative Resistor Unit is required.

Selecting External Regenerative Resistor

Use Yaskawa's SigmaSize+, an AC servo drive capacity selection program, to determine if you need an External Regenerative Resistor.

You can use one of the following two methods to manually calculate whether an External Regenerative Resistor is required. Refer to the following information if you do not use the SigmaSize+.

Simple Calculation (page 501)

Generative Energy (page 506)

Simple Calculation

When driving a Servomotor with a horizontal shaft, check if an External Regenerative Resistor is required using the following calculation method.

Note: If you use the SGD7S-470A, -550A, -590A, or -780A, always connect an External Regenerative Resistor.

SERVOPACKs without Built-in Regenerative Resistors: SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

The total amount of energy that can be charged in the capacitors is given in the following table. If the rotational energy (E_S) of the Servomotor and load exceeds the value in the following table, then connect an External Regenerative Resistor.

Applica	able SERVOPACK	Processable Regenerative Energy (Joules)	Remarks
	R70A, R90A, 1R6A	24.2	Value when main circuit input voltage
SGD7S-	2R8A	31.7	is 200 VAC
50D75-	R70F, R90F, 2R1F	28.6	Value when main circuit input voltage
	2R8F	48.4	is 100 VAC

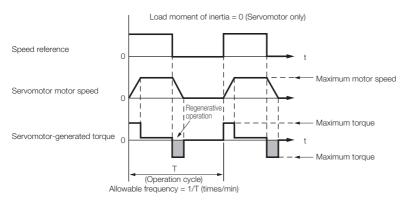
Calculate the rotational energy (E_S) of the servo system with the following equation:

 $E_S = J \times (n_M)^2 / 182$ (Joules)

- $J = J_M + J_L$
- J_M: Servomotor moment of inertia (kg⋅m²)
- J_L : Load moment of inertia at motor shaft (kg·m²)
- n_M : Servomotor operating motor speed (min⁻¹)

SERVOPACKs with Built-in Regenerative Resistors: SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, and -330A SGD7W-1R6A, -2R8A, -5R5A, and -7R6A SGD7C-1R6A, -2R8A, -5R5A, and -7R6A

Use the following equation to calculate the allowable frequency for regenerative operation. The following operating conditions were used: Operation cycle from a speed of 0 to the maximum motor speed to 0 (min⁻¹) with acceleration and deceleration operation. If the frequency of the operation cycle (1/T) is lower than the allowable frequency in the calculation results, an External Regenerative Resistor is not necessary. Finally, do the calculation with the actual operating speed and load moment of inertia to determine if an External Regenerative Resistor is required.



· Operating Conditions for Calculating the Allowable Regenerative Frequency



- $n = J_L/J_M$
- J_M: Servomotor moment of inertia (kg⋅m²)
- J_L : Load moment of inertia at motor shaft (kg·m²)
- * Assign the related value given in the table in Allowable Frequency for Regenerative Operation for Servomotor without Load (pages 503 to 505).

■ Allowable Frequency for Regenerative Operation for Servomotor without Load

Rotary Servomotors

		Allowable Frequencies in Regenerative Operation (Operations/Min)				Regenerativ	requencies in ve Operation ions/Min)
		SERVOPACK Model: SGD7S	SERVOPACK Model: SGD7W and SGD7C (Simultaneous Operation of Two Axes)	Servomotor Model		SERVOPACK Model: SGD7S	SERVOPACK Model: SGD7W and SGD7C (Simultaneous Operation of Two Axes)
	A1A	-	-		01A	-	200
SGMMV-	A2A	-	-		C2A	-	46
	A3A	-	-	SGM7P-	04A	-	29
	A5A	-	300		08A	11	11
	01A	-	180		15A	7.5	_
	C2A	-	130		03A	39	39
	02A	-	46		05A	29	29
	04A	-	25		09A	6.9	6.9
	06A	30	30		13A	6.1	-
	08A	15	15		20A	7.4	-
	A5A	-	560	SGM7G-	30A	9.5	_
	01A	-	360		44A	6.4	-
	C2A	-	260		55A	24	_
	02A	-	87		75A	34	_
	04A	-	56		1AA	39	-
	06A	77	77		1EA	31	-
	08A	31	31				
SGM7A-	10A	31	_				
	15A	15	-				
	20A	19	-				
	25A	15	-				
	30A	6.9	_				
	40A	11	_				
	50A	8.8	_				
	70A	86	_				

Appendices Capacity Selection for Regenerative Resistors

• Direct Drive Servomotors

			requencies in ve Operation ons/Min)			Allowable Frequencies in Regenerative Operation (Operations/Min)	
Servomotor Model		SERVOPACK Model: SGD7S	SERVOPACK Model: SGD7W and SGD7C (Simultaneous Operation of Two Axes)	Servomotor Model		SERVOPACK Model: SGD7S	SERVOPACK Model: SGD7W and SGD7C (Simultaneous Operation of Two Axes)
	01G	-	-		02A	-	150
	1AF	120	-		05A	-	83
	1CI	74	-		07A	-	62
	1ZI	91	-		04B	-	75
	02K	-	-		08C	-	21
	03H	-	-		10B	-	48
	05G	-	_		14B	65	65
	06J	350	_		16D	13	13
	06L	-	_	SGM7F-	17C	30	30
	06K	-	_		25C	31	31
	08G	430	-		35D	19	19
	08K	-	-		45M	25	25
	09J	250	-	· · · · · · · · · · · · · · · · · · ·	80M	19	_
	12L	-	-		1AM	8.9	_
SGM7D-	18G	350	-		80N	22	_
	18J	210	-		1EN	11	_
	20J	200	_		2ZN	9.1	_
	24G	270	_	-	04B	_	75
	281	52	_		08C	_	21
	2BI	89	_		10B	_	48
	2DI	110	_		14B	65	65
	30F	210	_	SGMCV-	16D	13	13
	30L	63	_		17C	30	30
	38J	150	_		25C	31	31
	34G	220	_		35D	19	19
	45G	190	_		02B	_	62
	58F	170	_		05B	-	34
	701	100	_		07B	-	22
	90F	140	_		04C	-	22
	02B	-	62		08D	-	6.1
	05B	-	34		10C	-	19
	07B	-	22		14C	-	22
	04C	-	22		17D	-	7
	08D	_	6.1	SGMCS-	25D	_	9.3
SGM7E-	10C	-	19		16E	3.7	3.7
	14C	-	22		35E	9.7	9.7
	17D	_	7		45M	25	25
	25D	_	9.3		80M	19	
	16E	3.7	3.7		80N	8.9	_
	35E	9.7	9.7		1AM	22	
			L		1EN	11	
							_

Linear Servomotors

Servomotor Model		Regenerativ	requencies in ve Operation ons/Min)	
		SERVOPACK Model: SGD7S	SERVOPACK Model: SGD7W and SGD7C (Simultaneous Operation of Two Axes)	
	30A050C	_	190	- 1
	30A080C	_	120	
SGLGW-	40A140C	_	56	
Using a	40A253C	_	32	
Stan-	40A365C	_	22	
dard- Force	60A140C	-	49	
Mag-	60A253C	_	27	
netic	60A365C	37	37	
Way	90A200C	34	-	
	90A370C	33	-	
	90A535C	24	-	
SGLGW-	40A140C	_	80	
Using a	40A253C	-	45	
High- Force	40A365C	62	62	
Mag-	60A140C	_	64	
netic	60A253C	71	71	
Way	60A365C	49	49	
	20A090A	_	27	
	20A120A	-	21	
	35A120A	_	14	
SGLFW-	35A230A	16	16	
JULI W	50A200B	10	10	
	50A380B	6.9	_	
	1ZA200B	7.8	-	
	1ZA380B	6.6	-	

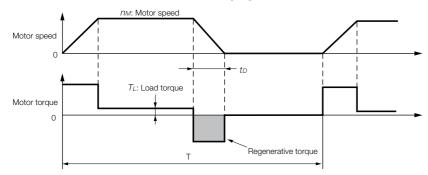
Servomotor Model		Allowable Frequencies in Regenerative Operation (Operations/Min)			
		SERVOPACK Model: SGD7S	SERVOPACK Model: SGD7W and SGD7C (Simultaneous Operation of Two Axes)		
	30A070A	_	38		
	30A120A	_	21		
	30A230A	22	11		
	45A200A	16	16		
	45A380A	10*1	-		
SGLFW2-	4070007	17 ^{*2}	_		
	90A200A	14	_		
	90A380A	11	_		
	90A560A	18	-		
	1DA380A	21	-		
	1DA560A	32	_		
	20A170A	15	15		
	20A320A	8.3	8.3		
	20A460A	7.1	_		
	35A170A	10	10		
	35A170H	8.5	8.5		
	35A320A	7	-		
SGLTW-	35A320H	5.9	-		
SGLIW-	35A460A	7.6	-		
	40A400B	13	-		
	40A600B	19	-		
	50A170H	15	15		
	50A320H	11	-		
	80A400B	28	_		
	80A600B	180	-		

*1. This value is in combination with the SGD7S-120A.

*2. This value is in combination with the SGD7S-180A.

Calculating the Regenerative Energy

This section shows how to calculate the regenerative resistor capacity for the acceleration/deceleration operation shown in the following figure.



Calculation Procedure for Regenerative Resistor Capacity

Step	Item	Code	Formula
1	Calculate the rotational energy of the Servo- motor.	E _S	$E_S = J n_M^2 / 182$
2	Calculate the energy consumed by load loss during the deceleration period	EL	$E_L = (\pi/60) n_M T_L t_D$ Note: If the load loss is unknown, calculate the value with E_L set to 0.
3	Calculate the energy lost from Servomotor winding resistance.	E _M	(Value calculated from the graphs in \blacklozenge Servo- motor Winding Resistance Loss on page 508) $\times t_D$
4	Calculate the energy that can be absorbed by the SERVOPACK.	E _C	Calculate from the graphs in ◆ SERVOPACK- absorbable Energy on page 507
5	Calculate the energy consumed by the regenerative resistor.	E _K	$E_{\mathcal{K}} = E_{\mathcal{S}} - (E_L + E_M + E_C)$
6	Calculate the required regenerative resistor capacity (W).	W _K	$W_K = E_K / (0.2 \times T)$

Note: 1. The 0.2 in the equation for calculating W_{K} is the value when the regenerative resistor's utilized load ratio is 20%.

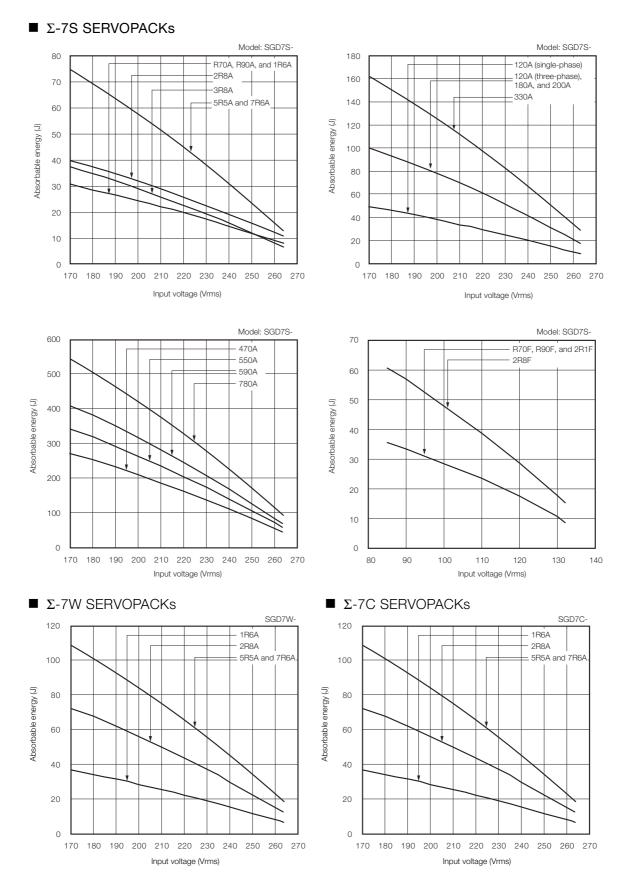
2. The units for the various symbols are given in the following table.

Code	Description	Code	Description
$E_{\rm S}$ to $E_{\rm K}$	Energy in joules (J)	T_L	Load torque (N·m)
W _K	Required regenerative resistor capacity (W)	t _D	Deceleration stopping time (s)
J	$= J_M + J_L (\text{kg·m}^2)$	Т	Servomotor repeat operation cycle (s)
n _M	Servomotor motor speed (min ⁻¹)		

If the value of W_K does not exceed the capacity of the built-in regenerative resistor of the SERVO-PACK, an External Regenerative Resistor is not required. If the value of W_K exceeds the capacity of the built-in regenerative resistor, install an External Regenerative Resistor with a capacity equal to the value for W calculated above.

SERVOPACK-absorbable Energy

The following figures show the relationship between the SERVOPACK's input power supply voltage and its absorbable energy.



Capacity Selection for Regenerative Resistors

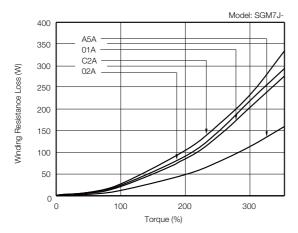
Servomotor Winding Resistance Loss

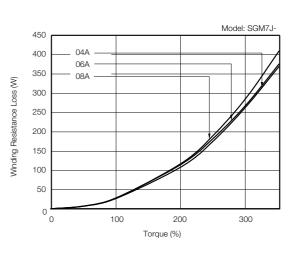
The following figures show the relationship for each Servomotor between the Servomotor's generated torque and the winding resistance loss.

SGMMV Rotary Servomotors

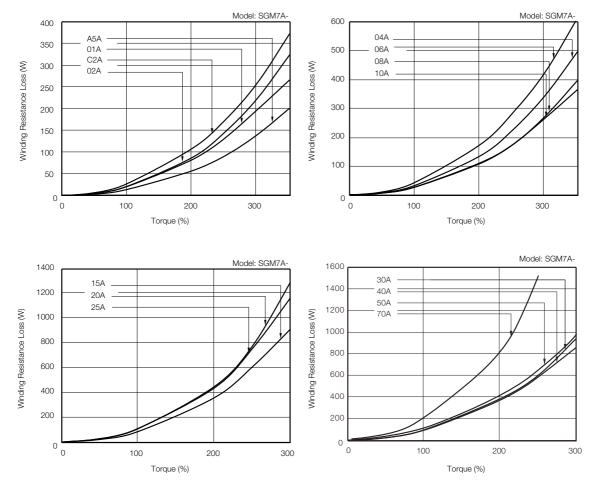
Contact your Yaskawa representative for information on the SGMMV Rotary Servomotors.

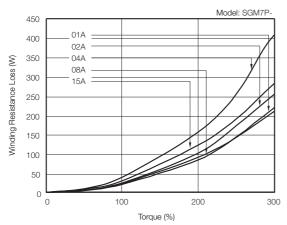
SGM7J Rotary Servomotors





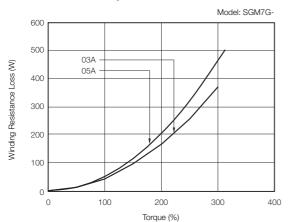
SGM7A Rotary Servomotors

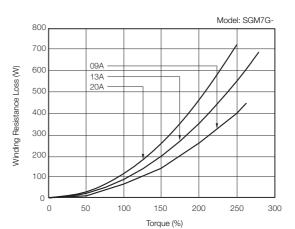


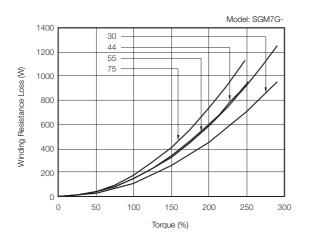


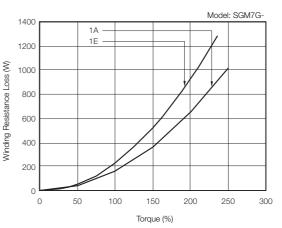
SGM7P Rotary Servomotors





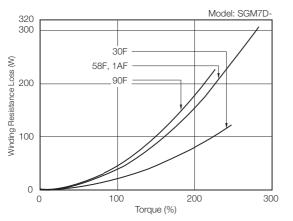


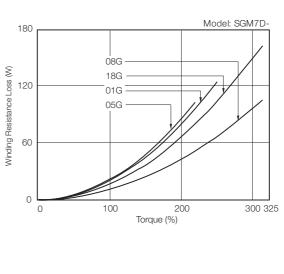


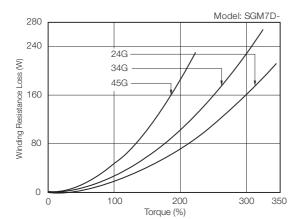


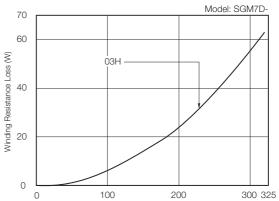
Capacity Selection for Regenerative Resistors

■ SGM7D Direct Drive Servomotors

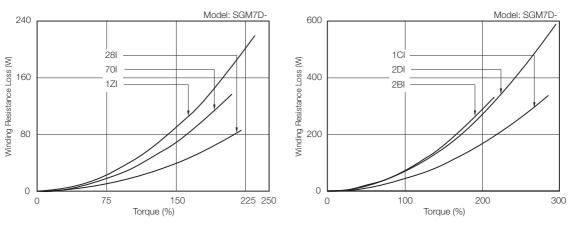




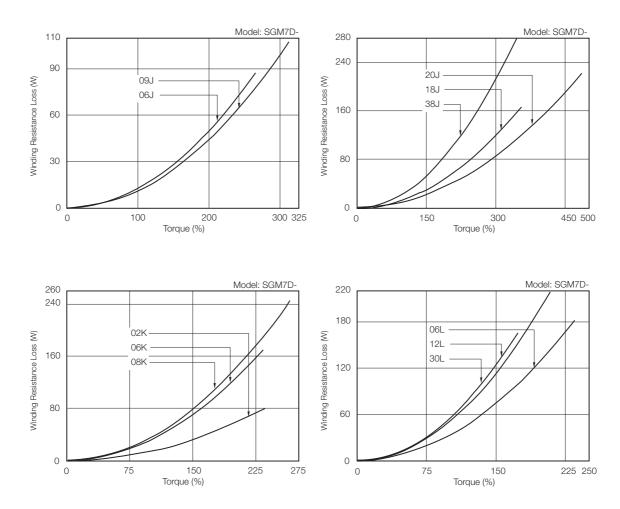




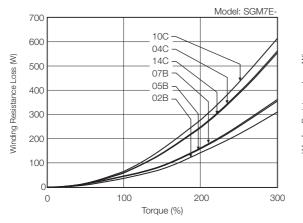
Torque (%)

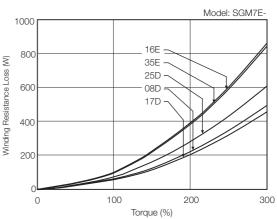


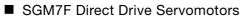
Appendices Capacity Selection for Regenerative Resistors

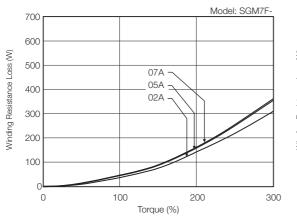


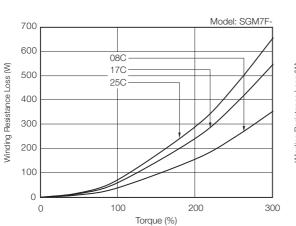
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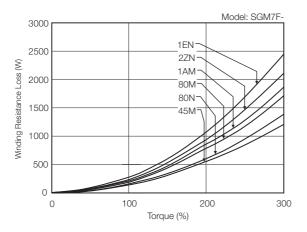


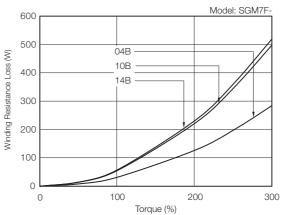


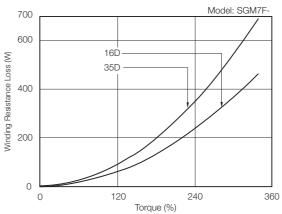


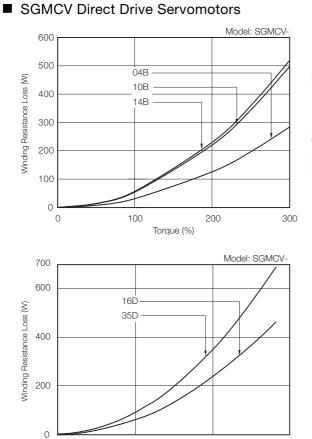


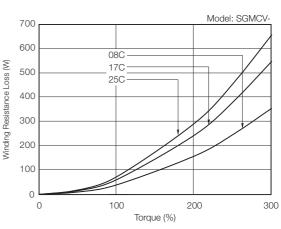












■ SGMCS Direct Drive Servomotors

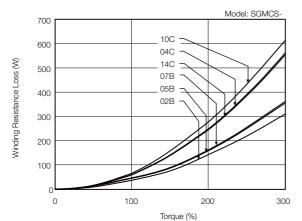
120

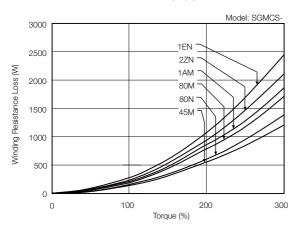
Torque (%)

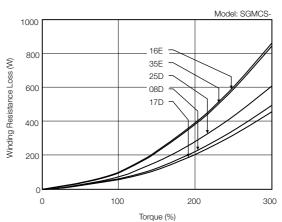
240

360

0



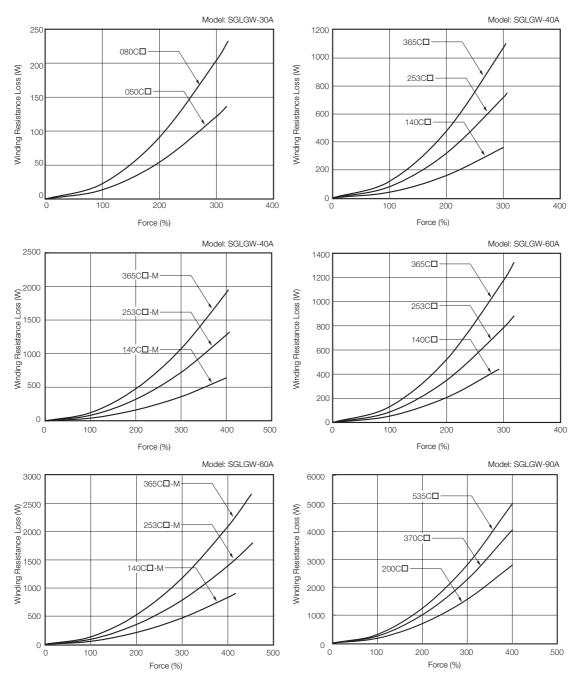


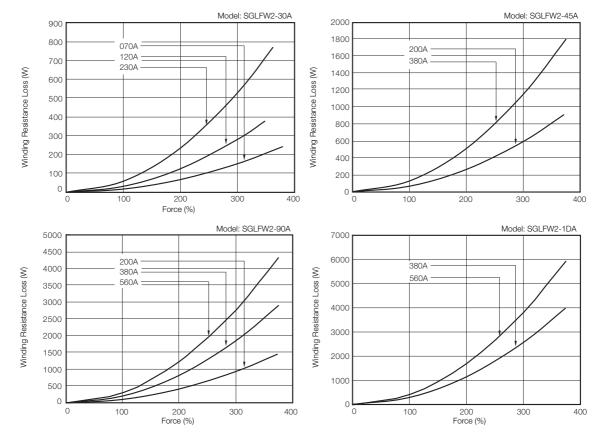


Capacity Selection for Regenerative Resistors

Capacity Selection for Regenerative Resistors

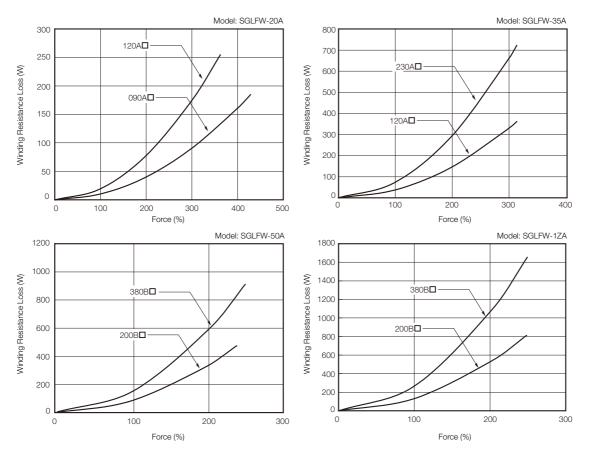
■ SGLGW Linear Servomotors





■ SGLFW2 Linear Servomotors

■ SGLFW Linear Servomotors



Model: SGLTW-20A Model: SGLTW-35A 460A Winding Resistance Loss (W) Winding Resistance Loss (W) 460A 🗆 · 320A 320AD -170A 170A 🗆 Force (%) Force (%) Model: SGLTW-35A Model: SGLTW-40A 320H 600B**D** Winding Resistance Loss (W) Winding Resistance Loss (W) 400B**D**-170H **k** 0 100 150 Force (%) Force (%) Model: SGLTW-50A Model: SGLTW-80A 320H🗆 -Winding Resistance Loss (W) Winding Resistance Loss (W) 600B**D** 400B**D** · 170H Force (%) Force (%)

■ SGLTW Linear Servomotors

International Standards

• : Certified, – : Not Certified							
			UL/CSA Standards	CE Marking	KC Mark		
Product		Model		CE	C	RoHS Directive	
SERVOPACKs		SGD7S	•	•	•	•	
		SGD7W	•	•	•	•	
		SGD7C	•	•	•	•	
Communi- cations Options	INDEXER Module	SGDV- OCA03A*	•	٠	•	•	
	DeviceNet Module	SGDV- OCA04A*, OCA05A*	•	•	•	•	
Feedback Option	Fully- Closed Module	SGDV- OFA01A*	•	•	•	•	
Safety Option	Safety Module	SGDV- OSA01A*	•	•	•	•	

 \ast Use this model number to purchase the Option Module separately.

		UL/CSA Standards	CE Marking	
Product	Model	c AV us	CE	RoHS Directive
	SGMMV	•	•	•
	SGM7J	•	•	•
Rotary Servomotors	SGM7A	•	•	•
	SGM7P	•	•	•
	SGM7G	•	•	•
	SGM7D	_	•	•
	SGM7E	Certification is pending.	Certification is pending.	•
Direct Drive Servomotors	SGM7F	•	Certification is pending.	•
	SGMCV	•	•	•
	SGMCS	-	*2	•*1
	SGLGW (SGLGM) *3	•	*4	•*1
Linear Servomotors	SGLFW2 (SGLFM2) ^{*3}	•* ⁵	•	•
Lineal Servomotors	SGLFW (SGLFM) ^{*3}	•	*4	•*1
	SGLTW (SGLTM) ^{*3}	•	*4	•*1

*1. Estimates are provided for RoHS-compliant products. The model numbers have an "-E" suffix.

*2. CE Marking certification has not yet been received for SGMCS-DDM and SGMCS-DDN Direct Drive Servomotors.

CE Marking certification has been received for the following Direct Drive Servomotors: SGMCS-DD, SGMCS-DD, and SGMCS-DDE. Contact your Yaskawa representative if the CE Marking label is required.

*3. The model numbers of the Magnetic Ways of Linear Servomotors are given in parentheses.

*4. CE Marking certification has been received. Contact your Yaskawa representative if the CE Marking label is required.

*5. UL certification has not yet been received for SGLFW2-DD560A Linear Servomotors.

MEMO

Warranty

Details of Warranty

Warranty Period

The warranty period for a product that was purchased (hereinafter called "delivered product") is one year from the time of delivery to the location specified by the customer or 18 months from the time of shipment from the Yaskawa factory, whichever is sooner.

Warranty Scope

Yaskawa shall replace or repair a defective product free of charge if a defect attributable to Yaskawa occurs during the above warranty period. This warranty does not cover defects caused by the delivered product reaching the end of its service life and replacement of parts that require replacement or that have a limited service life.

This warranty does not cover failures that result from any of the following causes.

- Improper handling, abuse, or use in unsuitable conditions or in environments not described in product catalogs or manuals, or in any separately agreed-upon specifications
- Causes not attributable to the delivered product itself
- · Modifications or repairs not performed by Yaskawa
- Use of the delivered product in a manner in which it was not originally intended
- Causes that were not foreseeable with the scientific and technological understanding at the time of shipment from Yaskawa
- · Events for which Yaskawa is not responsible, such as natural or human-made disasters

Limitations of Liability

- Yaskawa shall in no event be responsible for any damage or loss of opportunity to the customer that arises due to failure of the delivered product.
- Yaskawa shall not be responsible for any programs (including parameter settings) or the results of program execution of the programs provided by the user or by a third party for use with programmable Yaskawa products.
- The information described in product catalogs or manuals is provided for the purpose of the customer purchasing the appropriate product for the intended application. The use thereof does not guarantee that there are no infringements of intellectual property rights or other proprietary rights of Yaskawa or third parties, nor does it construe a license.
- Yaskawa shall not be responsible for any damage arising from infringements of intellectual property rights or other proprietary rights of third parties as a result of using the information described in catalogs or manuals.

Suitability for Use

- It is the customer's responsibility to confirm conformity with any standards, codes, or regulations that apply if the Yaskawa product is used in combination with any other products.
- The customer must confirm that the Yaskawa product is suitable for the systems, machines, and equipment used by the customer.
- Consult with Yaskawa to determine whether use in the following applications is acceptable. If use in the application is acceptable, use the product with extra allowance in ratings and specifications, and provide safety measures to minimize hazards in the event of failure.
 - Outdoor use, use involving potential chemical contamination or electrical interference, or use in conditions or environments not described in product catalogs or manuals
 - Nuclear energy control systems, combustion systems, railroad systems, aviation systems, vehicle systems, medical equipment, amusement machines, and installations subject to separate industry or government regulations
 - · Systems, machines, and equipment that may present a risk to life or property
 - Systems that require a high degree of reliability, such as systems that supply gas, water, or electricity, or systems that operate continuously 24 hours a day
 - · Other systems that require a similar high degree of safety
- Never use the product for an application involving serious risk to life or property without first ensuring that the system is designed to secure the required level of safety with risk warnings and redundancy, and that the Yaskawa product is properly rated and installed.
- The circuit examples and other application examples described in product catalogs and manuals are for reference. Check the functionality and safety of the actual devices and equipment to be used before using the product.
- Read and understand all use prohibitions and precautions, and operate the Yaskawa product correctly to prevent accidental harm to third parties.

Specifications Change

The names, specifications, appearance, and accessories of products in product catalogs and manuals may be changed at any time based on improvements and other reasons. The next editions of the revised catalogs or manuals will be published with updated code numbers. Consult with your Yaskawa representative to confirm the actual specifications before purchasing a product.

Σ -7 SERIES

IRUMA BUSINESS CENTER (SOLUTION CENTER)

480, Kamifujisawa, Iruma, Saitama, 358-8555, Japan Phone 81-4-2962-5151 Fax 81-4-2962-6138 http://www.yaskawa.co.jp

YASKAWA AMERICA, INC.

2121, Norman Drive South, Waukegan, IL 60085, U.S.A. Phone 1-800-YASKAWA (927-5292) or 1-847-887-7000 Fax 1-847-887-7310 http://www.yaskawa.com

YASKAWA ELÉTRICO DO BRASIL LTDA.

777, Avenida Piraporinha, Diadema, São Paulo, 09950-000, Brasil Phone 55-11-3585-1100 Fax 55-11-3585-1187 http://www.yaskawa.com.br

YASKAWA EUROPE GmbH

185, Hauptstraβe, Eschborn, 65760, Germany Phone 49-6196-569-300 Fax 49-6196-569-398 http://www.yaskawa.eu.com

YASKAWA ELECTRIC KOREA CORPORATION

35F, Three IFC, 10 Gukjegeumyung-ro, Yeongdeungpo-gu, Seoul, 07326, Korea Phone 82-2-784-7844 Fax 82-2-784-8495 http://www.yaskawa.co.kr

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.

151, Lorong Chuan, #04-02A, New Tech Park 556741, Singapore Phone 65-6282-3003 Fax 65-6289-3003 http://www.yaskawa.com.sg

YASKAWA ELECTRIC (THAILAND) CO., LTD.

59, 1st-5th Floor, Flourish Building, Soi Ratchadapisek 18, Ratchadapisek Road, Huaykwang, Bangkok 10310, Thailand Phone: +66-2-017-0099 Fax: +66-2-017-0799 http://www.yaskawa.co.th

YASKAWA ELECTRIC (CHINA) CO., LTD.

22F, One Corporate Avenue, No.222, Hubin Road, Shanghai, 200021, China Phone 86-21-5385-2200 Fax 86-21-5385-3299 http://www.yaskawa.com.cn

YASKAWA ELECTRIC (CHINA) CO., LTD. BEIJING OFFICE

Room 1011, Tower W3 Oriental Plaza, No.1, East Chang An Ave., Dong Cheng District, Beijing, 100738, China Phone 86-10-8518-4086 Fax 86-10-8518-4082

YASKAWA ELECTRIC TAIWAN CORPORATION 9F, 16, Nanking E. Rd., Sec. 3, Taipei, 104, Taiwan Phone 886-2-2502-5003 Fax 886-2-2505-1280 http://www.yaskawa-taiwan.com.tw



YASKAWA ELECTRIC CORPORATION

In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply. Specifications are subject to change without notice for ongoing product modifications and improvements.

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