YASKAWA

AC SERVO DRIVES
Σ-V SERIES

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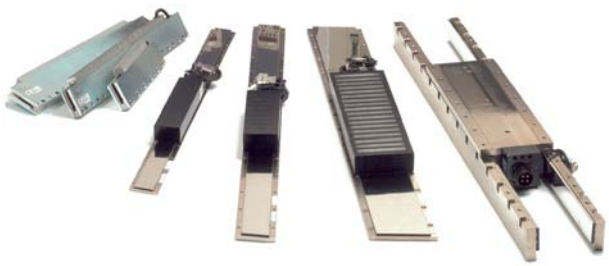


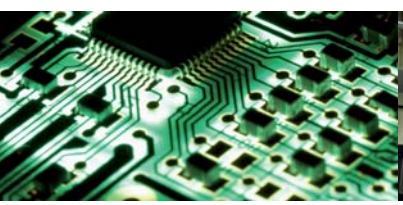
Yaskawa Σ-V Features

■ **Highest performance for maximum efficiency**
- optimised servomotors
- high resolution serial encoders
- servo amplifiers with ASICs (Application Specific Integrated Circuit)
- new intelligent algorithms
- precise and fast positioning
- vibrationless motion
- smooth running at lowest speed
- highest quality
- no manual adjustment required

■ **User-friendly software for fast and easy set-up**
- set-up software “SigmaWin+”
- no expert know-how is necessary to achieve optimum setting results
- optimized autotuning function
- automatic filter function to suppress vibrations
- automatic adjustment of the servo amplifiers to a wide range of inertia ratios
- free download of the servo motor selection program “SigmaSize+”

■ **Versatile communication with machine controllers**
- embedded open fieldbus system MECHATROLINK-II
- via several open and ethernet based fieldbus systems

■ **Compact and efficient: new design with many benefits**
- re-designed servo motors
- number of parts was reduced by about 30%
- increased vibration resistance by 100% to 5G
- powerlosses down by 30%
- advanced winding technologies
- high performance magnets



Σ-V – New Servo-Drive Series from YASKAWA: highest accuracy, easiest set-up and unlimited connectivity

Σ-V is a servo pack, consisting of servo motors, servo amplifiers and a powerful set-up tool. Σ-V replaces the successful Σ-II series which has been available for several years now for a wide range of applications. Customers using the Σ-II products for their machines, will have sufficient time to implement the changeover to Σ-V.

The new Σ-V series offers rotary, direct drive and linear motors. The rotary servo motor range will be available in several performance categories between 0.1 and 15 kW. They cover all market demands with regard to compact size, high dynamics, high efficiency, low maintenance and outstanding reliability.

The most impressive feature of the Σ-V series is its positioning accuracy of up to 10 nm with standard products, while offering shortest positioning times. In addition, the well known autotuning function was optimised for the most sophisticated applications. Example: The new autotuning algorithm allows the perfect set-up of a two axes in super high performance machine in less than two hours – compared to more than eight hours needed by other products in the market.

In short, Σ-V offers precise positioning at highest speed, smooth, vibration-free operation and easiest start up. For machine builders this means:

- Shortest cycle time – highest throughput
- Better product quality
- Less machine wear
- Shortest initial set-up time
- lowest lifecycle cost

Suitable for many applications

The major benefits of Σ-V, such as precise and fast positioning, highest machine speed, vibrationless motion, smooth running at lowest speed, make Σ-V ideal for machines in the fields of electronics, semiconductors, packaging, printing and machine tools. The new Σ-V generation will also be a perfect match for the injection molding and metal forming industries, where high throughput and point-to-point positioning are decisive factors.

A Passion for Quality

Since the company was founded, Yaskawa has been aiming at total quality. And while continuous improvement of the manufacturing process certainly is an important aspect of quality, the concept of total quality comprises more: The quest for quality needs to be an integral part of the construction process. Quality cannot be added on afterwards by adopting special production processes. Every day, more than 6 million servo drives worldwide are running and a proof of the high quality and reliability of Yaskawa products.

Yaskawa is certified to ISO 9001 and the environmental management system standard ISO 14001. The Σ-V is CE-certified, cULus-listed and RoHS-conform.

International Standards

Safety Standards

EN 954-1: Safety Category 3
IEC 61800-5-2: Safe Torque Off (STO)

RoHS Directive

RoHS Directive Stands for the EU directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.




■ Superlative Performance

Operate your machinery faster and with higher precision than ever!

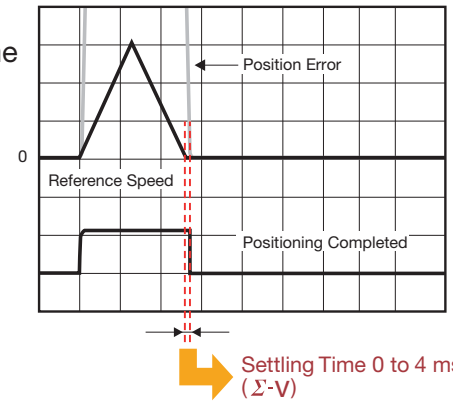
The Σ-V delivers the highest performance in the industry.

The best amplifier response in the industry slashes settling time

In-house comparison: 1/12th

Outstanding frequency response 1.6 kHz

●Servo Adjustment Example



Settling Time 0 to 4 ms! (Σ-V)

Enhanced vibration suppression

Existing functions to minimize vibration have been enhanced, and new ones added, improving tracking and further improving settling time. Vibration and noise during driving have also been cut, along with vibration at machine edges when stopping.

Contributing to machine performance in conjunction with a medium-inertia motor

Small Capacity

SGMJV Series

Low Heating

Improved motor constants have reduced both losses and heating.

Better Tact Time

Peak torque has been boosted from 300% to 350%, contributing to shorter tact times

Ease of Use

Moment of inertia has been doubled in the same motor, reducing the load inertia ratio and boosting gain for faster settling

Medium Capacity

SGMGV Series

Compact Design

Smaller package and about 20% lighter, but with the same inertia as the conventional model. A small encoder connector is applied.

Improved Vibration Resistance

New coupling delivers typical 5G vibration resistance

Resolution 1,048,576 pulses/revolution

■ Outstanding Expandability

Use servos that really fit into your system

A rich selection of models and options to match your requirements

Extensive variety of motors to match any machine

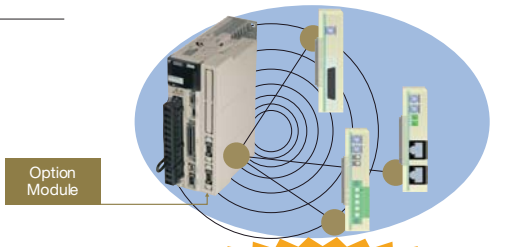
Medium-inertia servomotors ➡ Improved control stability
Low-inertia servomotors ➡ High-speed acceleration and deceleration

Selection of servo actuators

Support for direct drive servomotors, linear servomotors and linear sliders

Standard support for analog voltage/pulse train reference series or MECHATROLINK-Ⅱ communications reference series

Wide selection of option modules for various communication interfaces and feedback

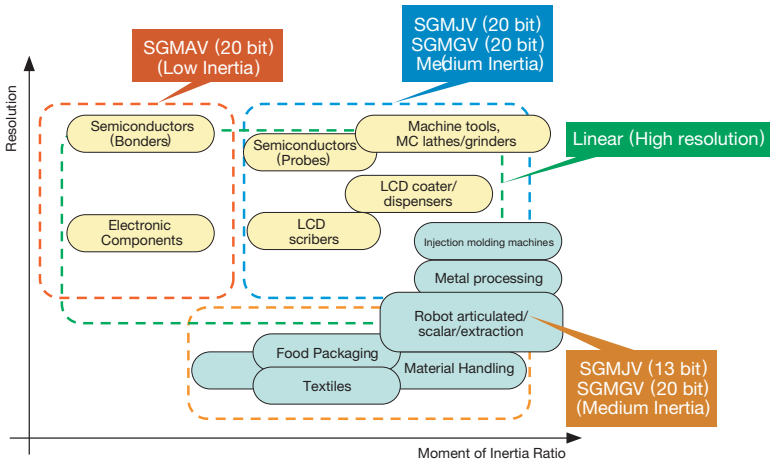


The first in the industry in Japan!
(as of April 2007)

Compliant with applicable safety standards

Easy compliance with machine safety standards

Motor line-up to handle a wide range of markets and applications



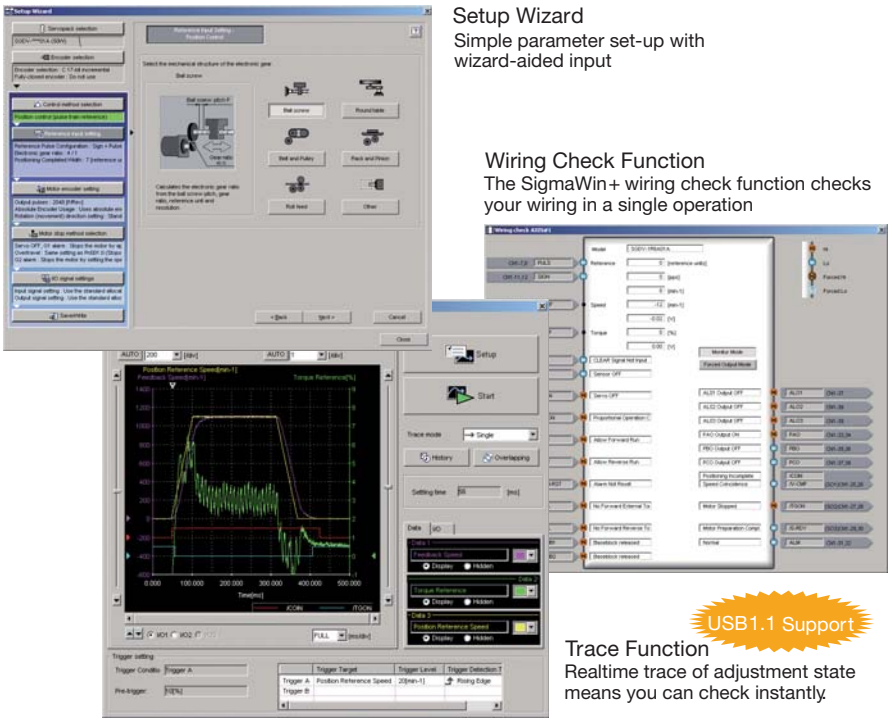
■ Simple Start-up

Making servo adjustment

Unpacking → Installation and Wiring → Basic Parameter Setting → Trial Operation

Faster setup

SigmaWin+



Setup Wizard
Simple parameter set-up with wizard-aided input

Wiring Check Function
The SigmaWin+ wiring check function checks your wiring in a single operation

USB1.1 Support

Trace Function
Realtime trace of adjustment state means you can check instantly.

Full of handy functions for start-up and more effective operation!

■ Selection

Servomotor capacity selection software

SigmaJunmaSize+

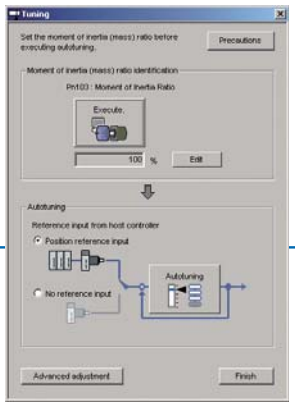
Optimal selection for your application:
With consideration of moment of inertia, DB resistance, etc.

Free software download at: http://www.yaskawa.eu.com/index.php?id=146

Let the Σ-V series simplify your life!

Gain and Filter Adjustment → Operation

Simple Tuning



New Advanced Autotuning Window

Get up and running quickly after hooking up the motor
New Tuning-less Function

Even without servo adjustment and with load changes, oscillation- and vibration-free drive is possible up to 20 times the load moment of inertia.

Settling time: 100 to 150 ms level

Minimize settling time with less vibration
New Advanced Autotuning

The reference filter and feedback gain adjustment functions have a new automatic feed forward gain adjustment for optimal adjustment performance.
The friction compensation function automatically cancels out the effect of friction on machine characteristics.

Settling time: 10 ms level

Fine-tuning is a must
New "One-parameter" Tuning

Fine-tuning can tweak machine performance to the max.

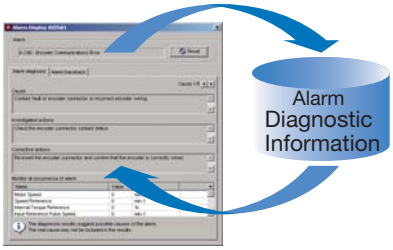
Settling time: 0 to 4 ms level

Maintenance

Faster Troubleshooting

PC tool
SigmaWin+

Alarm diagnostic function:
Presumes possible causes of the alarm and immediately displays suggested corrective actions.

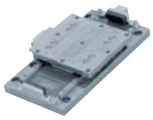


Free software download at: http://www.yaskawa.eu.com/index.php?id=146

■ Combinations of Σ-V Series SERVOPACK and Servomotor

Rotary Servomotors			Rated Power [W]	Rated Torque [Nm]	SERVOPACKs	
					Three-phase 200 VAC	Three-phase 400 VAC
Medium inertia small capacity motor	Single-/ Three-phase 230 VAC	SGMJV-A5A	50	0.159	SGDV-R70A□1A	–
		SGMJV-01A	100	0.318	SGDV-R90A□1A	–
		SGMJV-02A	200	0.637	SGDV-1R6A□1A	–
		SGMJV-04A	400	1.27	SGDV-2R8A□1A	–
		SGMJV-08A	750	2.39	SGDV-5R5A□1A	–
Low inertia small capacity motor	Single-/ Three-phase 230 VAC	SGMAV-A5A	50	0.159	SGDV-R70A□1A	–
		SGMAV-01A	100	0.318	SGDV-R90A□1A	–
		SGMAV-C2A	150	0.477	SGDV-1R6A□1A	–
		SGMAV-02A	200	0.637		–
		SGMAV-04A	400	1.27	SGDV-2R8A□1A	–
		SGMAV-06A	600	1.75	SGDV-5R5A□1A	–
		SGMAV-08A	750	2.39		–
		SGMAV-10A	1000	3.18	–	SGDV-120A □1A
Low inertia medium capacity motor	Three-phase 400 VAC	SGMSV-10	1000	3.18	–	SGDV-3R5D□1A
		SGMSV-15	1500	4.90	–	SGDV-5R4D□1A
		SGMSV-20	2000	6.36	–	
		SGMSV-25	2500	7.96	–	SGDV-8R4D□1A
		SGMSV-30	3000	9.80	–	SGDV-120D□1A
		SGMSV-40	4000	12.6	–	SGDV-170D□1A
		SGMSV-50	5000	15.8	–	
Medium inertia small capacity motor	Tree-phase 400 VAC	SGMEV-02	200	0.637	–	SGDV-1R9D□1A
		SGMEV-03	300	0.955	–	SGDV-1R9D□1A
		SGMEV-04	400	0.127	–	SGDV-1R9D□1A
		SGMEV-07	650	2.07	–	SGDV-3R5D□1A
		SGMEV-08	750	2.39	–	SGDV-3R5D□1A
		SGMEV-15	1500	4.77	–	SGDV-5R4D□1A
Medium inertia medium capacity motor	Three-phase 400 VAC	SGMGV-03D	300	1.56	–	SGDV-1R9D□1A
		SGMGV-05D	450	2.86	–	
		SGMGV-09D	850	5.39	–	SGDV-3R5D□1A
		SGMGV-13D	1300	8.34	–	SGDV-5R4D□1A
		SGMGV-20D	1800	11.5	–	SGDV-8R4D□1A
		SGMGV-30D	2900	18.6	–	SGDV-120D□1A
		SGMGV-44D	4400	28.4	–	SGDV-170D□1A
Direct Drive Servomotor	Three-phase 230 VAC	SGMCS-02B	42	2.0	SGDV-2R8A□1A	–
		SGMCS-05B	105	5.0		–
		SGMCS-07B	147	7.0		–
		SGMCS-04C	84	4.0		–
		SGMCS-10C	209	10.0		–
		SGMCS-14C	293	14.0		–
		SGMCS-08D	168	8.0		–
		SGMCS-17D	356	17.0		–
		SGMCS-25D	393	25.0		–
		SGMCS-16E	335	16.0	SGDV-5R5A□1A	–
		SGMCS-35E	550	35.0		–

■ Combination of Linear Servomotor with Σ-V Series SERVOPACK

Linear Servomotors			Peak Force (N)	Single-/ Three-phase 230 VAC
	Coreless type, with standard magnetic way	SGLGW-30A050	40	SGDV-R70A□5A
		SGLGW-30A080	80	SGDV-R90A□5A
		SGLGW-40A140	140	
		SGLGW-40A253	280	SGDV-1R6A□5A
		SGLGW-60A140	420	
		SGLGW-40A365	220	SGDV-2R8A□5A
		SGLGW-60A253	440	
		SGLGW-60A365	660	SGDV-5R5A□5A
	Coreless type, with high-efficiency magnetic way	SGLGW-40A140	230	SGDV-1R6A□5A
		SGLGW-60A140	460	
		SGLGW-40A253	690	SGDV-2R8A□5A
		SGLGW-40A365	360	SGDV-3R8A□5A
		SGLGW-60A253	720	
	With F-type iron core	SGLFW-20A090	86	SGDV-1R6A□5A
		SGLFW-20A120	125	
		SGLFW-35A120	220	
		SGLFW-35A230	440	SGDV-3R8A□5A
		SGLFW-50A200	600	SGDV-5R5A□5A
	With T-type iron core	SGLTW-20A170	380	SGDV-3R8A□5A
		SGLTW-35A170	660	SGDV-5R5A□5A
		SGLTW-50A170	900	
	Cylinder type Σ-Stick	SGLCW-D16A085	60	SGDV-R70A□5A
		SGLCW-D16A115	90	
		SGLCW-D16A145	120	SGDV-R90A□5A
		SGLCW-D20A100	150	SGDV-1R6A□5A
		SGLCW-D20A135	225	
		SGLCW-D20A170	300	
		SGLCW-D25A125	280	
		SGLCW-D25A170	420	SGDV-2R8A□5A
		SGLCW-D32A165	465	
		SGLCW-D25A215	420	SGDV-5R5A□5A
		SGLCW-D32A225	630	
		SGLCW-D32A285	840	
	Σ-Trac-μ	SGTMM-01	10	SGDV-R70A□5A
		SGTMM-03	25	SGDV-R90A□5A

ROTARY SERVOMOTORS
SGMJV

Features

- Medium inertia
- Instantaneous peak torque (350% of rated torque up to 3 sec.)
- High-resolution serial encoder: 20 bits (optional 13 bits)
- Maximum speed: 6000 min^{-1}
- Wide selection: 50 to 750 W capacity (optional holding brake)

Application Examples

- Chip mounters
- PCB drilling stations
- Robots
- Material transfer machines
- Food processing equipment

■ Model Designations

SGMJV - 01 A D A 2 1

Σ·V Series
Servomotor
SGMJV

Rated Output

Code	Specifications
A5	50 W
01	100 W
02	200 W
04	400 W
08	750 W

Power Supply Voltage

Code	Specifications
A	230 VAC

Serial Encoder

Code	Specifications
3	20-bit absolute (standard)
D	20-bit incremental (standard)
A	13-bit incremental (standard)

Design Revision Order

Code	Specifications
A	Standard

Shaft End

Code	Specifications
2	Straight without key (standard)
6	Straight with key and tap (optional)
8	Straight without key and with tap (optional)
B	With two flat seats (optional)

Options

Code	Specifications
1	Without options
C	With holding brake (24 VDC)
E	With oil seal and holding brake (24 VDC)
S	With oil seal

■ Ratings and Specifications

Duty Cycle: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩmin.
Ambient Temperature: 0 to 40℃
Excitation: Permanent magnet
Mounting: Flange method

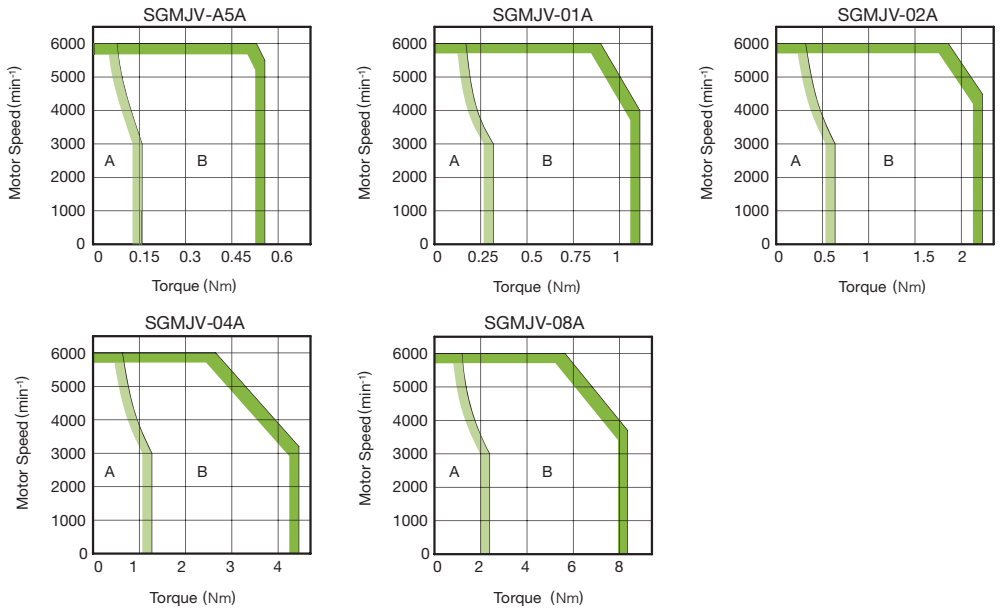
Isolation Class: B (130°C)
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP65
(except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		230 V				
Servomotor Model: SGMJV-□		A5A□A□□	01A□A□□	02A□A□□	04A□A□□	08A□A□□
Rated Output*1	W	50	100	200	400	750
Rated Torque*1,*2	Nm	0.159	0.318	0.637	1.27	2.39
Instantaneous Peak Torque*1	Nm	0.557	1.11	2.23	4.46	8.36
Rated Current*1	Arms	0.61	0.84	1.6	2.7	4.7
Instantaneous Max. Current*1	Arms	2.1	2.9	5.8	9.3	16.9
Rated Speed*1	min^{-1}	3000				
Max. Speed*1	min^{-1}	6000				
Torque Constant	Nm/Arms	0.285	0.413	0.435	0.512	0.544
Rotor Moment of Inertia (with holding brakes)	$kg{\cdot}m^2 \times 10^{-4}$	0.0414 (0.0489)	0.0665 (0.0740)	0.259 (0.323)	0.442 (0.506)	1.57 (1.74)
Rated Power Rate*1	kW/s	6.11	15.2	15.7	36.5	36.3
Rated Angular Acceleration*1	rad/s^2	38400	47800	24600	28800	15200
Applicable SERVOPACK	SGDV-□	R70 A	R90 A	1R6 A	2R8 A	5R5 A

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100℃. Other values quoted are at 20℃.
*2: Rated torques are continuous allowable torque values at 40℃ with an aluminum heat sink of the following dimensions attached.
SGMJV-A5, -01: 200 mm×200 mm×6 mm
SGMJV-02, -04, -08: 250 mm×250 mm×6 mm

Torque-Motor Speed Characteristics

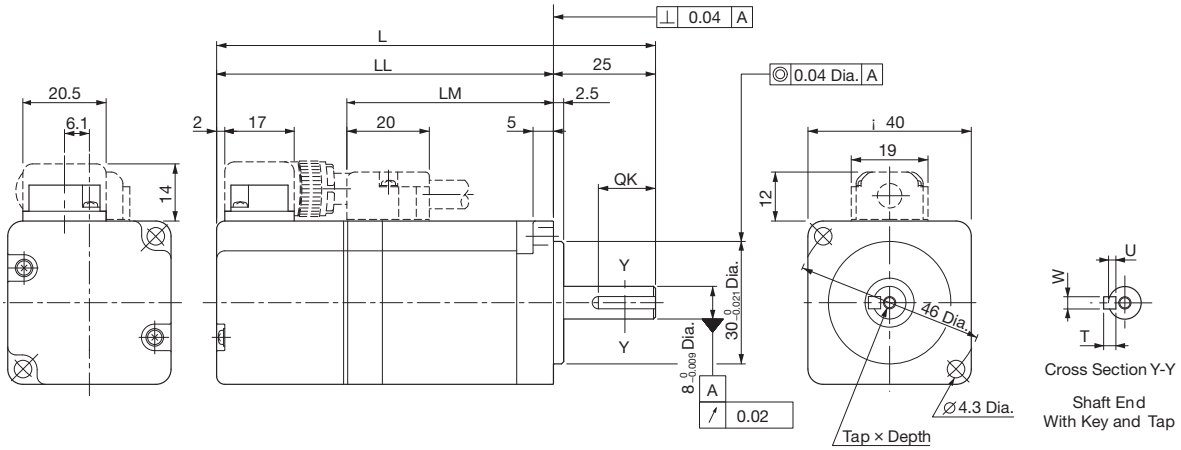
A: Continuous Duty Zone
B: Intermittent Duty Zone



■ External Dimensions (Units: mm)

Without Holding Brakes (With Holding Brakes)

(1) 50 to 100 W

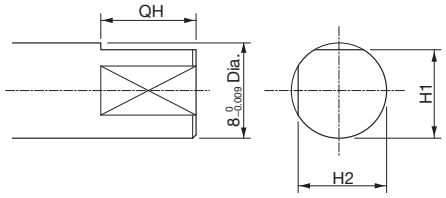


Model SGMJV-	L	LL	LM	Tap×Depth	Key Dimensions QK	U	W	T	Approx. Mass kg
A5A□A21 (A5A□A2C)	94 (139)	69 (114)	37	No tap	No key				0.3 (0.6)
A5A□A61 (A5A□A6C)				M3×6L	14	1.8	3	3	
A5A□A81 (A5A□A8C)					No key				
01A□A21 (01A□A2C)	107.5 (152.5)	82.5 (127.5)	50.5	No tap	No key				0.4 (0.7)
01A□A61 (01A□A6C)				M3×6L	14	1.8	3	3	
01A□A81 (01A□A8C)					No key				

Note: The models and values in parentheses are for servomotors with holding brakes.

Shaft End and Other Options

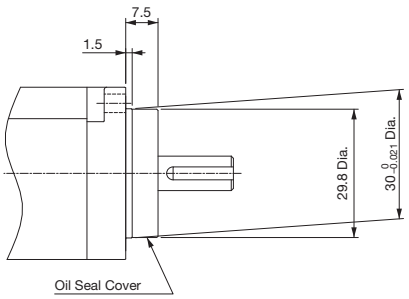
With Two Flat Seats



Model SGMJV-	Dimensions of Servomotor with Two Flat Seats mm QH	H1	H2
A5A□AB1 (A5A□ABC)	15	7.5	7.5
01A□AB1 (01A□ABC)	15	7.5	7.5

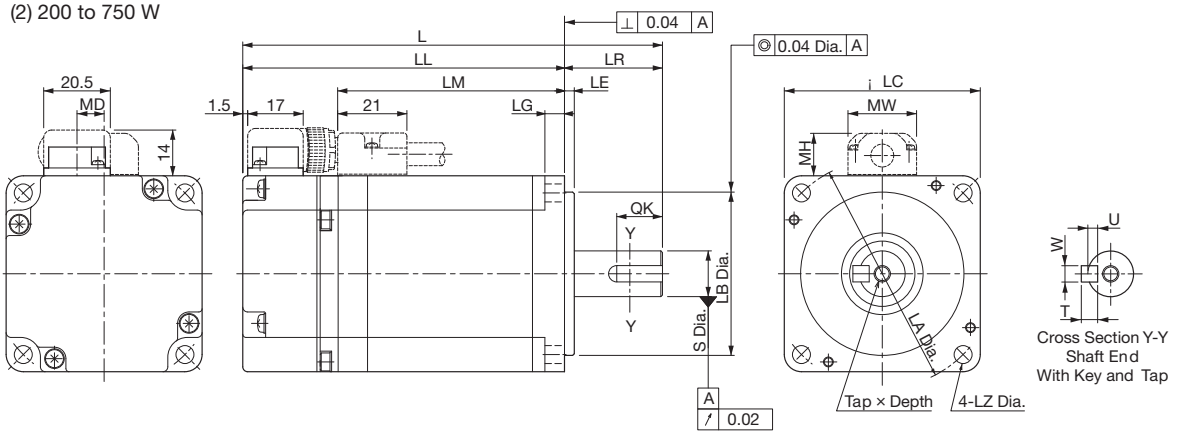
Note: The models in parentheses are for servomotors with holding brakes.

With an Oil Seal



Notes: 1 The 7th digit of the model designation is “S” or “E”.
2 Key dimensions are the same as those in the above table.

(2) 200 to 750 W

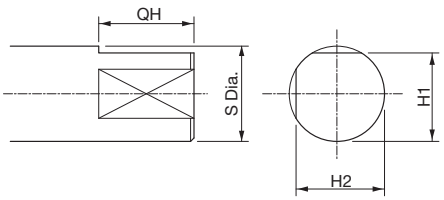


Model SGMJV-	L	LL	LM	Flange Face Dimensions							S	Tap× Depth	Key Dimensions				MD	MW	MH	Approx. Mass kg
				LR	LE	LG	LC	LA	LB	LZ			QK	U	W	T				
02A□A21 (02A□A2C)	110 (150)	80 (120)	51	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	No tap	No key				8.3	21	13	0.9 (1.5)
02A□A61 (02A□A6C)												M5×8L	14	3	5	5				
02A□A81 (02A□A8C)													No key							
04A□A21 (04A□A2C)	128.5 (168.5)	98.5 (138.5)	69.5	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	No tap	No key				8.3	21	13	1.3 (1.9)
04A□A61 (04A□A6C)												M5×8L	14	3	5	5				
04A□A81 (04A□A8C)													No key							
08A□A21 (08A□A2C)	155 (200)	115 (160)	85	40	3	8	80	90	$70^{0}_{-0.030}$	7	$19^{0}_{-0.013}$	No tap	No key				13.8	27	15	2.7 (3.6)
08A□A61 (08A□A6C)												M6×10L	22	3.5	6	6				
08A□A81 (08A□A8C)													No key							

Note: The models and values in parentheses are for servomotors with holding brakes.

Shaft End and Other Options

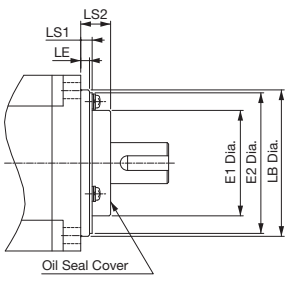
With Two Flat Seats



Model SGMJV-	Dimensions of Servomotor with Two Flat Seats mm			
	QH	S	H1	H2
02A□AB1 (02A□ABC)	15	$14^{0}_{-0.011}$	13	13
04A□AB1 (04A□ABC)	15	$14^{0}_{-0.011}$	13	13
08A□AB1 (08A□ABC)	22	$19^{0}_{-0.013}$	18	18

Note: The models in parentheses are for servomotors with holding brakes.

With an Oil Seal



Model SGMJV-	Dimensions of Servomotor with an Oil Seal			
	E1	E2	LS1	LS2
02, 04	36	48	4	10
08	49	66	6	11

Notes: 1 The 7th digit of the model designation is "S" or "E".
2 Key dimensions are the same as those in the above table.

ROTARY SERVOMOTORS
SGMAV

Features

- Extremely low inertia
- Super high power rate
- Instantaneous peak torque (300% of rated torque)
- High-resolution serial encoder: 20 bits
- Maximum speed: 6000 min^{-1}
- Wide selection: 50 to 1.0 KW capacity (optional holding brake)

Application Examples

- Chip mounters
- PCB drilling stations
- Robots
- Material transfer machines
- Food processing equipment
- Packaging
- Semiconductor equipment

■ Model Designations

SGMAV - 01 A D A 2 1

Σ·V Series
Servomotor
SGMAV

Rated Output

Code	Specifications
A5	50 W
01	100 W
C2	150 W
02	200 W
04	400 W
06	550 W
08	750 W
10	1.0 kW

Power Supply Voltage

Code	Specifications
A	230 VAC

Serial Encoder

Code	Specifications
3	20-bit absolute (standard)
D	20-bit incremental (standard)

Design Revision Order

Code	Specifications
A	Standard

Shaft End

Code	Specifications
2	Straight without key (standard)
6	Straight with key and tap (optional)
8	Straight without key and with tap (optional)
B	With two flat seats (optional)

Options

Code	Specifications
1	Without options
C	With holding brake (24 VDC)
E	With oil seal and holding brake (24 VDC)
S	With oil seal

■ Ratings and Specifications

Duty cycle: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩ min.
Ambient Temperature: 0 to 40°C
Excitation: Permanent magnet
Mounting: Flange method

Isolation Class: B (130°C)
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP65 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Rotation Direction: Counterclockwise (CWW)

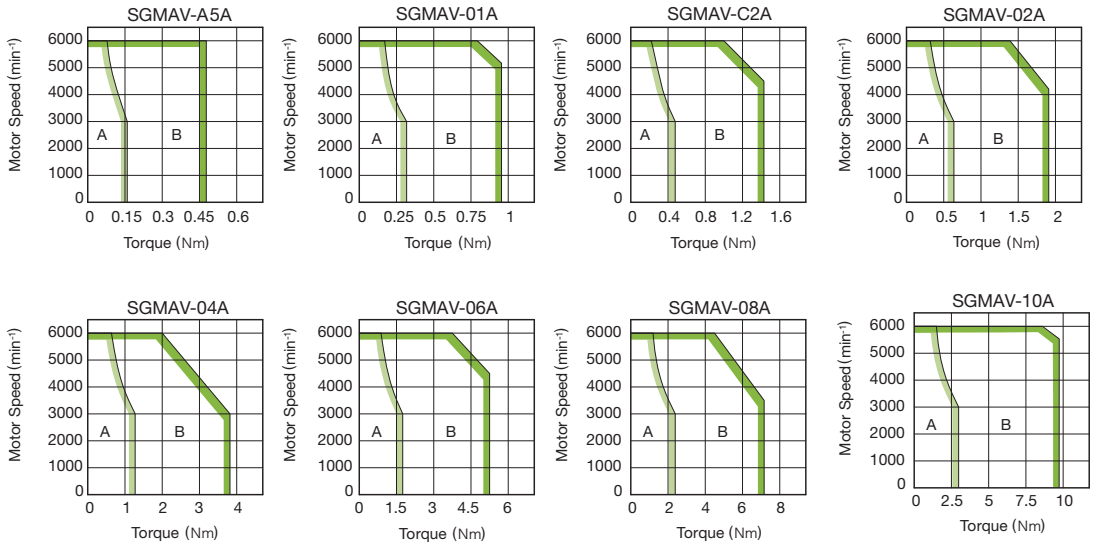
Voltage		230 V							
Servomotor Model: SGMAV-□		A5A□A□□	01A□A□□	C2A□A□□	02A□A□□	04A□A□□	06A□A□□	08A□A□□	10A□A□□
Rated Output*1	W	50	100	150	200	400	550	750	3000
Rated Torque*1, *2	Nm	0.159	0.318	0.477	0.637	1.27	1.75	2.39	3.18
Instantaneous Peak Torque*1	Nm	0.477	0.955	1.43	1.91	3.82	5.25	7.16	9.55
Rated Current*1	Arms	0.66	0.91	1.3	1.5	2.6	3.8	5.3	7.4
Instantaneous Max. Current*1	Arms	2.1	2.8	4.2	5.3	8.5	12.2	16.6	23.9
Rated Speed*1	min^{-1}	3000							
Max. Speed*1	min^{-1}	6000							
Torque Constant	Nm/Arms	0.265	0.375	0.381	0.450	0.539	0.496	0.487	0.467
Rotor Moment of Inertia (with holding brakes)	$kg·m^2 \times 10^{-4}$	0.0242 (**0.0312**)	0.0380 (**0.0450**)	0.0531 (**0.0601**)	0.116 (**0.180**)	0.190 (**0.254**)	0.326 (**0.390**)	0.769 (**0.940**)	1.2 (1.41)
Rated Power Rate*1	kW/s	10.4	26.6	42.8	35.0	84.9	93.9	74.1	84.3
Rated Angular Acceleration*1	rad/s^2	65800	83800	89900	54900	67000	53700	31000	26500
Applicable SERVOPACK	SGDV-□	R70 A	R90 A	1R6 A	1R6 A	2R8 A	5R5 A	5R5 A	120A

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100°C. Other values quoted are at 20°C.

*2: Rated torques are continuous allowable torque values at 40°C with an aluminum heat sink of the following dimensions attached.
SGMAV-A5: 200 mm×200 mm×6 mm
SGMAV-01, -C2, -02, -04, -06, -08: 250 mm×250 mm×6 mm

Torque-Motor Speed Characteristics

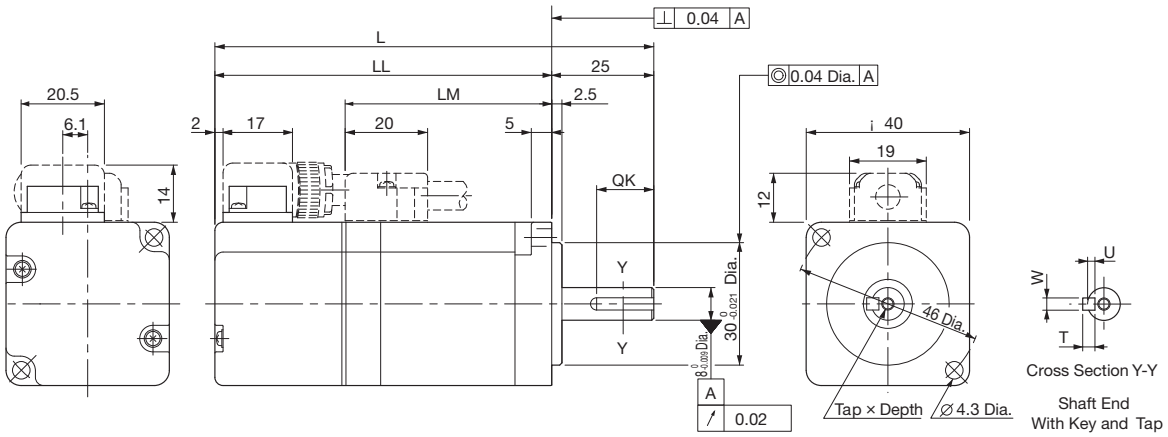
A: Continuous Duty Zone B: Intermittent Duty Zone



■ External Dimensions (Units: mm)

Without Holding Brakes (With Holding Brakes)

(1) 50 to 150 W

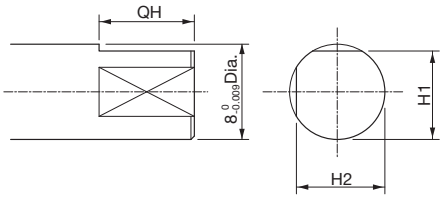


Model SGMAV-	L	LL	LM	Tap×Depth	Key Dimensions				Approx. Mass kg
					QK	U	W	T	
A5A□A21 (A5A□A2C)	95.5 (140.5)	70.5 (115.5)	38.5	No tap	No key				0.3 (0.6)
A5A□A61 (A5A□A6C)				M3×6L	14	1.8	3	3	
A5A□A81 (A5A□A8C)					No key				
01A□A21 (01A□A2C)	107.5 (152.5)	82.5 (127.5)	50.5	No tap	No key				0.4 (0.7)
01A□A61 (01A□A6C)				M3×6L	14	1.8	3	3	
01A□A81 (01A□A8C)					No key				
C2A□A21 (C2A□A2C)	119.5 (164.5)	94.5 (139.5)	62.5	No tap	No key				0.5 (0.8)
C2A□A61 (C2A□A6C)				M3×6L	14	1.8	3	3	
C2A□A81 (C2A□A8C)					No key				

Note: The models and values in parentheses are for servomotors with holding brakes.

Shaft End and Other Options

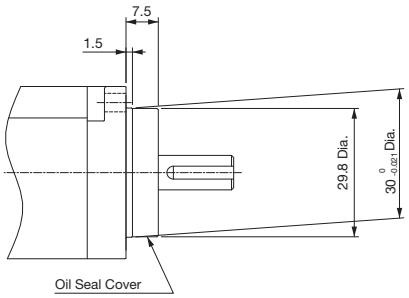
With Two Flat Seats



Model SGMAV-	Dimensions of Servomotor with Two Flat Seats		
	QH	H1	H2
A5A□AB1 (A5A□ABC)	14	7.5	7.5
01A□AB1 (01A□ABC)			
C2A□AB1 (C2A□ABC)			

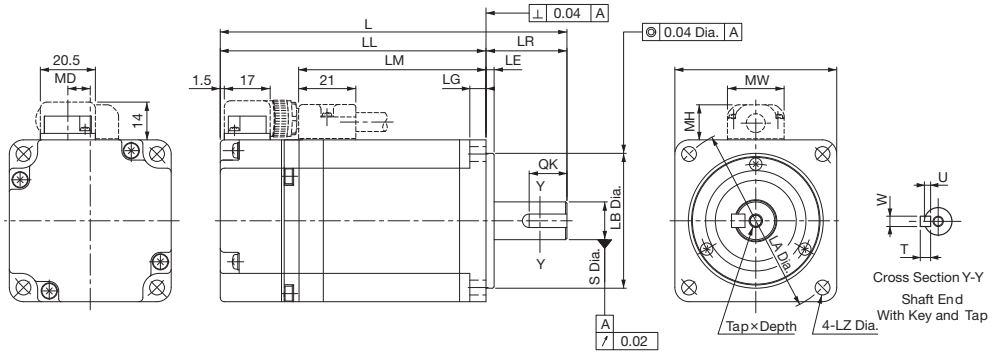
Note: The models in parentheses are for servomotors with holding brakes.

With an Oil Seal



Note: The 7th digit of the model designation is "S" or "E." The key dimensions are the same as those in the above table.

(2) 200 to 1.0 kW

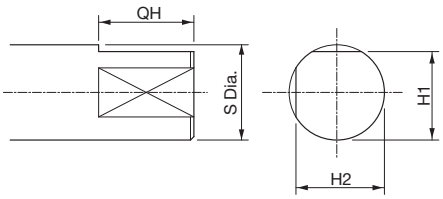


Model SGMAV-	L	LL	LM	Flange Face Dimensions							S	Tap × Depth	Key Dimensions				MD	MW	MH	Approx. Mass kg
				LR	LE	LG	LC	LA	LB	LZ			QK	U	W	T				
02A□A21 (02A□A2C)	110 (150)	80 (120)	51	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	No tap	No key				8.5	21	13	0.9 (1.5)
02A□A61 (02A□A6C)												M5×8L	20	3	5	5				
02A□A81 (02A□A8C)													No key							
04A□A21 (04A□A2C)	128.5 (168.5)	98.5 (138.5)	69.5	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	No tap	No key				8.5	21	13	1.2 (1.8)
04A□A61 (04A□A6C)												M5×8L	20	3	5	5				
04A□A81 (04A□A8C)													No key							
06A□A21 (06A□A2C)	154.5 (200.5)	124.5 (170.5)	95.5	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	No tap	No key				8.5	21	13	1.7 (2.4)
06A□A61 (06A□A6C)												M5×8L	20	3	5	5				
06A□A81 (06A□A8C)													No key							
08A□A21 (08A□A2C)	155 (200)	115 (160)	85	40	3	8	80	90	$90^{0}_{-0.035}$	7	$19^{0}_{-0.013}$	No tap	No key				13.8	27	15	2.3 (3.2)
08A□A61 (08A□A6C)												M6×10L	22	3.5	6	6.5				
08A□A81 (08A□A8C)													No key							
10A□A21 (10A□A2C)	185 (235)	145 (195)	115	40	3	8	80	90	$90^{0}_{-0.035}$	7	$19^{0}_{-0.013}$	No tap	No key				13.8	27	15	3.6 (4.6)
10A□A21 (10A□A2C)												M6×10L	22	3.5	6	6.5				

Note: The models and values in parentheses are for servomotors with holding brakes.

Shaft End and Other Options

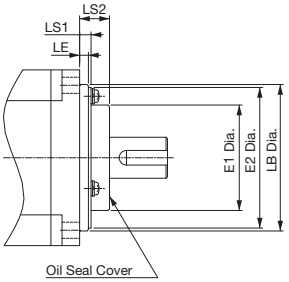
With Two Flat Seats



Model SGMAV-	Dimensions of Servomotor with Two Flat Seats			
	QH	S	H1	H2
02A□AB1 (02A□ABC)	14	$14^{0}_{-0.011}$	13	13
04A□AB1 (04A□ABC)				
06A□AB1 (06A□ABC)				
08A□AB1 (08A□ABC)	22	$19^{0}_{-0.013}$	18	18

Note: The models in parentheses are for servomotors with holding brakes.

With an Oil Seal



Model SGMAV-	Dimensions of Servomoter with an Oil Seal mm			
	E1	E2	LS1	LS2
02, 04, 06	36	48	4	10
08	49	66	6	11

Note: The 7th digit of the model designation is “S” or “E.”
The key dimensions are the same as those in the above table.

ROTARY SERVOMOTORS
SGMGV

Features

- Medium inertia
- Wide selection: 300 W to 4.4 kW capacity, holding brake option
- High resolution serial encoder: 20 bits
- Standard protection class: IP67

Application Examples

- Machine tools
- Transfer machines
- Material handling machines
- Food processing equipment
- Packaging

■ Model Designations

SGMGV - 03 D 3 A 2 F

Options

Code	Specifications
F	Without options
E	With oil seal and holding brake (24 VDC)
S	With oil seal
H	24 VDC brake

Rated Output

Code	Specifications	Code	Specifications
03	300 W	20	1.8 kW
05	450 W	30	2.9 kW
09	850 W	44	4.4 kW
13	1.3 kW		

Shaft End

Code	Specifications
2	Straight without key (standard)
6	Straight with key and tap (optional)

Power Supply Voltage

Code	Specifications
D	400 VAC

Design Revision Order

Code	Specifications
A	Standard

Serial Encoder

Code	Specifications
3	20-bit absolute (standard)
D	20-bit incremental (standard)

Ratings and Specifications

Duty cycle: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩ min.
Ambient Temperature: 0 to 40°C
Excitation: Permanent magnet
Mounting: Flange method

Isolation Class: F (155°C)
Withstand Voltage: 1 800 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP67 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

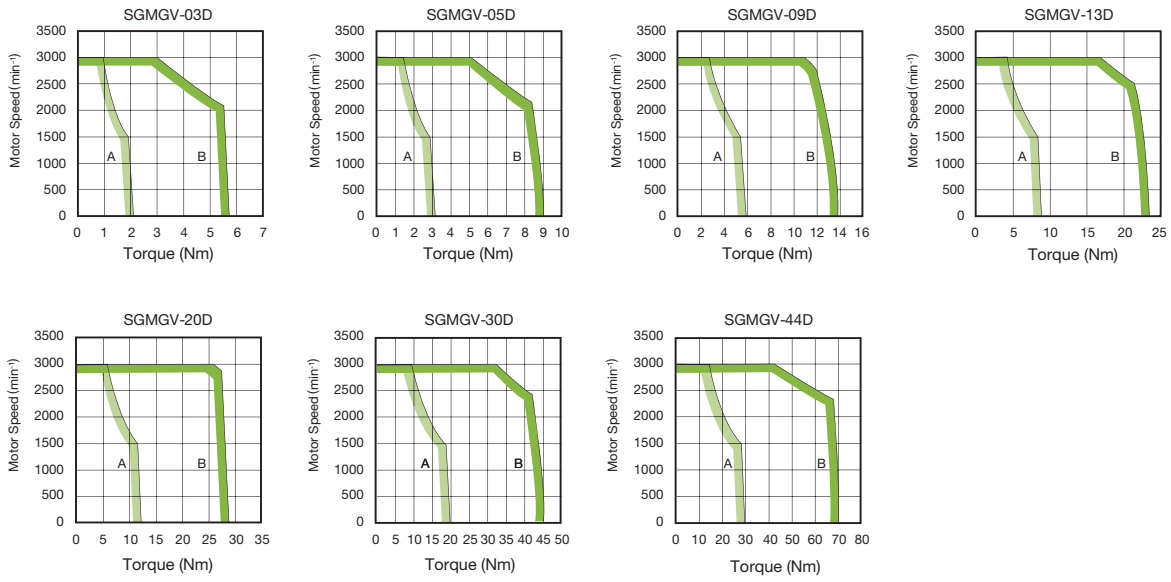
Voltage Servomotor Model: SGMGV-□		400 V						
		03D □A□□	05D □A□□	09D □A□□	13D □A□□	20D □A□□	30D □A□□	44D □A□□
Rated Output*	kW	0.3	0.45	0.85	1.3	1.8	2.9	4.4
Rated Torque*	Nm	1.96	2.86	5.39	8.34	11.5	18.6	28.4
Instantaneous Peak Torque*	Nm	5.88	8.92	13.8	23.3	28.7	45.1	71.1
Rated Current*	Arms	1.4	1.9	3.5	5.4	8.4	11.9	16.5
Instantaneous Max. Current*	Arms	4	5.5	8.5	14	20	28	40.5
Rated Speed*	min^{-1}	1500						
Max. Speed*	min^{-1}	3000						
Torque Constant	Nm/Arms	1.56	1.74	1.74	1.80	1.53	1.72	1.86
Rotor Moment of Inertia (with holding brakes)	$kg·m^2 \times 10^{-4}$	2.48 (2.69)	3.33 (3.54)	13.9 (16)	19.9 (22)	26 (28.1)	46 (54.5)	67.5 (76.0)
Rated Power Rate*	kW/s	15.5	24.6	20.9	35.0	50.9	75.2	119
Rated Angular Acceleration*	rad/s^2	7900	8590	3880	4190	4420	4040	4210
Applicable SERVOPACK SGDV-□		1R9D	1R9D	09D	13D	20D	30D	40D

*: These items and torque-motor speed characteristics quoted in combination with a SERVOPACK are at an armature winding temperature of 20°C.

Notes: 1 SGMV-03/-05: 250 mm × 250 mm × 60 mm (aluminum)
SGMGV-09/-13/-20: 400 mm × 400 mm × 22 mm (iron)
SGMGV-30/-44: 550 mm × 550 mm × 30 mm (iron)

Torque-Motor Speed Characteristics

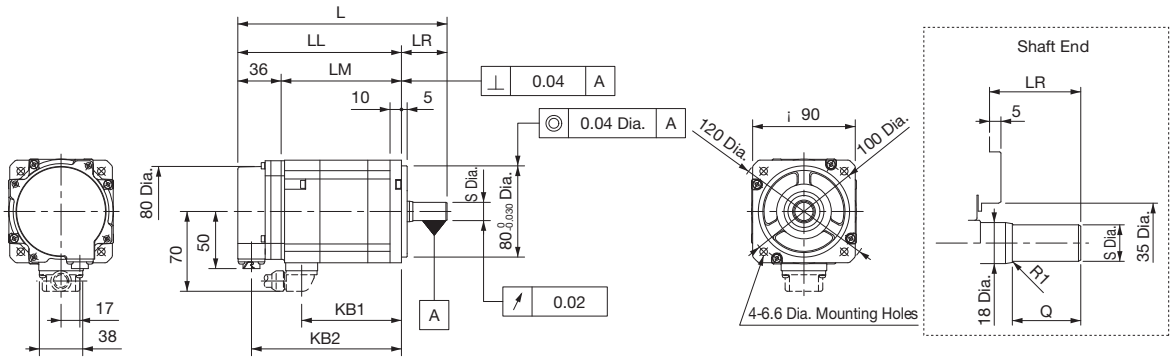
A: Continuous Duty Zone B: Intermittent Duty Zone



External Dimensions (Units: mm)

Without Holding Brakes

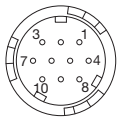
(1) 300 W, 450 W



Model SGMGV-	L	LL	LM	LR	KB1	KB2	Shaft End Dimensions		Approx. Mass kg
							S	Q	
03D□A21	163	126	90	37	75	114	$14^{0}_{-0.011}$	25	2.6
05D□A21	179	139	103	40	88	127	$16^{0}_{-0.011}$	30	3.2

Note: Models with oil seals are of the same configuration.

Cable Specifications for Encoder-end Connector (20-bit Encoder)



Receptacle: CM10-R10P-D
Applicable plug (To be provided by the customer)
Plug: CM10-AP10S-*-D (Angle)
CM10-SP10S-*-D (Straight)
(Asterisks (*) indicate a value that depending on cable size.)

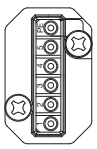
With an Absolute Encoder

1	PS	6	BAT(+)
2	/PS	7	-
3	-	8	-
4	PG5V	9	PG0V
5	BAT(-)	10	FG (Frame Ground)

With an Incremental Encoder

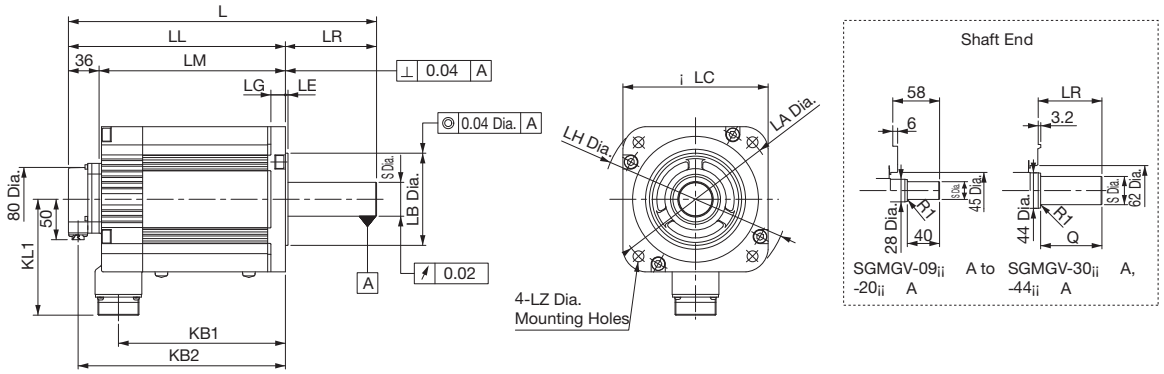
1	PS	6	-
2	/PS	7	-
3	-	8	-
4	PG5V	9	PG0V
5	-	10	FG (Frame Ground)

Cable Specifications for Servomotor-end Connector



PE	FG (Frame Ground)
5	-
4	-
3	Phase U
2	Phase V
1	Phase W

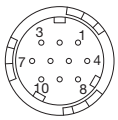
(2) 850 W to 4.4 kW



Model SGMGV-	L	LL	LM	LR	KB1	KB2	KL1	Flange Face Dimensions							Shaft End Dimensions		Approx. Mass kg
								LA	LB	LC	LE	LG	LH	LZ	S	Q	
09D□A21	195	137	101	58	83	125	104	145	$110^{0}_{-0.035}$	130	6	12	165	9	$19^{0}_{-0.013}$	40	5.5
13D□A21	211	153	117	58	99	141	104	145	$110^{0}_{-0.035}$	130	6	12	165	9	$22^{0}_{-0.013}$	40	7.1
20D□A21	229	171	135	58	117	159	104	145	$110^{0}_{-0.035}$	130	6	12	165	9	$24^{0}_{-0.013}$	40	8.6
30D□A21	239	160	124	79	108	148	134	200	$114.3^{0}_{-0.025}$	180	3.2	18	230	13.5	$35^{+0.01}_{0}$	76	13.5
44D□A21	263	184	148	79	132	172	134	200	$114.3^{0}_{-0.025}$	180	3.2	18	230	13.5	$35^{+0.01}_{0}$	76	17.5

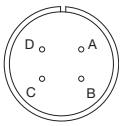
Note: Models with oil seals are of the same configuration.

Cable Specifications for Encoder-end Connector (20-bit Encoder)



Receptacle: CM10-R10P-D
Applicable plug (To be provided by the customer)
Plug: CM10-AP10S-*-D (Angle)
CM10-SP10S-*-D (Straight)
(Asterisks (*) indicate a value that depending on cable size.)

Cable Specifications for Servomotor-end Connector



A	Phase U
B	Phase V
C	Phase W
D	FG (Frame Ground)

With an Absolute Encoder

1	PS	6	BAT(+)
2	/PS	7	-
3	-	8	-
4	PG5V	9	PG0V
5	BAT(-)	10	FG (Frame Ground)

With an Incremental Encoder

1	PS	6	-
2	/PS	7	-
3	-	8	-
4	PG5V	9	PG0V
5	-	10	FG (Frame Ground)

ROTARY SERVOMOTORS
SGMEV

Features

- Low and medium inertia
- Wide selection: 200 W to 1.5 kW capacity, holding brake option
- High resolution serial encoder: 20 bits
- Standard protection class: IP55

Application Examples

- Transfer machines
- Material handling machines
- Food processing equipment
- Packaging

■ Model Designations

SGMEV - 02 D D A 2 1

Options

Code	Specifications
1	Without options
C	24 VDC brake
E	With oil seal and holding brake (24 VDC)
S	With oil seal

Rated Output

Code	Specifications	Code	Specifications
02	200 W	03	300 W
04	400 W	07	750 W
08	750 W		
15	1.5 kW		
cubic form		smal flange	

Shaft End

Code	Specifications
2	Straight without key (standard)
6	Straight with key and tap (optional)

Power Supply Voltage

Code	Specifications
D	400 VAC

Design Revision Order

Code	Specifications
A	Standard
E	IP67, for 02, 04, 08 and 15

Serial Encoder

Code	Specifications
3	20-bit absolute (standard)
D	20-bit incremental (standard)

■ Ratings and Specifications

Duty Cycle: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩmin.
Ambient Temperature: 0 to 40℃
Excitation: Permanent magnet
Mounting: Flange method

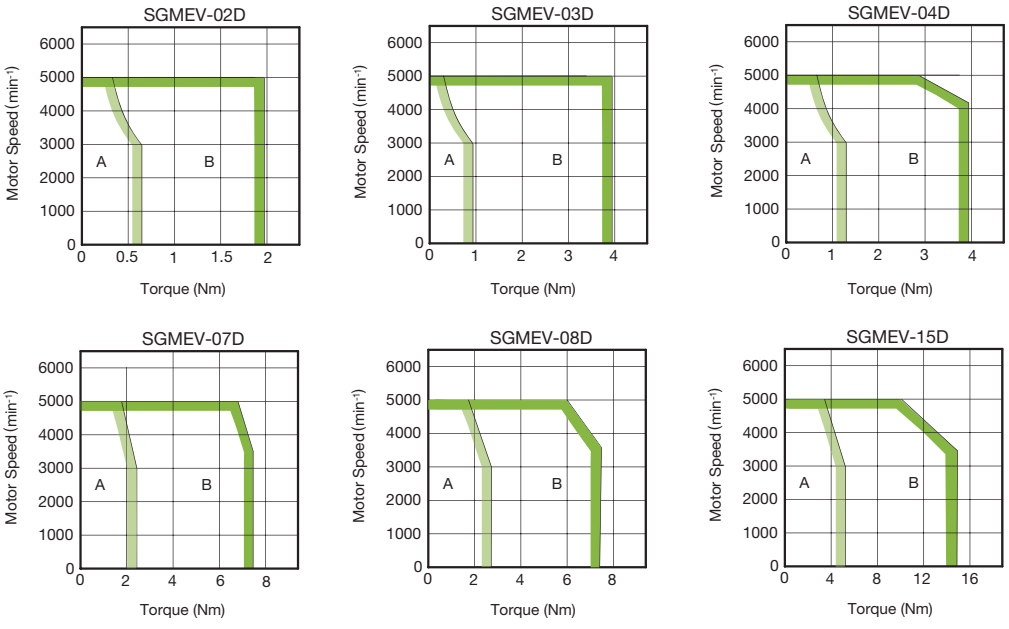
Isolation Class: B (130°C)
Withstand Voltage: 1800 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55
(except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		400 V					
Servomotor Model: SGMEV-□□D		02	03	04	07	08	15
Rated Output*1	W	200	300	400	650	750	1500
Rated Torque*1,*2	Nm	0.637	0.955	1.27	2.07	2.39	4.77
Instantaneous Peak Torque*1	Nm	1.91	3.82	3.82	7.16	7.16	14.3
Rated Current*1	Arms	1.4	1.3	1.4	2.2	2.6	4.5
Instantaneous Max. Current*1	Arms	4.6	5.1	4.4	8.4	7.8	13.7
Rated Speed*1	min^{-1}	3000					
Max. Speed*1	min^{-1}	5000					
Torque Constant	Nm/Arms	0.481	0.837	0.963	1.02	0.994	1.13
Rotor Moment of Inertia (with holding brakes)	$kg·m^2 \times 10^{-4}$	0.193 (0.109)	0.173 (0.058)	0.331 (0.109)	0.672 (0.140)	2.1 (0.875)	4.02 (0.875)
Rated Power Rate*1	kW/s	21	52.9	49	63.8	27.1	56.7
Rated Angular Acceleration*1	rad/s^2	33000	55300	30800	25000	11400	11900
Applicable SERVOPACK	SGDV-□	1R9D	1R9D	1R9D	3R5D	3R5D	5R4D

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100℃. Other values quoted are at 20℃.
*2: Rated torques are continuous allowable torque values at 40℃ with an aluminum heat sink of the following dimensions attached.

Torque-Motor Speed Characteristics

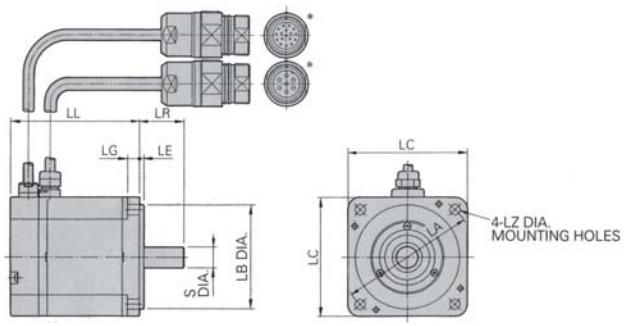
A: Continuous Duty Zone B: Intermittent Duty Zone



External Dimensions (Units: mm)

Without Holding Brakes

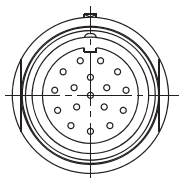
(1) 400 V



Model SGMEV	L	LC	LA	LZ	LG	LB	LE	S	LR	Approx. Mass kg
- 01 □	62	60	70	5.5	6	$50^{0}_{-0.025}$	3	$8^{0}_{-0.009}$	25	0.7
- 02 □	67	80	90	7	8	$70^{0}_{-0.03}$	3	$14^{0}_{-0.011}$	30	1.4
- 04 □	87									2.1
- 08 □	68.5	120	145	10	10	$110^{0}_{-0.035}$	3.5	$16^{0}_{-0.011}$	40	4.2
- 15 □	114.5							$19^{0}_{-0.013}$		6.6

Note: Models with oil seals are of the same configuration.

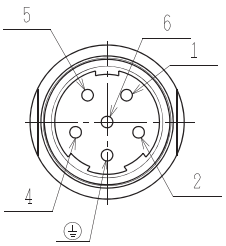
Cable Specifications for Encoder-end Connector



Pin No.	Description	Colour
1	0 V (Battery)	Orange/White
2	3.6 V (Battery)	Orange
3	Data +	Blue
4	Data -	Blue/White
5 – 7	Free	-
8	+ 5 V (Power supply)	Red
9	0 V (Power supply)	Black
10 – 17	Free	-
Connector case	Frame ground	Shield wire

Extention: SRUC17GMRWN087
Pin: 021.402.1020
Maker: Interconnectron

Cable Specifications for Servomotor-end Connector

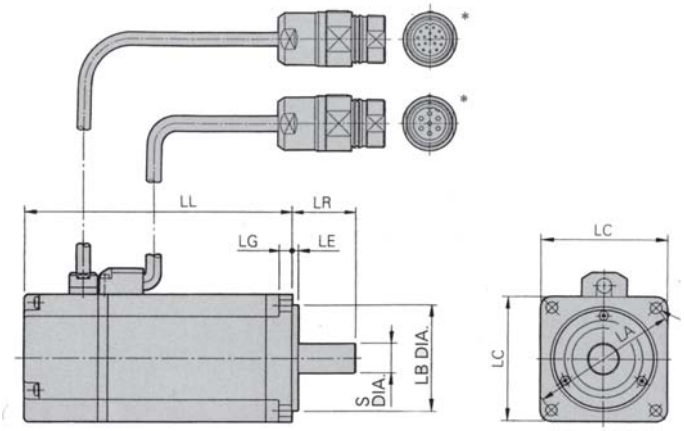


Pin No.	Description	Colour
1	Phase U	Red
2	Phase V	White
4	Phase W	Blue
5, 6	Free	-
⏚	Frame ground	Green/Yellow

◇2 Extention: LRRA06AMRPN182
Pin: 021.279.1020
Maker: Interconnectron

Without Holding Brakes

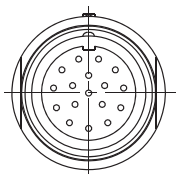
(1) 400 V



Model SGMEV	L	LC	LA	LZ	LG	LB	LE	S	LR	Approx. Mass kg
- 03 D	124.5	60	70	5.5	6	$0\ ^{0}_{-0.025}$	3	$14^{0}_{-0.011}$	30	1.7
- 07 D	145									3.4

Note: Models with oil seals are of the same configuration.

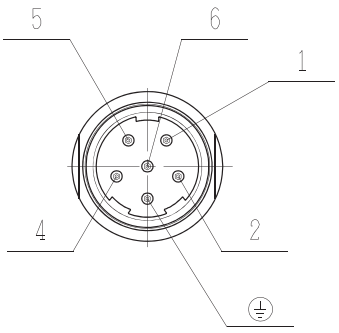
Cable Specifications for Encoder-end Connector



Pin No.	Description	Colour
1	0 V (Battery)	Orange/White
2	3.6 V (Battery)	Orange
3	Data +	Blue
4	Data -	Blue/White
5 – 7	Free	-
8	+ 5 V (Power supply)	Red
9	0 V (Power supply)	Black
10 – 17	Free	-
Connector case	Frame ground	Shield wire

Extention: SRUC17GMRWN087
Pin: 021.402.1020
Maker: Interconnectron

Cable Specifications for Servomotor-end Connector



Pin No.	Description	Colour
1	Phase U	Red
2	Phase V	White
4	Phase W	Blue
5, 6	Free	-
⏚	Frame ground	Green/Yellow

◇1 Extention: LRRA06AMRPN182
Pin: 021.279.1020
Maker: Interconnectron

ROTARY SERVOMOTORS
SGMSV

Features

- Low inertia
- Wide selection: 1.0 kW to 5.0 kW capacity, holding brake option
- High resolution serial encoder: 20 bits
- Standard protection class: IP67

Application Examples

- Machine tools
- Transfer machines
- Material handling machines
- Food processing equipment
- Packaging

■ Model Designations

SGMSV - 10 D D A 2 F

Options

Code	Specifications
F	Without options
E	With oil seal and holding brake (24 VDC)
S	With oil seal
H	24 VDC brake

Rated Output

Code	Specifications	Code	Specifications
10	1.0 kW	30	3.0 kW
15	1.5 kW	40	4.0 kW
20	2.0 kW	50	5.0 kW
25	2.5 kW		

Shaft End

Code	Specifications
2	Straight without key (standard)
6	Straight with key and tap (optional)

Power Supply Voltage

Code	Specifications
D	400 VAC

Design Revision Order

Code	Specifications
A	Standard

Serial Encoder

Code	Specifications
3	20-bit absolute (standard)
D	20-bit incremental (standard)

■ Ratings and Specifications

Duty Cycle: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩmin.
Ambient Temperature: 0 to 40℃
Excitation: Permanent magnet
Mounting: Flange method

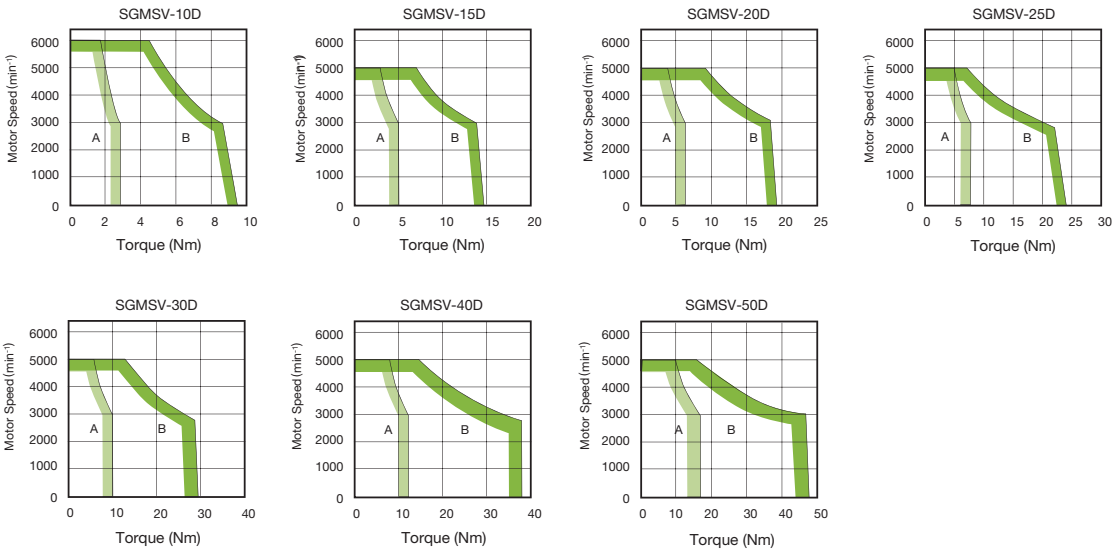
Isolation Class: B (130°C)
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP65
(except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		400 V						
Servomotor Model: SGMSV-□		10 D	15 D	20 D	25 D	30 D	40 D	50 D
Rated Output*1	kW	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Rated Torque*1,*2	Nm	3.18	4.9	6.36	7.96	9.8	12.6	15.8
Instantaneous Peak Torque*1	Nm	9.45	14.7	19.1	23.9	29.4	37.8	47.6
Rated Current*1	Arms	2.8	4.7	6.1	7.4	8.9	12.5	27.6
Instantaneous Max. Current*1	Arms	8.5	14	20	25	28	38	84
Rated Speed*1	min^{-1}	3000						
Max. Speed*1	min^{-1}	6000	5000					
Torque Constant	Nm/Arms	1.27	1.23	1.18	1.15	1.16	1.06	0.604
Rotor Moment of Inertia (with holding brakes)	$kg·m^2 \times 10^{-4}$	1.74 (1.99)	2.0 (2.25)	2.47 (2.72)	3.19 (3.44)	7.0 (9.2)	9.60 (11.8)	12.3 (14.5)
Rated Power Rate*1	kW/s	58 (51)	120 (107)	164 (149)	199 (184)	137 (104)	165 (135)	203 (172)
Rated Angular Acceleration*1	rad/s^2	18300 (16000)	24500 (21800)	25700 (23400)	25000 (23100)	14000 (10700)	13100 (10700)	12800 (10900)
Applicable SERVOPACK	SGDV-□	3R5D	5R4D	8R4D	120D	120D	170D	330A

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100℃. Other values quoted are at 20°C.
*2: Rated torques are continuous allowable torque values at 40°C with an aluminum heat sink of the following dimensions attached.

Torque-Motor Speed Characteristics

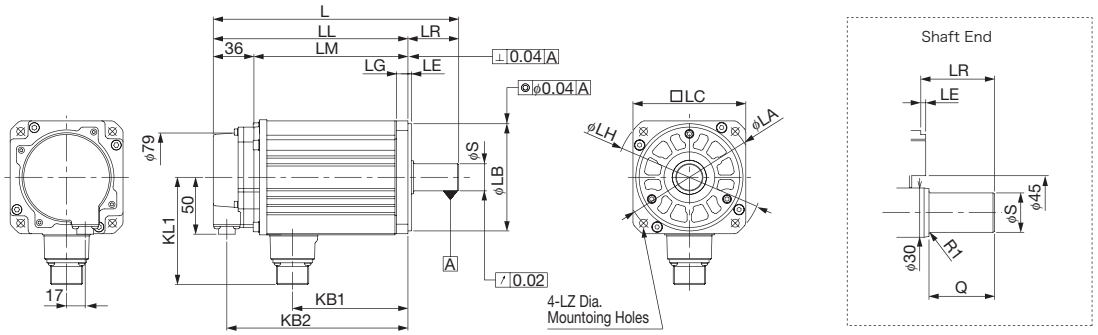
A: Continuous Duty Zone B: Intermittent Duty Zone



■ External Dimensions (Units: mm)

Without Holding Brakes

(1) 1 to 5 kW



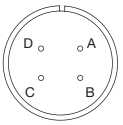
Model SGMSV-	L	LL	LM	LR	KB1	KB2	KL1	Flange Face Dimension								Key Dimensions		Approx. Mass kg
								LA	LB	LC	LE	LF	LG	LH	LZ	S	Q	
10 □□ A21	192	147	111	45	76	135	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	4.1
15 □□ A21	202	157	121	45	86	145	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	4.6
20 □□ A21	218	173	137	45	102	161	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	5.4
25 □□ A21	241	196	160	45	125	184	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	6.8
30 □□ A21	259	196	160	63	124	184	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	10.5
40 □□ A21	296	233	197	63	161	221	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	13.5
50 □□ A21	336	273	237	63	201	261	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	16.5

Note: Models with oil seals are of the same configuration.

Cable Specifications for Encoder-end Connector
(20-bit Encoder)

Receptacle: CM10-R10P-D
Applicable plug (To be provided by the customer)
Plug: CM10-AP10S-*-D (Angle)
CM10-SP10S-*-D (Straight)
(Asterisks (*) indicate a value that depending on cable size.)

Cable Specifications for Servomotor-end Connector



A	Phase U
B	Phase V
C	Phase W
D	FG (Frame Ground)

With an Absolute Encoder

1	PS	6	BAT (+)
2	/PS	7	-
3	-	8	-
4	PG5V	9	PG0V
5	BAT (-)	10	FG (Frame Ground)

With an Incremental Encoder

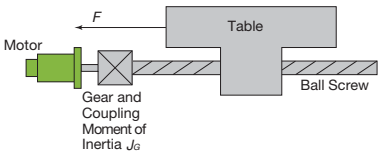
1	PS	6	-
2	/PS	7	-
3	-	8	-
4	PG5V	9	PG0V
5	-	10	FG (Frame Ground)

■ Rotary Motor Selection

Load Date

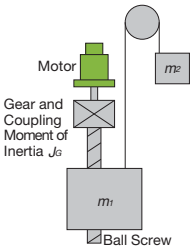
①Ball Screw Horizontal Axis

Load weight	m	_____	kg
Thrust	F	_____	N
Friction coefficient	μ	_____	
Mechanical efficiency	η	_____	
Reduction ratio	R(=n_M/n_L)	_____	
Gear + Coupling	J_G	_____	kg·cm^2
Ball screw lead	P_B	_____	mm
Ball screw diameter	d_B	_____	mm
Ball screw length	ℓ_B	_____	mm



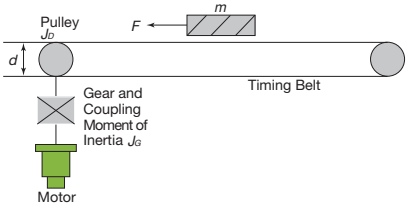
②Ball Screw Vertical Axis

Load weight	m_1	_____	kg
Counterweight	m_2	_____	kg
Friction coefficiency	μ	_____	
Mechanical efficiency	η	_____	
Reduction ratio	R(=n_M/n_L)	_____	
Gear + Coupling	J_G	_____	kg·cm^2
Ball screw lead	P_B	_____	mm
Ball screw diameter	d_B	_____	mm
Ball screw length	ℓ_B	_____	mm



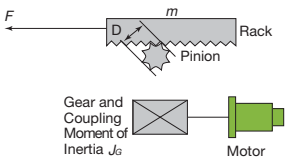
③Timing Belt

Load weight	m	_____	kg
Thrust	F	_____	N
Friction coefficiency	μ	_____	
Mechanical efficiency	η	_____	
Reduction ratio	R(=n_M/n_L)	_____	
Gear + Coupling	J_G	_____	kg·cm^2
Pulley	J_P	_____	kg·cm^2
Pulley diameter	d_P	_____	mm



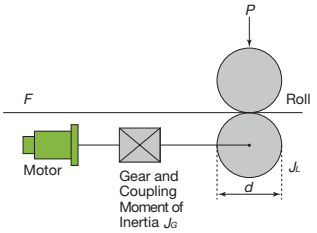
④Rack & Pinion

Load weight	m	_____	kg
Thrust	F	_____	N
Friction coefficiency	μ	_____	
Mechanical efficiency	η	_____	
Reduction ratio	R(=n_M/n_L)	_____	
Gear + Coupling	J_G	_____	kg·cm^2
Pinion diameter	d	_____	mm
Pinion Thickness	t	_____	mm



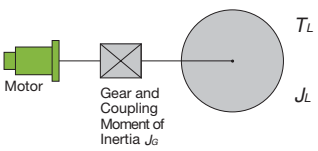
⑤Roll Feeder

Load Moment of Inertia	J_L	_____	kg·cm^2
Tension	F	_____	N
Pressure	P	_____	N
Roll diameter	d	_____	mm
Friction coefficiency	μ	_____	
Mechanical efficiency	η	_____	
Reduction ratio	R(=n_M/n_L)	_____	
Gear + Coupling	J_G	_____	kg·cm^2



⑥Rotor

Load Moment of Inertia	J_L	_____	kg·cm^2
Load Torque	T_L	_____	kg·cm
Mechanical efficiency	η	_____	
Reduction ratio	R(=n_M/n_L)	_____	
Gear + Coupling	J_G	_____	kg·cm^2

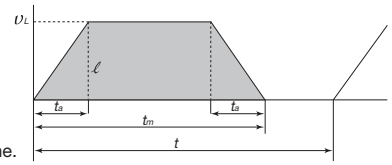


Driving Pattern

Duty Cycle

DUTY	t	_____	s
Positioning distance	ℓ	_____	m
Speed	υ_L	_____	m/s
Positioning time	t_m	_____	s
Accel/decel time	t_a	_____	s

Note : Fill in either Vℓ or ts. If both are filled in, specify the prior one.



SERVOPACKs SGDV
ANALOG/PULSE

Features

■ Unprecedented ease-of-use through cutting-edge technology
- New tuning-less function means no adjustment needed
- Impressive load regulation with strengthened vibration suppression function.

■ Fast setup time
- Setup wizard function and wiring conformation function of engineering tool SigmaWin+ allows easy setup just by watching the monitor.

■ High response characteristics at 1.6 kHz
- New advanced autotuning.
- Reduced positioning time through model following control, and smooth machine control enabled by vibration suppression function.

■ Model Designations

SGDV - R70 A 01 A □

Σ-V Series
SGDV SERVOPACK

Current

Voltage	Code	Applicable Servomotor Max. Capacity kW
230 V	R70	0.05
	R90	0.1
	1R6	0.2
	2R8	0.4
	3R8	0.5
	5R5	0.75
400 V	1R9	0.5
	3R5	1.0
	5R4	1.5
	8R4	2.0
	120	3.0
	170	5.0

Voltage

Code	Specifications
A	230 VAC
D	400 VAC

Interface Specifications

Code	Specifications
01	Analog voltage/Pulse Train Reference type (for rotary servomotors)
05	Analog voltage/Pulse Train Reference type (for linear servomotors)

Design Revision Order
A, B…

Options

Code	Specifications
Blank	Base-mounted (standard)
001000	Rack-mounted (optional)
008000	Single-phase 230V, 1.5 KW

■ Ratings

SERVOPACK Model SGDV-		R70A	R90A	1R6A	2R8A	3R8A	5R5A	1R9D	3R5D	5R4D	8R4D	120D	170D
Main Circuit		Single-/Three-phase 200 to 230 VAC +10% to -15% 50/60 Hz						Three-phase 380 to 480 VAC+10% to -15% 50/60 Hz					
Control Circuit		Single-phase 200 to 230 VAC +10% to -15% 50/60 Hz						24 VDC ± 15%					
Applicable Servomotor Max. Capacity	kW	0.05	0.1	0.2	0.4	0.5	0.75	0.5	1	1.5	2	3	5
Continuous Output Current	Arms	0.66	0.91	1.6	2.8	3.8	5.5	1.9	3.5	5.4	8.4	11.9	16.5
Max. Output Current	Arms	2.1	2.9	6.5	9.3	11	16.9	5.5	8.5	14	20	28	42

■ Specifications

Items		Main Voltage	Specifications
Input Power Supply	Main Circuit	230 V	Single-/Three-phase 200 to 230 VAC +10% to -15% 50/60 Hz
		400 V	Three-phase 380 to 480 VAC +10% to -15% 50/60 Hz
	Control Circuit	230 V	Single-phase 200 to 230 VAC +10% to -15% 50/60 Hz
		400 V	24 VDC ±15%
Control Method			For 230 V, for 400 V, three-phase full-wave rectification IGBT PWM control, Sign-wave driven
Feedback	Rotary Servomotors		Serial encoder: 13-bit (incremental encoder) Serial encoder: 20-bit (incremental/absolute encoder) 4 Mb/s communications
	Linear Servomotors		Serial Converter 4 Mb/s communications
Operating Conditions	Ambient/Storage Temperature		Ambient temperature: 0 to +55℃, storage temperature: -20 to +85℃
	Ambient/Storage Humidity		90%RH or less (no condensation)
	Vibration Level/Shock Resistance		Vibration level: 4.9 m/s^2, shock resistance: 19.6 m/s^2
	Protection class/Pollution degree		Protection class: IP 1X, pollution degree: 2 Do not use SERVOPACKs in the following locations: ・Locations subject to corrosive or flammable gasses ・Locations subject to dust, including iron dust, and salts ・Locations subject to exposure to water, oil, or chemicals
	Others		Do not use SERVOPACKs in the following locations: ・Locations subject to static electricity noise, strong electromagnetic/magnetic fields, radioactivity
	Altudude		1000 m or less
Compliant Standards			UL 508C EN50178, EN55011 class A group 1, EN61800-3, EN61800-5-1
Configuration			Base-mounted (Rack mounting available as an option for some models.)
Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at servomotor will not stop with a rated torque load.)
	Speed Regulation*1	Load Variation	0% to 100% load: ±0.01% max. (at rated speed)
		Voltage Variation	Rated voltage: ±10% : 0% (at rated speed)
		Temperature Variation	25±25℃ : ±0.1% max. (at rated speed)
	Torque Control Tolerance (Repeatability)		±1%
	Soft Start Time Setting		0 to 10 s (can be set individually for acceleration and deceleration.)
I/O Signals	Encoder Output Pulses		Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.
Communications	RS-422A Communications	Interface	Digital operator, RS-422A port of personal computers etc.
		1:n communications	RS-422A port: n = 15 max. available
		Axis address setting	Set by parameters
		Function	Status display, parameter settings, adjustment functions, utility functions, parameter copy functions
	USB Communications	Interface	Personal computers (application: SigmaWin+)
		Communications	Compliant with USB1.1 standard
		Function	Status display, parameter settings, adjustment functions, utility functions, parameter copy functions, waveform trace
Display		Power Charge	CHARGE for main circuit power supply input confirmation LED (Red) 1 ch
Regenerative Processing			230 VAC SGDV-R70A, -R90A, -R6A, -2R8A: External regenerative resistor (optional)
			230 VAC SGDV-3R8A, -5R5A: Built-in regenerative resistor
			400 VAC model: Built-in regenerative resistor
Analog Monitor			Analog monitor connector built in for monitoring speed, torque and other reference signals. Number of channels: 2 ch
Protective Functions			Overcurrent, overvoltage, undervoltage, overload, regeneration error
Utility Functions			Alarm trace back, JOG operation, origin search, etc.
Safety Functions		Input	/HWBB1, /HWBB2: Hard wire base block signal
		Output	EDM1: Status monitor (fixed output) of built-in safety circuit
Option Card Function		Feedback	Serial encoder communications input for fully-closed loop control

*1: Speed regulation is defined as follows:

$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

The motor speed may change due to voltage variations or amplifier drift and changes in processing resistance due to temperature variation. The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature variations.

■ Specifications

Items			Specifications
I/O Signal	Sequence Input	Number of Channels	7 ch
		Function	Signal allocations and positive/negative logics can be modified. Servo ON (/SVON), P control (/P-CON), alarm reset (/ALM-RST), forward run prohibited (P-OT), reverse run prohibited (N-OT), forward torque limit (/P-CL), reverse torque limit (/N-CL), internal speed setting switching, control mode switching (/C-SEL), zero clamp (/ZCLAMP), reference pulse inhibit (/INHIBIT), gain changeover
	Sequence Output	Number of Channels	3 ch
		Function	Signal allocations and positive/negative logics can be modified. Positioning completion (/COIN), speed coincidence detection (/V-CMP), servomotor rotation detection (/TGON), servo ready (/S-RDY), torque limit detection (/CLT), speed limit detection (/VLT), break interlock (/BK), warning (/WARN), NEAR (/NEAR)
Panel Operator		Display	7 segments, 5 digits LED (Red)
		Switch	Push switch: 4 ch
Torque Control	Analog Input	Reference Voltage	±3 VDC (Variable setting range: ±1 to 10 VDC) at rated torque, max. input voltage: ±12 V
		Input Impedance	About 14 kΩ min.
		Circuit Time Constant	30 μs
Speed Control	Analog Input	Reference Voltage	±6 VDC (variable setting range: ±2 to 10 VDC) at rated speed, max. input voltage: ±12 V
		Input Impedance	About 14 kΩ min.
		Circuit Time Constant	30 μs
	Set Speed Reference	Movement Direction Selection	/P-CON signal
		Rotation Direction Selection	Switches the direction by /P-CON
		Speed Selection	Speed 1 to 3 selection
	Function	Soft Start Setting	0 to 10 s (can be set individually for acceleration and deceleration.)
Position Control	Reference Pulse	Type	Sign + pulse train, 90° phase difference 2-phase pulse (phase A + phase B), or CCW + CW pulse train
		Form	Non-insulated line driver (+5 V level), open collector
		Frequency	×1 multiplier: 4 Mpps ×2 multiplier: 2 Mpps ×4 multiplier: 1 Mpps Open collector: 200 kpps Frequencies drop when the duties have errors.
	Clear Signal	Function	Clears error pulse by external signals.
		Form	Compliant with line driver, open collector
Others	Alarm Code Output		3-bit, open collector output (non-insulated)
	SEN signal		Included

■ Power Supply Capacities and Power Losses

The following table shows SERVOPACKs power supply capacities and power losses at the rated output.

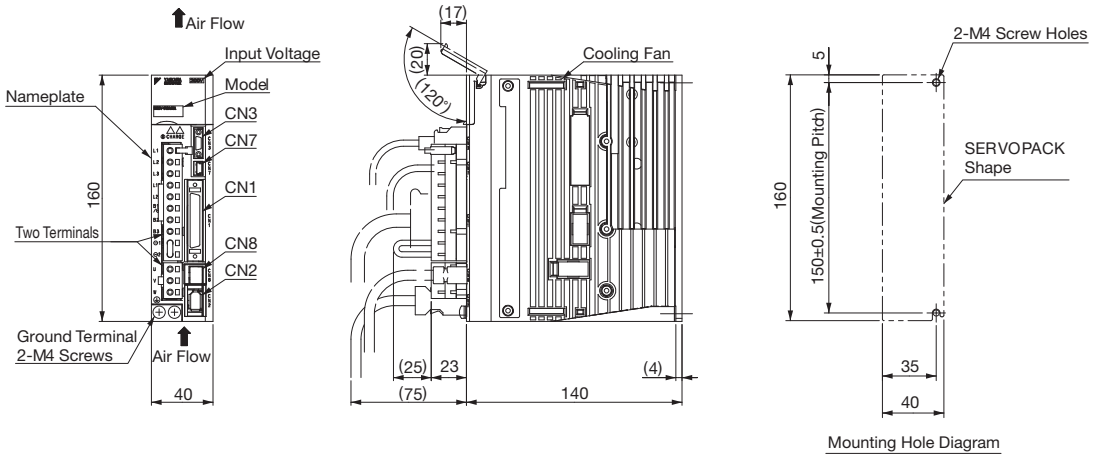
Main Circuit Power Supply	Applicable Servomotor Max. Capacity kW	SERVOPACK Model SGDV-	Power Supply Capacity kVA	Output Current A	Main Circuit Power Loss W	Regenerative Resistor Power Loss W	Control Circuit Power Loss W	Total Power Loss W
Single-/ Three-phase 230 V	0.05	R70A	0.2	0.66	5.1	—	17	22.1
	0.1	R90A	0.3	0.91	7.3			24.3
	0.2	1R6A	0.6	1.6	13.5			30.5
	0.4	2R8A	1	2.8	24.0			41.0
	0.5	3R8A	0.9	3.8	20.1	8		45.1
	0.75	5R5A	1.6	5.5	43.8			68.8
Three-phase 400 V	0.5	1R9D	1.1	1.9	24.6	14	21	59.6
	1.0	3R5D	2.3	3.5	46.1			81.1
	1.5	5R4D	3.5	5.4	71.3			106.3
	2.0	8R4D	4.5	8.4	77.9	28	25	130.9
	3.0	120D	7.1	11.9	108.7			161.7
	5.0	170D	11.7	16.5	161.1	36	24	221.1

Notes: 1 SGDV-R70A, -R90A, -1R6A, and -2R8A SERVOPACKs do not have built-in regenerative resistors. If the regenerative energy exceeds the specified value, connect an external regenerative resistor.
2 Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
·Remove the lead from the internal regenerative resistor in the SERVOPACK. (SGDV-3R8, -5R5A, and 400-V SERVOPACKs)
·Install an external regenerative resistor.
3 External regenerative resistors are options.

■ External Dimensions (Units: mm)

Base-mounted SERVOPACKs

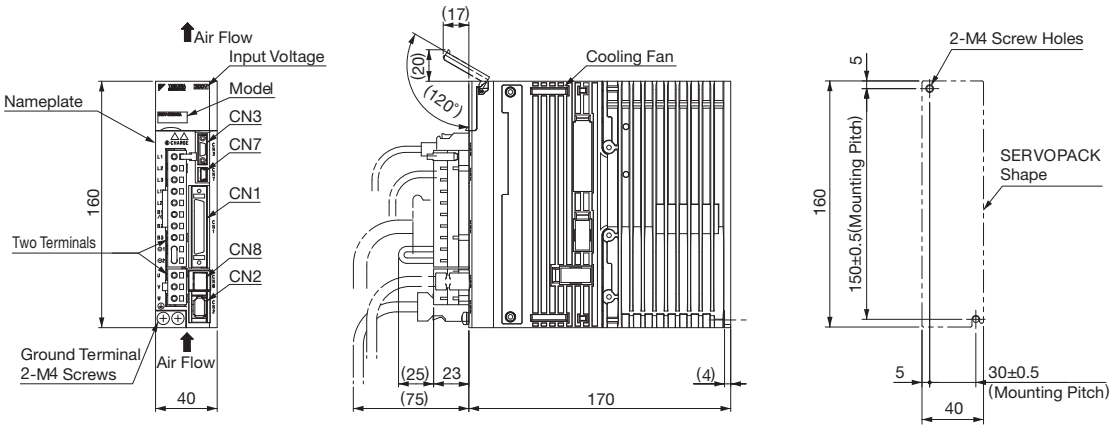
(1) Three-phase 230 VAC, Model: SGDV-R70A0 □A, -R90A0□A, and -1R6A0□A



Mounting Hole Diagram

Approx. Mass: 0.9 kg

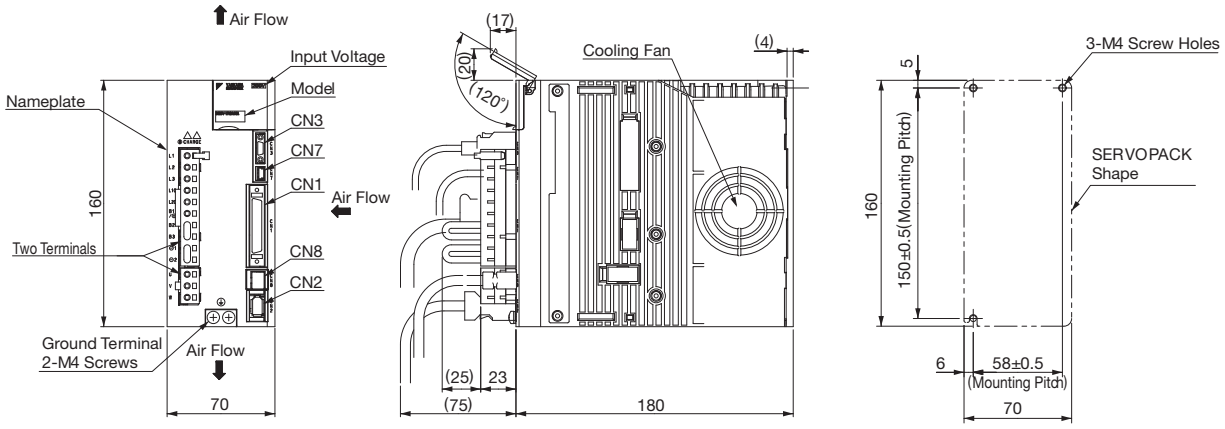
(2) Three-phase 230 VAC, Model: SGDV-2R8A0 □A



Mounting Hole Diagram

Approx. Mass: 1.0 kg

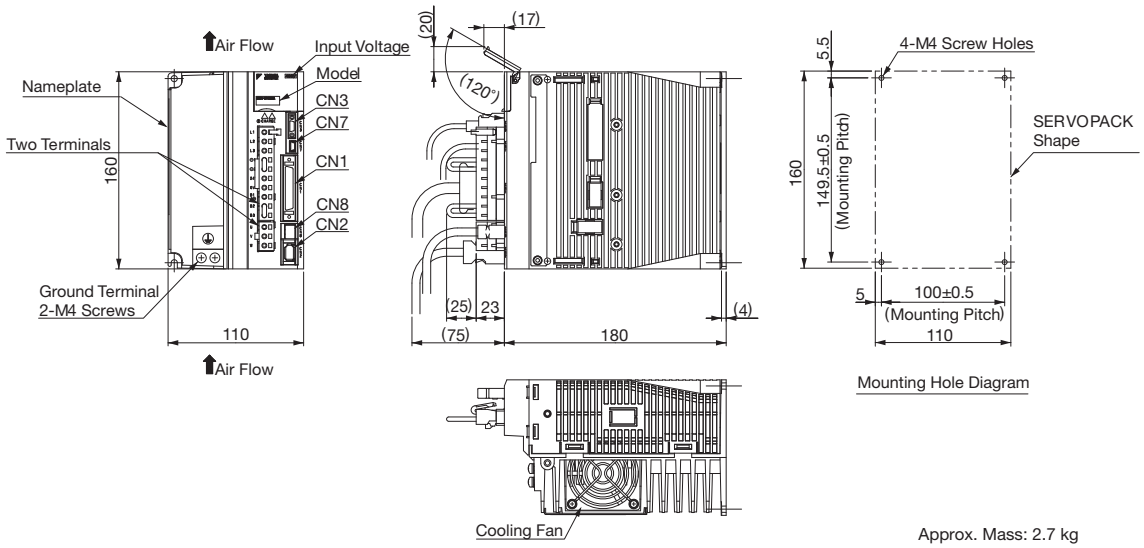
(3) Three-phase 230 VAC, Model: SGDV-3R8A0 □A, and -5R5A0□A



Mounting Hole Diagram

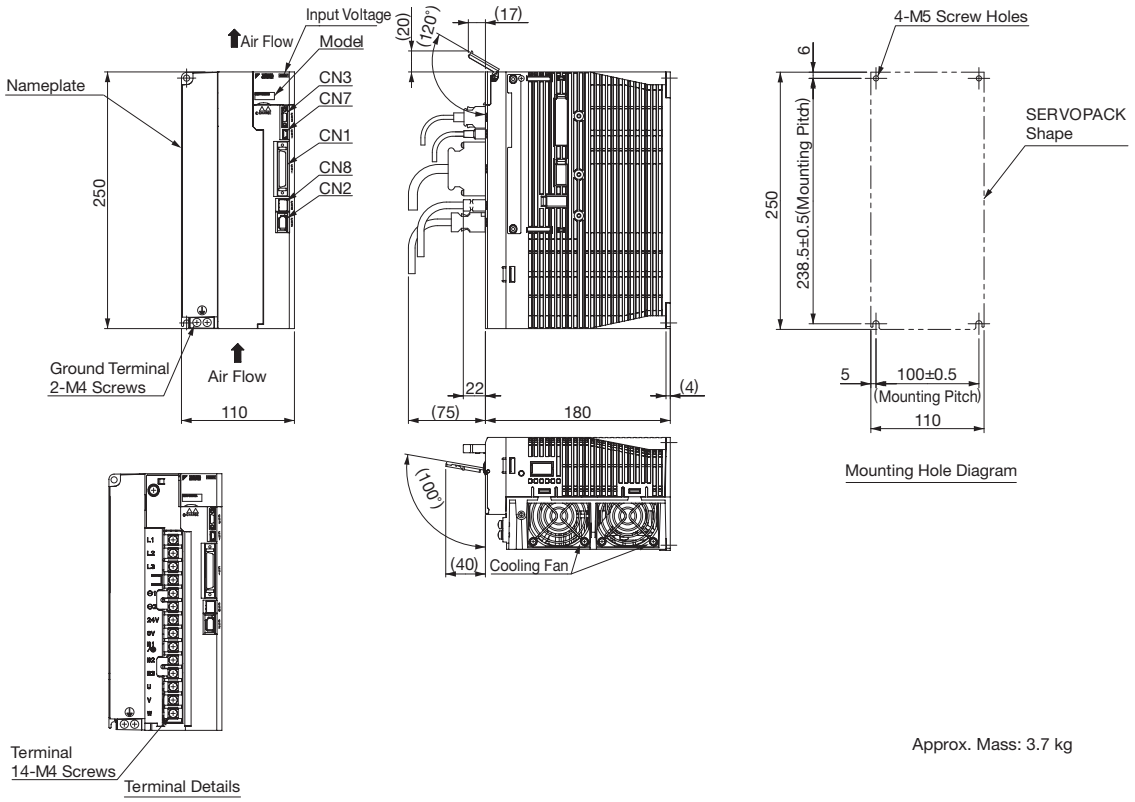
Approx. Mass: 1.5 kg

(4) Three-phase 400 VAC, Model: SGDV-1R9D0 □A, -3R5D0□A, and -5R4D0□A



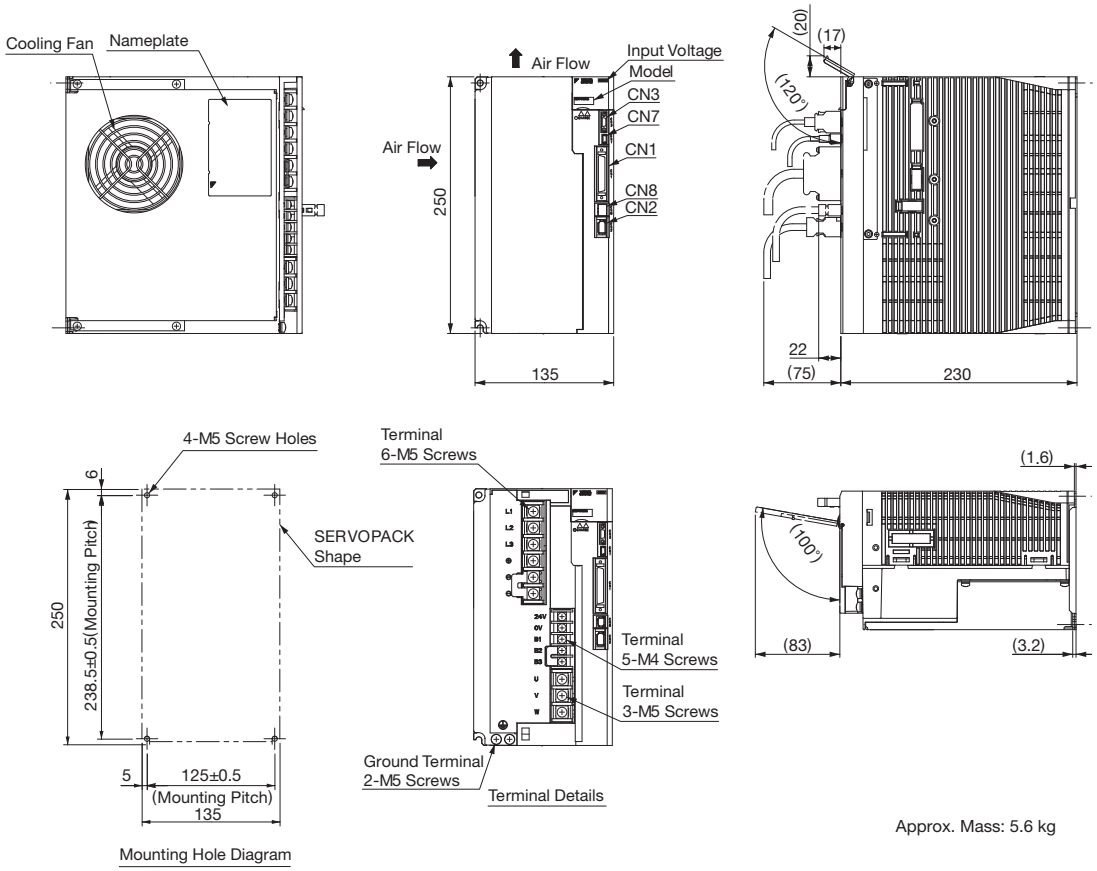
Approx. Mass: 2.7 kg

(5) Three-phase 400 VAC, Model: SGDV-8R4D0 □A and -120D0□A



Approx. Mass: 3.7 kg

(6) Three-phase 400 VAC, Model: SGDV-170D0 □A



Approx. Mass: 5.6 kg

Connectors for Rack-mounted SERVOPACKs

Description	Port	Model	Pole	Manufacturer
I/O	CN1	10250-52A2PL	50	Sumitomo 3M Ltd.
Encoder	CN2	53984-0671	6	Molex Japan Co., Ltd.
Serial Port	CN3	HDR-EC14LFDTN-SLE-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
USB	CN7	MNC23-5K5H00	5	ADVANCED-CONNECTEK INC.
Safety	CN8	1981080-1	8	Tyco Electronics AMP K.K.

Note: The connectors above or their equivalents are used for SERVOPACKs.

SERVOPACKs SGDV
MECHATROLINK-II

Features

■ **Real-time communications**

MECHATROLINK-II communications enable high-speed control for 30 stations at a maximum transmission speed of 10 Mbps in a transmission cycle from 250 μ s to 4 ms (user setting). Such a high transmission speed allows real-time transmission of various data required for control.

■ **Cost savings**

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

■ **High-precision motion control**

The SGDV SERVOPACK when connected to the host controller in the MECHATROLINK-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.

■ Model Designations

SGDV - R70 A 11 A □

Σ-V Series
SGDV SERVOPACK

Current

Voltage	Code	Applicable Servomotor Max. Capacity kW
230 V	R70	0.05
	R90	0.1
	1R6	0.2
	2R8	0.4
	3R8	0.5
	5R5	0.75
400 V	1R9	0.5
	3R5	1.0
	5R4	1.5
	8R4	2.0
	120	3.0
	170	5.0

Voltage

Code	Specifications
A	230 VAC
D	400 VAC

Interface Specifications

Code	Specifications
11	MECHATROLINK-II communications Reference Type (for rotary servomotors)
15	MECHATROLINK-II communications Reference Type (for linear servomotors)

Design Revision Order
A, B...

Options

Code	Specifications
Blank	Base-mounted (standard)
001000	Rack-mounted (optional)
008000	Single-phase 230V, 1.5 KW

■ Ratings

SERVOPACK Model SGDV-		R70A	R90A	1R6A	2R8A	3R8A	5R5A	1R9D	3R5D	5R4D	8R4D	120D	170D
Main Circuit		Single-/Three-phase 200 to 230 VAC +10% to -15% 50/60 Hz						Three-phase 380 to 480 VAC+10% to -15% 50/60 Hz					
Control Circuit		Single-phase 200 to 230 VAC +10% to -15% 50/60 Hz						24 VDC ± 15%					
Applicable Servomotor Max. Capacity	kW	0.05	0.1	0.2	0.4	0.5	0.75	0.5	1	1.5	2	3	5
Continuous Output Current	Arms	0.66	0.91	1.6	2.8	3.8	5.5	1.9	3.5	5.4	8.4	11.9	16.5
Max. Output Current	Arms	2.1	2.9	6.5	9.3	11	16.9	5.5	8.5	14	20	28	42

■ Specifications

Items			Specifications
Input Power Supply	Main Circuit	230 V	Single-/Three-phase 200 to 230 VAC +10% to -15% 50/60 Hz
		400 V	Three-phase 380 to 480 VAC +10% to -15% 50/60 Hz
	Control Circuit	230 V	Single-phase 200 to 230 VAC +10% to -15% 50/60 Hz
		400 V	24 VDC ±15%
Control Method			For 200 V, for 400 V, three-phase full-wave rectification IGBT PWM control, Sign-wave driven
Feedback			Serial encoder: 13-bit (incremental encoder) Serial encoder: 20-bit (incremental/absolute encoder) 4 Mb/s communications, 8 Mb/s communications
Operating Conditions	Ambient/Storage Temperature		Ambient temperature: 0 to +55℃, storage temperature: -20 to +85℃
	Ambient/Storage Humidity		90%RH or less (no condensation)
	Vibration Level/Shock Resistance		Vibration level: 4.9 m/s^2, shock resistance: 19.8 m/s^2
	Protection class/Pollution degree		Protection class: IP 1X, pollution degree: 2 Do not use SERVOPACKs in the following locations: ・Locations subject to corrosive or flammable gasses ・Locations subject to exposure to water, oil, or chemicals ・Locations subject to dust, including iron dust, and salts
	Others		Do not use SERVOPACKs in the following locations: ・Locations subject to static electricity noise, strong electromagnetic/magnetic fields, radioactivity
	Elevation		1000 m or less
Compliant Standards			UL 508C EN50178, EN55011 class A group 1, EN61800-3, EN61800-5-1
Configuration			Base-mounted (Rack mounting available as an option for some models.)
Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at servomotor will not stop with a rated torque load.)
	Speed Regulation*1	Load Variation	0% to 100% load: ±0.01% max. (at rated speed)
		Voltage Variation	Rated voltage: ±10% : 0% (at rated speed)
		Temperature Variation	25±25℃ : ±0.1% max. (at rated speed)
	Torque Control Tolerance (Repeatability)		±1%
	Soft Start Time Setting		0 to 10 s (can be set individually for acceleration and deceleration.)
I/O Signals	Encoder Output Pulses		Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.
Communications	RS-422A Communications	Interface	Digital operator, RS-422A port of personal computers etc.
		1:n communications	RS-422A port: n = 15 max. available
		Axis address setting	Set by parameters
		Function	Status display, parameter settings, adjustment functions, utility functions
	USB Communications	Interface	Personal computers (application: SigmaWin+)
		Communications	Compliant with USB1.1 standard
		Function	Status display, parameter settings, adjustment functions, utility functions
Display		Power Charge	CHARGE for main circuit power supply input confirmation LED (red) 1 ch
Analog Monitor			Analog monitor connector built in for monitoring speed, torque and other reference signals. Number of channels: 2 ch
Protective Functions			Overcurrent, overvoltage, undervoltage, overload, regeneration error
Utility Functions			Alarm trance back, JOG operations, origin search, etc.
Regenerative Processing			230 VAC SGDV-R70A, -R90A, -1R6A, -2R8A: External regenerative resistor (optional) 230 VAC SGDV-3R8A, -5R5A: Built-in regenerative resistor 400 VAC model: Built-in regenerative resistor
Safety Functions		Input	/HWBB1, /HWBB2: Hard wire base block signal
		Output	EDM1: Status monitor (fixed output) of built-in safety circuit
Option Card Function		Feedback	Serial encoder communications input for fully-closed loop control

*1: Speed regulation is defined as follows:

$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

The motor speed may change due to voltage variations or amplifier drift and changes in processing resistance due to temperature variation. The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature variations.

■ Specifications

Items			Specifications
I/O Signal	Sequence Input	Number of Channels	7 ch
		Function	Signal allocations and positive/negative logics can be modified. Homing deceleration switch signal (/DEC), external latch signal (/EXT1 to 3), forward run prohibited (P-OT), reverse run prohibited (N-OT), forward torque (force) limit (/P-CL), reverse torque limit (/N-CL)
	Sequence Output	Number of Channels	3 ch
		Function	Signal allocations and positive/negative logics can be modified. Positioning completion (/COIN), speed coincidence detection (/V-CMP), servomotor rotation detection (/TGON), servo ready (/S-RDY), torque limit detection (/CLT), speed limit detection (/VLT), break interlock (/BK), warning (/WARN), NEAR (/NEAR)
Panel Operator		Display	7 segments-1 digit LED (red)
		Switch	Rotary switch: 16 ch, DIP switch: 4 ch
MECHATROLINK Communications		Communications Protocol	MECHATROLINK-II
		Station Address	41H to 5FH (max. number of slaves: 30)
		Transmission Speed	10 Mbps, 4 Mbps
		Transmission Cycle	250 μs, 0.5 to 4.0 ms (multiple of 0.5 ms)
		Number of Words for Link Transmission	Can be switched between 17-bytes / station and 32-bytes / station by the setting of the DIP switch.
Command Method		Performance	Position control, speed control, and torque control through MECHATROLINK- 2 communications
		Command Input	MECHATROLINK commands and MECHATROLINK- 2 commands (for sequence, motion, data setting/reference, monitor, adjustment, and other commands.)

■ Power Supply Capacities and Power Losses

The following table shows SERVOPACKs power supply capacities and power losses at the rated output.

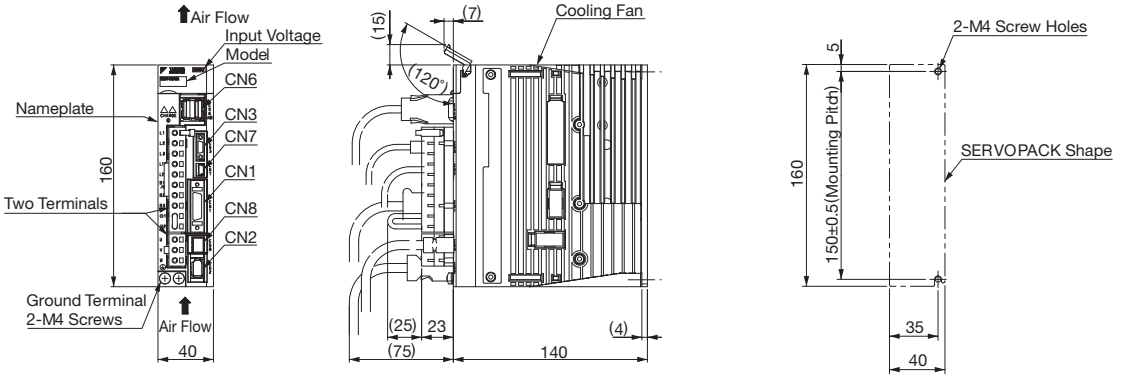
Main Circuit Power Supply	Applicable Servomotor Max. Capacity kW	SERVOPACK Model SGDV-	Power Supply Capacity kVA	Output Current A	Main Circuit Power Loss W	Regenerative Resistor Power Loss W	Control Circuit Power Loss W	Total Power Loss W
Three-phase 230 V	0.05	R70A	0.2	0.66	5.1	—	17	22.1
	0.1	R90A	0.3	0.91	7.3			24.3
	0.2	1R6A	0.6	1.6	13.5			30.5
	0.4	2R8A	1	2.8	24.0			41.0
	0.5	3R8A	0.9	3.8	20.1	8		45.1
	0.75	5R5A	1.6	5.5	43.8			68.8
Three-phase 400 V	0.5	1R9D	1.1	1.9	24.6	14	21	59.6
	1.0	3R5D	2.3	3.5	46.1			81.1
	1.5	5R4D	3.5	5.4	71.3			106.3
	2.0	8R4D	4.5	8.4	77.9	28	25	130.9
	3.0	120D	7.1	11.9	108.7			161.7
	5.0	170D	11.7	16.5	161.1	36	24	221.1

Notes: 1 SGDV-R70A, -R90A, -1R6A, and -2R8A SERVOPACKs do not have built-in regenerative resistors. If the regenerative energy exceeds the specified value, connect an external regenerative resistor.
2 Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
·Remove the lead from the internal regenerative resistor in the SERVOPACK (SGDV-3R8, -5R5A, and 400-V SERVOPACKs).
·Install an external regenerative resistor.
3 External regenerative resistors are options.

■ External Dimensions (Units: mm)

Base-mounted SERVOPACKs

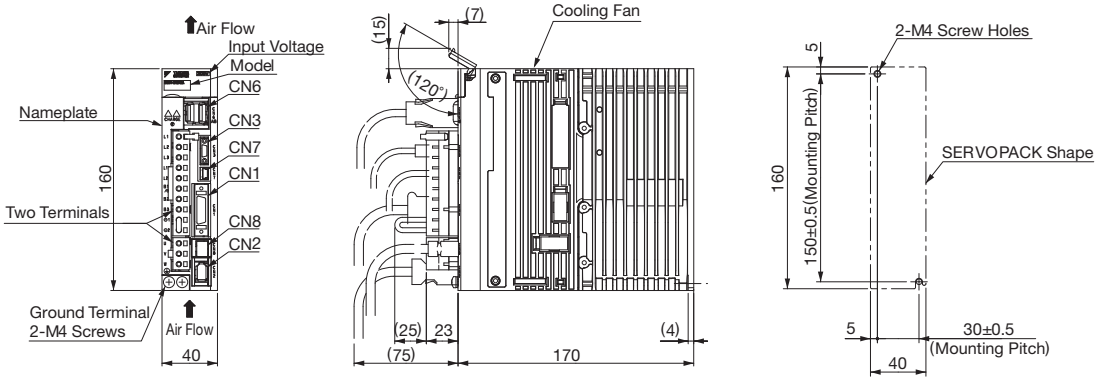
(1) Three-phase 230 VAC, model: SGDV-R70A1 □A, -R90A1□A, and -1R6A1□A



Mounting Hole Diagram

Approx. Mass: 0.9 kg

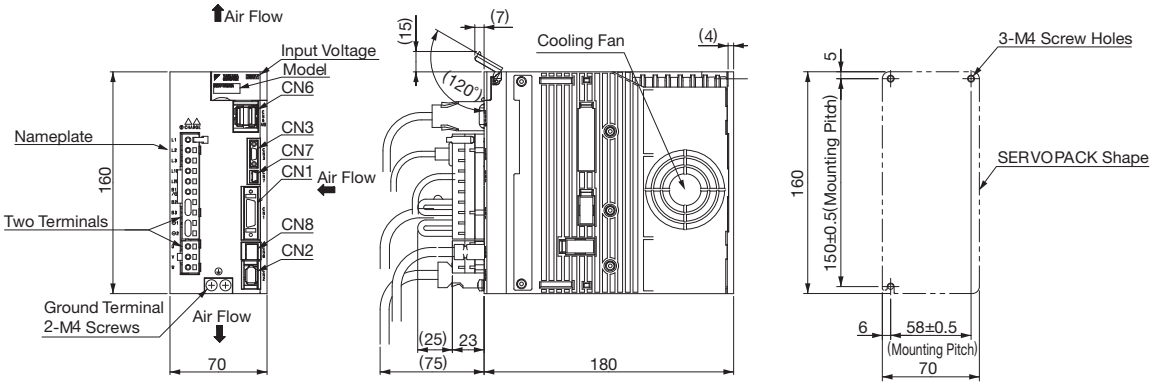
(2) Three-phase 230 VAC, model: SGDV-2R8A1 □A



Mounting Hole Diagram

Approx. Mass: 1.0 kg

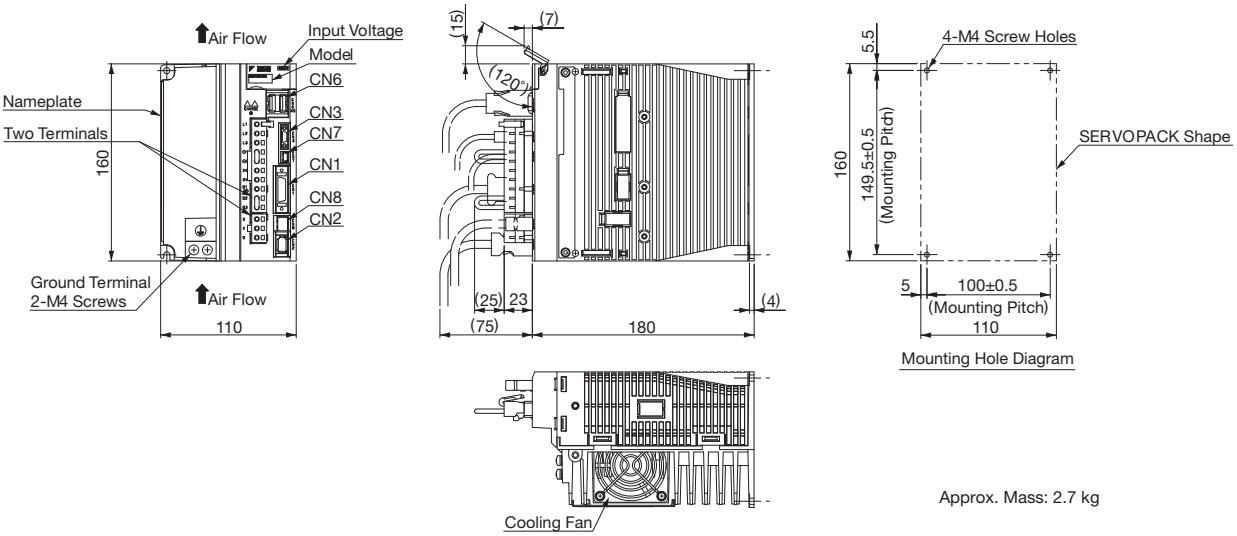
(3) Three-phase 230 VAC, model: SGDV-3R8A1 □A and -5R5A1□A



Mounting Hole Diagram

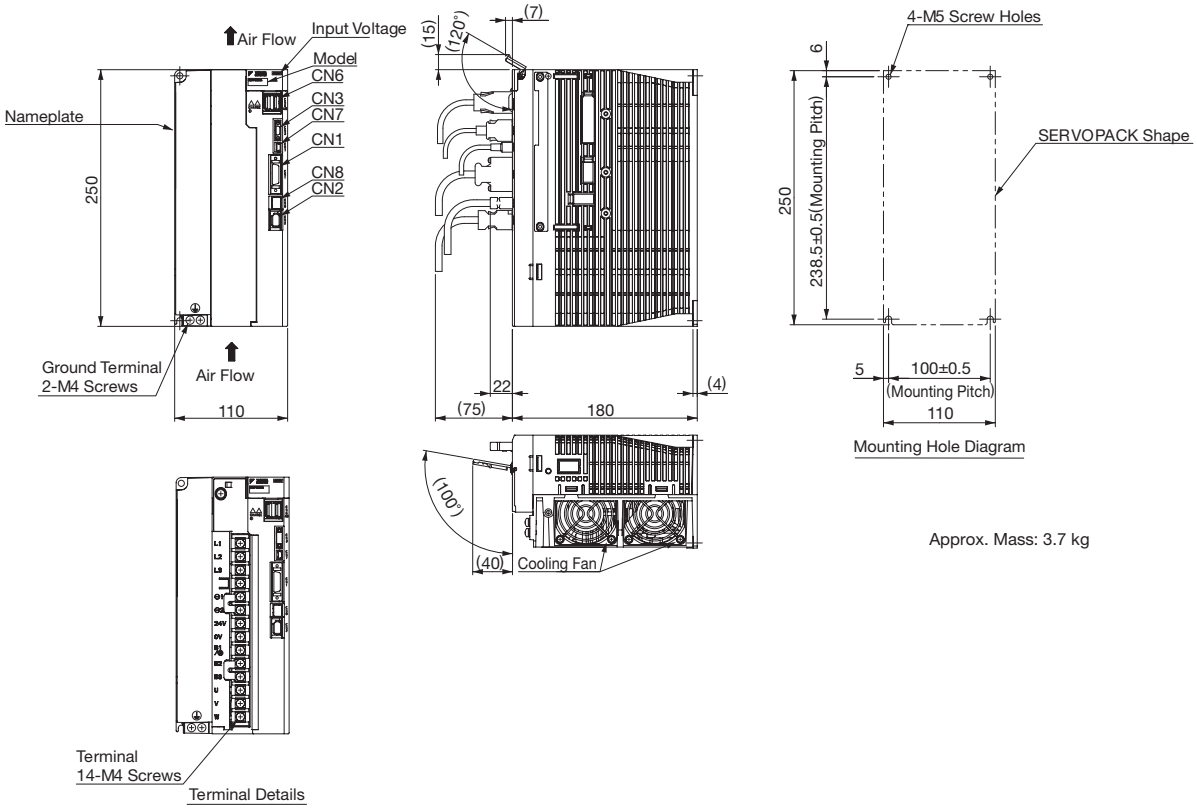
Approx. Mass: 1.5 kg

(4) Three-phase 400 VAC, model: SGDV-1R9D1 □A, -3R5D1□A, and -5R4D1□A



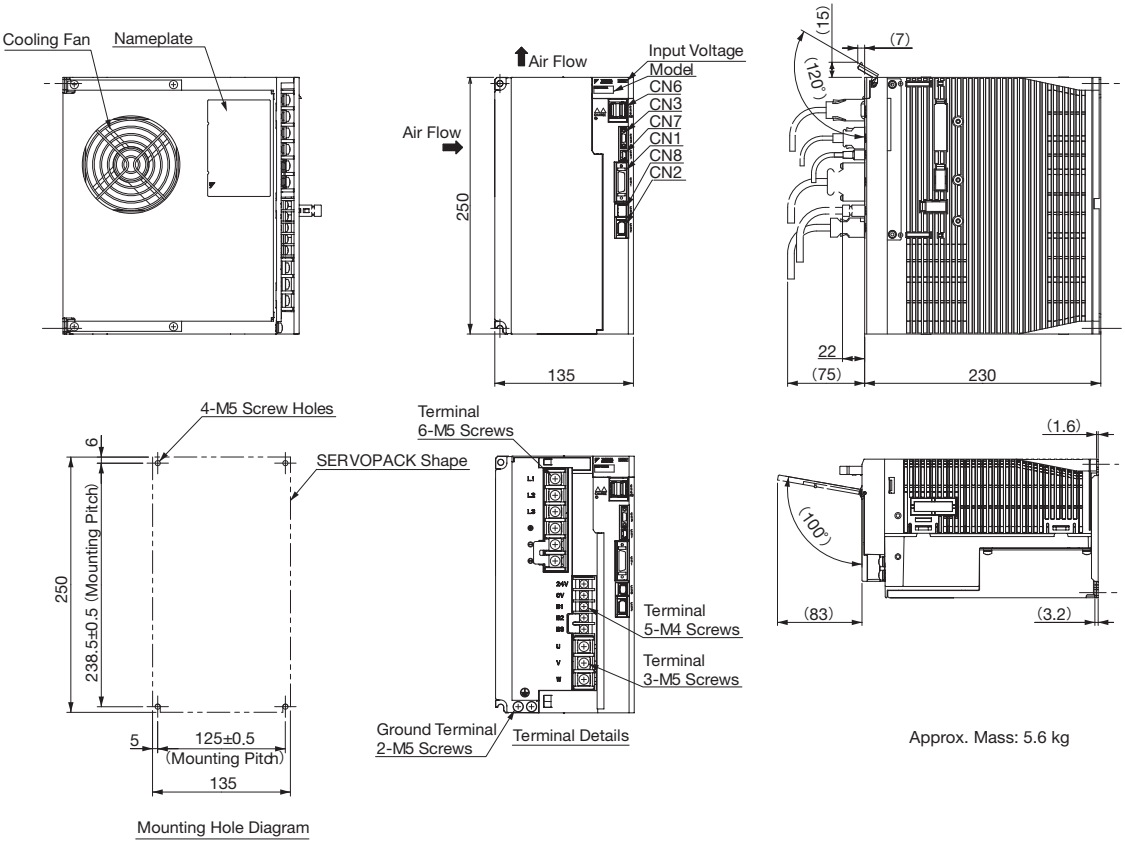
Approx. Mass: 2.7 kg

(5) Three-phase 400 VAC, model: SGDV-8R4D1 □A and -120D1□A



Approx. Mass: 3.7 kg

(6) Three-phase 400 VAC, model: SGDV-170D1□A



Connectors for Base-mounted SERVOPACKs

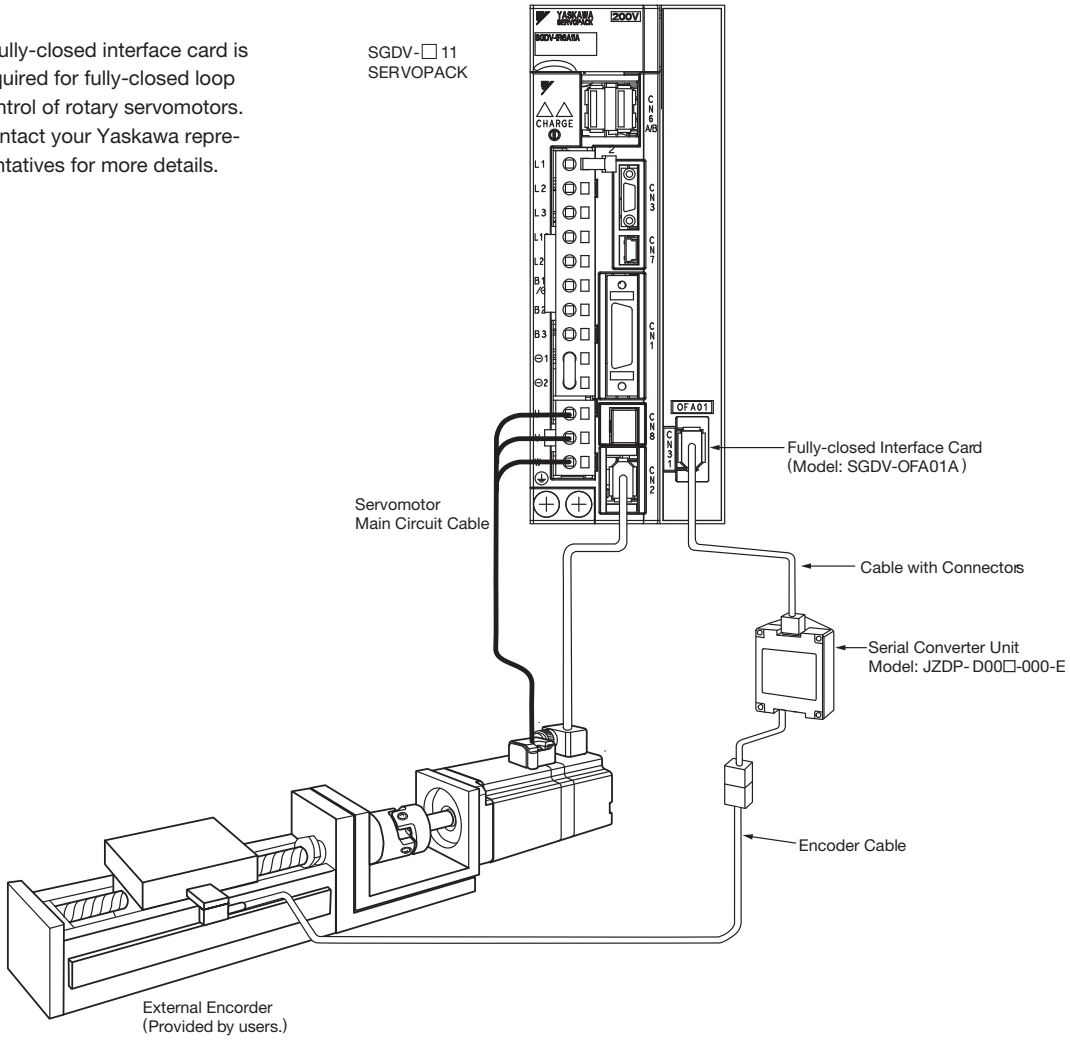
Port	Model	Pole	Manufacturer
CN1	10226-52A2PL	26	Sumitomo 3M Ltd.
CN2	53984-0671	6	Molex Japan Co., Ltd.
CN3	HDR-EC14LFDTN-SLE-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
CN6	1903815-1	8	Tyco Electronics AMP K.K.
CN7	MNC23-5K5H00	5	ADVANCED-CONNECTEK INC.
CN8	1981080-1	8	Tyco Electronics AMP K.K.

Note: The connectors above or their equivalents are used for SERVOPACKs.

■ External Converter Units for Fully-closed Loop Control

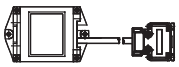
System Configuration for Fully-closed Loop Control

A fully-closed interface card is required for fully-closed loop control of rotary servomotors. Contact your Yaskawa representatives for more details.



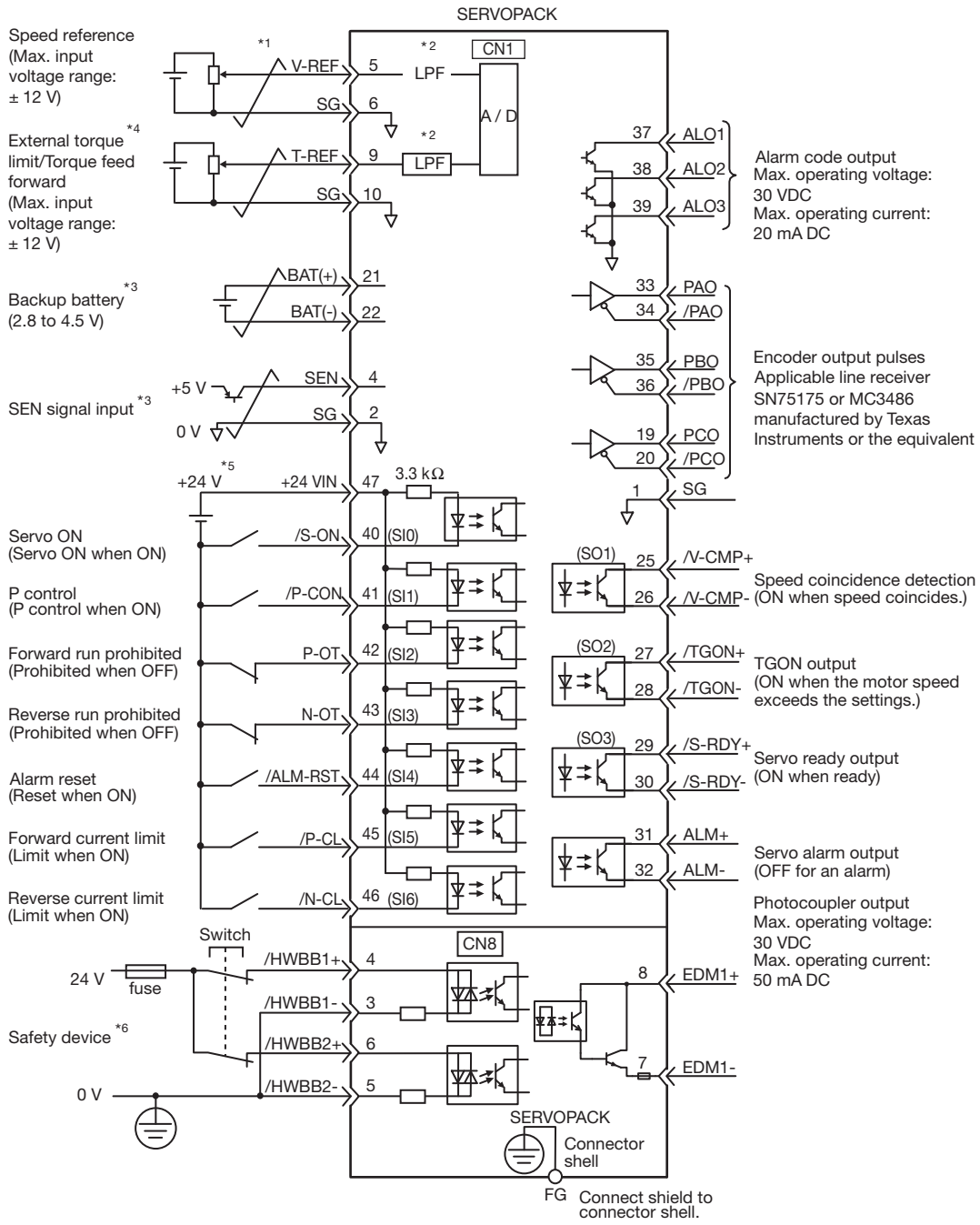
■ Model Designations

JZDP - D00□ -000 -E

Serial Converter Unit Model			
Code	Appearance	Applicable External Encoder	Hall Sensor
D003		Manufactured by HEIDENHAIN Corporation	None
D005		Manufactured by Renishaw plc.	None

EXAMPLES

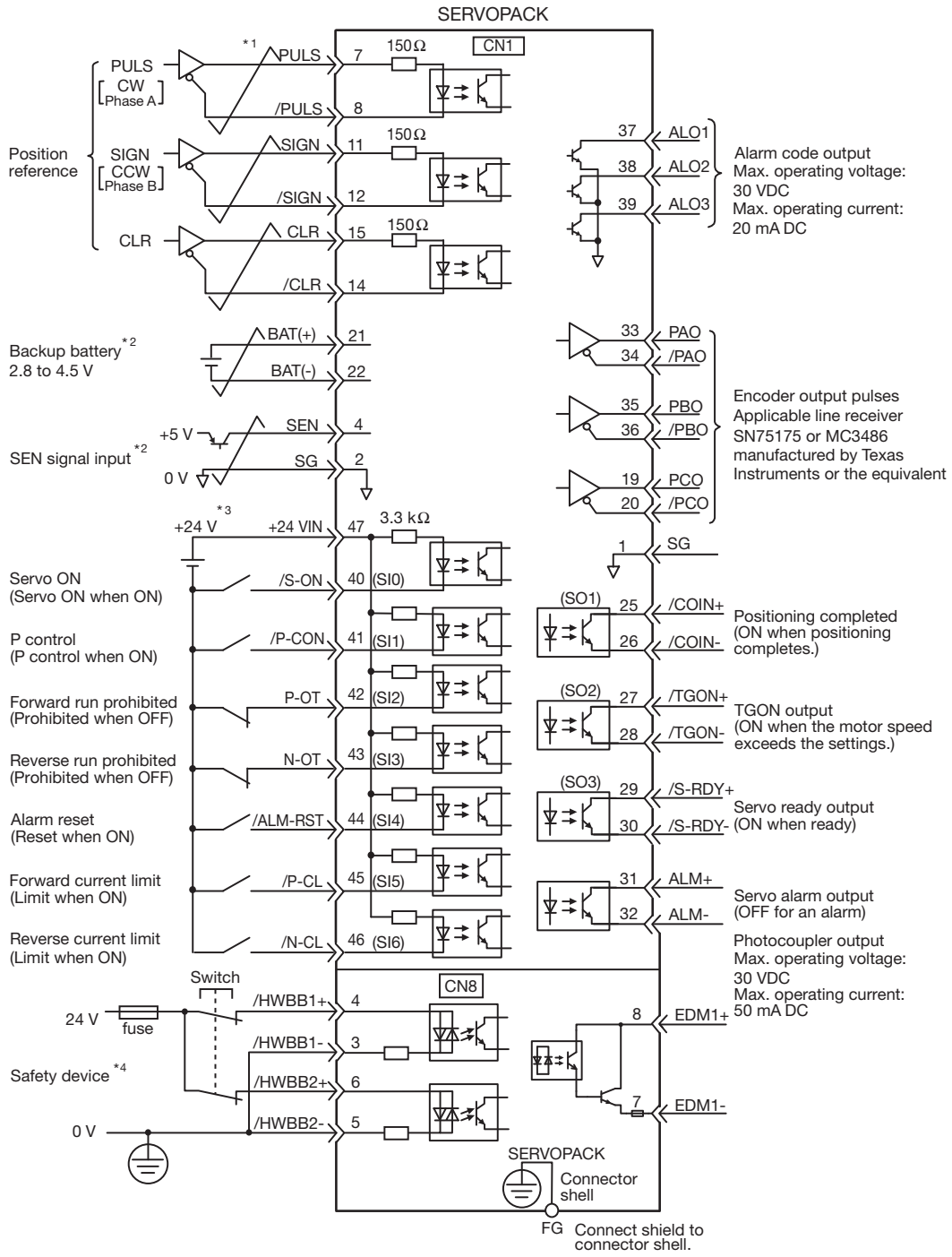
■ Example of I/O Signal Connections in Speed Control



*1 ⫽ represents twisted-pair wires.
*2 The time constant for the primary filter is 30μs.
*3 Connect when using an absolute encoder. When the encoder cable for the battery case is connected, do not connect a backup battery.
*4 Enabled by the parameter setting.
*5 Customers must purchase a 24 VDC power supply with double-shielded enclosure.
*6 For servo ON, connect to safety device and set wiring to enable safety function. When not using the safety function, use the SERVOPACK with the plug (JZSP-CVH05-E, provided as an accessory) inserted into the CN8.

Note: The functions allocated to the input signals SI0 to SI6 and the output sign als SO1 to SO3 can be changed by using the parameters.

■ Example of I/O Signal Connections in Position Control



*1 represents twisted-pair wires.

*2 Connect when using an absolute encoder. When the encoder cable for the battery case is connected, do not connect a backup battery.

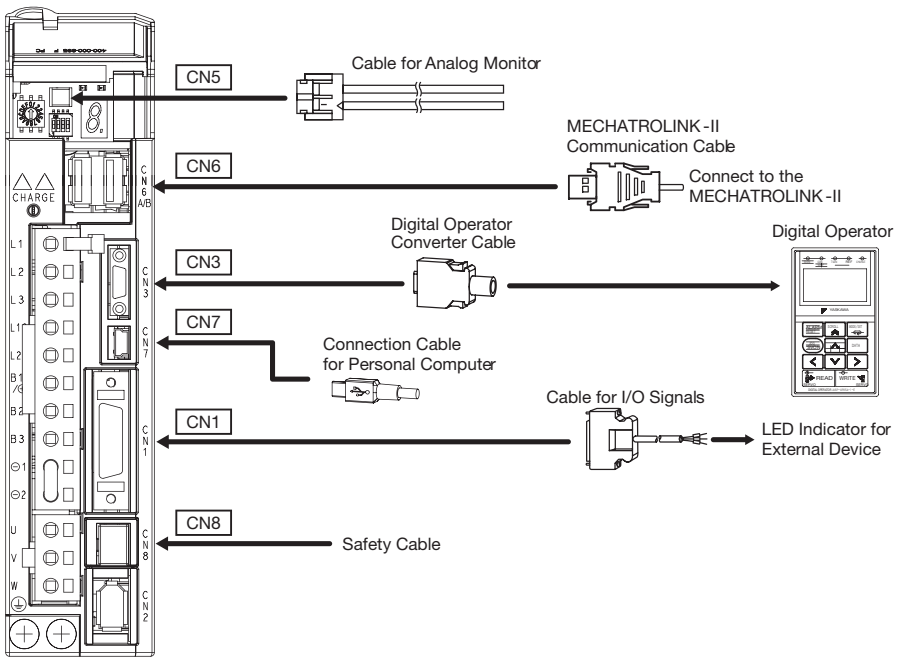
*3 Customers must purchase a 24 VDC power supply with double-shielded enclosure.

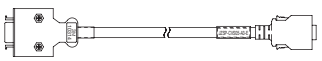
*4 For servo ON, connect to safety device and set wiring to enable safety function. When not using the safety function, use the SERVOPACK with the plug (JZSP-CVH05-E, provided as an accessory) inserted into the CN8.

Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

SELECTING CABLES

Cables for CN1 CN3 CN5 CN6 CN7 CN8 (MECHATROLINK-II Communications Reference Type SERVOPACKs)

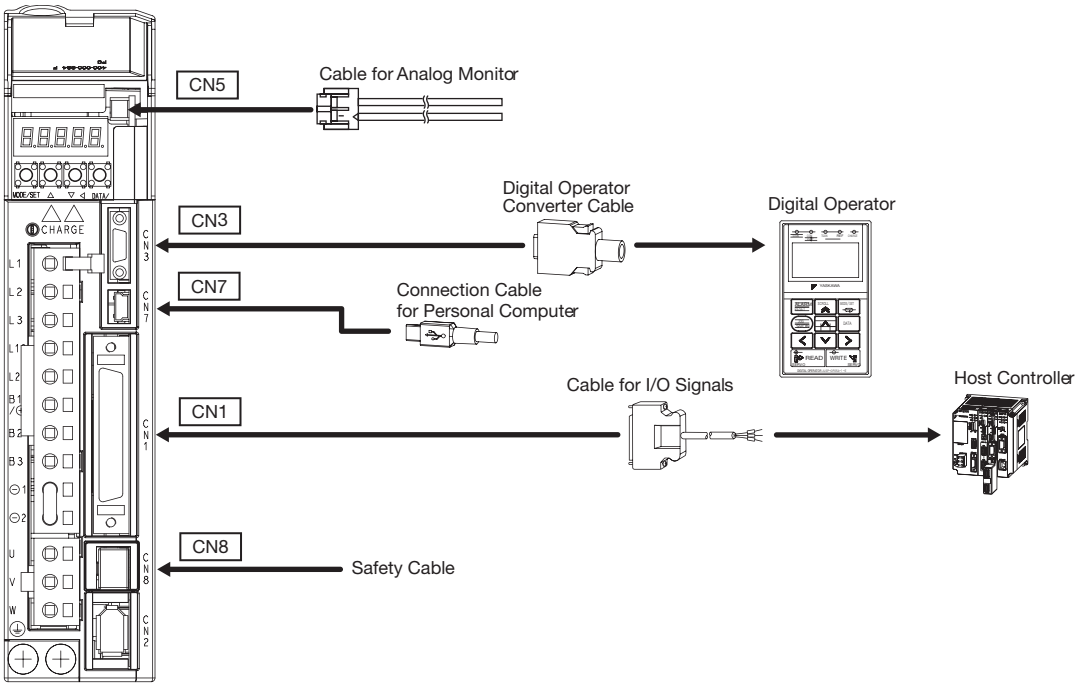


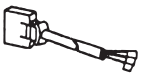
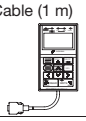
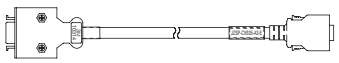
Name		Length	Order No.	Specifications	Details
CN1 Cables for I/O Signals	Connector Kit		JZSP-CSI9-2-E	Soldered	(1)
	Connector		Connector: 10126-3000PE Case: 10326-52A0-008 (Sumitomo 3M Ltd.)		
CN3	Digital Operator		JUSP-OP05A-1-E	With Connection Cable (1 m) 	(2)
	Digital Operator Converter Cable *1		JZSP-CVS05-A3-E	Cable with Connectors at Both Ends (0.3 m) 	(3)
CN7 Connection Cables for Personal Computer			JZSP-CVS06-02-E		-
CN6A CN6B MECHATROLINK-II Communication Cable	Cables with Connectors at Both Ends	0.5 m	JEPMC-W6002-A5-E		(5)
		1 m	JEPMC-W6002-01-E		
		-	JEPMC-W6002-□-E		
	Terminator		JEPMC-W6022-E		(6)
CN5 Cables for Analog Monitor		1 m	JZSP-CA01-E	SERVOPACK End 	(4)
CN8 Cables for Safety Functions	Cables with Loose Wires at One End *2		JZSP-CVH03-03-E		-

*1 : A converter cable is required to use Σ-III series digital operators (model: JUSP-OP05A) for Σ-V series SERVOPACKs.
*2 : When using the safety function, connect this cable to the safety devices.
Even when not using the safety function, use SERVOPACKs with the Safe Japan Connector (model: JZSP-CVH05-E) connected.

SELECTING CABLES

Cables for CN1 CN3 CN5 CN7 CN8 (Analog voltage / Pulse Train Reference type SERVOPACK)



Name		Length	Order No.	Specifications	Details
CN1 Cables for I/O Signals	Connector Terminal Converter Unit		JUSP-TA50PG-E	Terminal Block and 0.5 m Connection Cable 	(1)
	Cables with Loose Wires at One End	1 m	JZSP-CSI01-1-E	Cable with Loose Wire at One Peripheral Devices 	(2)
		2 m	JZSP-CSI01-2-E		
		3 m	JZSP-CSI01-3-E		
CN3	Digital Operator		JUSP-OP05A-1-E	With Connection Cable (1 m) 	(3)
	Digital Operator Converter Cable*1		JUSP-CVS05-A3-E	Cable with Connectors at Both Ends (0.3 m) 	(4)
CN7 Connection Cables for Personal Computer			JZSP-CVS06-02-E		-
CN5 Cables for Analog Monitor		1 m	JZSP-CA01-E	SERVOPACK End 	(5)
CN8 Cables for Safety Functions	Cables with Loose Wires at One End*2		JZSP-CVH03-03-E	———	-

*1 : A converter cable is required to use Σ-III series digital operators (model: JUSP-OP05A) for Σ-V series SERVOPACKs.
*2 : When using the safety function, connect this cable to the safety devices.
Even when not using the safety function, use SERVOPACKs with the Safe Japan Connector (model: JZSP-CVH05-E) connected.

Notes

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Yaskawa is certified to ISO 9001 and the environmental management system standard ISO 14001.

International Standards

Safety Standards

EN 954-1: Safety Category 3
IEC 61800-5-2: Safe Torque Off (STO)

RoHS Directive

RoHS Directive Stands for the EU directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Technical specifications are subject to change without notice.

While every care has been taken in the compilation of this information and every attempt was made to present up-to-date and accurate information, we cannot guarantee that inaccuracies will not occur.

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