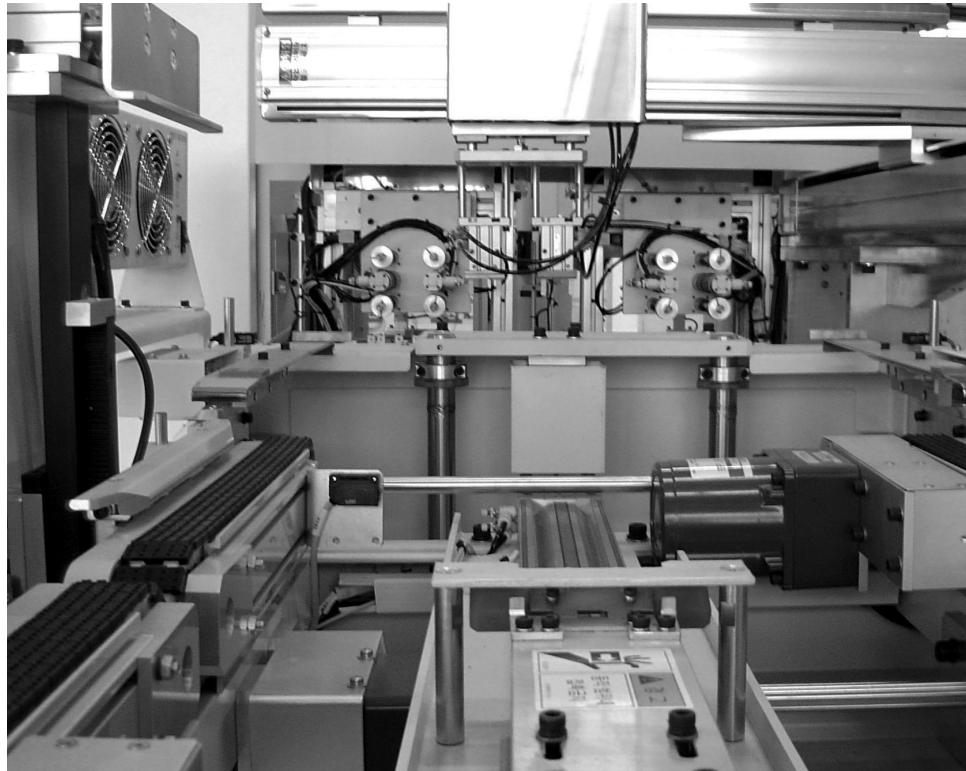




***Allen-Bradley***

# OEMax Servo Motor



**User Manual**

## Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation Korea, Ltd. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation Korea, Ltd. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation Korea, Ltd. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation Korea, Ltd., is prohibited.

Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

<b>WARNING</b> 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
<b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.
<b>ATTENTION</b> 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence
<b>WARNING</b> 	Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
<b>BURN HAZARD</b> 	Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that surfaces may be at dangerous temperatures.

# Preface

---

The preface briefly introduces the manual.

The following contents are included in the preface.

- User of the Manual
- Purpose of the Manual
- Reference
- Symbols and Notations

## User of the Manual

This user manual describes installation, specifications, motor capacity selection and maintenance and repair of all servo motors of Rockwell Automation Korea Ltd. This manual is made for the engineers who want to install, wire, and operate servo motors or apply them to a control system.

Those who do not have basic understanding of servo motors need to receive the product education provided by Rockwell Automation Korea Ltd. before using the product.

## Purpose of the Manual

This manual explains the installation, specification, motor capacity selection, and maintenance and repair of servo motors. Necessary diagrams and other drawings are provided.

## Reference

The following documents contain additional information concerning related servo motor products.

Usage	Manual	Document Number
CSD3 series servo drive installation, operation, maintenance and repair information	CSD3 Series Servo Drive User Manual	CSD3-UM001
CSD3 Plus series servo drive installation, operation, maintenance and repair information	CSD3 Plus Servo Drive User Manual	CSD3P-UM001
CSDJ Plus series servo drive installation, operation, maintenance and repair information	CSDJ Plus Servo Drive User Manual	CSDJ-UM001
CSDP Plus series servo drive installation, operation, maintenance and repair information	CSDP Plus Servo Drive User Manual	CSDPP-UM001
CSDP Plus servo drive installation information	CSDP Plus Servo Drive Installation Manual	CSDPP-IN001

You can view or download publications at <http://www.oemax.co.kr> or <http://www.oemax.com>. To order paper copies of technical documentation, contact your local OEMax distributor or sales representatives.

## Symbols and Notations

The following symbols and notations are used in this manual.

- Bullet points are used to provide multiple kinds of information. They are not used for sequential procedures.
- Numbers are used to provide sequential procedures or hierarchical information.

## Safety Notice

Please read and understand the user manual before installation and operation. Please be aware of and abide by the following safety notices for the safety and protection of yourself and your property.

### Use

#### ATTENTION



- Do not touch the inside of the servo drive.
- Make sure that the servo drive and the motor are fully grounded.
- Do not put excessive stress on the motor power and encoder cable.
- Never touch the revolving part of the motor during operation Station No.

#### WARNING



- Avoid using the product near wet places or corrosive and inflammable materials.
- Operate the system with no load during pilot operation.

### Storage

#### WARNING



- Do not store the product near wet places, rain, toxic gas or fluid.
- Keep the product out of the direct rays of the sun and store it within the storage temperature and humidity ranges.
- Avoid overloading if the product is stored in a warehouse.

### Transportation

#### WARNING



- Do not carry the product by holding the cable and the motor shaft.

## Installation and Wiring

### ATTENTION



- When installing and wiring servo motor, refer to the user guide of the model and take necessary actions.

## Maintenance and Repair

### WARNING



- Do not disassemble or remodel the product. Any damage caused after the user disassembles or remodels the product will be excluded from the company's warranty.
- The company bears no responsibility for injuries or physical damage caused by remodeling of this product.
- In case of a failure that cannot be dealt with, please contact the local OEMax distributor or sales representatives.

# Contents

---

<b>Preface</b>	Disclaimer .....	2
	User of the Manual .....	P-1
	Purpose of the Manual .....	P-1
	Reference .....	P-1
	Symbols and Notations .....	P-2
	Safety Notice .....	P-3
	Use .....	P-3
	Storage .....	P-3
	Transportation .....	P-3
	Installation and Wiring .....	P-4
	Maintenance and Repair .....	P-4
<b>Overview</b>	Name of Each Part of Servo Motor.....	1-1
	Servo Motor Label Format.....	1-2
	Decelerator Label Format.....	1-5
<b>Installation</b>	<b>Chapter 1</b>	
	Servo Motor Installation.....	2-1
	Precautions for Installation .....	2-1
	Coupling Assembly .....	2-3
	Load Connection .....	2-4
	Allowed Load on Motor Shaft .....	2-4
	Servo Motor Installation Environment.....	2-5
	Installation of Servo Drive .....	2-5
<b>Motor Specifications</b>	<b>Chapter 2</b>	
	CSMD Series Motor .....	3-1
	Common Specifications.....	3-1
	Basic Specifications .....	3-2
	Brake Specifications .....	3-3
	Speed Torque Curve .....	3-3
	CSMF Series Motor .....	3-5
	Common Specifications.....	3-5
	Basic Specifications .....	3-5
	Brake Specifications .....	3-6
	Speed Torque Curve .....	3-7
	CSMH Series Motor .....	3-8
	Common Specifications.....	3-8
	Basic Specifications .....	3-8
	Brake Specifications .....	3-9
	Speed Torque Curve .....	3-10
	CSMK Series Motor .....	3-11
	Common Specifications.....	3-11
	Basic Specifications .....	3-11
	Brake Specifications .....	3-12
	Speed Torque Curve .....	3-12

---

CSMQ Series Motor .....	3-14
Common Specifications.....	3-14
Basic Specifications .....	3-14
Brake Specifications.....	3-15
Speed Torque Curve .....	3-16
CSMR Series Motor .....	3-17
Common Specifications.....	3-17
Basic Specifications .....	3-17
Brake Specifications.....	3-18
Speed Torque Curve .....	3-19
CSMS Series Motor.....	3-20
Common Specifications.....	3-20
Basic Specifications .....	3-20
Brake Specifications.....	3-21
Speed Torque Curve .....	3-22
CSMT Series Motor .....	3-24
Common Specifications.....	3-24
Basic Specifications .....	3-24
Brake Specifications.....	3-25
Speed Torque Curve .....	3-25
CSMZ Series Motor .....	3-27
Common Specifications.....	3-27
Basic Specifications .....	3-27
Brake Specifications.....	3-28
Speed Torque Curve .....	3-28
RSMD Series Motor .....	3-30
Common Specifications.....	3-30
Brake Specifications .....	3-30
Basic Specifications .....	3-31
Speed Torque Curve .....	3-32
RSMF Series Motor .....	3-34
Common Specifications.....	3-34
Brake Specifications .....	3-34
Basic Specifications .....	3-35
Speed Torque Curve .....	3-36
RSMH Series Motor .....	3-37
Common Specifications.....	3-37
Brake Specifications .....	3-37
Basic Specifications .....	3-38
Speed Torque Curve .....	3-39
RSMK Series Motor .....	3-40
Common Specifications.....	3-40
Brake Specifications .....	3-40
Basic Specifications .....	3-41
Speed Torque Curve .....	3-42
RSML Series Motor .....	3-44
Common Specifications.....	3-44
Brake Specifications .....	3-44
Basic Specifications .....	3-45
Speed Torque Curve .....	3-46

---

RSMS Series Motor .....	3-48
Common Specifications.....	3-48
Brake Specifications .....	3-48
Basic Specifications .....	3-49
Speed Torque Curve .....	3-50
RSMQ Series Motor .....	3-52
Common Specifications.....	3-52
Brake Specifications .....	3-52
Basic Specifications .....	3-53
Speed Torque Curve .....	3-54
RSMZ Series Motor .....	3-55
Common Specifications.....	3-55
Brake Specifications .....	3-55
Basic Specifications .....	3-56
Speed Torque Curve .....	3-57
Allowed Load on Motor Shaft.....	3-58
Load Location on Motor Shaft .....	3-58
CSMD/F/H/K/S Series Motor.....	3-59
CSMQ/Z Series Motor .....	3-59
CSMR/T Series Motor .....	3-60
RSMD/F/H/K/L/S Series Motor.....	3-60
RSMQ/Z Series Motor .....	3-61

## Chapter 4

### Motor Diagram and Dimensions

CSM Series Motor .....	4-1
Diagram and Dimensions .....	4-1
Shaft-End Specifications .....	4-2
CSM Series Motor - Decelerator Attached .....	4-3
Diagram and Dimensions .....	4-3
Shaft-End Specifications .....	4-4
CSMT Series Motor .....	4-6
Diagram and Dimensions .....	4-6
Shaft-End Specifications .....	4-7
CSMR Series Motor .....	4-8
Diagram and Dimensions .....	4-8
Shaft-End Specifications .....	4-8
CSMQ Series Motor .....	4-9
Diagram and Dimensions .....	4-9
Shaft-End Specifications .....	4-9
CSMZ Series Motor .....	4-10
Diagram and Dimensions .....	4-10
Shaft-End Specifications .....	4-11
RSMZ/Q Series Motor.....	4-12
Diagram and Dimensions .....	4-12
Shaft-End Specifications .....	4-13
CSMD/H/K/S Series Motor.....	4-15
Diagram and Dimensions .....	4-15
Shaft-End Specifications .....	4-17
RSMD/S/H/F Series Motor .....	4-18

---

Diagram and Dimensions .....	4-18
Shaft-End Specifications .....	4-21
RSMK/L Series Motor .....	4-23
Diagram and Dimensions .....	4-23
Shaft-End Specifications .....	4-24

## Chapter 5

### Cable Specifications

Motor 3-Phase Power Cable .....	5-1
Motor 3-Phase Power Cable .....	5-1
Large Capacity Motor Power Cannon Plug Specifications .....	5-2
Motor 3-Phase Power Cable Order Code .....	5-5
Encoder Cable .....	5-6
Encoder Cable Specifications .....	5-6
Large Capacity Motor Encoder Cannon Plug Specifications .....	5-12
Encoder Code Order Code .....	5-12
Motor Brake Cable .....	5-14
Motor Brake Cable Specifications .....	5-14
User I/O Cable .....	5-15
Communication Cable .....	5-17
Cable Connector Specifications .....	5-18
SERCOS Cables .....	5-18

## Chapter 6

### Load Calculation

Roll Load .....	6-1
Mechanical Configuration .....	6-1
Movement Amount (M) .....	6-1
Motor Shaft Revolving Speed (r/min) .....	6-1
Load Torque (N. m) .....	6-2
Load Inertia Moment (Kg. m <sup>2</sup> ) .....	6-2
JR .....	6-2
Minimum Acceleration Time (s) .....	6-3
Minimum Deceleration Time (s) .....	6-3
Load Operation Power (W) .....	6-3
Load Acceleration Power (W) .....	6-3
Acceleration Torque Required (N. m) .....	6-3
Deceleration Torque Required (N. m) .....	6-3
Torque Effective Value (N. m) .....	6-4
Timing Belt Load .....	6-5
Mechanical Configuration .....	6-5
Movement Amount (m) .....	6-5
Motor Shaft Revolving Speed (r/min) .....	6-5
Load Torque (N. m) .....	6-5
Load Inertia Moment (kg. m <sup>2</sup> ) .....	6-6
Minimum Acceleration Time (s) .....	6-6
Minimum Deceleration Time (s) .....	6-6
Load Operation Power (W) .....	6-6
Load Acceleration Power (W) .....	6-6
Acceleration Torque Required (N. m) .....	6-7

Deceleration Torque Required (N. m) .....	6-7
Torque Effective Value (N. m) .....	6-7
Horizontal Ball Screw Load .....	6-7
Machine Configuration .....	6-7
Movement Amount (m).....	6-8
Motor Shaft Revolving Speed (r/min) .....	6-8
Load Torque (N. m).....	6-8
Load Inertia Moment (kg. m <sup>2</sup> ) .....	6-8
Minimum Acceleration Time(s).....	6-8
Minimum Deceleration Time (s).....	6-9
Load Operation Power (W).....	6-9
Load Acceleration Power (W).....	6-9
Acceleration Torque Required (N. m) .....	6-9
Deceleration Torque Required (N. m) .....	6-9
Torque Effective Value (N. m) .....	6-9
Vertical Ball Screw Load.....	6-10
Mechanical Configuration .....	6-10
Movement Amount (m).....	6-10
Motor Shaft Revolving Speed (r/min) .....	6-10
Load Torque (N. m).....	6-11
Load Inertia Moment (kg. m <sup>2</sup> ) .....	6-11
Minimum Acceleration Time (s).....	6-11
Minimum Deceleration Time(s) .....	6-11
Load Operation Power (W).....	6-11
Load Acceleration Power (W).....	6-12
Acceleration Torque Required (N. m) .....	6-12
Deceleration Torque Required (N. m) .....	6-12
Torque Effective Value (N. m) .....	6-12
Rack & Pinion Load .....	6-13
Mechanical Configuration .....	6-13
Movement Amount (m).....	6-13
Motor Shaft Revolving Speed (r/min) .....	6-13
Load Torque (N. m).....	6-13
Load Inertia Moment (kg. m <sup>2</sup> ) .....	6-14
Minimum Acceleration Time (s).....	6-14
Minimum Deceleration Time (s) .....	6-14
Load Operation Power (W).....	6-14
Load Acceleration Power (W).....	6-14
Acceleration Torque Required (N. m) .....	6-15
Deceleration Torque Required (N. m) .....	6-15
Torque Effective Value (N. m) .....	6-15
Disk Load .....	6-15
Mechanical Configuration .....	6-15
Movement Amount (rad).....	6-16
Motor Shaft Revolving Speed (r/min) .....	6-16
Load Torque (N. m).....	6-16
Load Inertia Moment (kg. m <sup>2</sup> ) .....	6-16
Minimum Acceleration Time(s) .....	6-16
Minimum Deceleration Time(s) .....	6-17
Load Operation Power (W).....	6-17

---

Load Acceleration Power (W) .....	6-17
Acceleration Torque Required (N. m) .....	6-17
Deceleration Torque Required (N. m) .....	6-17
Torque Effective Value (N. m) .....	6-17

## Chapter 7

### **Motor Capacity Selection**

System Configuration .....	7-1
Horizontal Ball Screw Load System .....	7-1
System Configuration Condition Value .....	7-1
Speed Diagram .....	7-2
Servo Motor Selection Criteria	
Calculation and Review .....	7-2
Selection Criteria Calculation .....	7-2
Tentative Selection of Servo Motor .....	7-3
Review Selection Criteria of Tentatively Selected Servo Motor .....	7-4
Final Selection of Servo Motor .....	7-5

## Chapter 8

### **Maintenance and Repair**

Maintenance and Repair .....	8-1
Servo Motor Maintenance and Repair .....	8-1
Servo Drive Maintenance and Repair .....	8-1

### **Index**

## Overview

This chapter describes general facts about servo motors, such as a name of each part and its label format.

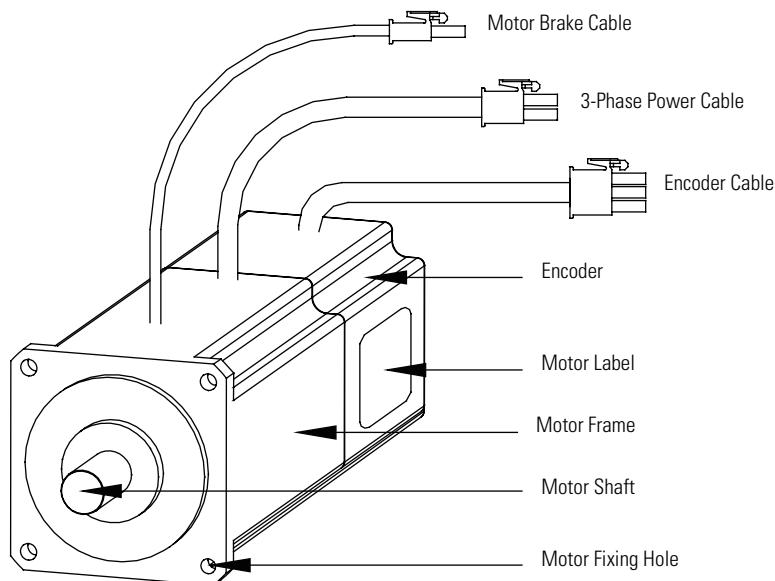
### Name of Each Part of Servo Motor

The figure below shows a name of each part of a motor

Motors that are not equipped with brakes do not have any brake cables. The name of each part can be different from what is shown in the figure below depending on motor model.

**NOTE**

For further information about a servo drive, refer to the user manual of the corresponding servo drive.



**NOTE**

For specifications and order codes for the following cables, refer to "Cable Specifications" in Chapter 5.

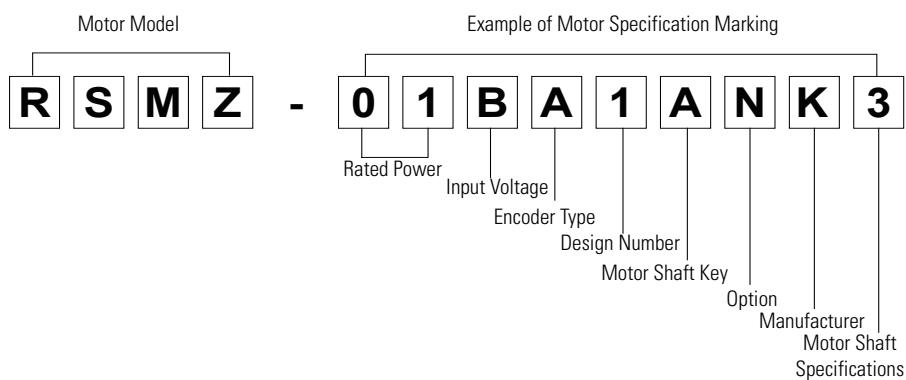
- 3-Phase Power Cable
- Encoder Cable
- Motor Brake Cable

For specifications and order codes of the following cables, refer to the user manual of the servo drive you purchased.

- I/O Cable
- Communication Cable

**Servo Motor Label Format**

The figure below shows the model name format on the label.



The table below shows examples of possible markings on the label of a servo motor. (Excluding design number and manufacturer name.)

Table 1.1 Motor Model

**Marking (Available motor models)**

CSM	RSMD
CSMD	RSMF
CSMH	RSMH
CSMK	RSMK
CSMQ	RSML
CSMR	RSMS
CSMS	RSMQ
CSMT	RSMZ
CSMZ	

Table 1.2 Rated Power

<b>Symbol</b>	<b>Meaning</b>
A3	30 W
A5	50 W
01	100 W
02	200 W
04	400 W
:	:
10	1 kW
:	:
50	5 kW

Table 1.3 Input Voltage

<b>Symbol</b>	<b>Meaning</b>
B	AC 220V

Table 1.4 Encoder Type

<b>Motor Model</b>	<b>Symbol</b>	<b>Resolution/1 Rotation</b>	<b>Encoder Type</b>
CSMR/T RSMD/F/H/K/L/Q/S/Z	Q	131072	Abs. Serial
	R	131072	Serial Inc.
<b>Motor Model</b>	<b>Symbol</b>	<b>Pulse/1 Rotation</b>	<b>Encoder Type</b>
CSM CSMR/T	S	2048	15 Wire Inc.
	B	2048	9 Wire Inc.
	A	2048	Abs. Value
	D	2500	15 Wire Inc.
	C	2000	15 Wire Inc.
	K	5000	15 Wire Inc.
CSMD/H/K/Q/S/Z	A	2500	11 Wire Inc.
	H	2048	Compact Abs. Value
	M	10000	15 Wire Inc.
	K	5000	15 Wire Inc.
	L	6000	15 Wire Inc.
RSMD/F/H/K/L/Q/S/Z	A	2500	9 Wire Inc.
	H	2048	Compact Abs. Value
	M	10000	15 Wire Inc.

Table 1.5 Motor Shaft Key

Symbol	Meaning
A	Key Present
B	Key Absent

Table 1.6 Option

Symbol	Meaning
N	Option Absent
B	Brake Present
S	Oil Seal Present
T	Brake and Oil Seal Present

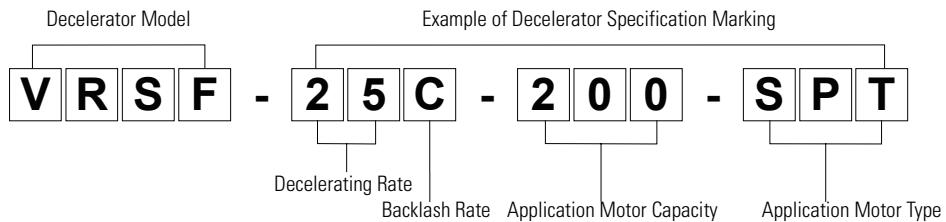
Table 1.7 Motor Shaft Specifications

Symbol	Meaning
1	Circle (Coupling Lock)
2	2-Side Slice (Set Screw Lock)
3	Key Lock
4	Tapper Lock
5	General Decelerator Installed
6	Harmonic Drive Installed

## Decelerator Label Format

The figure below shows the model name format on the label of the decelerator.

The decelerator can only be installed on CSM and CSMT motors.



The table below shows examples of possible markings on the label of a decelerator. (Excluding decelerator model.)

Table 1.8 Option

Symbol	Decelerating Rate
03	1/3
05	1/5
09	1/9
15	1/15
25	1/25

Table 1.9 Backlash Rate<sup>(1)</sup>

Symbol	Meaning
B	0.7 degree
C	0.5 degree
D	
E	

<sup>(1)</sup> The backlash class of a decelerator is fixed at the factory.

Table 1.10 Application Motor Capacity

Symbol	Meaning
030	30 W
050	50 W
:	:
800	800 W

Table 1.11 Application Motor Type

Symbol	Meaning
SPT	CSM, CSMT



## Installation

This chapter describes what you should know when installing a servo motor. For the dimensional data necessary for installation, See "Motor Specifications" in Chapter 3 and "Motor Diagram and Dimensions" in Chapter 4. For the dimensional data of a servo drive and its peripherals, See the user manual of the corresponding servo drive.

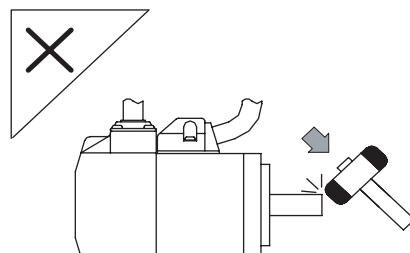
### Servo Motor Installation

### Precautions for Installation

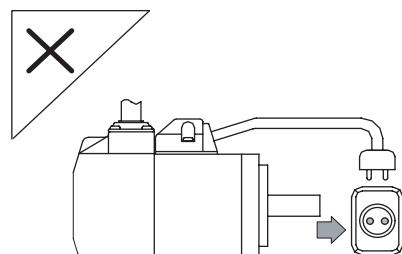
Install a servo motor following the cautions below.

A motor is a precision device. Treat encoders, motors shafts and bearings with special care.

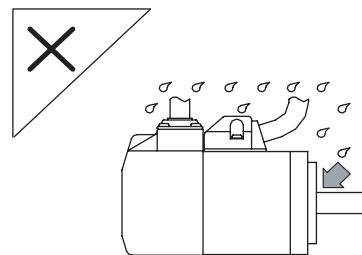
- Shock is a major cause of performance degradation of a motor.



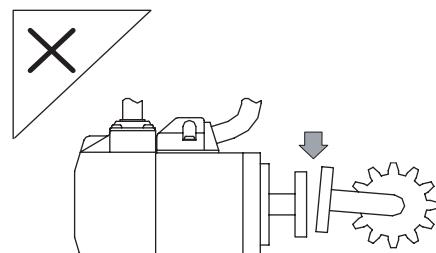
- Do not connect the motor directly to a power supply.



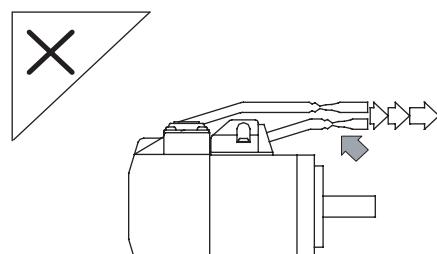
- Keep the motor away from water or oil.



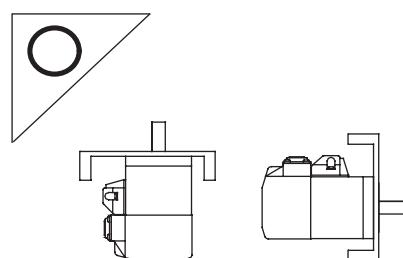
- Check the concentricity of coupling connected to load with special care.



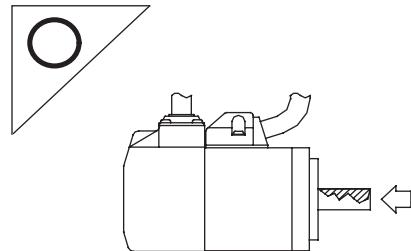
- Do not put the electric wires under constant stress.



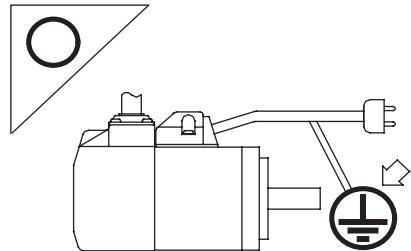
- Mounting is possible either horizontally or vertically.



- The shaft is oiled for corrosion prevention. Remove the oil before installation.



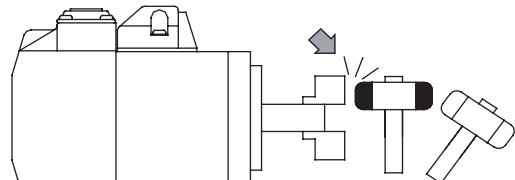
- Please connect the grounding line of the motor to the grounding connection terminal of the drive.



## Coupling Assembly

Avoid excessive shock.

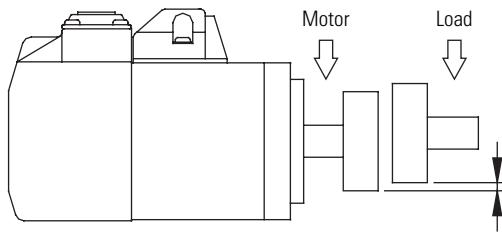
Excessive shock during assembling of coupling can damage the encoder. Use coupling assembly tools to facilitate the assembly process.



## Load Connection

Align connection axes of a motor and a load with each other.

Measure the concentricity of a motor shaft and a load shaft after assembling the coupling. Measure at four points rotating it by 90 degrees, and adjust them so that the difference of maximum and minimum values does not exceed 0.03mm.



### ATTENTION

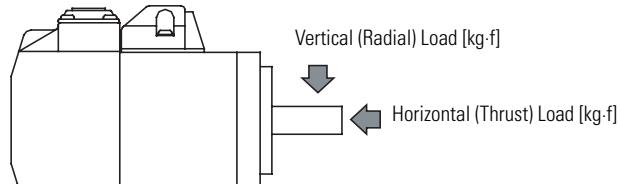


Misalignment of the motor and load axes is a main cause of performance degradation.

## Allowed Load on Motor Shaft

Make sure that the force exerted on the motor shaft is within the allowed load.

For allowed load on motor shaft for each model, See "Allowed Load on Motor Shaft" on page 3-58.



## Servo Motor Installation Environment

Environmental requirements for a servo motor are as follows:

Table 2.1 Servo Motor Installation Specifications

Item	Condition
Storage Temperature	-20 to 60 °C
Operating Temperature	0 to 55 °C
Operating Humidity	RH 90% or less, non-condensing
Installation Site	The installation site needs to meet the following conditions. <ul style="list-style-type: none"><li>• Indoors</li><li>• Good ventilation</li><li>• Easy to check and clean.</li><li>• No explosive gas.</li></ul>

## Installation of Servo Drive

### NOTE

For further information on installation and dimensional data of a servo drive, refer to the user manual of the drive.



## Motor Specifications

This chapter describes common and basic specifications, speed torque curves, and brake specifications of each servo motor series. Allowed load data on a motor shaft is described in a separate section.

**NOTE**

As for specifications of a servo drive, refer to the user manual of the servo drive.

### CSMD Series Motor

### Common Specifications

Table 3.1 CSMD Series Motor Common Specifications

Item	Specifications
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rated	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

## Basic Specifications

Table 3.2 CSMD Series Motor Basic Specifications

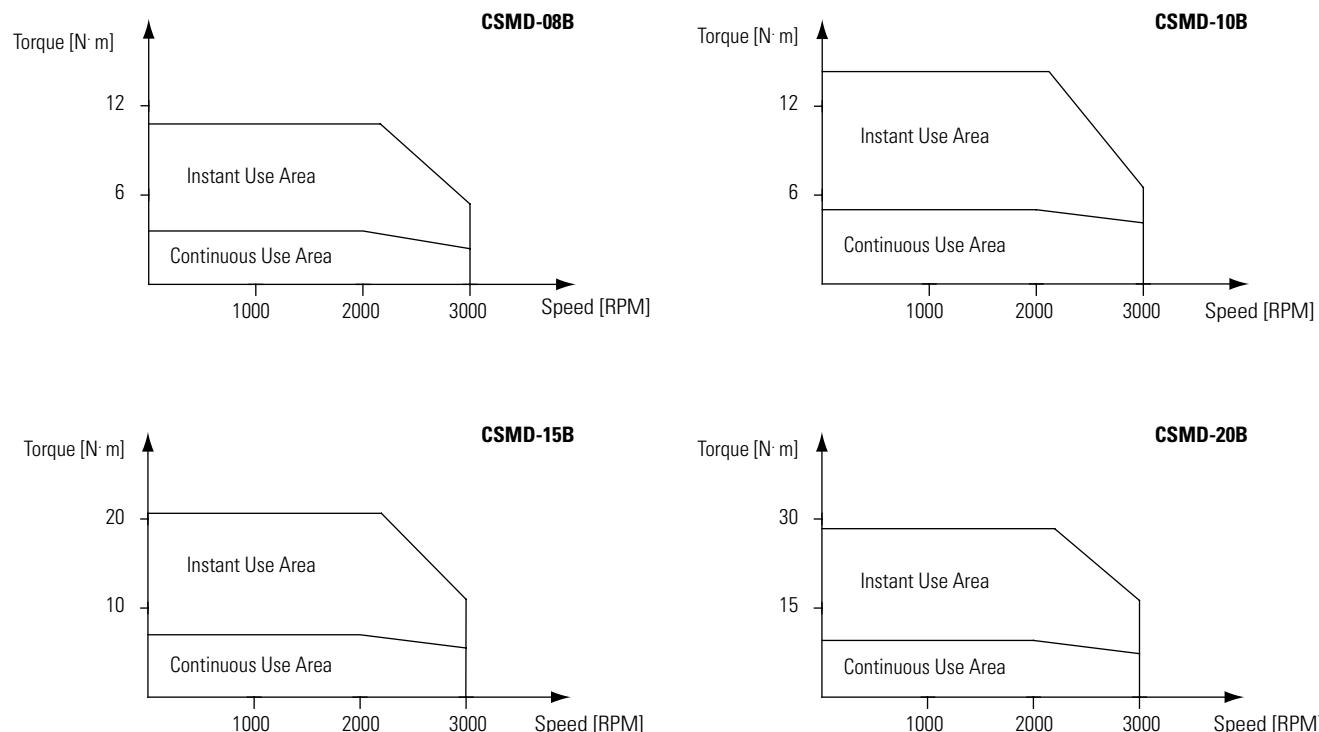
		CSMD-									
		08B	10B	15B	20B	25B	30B	35B	40B	45B	50B
Rated Voltage	V	220									
Rated Power	kW	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Rated Torque	Kgf·cm N·m	36.4 3.57	49 4.8	73 1.15	97.4 9.54	121 11.86	146 14.3	169 16.6	192 18.8	219 21.4	243 23.8
Maximum Instant Torque	Kgf·cm N·m	109 10.7	147 14.4	219 21.5	292 28.5	363 35.6	438 42.9	510 50.0	576 56.4	657 64.3	729 71.4
Rated Revolving Speed	RPM	2000									
Maximum Revolving Speed	RPM	3000									
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	2.88 2.82	6.30 6.17	11.4 11.2	15.5 15.2	19.6 19.2	22.8 22.3	36.6 35.9	43.4 42.5	51.6 50.6	61.9 60.7
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	3.19 3.13	6.93 6.17	13.6 12.3	17.0 16.7	21.5 21.1	25.1 24.6	41.0 40.2	47.8 46.8	56.7 55.6	68.1 66.7
Power Rate	kW/s	45.1	37.3	45.8	60.0	73.2	91.6	76	83.2	91.1	93.5
Mechanical Time Constant	ms	0.5	0.7	0.81	0.75	0.72		1.0			0.9
Electric Time Constant	ms	15.7	18	19	21	20		24		30	32
Rated Current	A (rms)	5.0	5.6	9.4	12.3	14	17.8	18.7	23.4	26.2	28
Maximum Instant Current	A (rms)	21	24	28.2	36.9	42	53.4	56.1	70.2	78.6	84
Space in Shaft Direction (Max.)	mm	0.3									
Weight (When Brake is Attached)	Kg	4.8 6.5	6.8 8.7	8.5 10.1	10.6 12.5	12.8 14.7	14.6 16.5	16.2 18.7	18.8 21.3	21.5 25	25 28.5
Revolving Direction	U→V→W: CW										
Color	Black										
Oil Seal	Embedded										

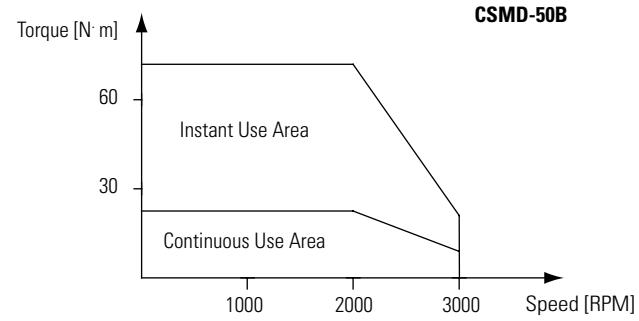
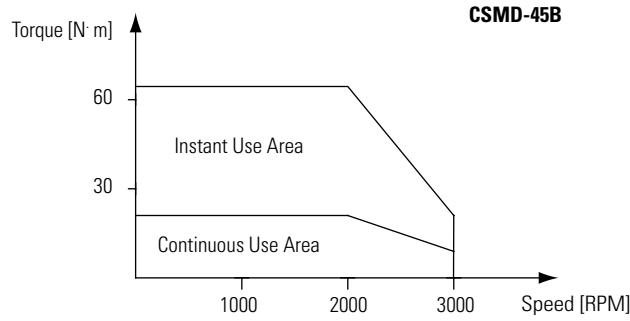
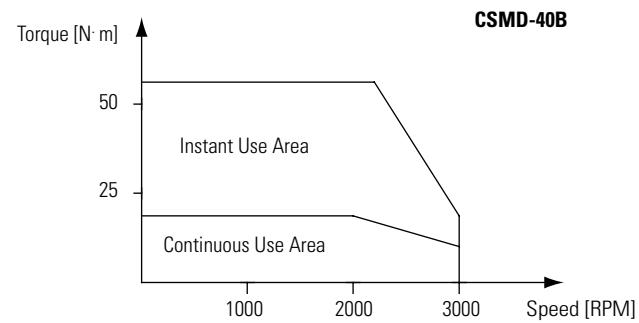
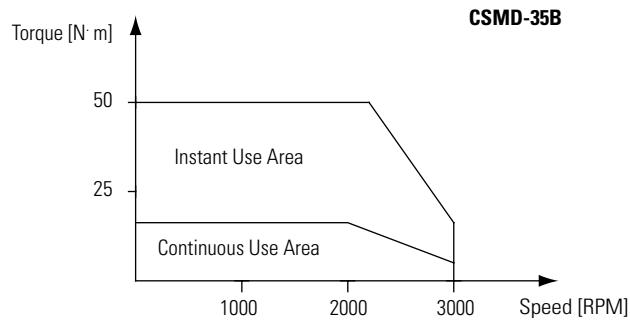
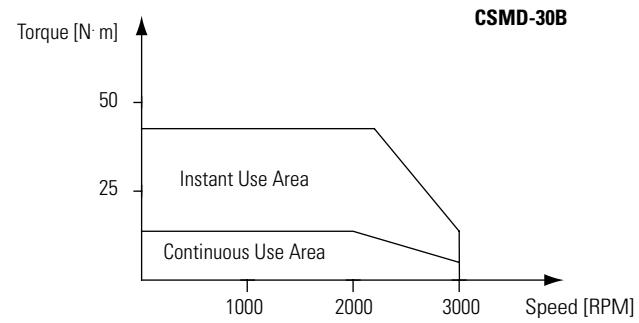
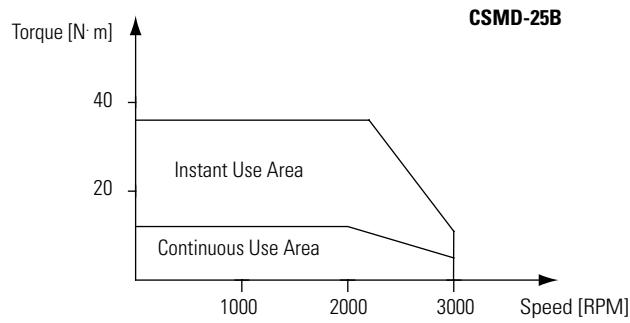
## Brake Specifications

Table 3.3 CSMD Motor Brake Specifications

		CSMD-							
		08B	10B	15B, 20B	25B, 30B	35B, 40B	45B, 50B		
Stiction Torque	N·m Kgf·cm	7.84 or more 80	4.9 or more 50	13.7 or more 140	16.1 or more 165	21.5 or more 220	24.5 or more 250		
Rotor Inertia	Kg·m <sup>2</sup> ·10 <sup>-4</sup> Kg·cm·s <sup>2</sup>	0.33 0.34	1.35 1.38			4.25 4.34	9.0 9.18		
Brake Pull-in Time	ms	50 or less	80 or less	100 or less	110 or less	90 or less	80 or less		
Brake Release Time	ms	15 or less	70 or less	50 or less			35 or less		
Release Voltage	VDC	2 or more							
Rated Voltage	VDC	24 ± 2.4							
Rated Current	A	0.81 ± 10%	0.59 ± 10%	0.79 ± 10%	0.90 ± 10%	1.1 ± 10%	1.3 ± 10%		
Allowed Brake Energy: once	J Kgf·m	392 40	588 60	1176 120	1470 150	1078 110	1372 140		
Overall Allowed Brake Energy	J Kgf·m	$4.9 \times 10^5$ $5 \times 10^4$	$7.8 \times 10^5$ $8 \times 10^4$	$1.5 \times 10^6$ $1.5 \times 10^5$	$2 \times 10^6$ $2.2 \times 10^5$	$2.4 \times 10^6$ $2.5 \times 10^5$	$2.9 \times 10^6$ $3 \times 10^5$		

## Speed Torque Curve





**CSMF Series Motor****Common Specifications**

Table 3.4 CSMF Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40°C
Storage Temperature Range	-20 to +80°C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.5 CSMF Series Motor Basic Specifications

		<b>CSMF-</b>					
		<b>04B</b>	<b>08B</b>	<b>15B</b>	<b>25B</b>	<b>35B</b>	<b>45B</b>
Rated Voltage	V	220					
Rated Power	kW	0.4	0.75	1.5	2.5	3.5	4.5
Rated Torque	Kgf·cm N·m	19.5 1.91	36.4 3.57	73 7.15	121 11.86	169 16.56	219 21.46
Maximum Instant Torque	Kgf·cm N·m	58.5 5.3	109 10.68	219 21.46	310 30.38	450 44.1	560 54.88
Rated Revolving Speed	RPM	2000					
Maximum Revolving Speed	RPM	3000					
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	2.50 2.45	10.3 10.1	20.5 20.1	42.1 41.3	52.7 51.6	73.8 72.3
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	2.8 2.7	11.1 10.9	21.9 21.9	46.2 45.3	56.8 55.7	80.1 78.5
Power Rate	kW/s	14.9	12.6	25.5	34	53.1	63.7
Mechanical Time Constant	ms	1.2	1.9	1.4	1.3	1.06	0.88
Electric Time Constant	ms	14	21	25	35	41	

Table 3.5 CSMF Series Motor Basic Specifications

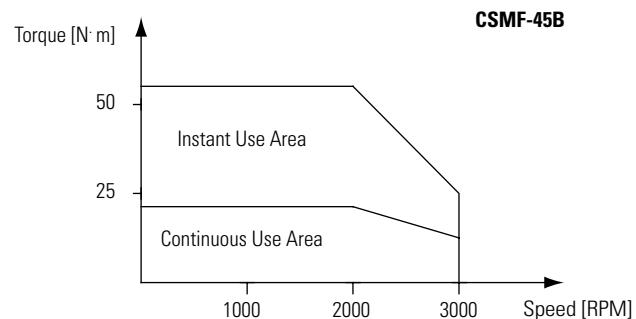
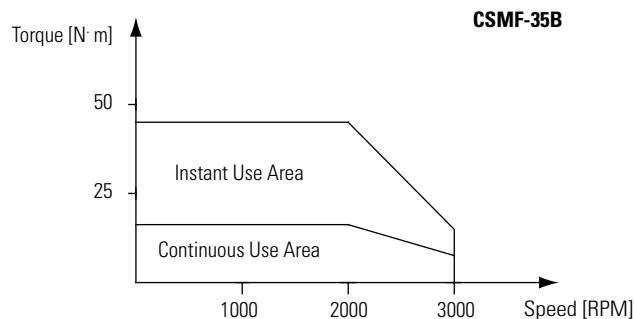
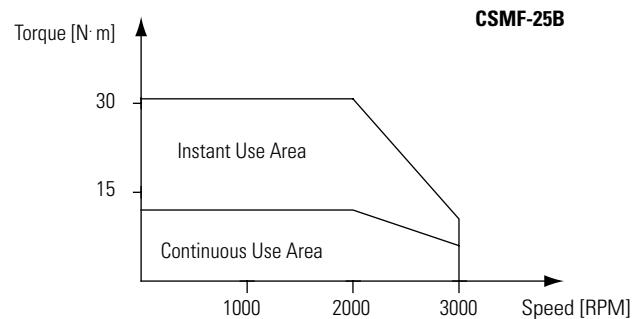
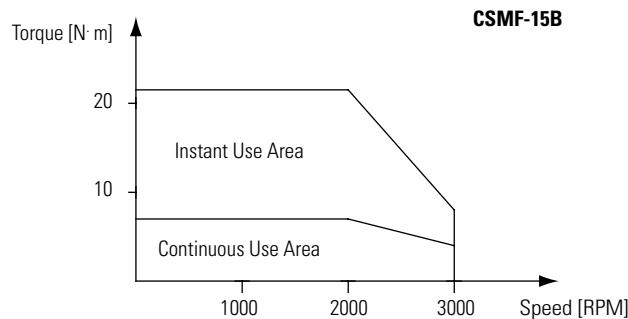
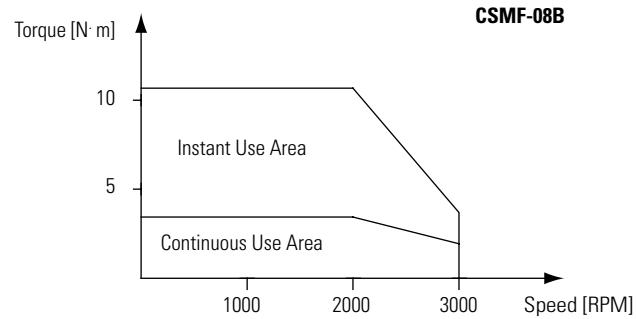
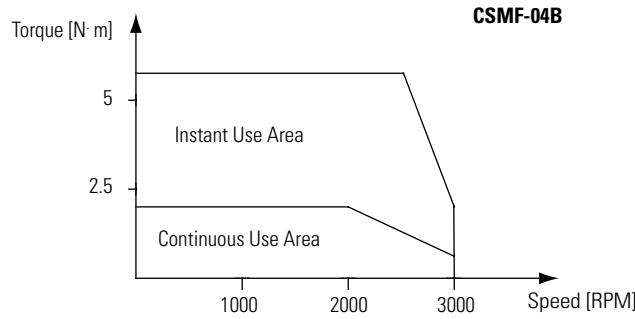
Rated Current	A (rms)	2.8	5.0	9.5	13.4	20	23.5
Maximum Instant Current	A (rms)	12	21	40	57	84	100
Space in Shaft Direction (Max.)	mm	0.3					
Weight (When Brake is Attached)	Kg	4.7 6.7	8.6 10.6	11 14	14.8 17.5	15.5 19.2	19.9 24.3
Revolving Direction		U→V→W: CW					
Color		Black					
Oil Seal		Embedded					

## Brake Specifications

Table 3.6 CSMF Series Motor Brake Specifications

		<b>CSMF-</b>			
		<b>04B</b>	<b>08B, 15B</b>	<b>25B, 35B</b>	<b>45B</b>
Stiction Torque	N·m Kgf·cm	4.9 or more 50	7.8 or more 80	21.6 or more 220	31.4 or more 320
Rotor Inertia	$\text{Kg}\cdot\text{m}^2 \cdot 10^{-4}$ $\text{Kg}\cdot\text{cm}^2 \cdot s^2$	1.35 1.38	4.7 9.2	8.75 8.9	8.75 8.9
Brake Pull-in Time	ms	80 or less		150 or less	
Brake Release Time	ms	70 or less	35 or less	100 or less	
Release Voltage	VDC	2 or more			
Rated Voltage	VDC	24±2.4			
Rated Current	A	0.59 ± 10%	0.83 ± 10%	0.75 ± 10%	
Allowed Brake Energy: once	J Kgf·m	588 60	1372 140	1470 150	
Overall Allowed Brake Energy	J Kgf·m	$7.8 \times 10^5$ $8 \times 10^4$	$2.9 \times 10^6$ $3 \times 10^5$	$1.5 \times 10^6$ $1.5 \times 10^5$	$2.2 \times 10^6$ $2.2 \times 10^5$

## Speed Torque Curve



**CSMH Series Motor****Common Specifications**

Table 3.7 CSMH Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40°C
Storage Temperature Range	-20 to +80°C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.8 CSMH Series Motor Basic Specifications

		CSMH-						
		05B	10B	15B	20B	30B	40B	50B
Rated Voltage	V	220						
Rated Power	kW	0.5	1	1.5	20	30	40	50
Rated Torque	Kgf·cm N·m	24.3 2.38	49 4.8	73 7.15	97.4 9.54	146 14.31	192 18.8	243 23.8
Maximum Instant Torque	Kgf·cm N·m	61.0 6.0	147 14.4	219 21.5	292 28.5	483 42.9	576 56.4	729 71.4
Rated Revolving Speed	RPM	2000						
Maximum Revolving Speed	RPM	3000						
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	14.3 14.0	26.5 26.0	43.8 42.9	63.3 62.0	96.0 94.1	122.4 120.0	173.5 170.0
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	15.5 15.2	27.8 27.2	45.0 44.1	69.3 67.9	102 100.0	128.6 126.0	179.6 176.0
Power Rate	kW/s	4.0	8.9	11.9	14.7	21.8	29.5	33.4
Mechanical Time Constant	ms	4	2.9	3.1	2.1	2.5	2.2	2.3
Electric Time Constant	ms	15	18	19	26	30	31	

Table 3.8 CSMH Series Motor Basic Specifications

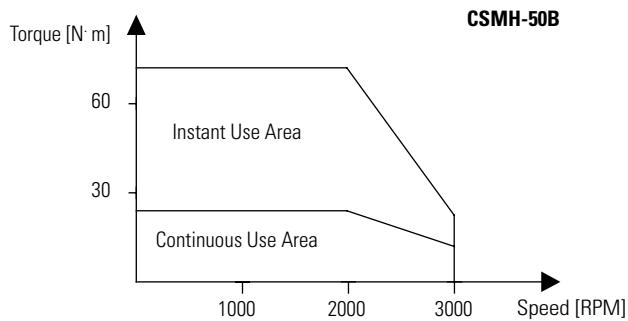
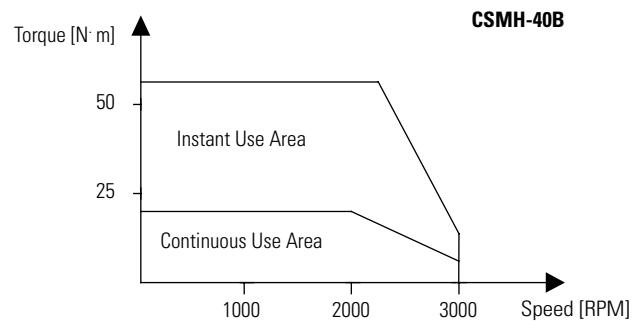
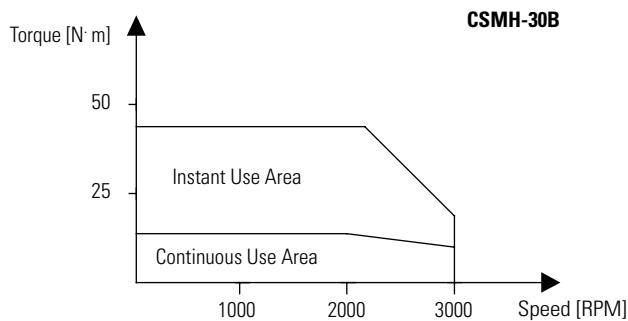
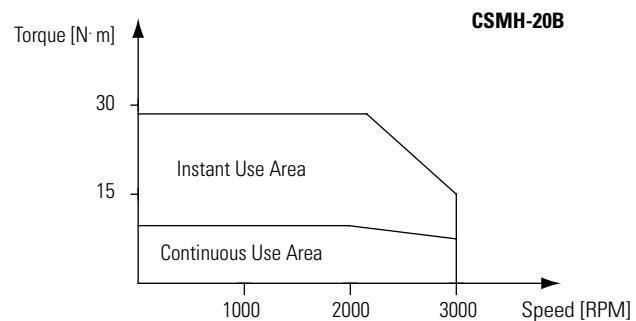
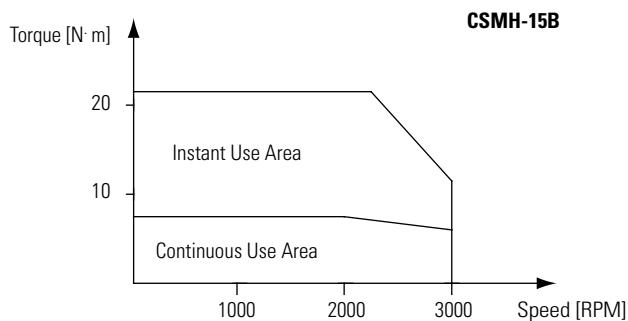
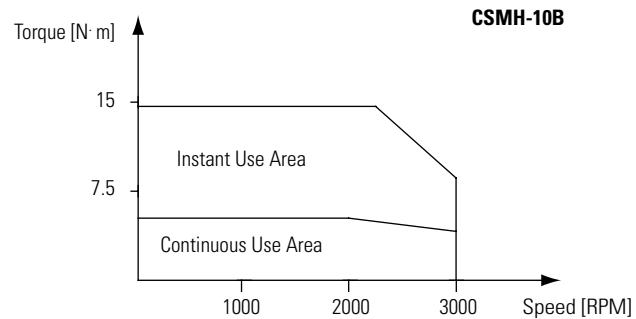
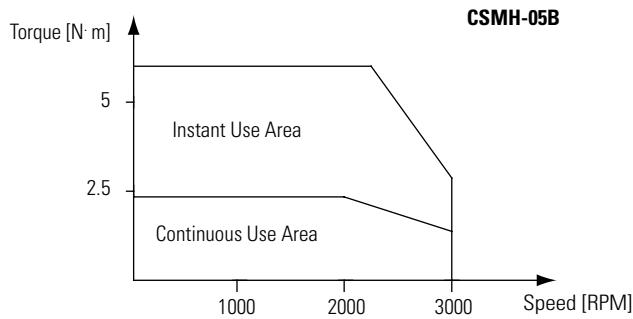
Rated Current	A (rms)	3.2	5.6	9.4	12.3	17.8	23.4	28.0
Maximum Instant Current	A (rms)	11.5	24	40	52	76	100	120
Space in Shaft Direction (Max.)	mm	0.3						
Weight (When Brake is Attached)	Kg	5.3 6.9	8.9 9.5	10.0 11.6	16.0 19.5	18.2 21.7	22.0 25.5	26.7 30.2
Revolving Direction		U→V→W: CW						
Color		Black						
Oil Seal		Embedded						

## Brake Specifications

Table 3.9 CSMH Series Motor Brake Specifications

		<b>CSMH-</b>		
		<b>05B, 10B</b>	<b>15B</b>	<b>20B, 30B, 40B, 50B</b>
Stiction Torque	N·m Kgf·cm	4.9 or more 50	13.7 or more 140	24.5 or more 250
Rotor Inertia	Kg·m <sup>2</sup> ·10 <sup>-4</sup> Kg·cm·s <sup>2</sup>	1.35 1.38		9.0 9.18
Brake Pull-in Time	ms	80 or less	100 or less	80 or less
Brake Release Time	ms	70 or less	50 or less	25 or less
Release Voltage	VDC	2 or more		
Rated Voltage	VDC	24±2.4		
Rated Current	A	0.59 ± 10%	0.79 ± 10%	1.3 ± 10%
Allowed Brake Energy: once	J Kgf·m	588 60	1176 120	1372 140
Overall Allowed Brake Energy	J Kgf·m	7.8 × 10 <sup>5</sup> 8 × 10 <sup>4</sup>	1.5 × 10 <sup>6</sup> 3 × 10 <sup>5</sup>	2.9 × 10 <sup>6</sup> 1.5 × 10 <sup>5</sup>

## Speed Torque Curve



**CSMK Series Motor****Common Specifications**

Table 3.10 CSMK Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40°C
Storage Temperature Range	-20 to +80°C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.11 CSMK Series Motor Basic Specifications

		CSMK-							
		03B	06B	09B	12B	20B	30B	45B	60B
Rated Voltage	V	220							
Rated Power	kW	0.3	0.6	0.9	1.2	2.0	3.0	4.5	6.0
Rated Torque	Kgf·cm N·M	28.9 2.84	58.1 5.7	87.9 8.62	117.2 11.5	195 19.1	289.5 28.4	437.4 42.9	583.2 57.2
Maximum Instant Torque	Kgf·cm N·M	64.3 6.3	146.8 14.4	196.8 19.3	285.5 28.0	448.6 44.0	649.5 63.7	1091 107	1320 129
Rated Revolving Speed	RPM	1000							
Maximum Revolving Speed	RPM	2000							
Rotor Inertia (When Brake is Attached)	Kg·m <sup>2</sup> ·10 <sup>-4</sup>	3.9 5.1	6.17 7.45	11.2 12.3	30.4 36.2	35.5 41.4	55.7 61.7	80.9 89.2	99 108
Power Rate (When Brake is Attached)	kW/s	20.7	52.7	66.3	43.3 36.3	103 88.3	145 131	228 207	331 304
Mechanical Time Constant (When Brake is Attached)	ms	1.4	0.81	0.88	1 1.2	0.97 1.1	0.74 0.82	0.70 0.78	0.9 0.98
Electric Time Constant	ms	14	17	20	26	25	30	31	33
Rated Current	A (rms)	3	5.7	7.6	11.6	18.5	24	33	47

Table 3.11 CSMK Series Motor Basic Specifications

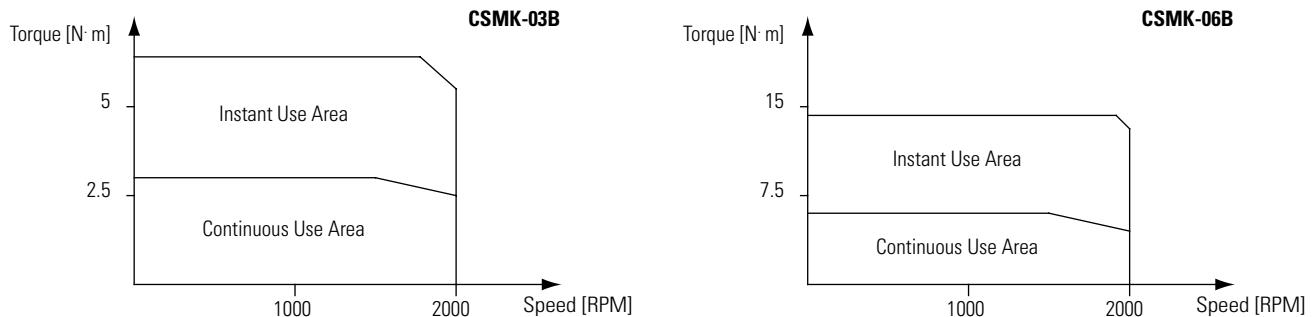
Maximum Instant Current	A (rms)	11	21	24	40	60	80	118	155
Space in Shaft Direction (Max.)	mm	0.3							
Weight (When Brake is Attached)	Kg	5.1 6.7	6.8 8.4	8.5 10	15.5 19	17.5 21	25 28.5	34 39.5	41 46.5
Revolving Direction	U→V→W: CW								
Color	Black								
Oil Seal	Embedded								

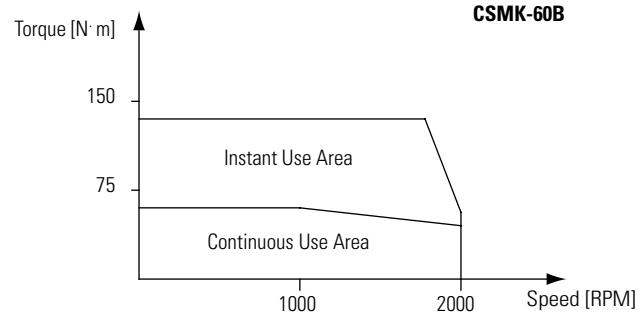
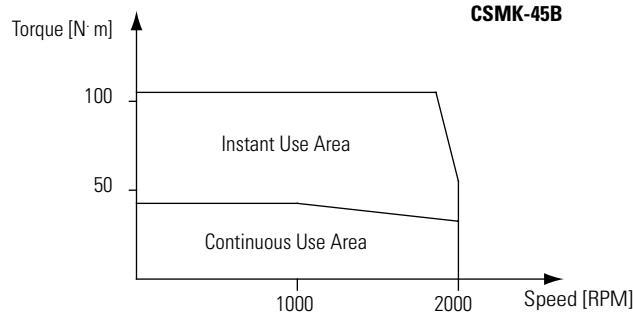
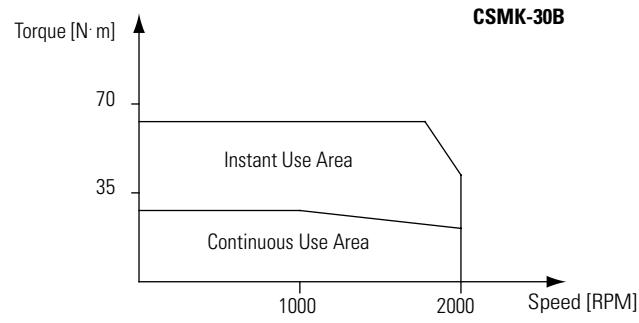
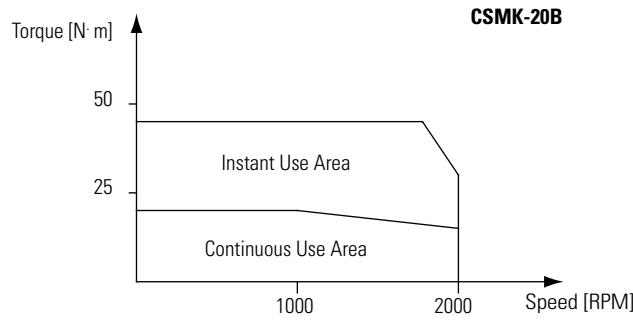
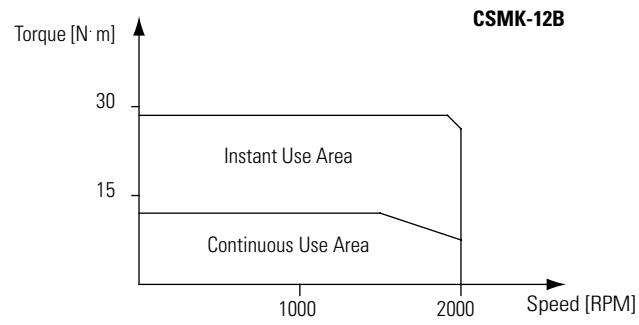
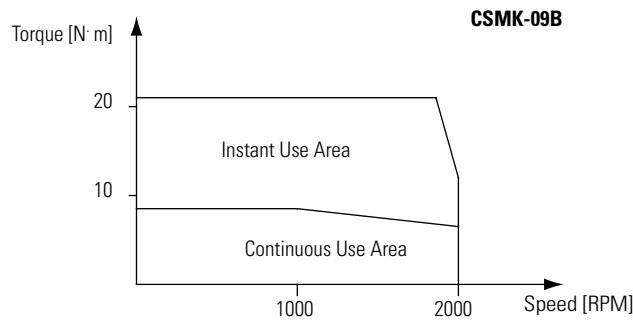
## Brake Specifications

Table 3.12 CSMK Series Motor Brake Specifications

		CSMK-			
		03B	06B, 09B	12B, 20B	30B, 45B, 60B
Stiction Torque	N·m Kgf·cm	4.9 or more 50	11.8 or more 120	24.5 or more 250	58.8 or more 600
Rotor Inertia	Kg·m <sup>2</sup> ·10 <sup>-4</sup> gf·cm·s <sup>2</sup>	1.35 1.38		4.7 4.7	
Brake Pull-in Time	ms	80 or less			150 or less
Brake Release Time	ms	70 or less	15 or less	25 or less	50 or less
Release Voltage	VDC	2 or more			
Rated Voltage	VDC	24 ± 2.4			
Rated Current	A	0.59 ± 10%	0.81 ± 10%	1.3 ± 10%	1.4 ± 10%
Allowed Brake Energy	J	60	40	140	
Overall Allowed Brake Energy	J	8 × 10 <sup>4</sup>	5 × 10 <sup>4</sup>	3 × 10 <sup>5</sup>	3 × 10 <sup>4</sup>

## Speed Torque Curve





**CSMQ Series Motor****Common Specifications**

Table 3.13 CSMQ Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.14 CSMQ Series Motor Basic Specifications

		<b>CSMQ-</b>		
		<b>01B</b>	<b>02B</b>	<b>04B</b>
Rated Voltage	V	220		
Rated Power	kW	0.1	0.2	0.4
Rated Torque	Kgf·cm N·M	3.24 0.318	6.5 0.637	13 1.274
Maximum Instant Torque	Kgf·cm N·M	9.7 0.95	19.5 1.911	39 3.822
Rated Revolving Speed	RPM	3000		
Maximum Revolving Speed	RPM	5000		
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.09 0.09	0.35 0.34	0.65 0.64
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.12 0.12	0.43 0.42	0.73 0.72
Power Rate (When Brake is Attached)	kW/s	11.4	11.8	25.5
Mechanical Time Constant	ms	0.95	0.79	0.59
Electric Time Constant	ms	2.9	5.6	6.6

**Table 3.14 CSMQ Series Motor Basic Specifications**

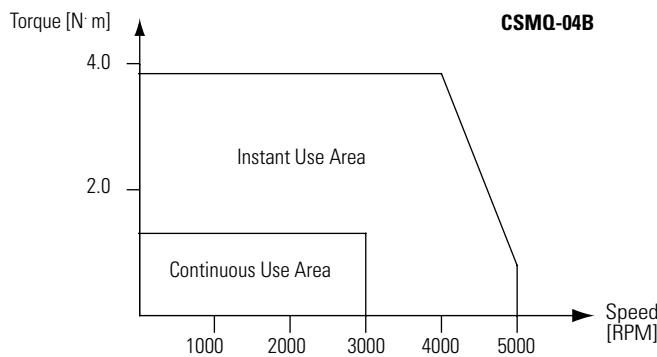
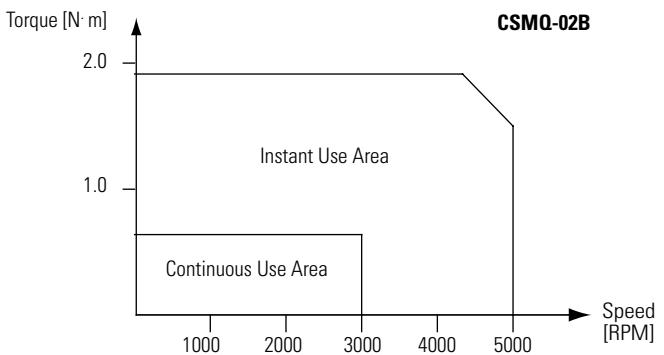
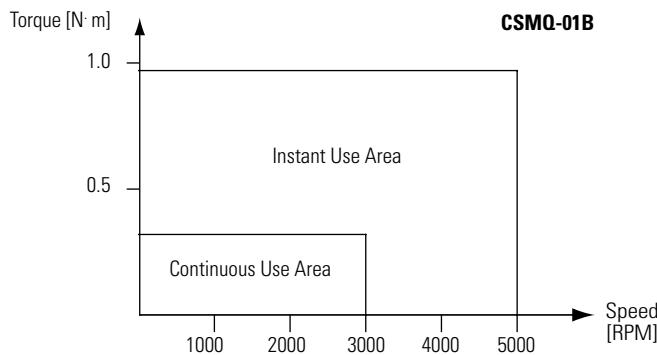
Rated Current	A (rms)	1.0	1.6	2.5
Maximum Instant Current	A (rms)	4.3	6.8	10.5
Space in Shaft Direction (Max.)	mm	0.3		
Weight	Kg	0.65	1.3	1.8
Revolving Direction	U→V→W: CW			
Color	Black			
Oil Seal	Optional Specifications			

## Brake Specifications

**Table 3.15 CSMQ Series Motor Brake Specifications**

		<b>CSMQ-</b>	
		<b>01B</b>	<b>02B, 04B</b>
Stiction Torque	N·m Kgf·cm	0.29 or more 3	1.27 or more 13
Rotor Inertia	Kg·m <sup>2</sup> ·10 <sup>-4</sup> gf·cm·s <sup>2</sup>	0.03 0.03	0.09 0.09
Brake Pull-in Time	ms	50 or less	60 or less
Brake Release Time	ms	15 or less	
Release Voltage	VDC	1 or more	
Rated Voltage	VDC	24 ± 2.4	
Rated Current	A	0.29	0.41
Allowed Brake Energy	J Kgf·m	137 14	196 20
Overall Allowed Brake Energy	J Kgf·m	44.1 × 10 <sup>3</sup> 4500	147 × 10 <sup>3</sup> 15000

### Speed Torque Curve



**CSMR Series Motor****Common Specifications**

Table 3.16 CSMR Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.17 CSMR Series Motor Basic Specifications

		<b>CSMR-</b>		
		<b>01B</b>	<b>02B</b>	<b>04B</b>
Rated Voltage	V	220		
Rated Power	kW	0.1	0.2	0.4
Rated Torque	Kgf·cm N·M	3.25 0.318	6.5 0.64	13 1.27
Maximum Instant Torque	Kgf·cm N·M	9.7 0.95	19.5 1.91	39 3.82
Rated Revolving Speed	RPM	3000		
Maximum Revolving Speed	RPM	5000		
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.09 0.09	0.30 0.30	0.57 0.56
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.19 0.19	0.53 0.53	0.80 0.79
Power Rate	kW/s	11.5	13.8	29.1
Mechanical Time Constant	ms	1.2	1.0	0.6
Electric Time Constant	ms	2.5	3.2	4.8

Table 3.17 CSMR Series Motor Basic Specifications

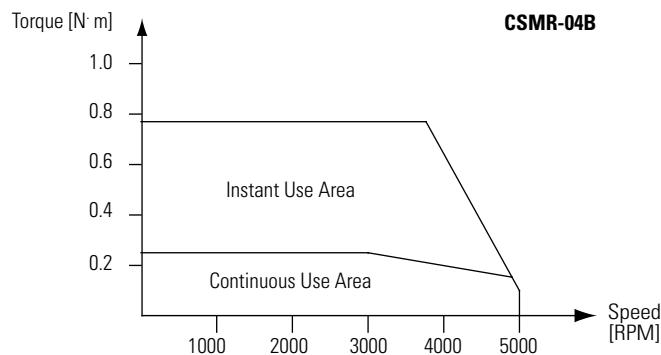
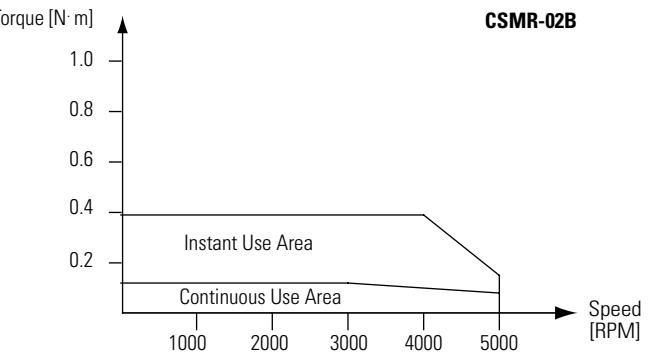
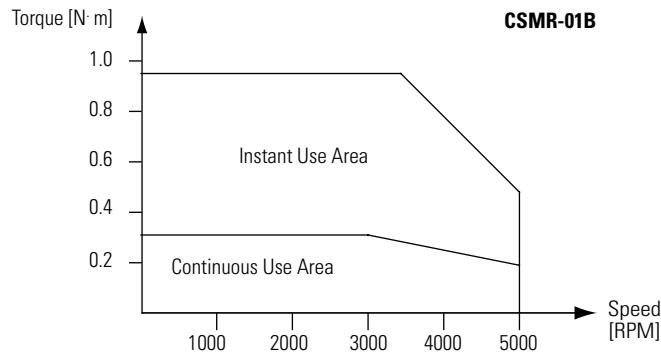
Shaft Stiction Torque (Max.)	Kgf.cm	0.2	0.6	
Rated Current	A (rms)	0.9	1.5	2.7
Maximum Instant Current	A (rms)	2.5	4.2	7.8
Space in Shaft Direction (Max.)	mm	0.2		
Weight (When Brake is Attached)	Kg	0.6 0.9	1.1 1.9	1.6 2.4
Revolving Direction		U→V→W: CW		
Color		Black		
Oil Seal		Optional Specifications		

## Brake Specifications

Table 3.18 CSMR Series Motor Brake Specifications

		CSMR-	
		01B	02B, 04B
Stiction Torque	N·m Kgf·cm	0.32 3.25	1.27 13
Brake Pull-in Time	ms	40 or less	80 or less
Brake Release Time	ms	20 or less	50 or less
Rated Voltage	VDC	24 ± 2.4	
Power Consumption	W	9	9.5

## Speed Torque Curve



**CSMS Series Motor****Common Specifications**

Table 3.19 CSMS Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.20 CSMS Series Motor Basic Specifications

		CSMS-								
		10B	15B	20B	25B	30B	35B	40B	45B	50B
Rated Voltage	V	220								
Rated Power	kW	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Rated Torque	Kgf·cm N·M	32.4 3.18	48.7 4.77	64.9 6.36	81 7.94	97.3 9.54	113 11.07	129 12.64	146 14.31	162 15.88
Maximum Instant Torque	Kgf·cm N·M	97 9.51	146 14.31	195 19.11	243 23.81	292 28.62	339 33.22	387 37.93	483 42.92	486 47.63
Rated Revolving Speed	RPM	300								
Maximum Revolving Speed	RPM	5000						4500		
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	1.72 1.69	2.64 2.59	3.53 3.46	4.40 4.31	6.91 6.77	8.06 7.90	13.0 12.7	15.6 115.3	18.2 17.8
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	1.92 1.88	2.90 2.84	3.89 3.81	4.84 4.74	7.60 7.45	8.88 8.69	14.4 14.1	17.3 17.0	20.1 19.7
Power Rate	kW/s	60	88	117	146	134	155	125	134	140
Mechanical Time Constant	ms	0.78	0.54	0.53	0.52	0.46	0.45	0.51	0.45	0.46
Electric Time Constant	ms	6.7	10	10.8	11	17	20			
Rated Current	A (rms)	7.2	9.4	13	15.9	18.6	21.6	24.7	28	28.5

Table 3.20 CSMS Series Motor Basic Specifications

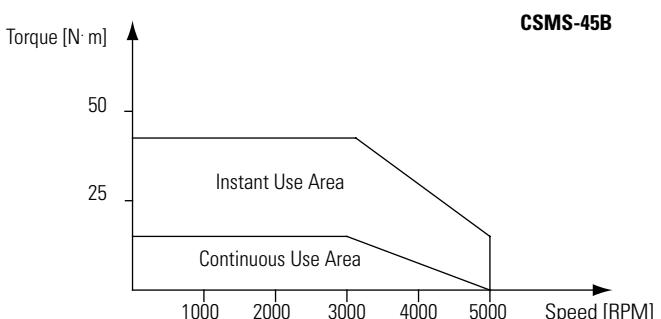
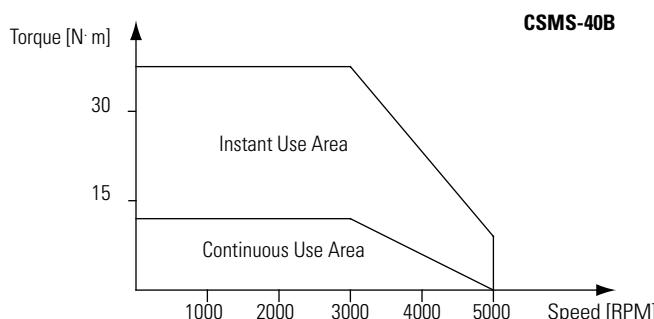
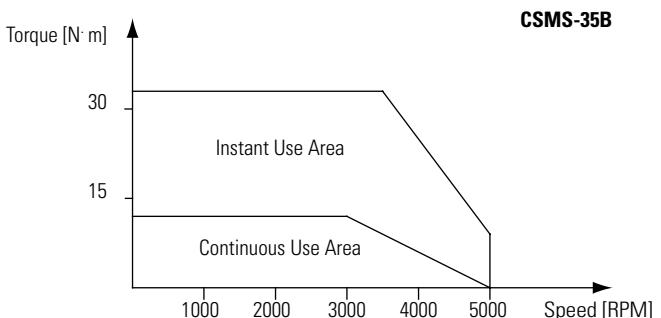
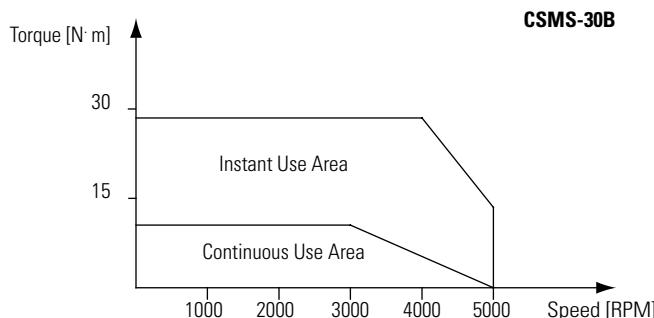
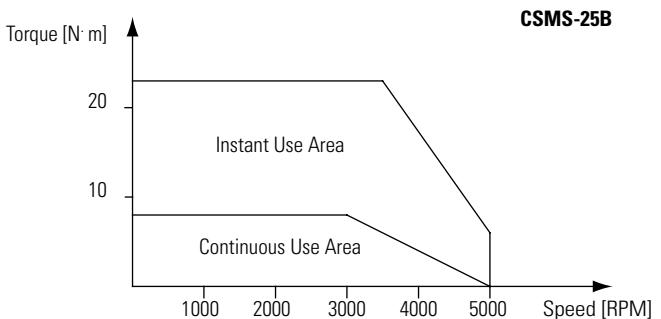
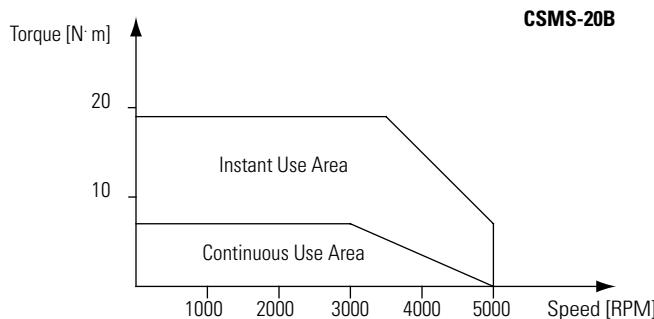
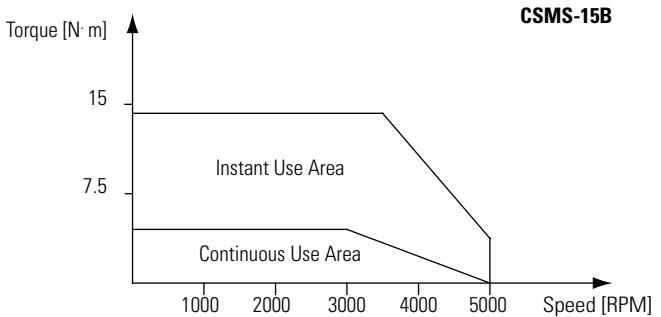
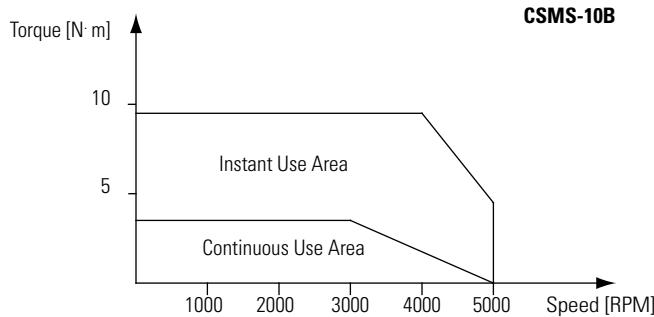
Maximum Instant Current	A (rms)	30	40	560	68	80	92	105	118	120
Space in Shaft Direction (Max.)	mmX	0.3								
Weight (When Brake is Attached)	Kg	4.5 5.1	5.1 6.5	6.5 7.9	7.5 8.9	9.3 11.0	10.9 12.6	12.9 14.8	15.1 17.0	17.3 19.2
Revolving Direction	U→V→W: CW									
Color	Black									
Oil Seal	Embedded									

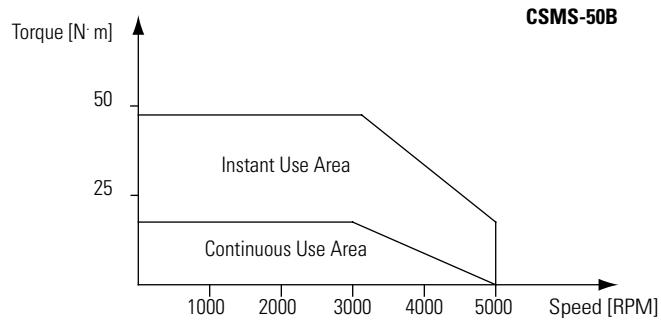
## Brake Specifications

Table 3.21 CSMS Motor Brake Specifications

		<b>CSMS-</b>			
		<b>10B</b>	<b>15B, 25B</b>	<b>30B, 35B</b>	<b>40B, 50B</b>
Stiction Torque	N·m Kgfcm	4.9 or more 50	7.8 or more 80	11.8 or more 120	16.1 or more 165
Rotor Inertia	$\text{Kg}\cdot\text{m}^2 \cdot 10^{-4}$ $\text{Kg}\cdot\text{cm}^2 \cdot \text{s}^2$	0.25 0.26	0.33 0.33	1.35 1.38	
Brake Pull-in Time	ms	50 or less		80 or less	110 or less
Brake Release Time	ms	15 or less			50 or less
Release Voltage	VDC	2 or more			
Rated Voltage	VDC	24 ± 2.4			
Rated Current	A	0.74 ± 10%	0.81 ± 10%	0.90 ± 10%	
Allowed Brake Energy: once	J Kgf·m	392 40			1470 150
Overall Allowed Brake Energy	J Kgf·m	$2.0 \times 10^5$ $2 \times 10^4$	$4.9 \times 10^5$ $5 \times 10^4$	$4.9 \times 10^6$ $5 \times 10^5$	$2 \times 10^6$ $2.2 \times 10^5$

## Speed Torque Curve





**CSMT Series Motor****Common Specifications**

Table 3.22 CSMT Series Motor Common Specifications

Item	Specifications
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-10 to +80 °C
Insulation Resistance	500VDC 100 MΩ
Number of Poles	8 Poles
Insulation Grade	F Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	20 to 85% (Non-condensing)

**Basic Specifications**

Table 3.23 CSMT Series Motor Basic Specifications

		CSMT-							
		A3B	A5B	01B	02B	04B	06B	08B	10B
Rated Voltage	V	220							
Rated Power	W	30	50	100	200	400	600	750	950
Rated Torque	Kgf·cm N·m	0.97 0.095	1.62 0.159	3.25 0.318	6.5 0.64	13.0 1.27	19.5 1.91	24.4 2.39	30.9 3.0
Maximum Instant Torque	Kgf·cm N·m	2.9 0.29	4.9 0.48	9.7 0.95	19.5 1.91	39 3.82	58.5 5.73	73 7.16	92.6 9.1
Rated Revolving Speed	RPM	3000							
Maximum Revolving Speed	RPM	5000							
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.01 0.01	0.02 0.02	0.03 0.03	0.18 0.18	0.34 0.34	1.00 0.98	1.10 1.08	1.56 1.53
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.04 0.04	0.05 0.05	0.06 0.06	0.28 0.28	0.44 0.44	1.24 1.22	1.34 1.32	1.66 1.63
Power Rate	kW/s	9.2	12.9	34.5	23.0	48.7	37.3	51.3	56.4
Mechanical Time Constant	ms	1.1	0.9	0.6	0.9	0.7	0.6	0.6	0.6
Electric Time Constant	ms	0.8	1.1	1.6	3.2	3.5	6.0	4.8	5.6
Shaft Stiction Torque (Max.)	Kgf·cm	0.2			0.4		0.8		1.5
Rated Current	A (rms)	0.3	0.6	1.1	1.7	3.3	4.4	5.0	5.4
Maximum Instant Current	A (rms)	0.9	1.5	3.0	4.9	3.2	9.6	14.1	15.3
Space in Shaft Direction (Max.)	mm	0.2							

Table 3.23 CSMT Series Motor Basic Specifications

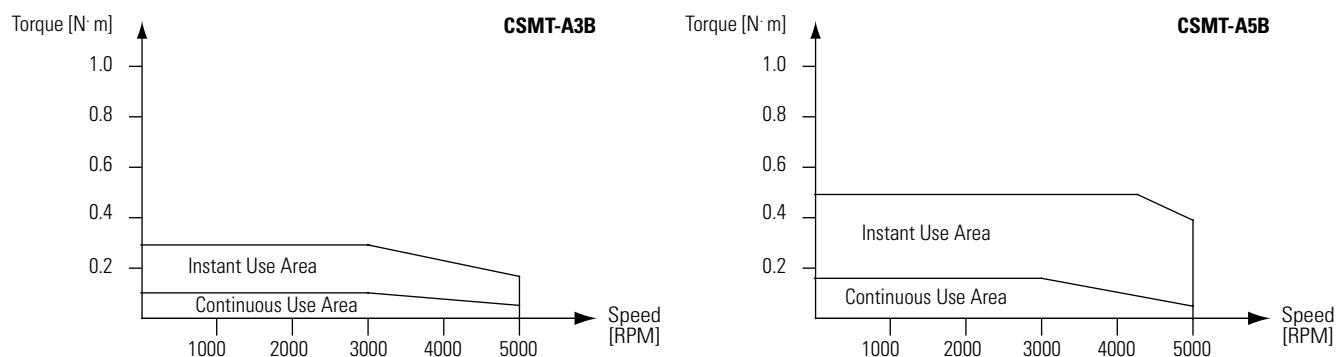
Weight (When Brake is Attached)	Kg	0.3 0.5	0.4 0.6	0.5 0.7	0.9 1.4	1.3 1.8	2.2 3.1	2.5 3.4	3.7 4.5
Revolving Direction	U→V→W: CCW								
Color	Black								
Oil Seal	Optional Specifications								

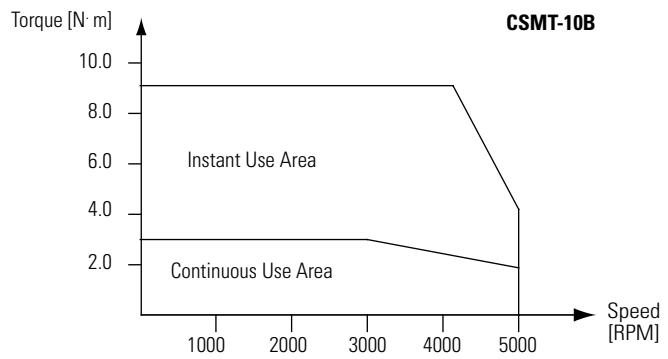
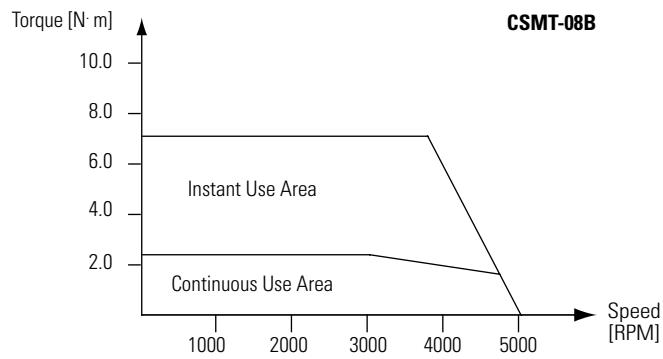
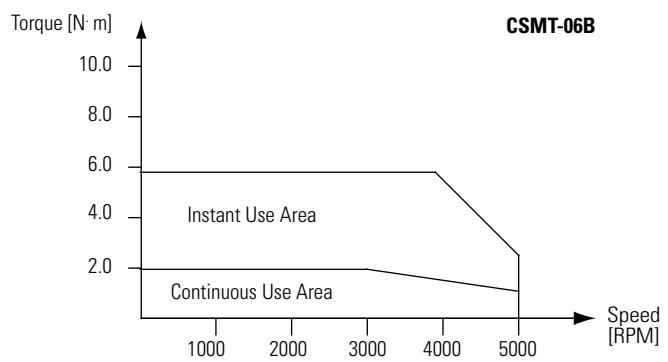
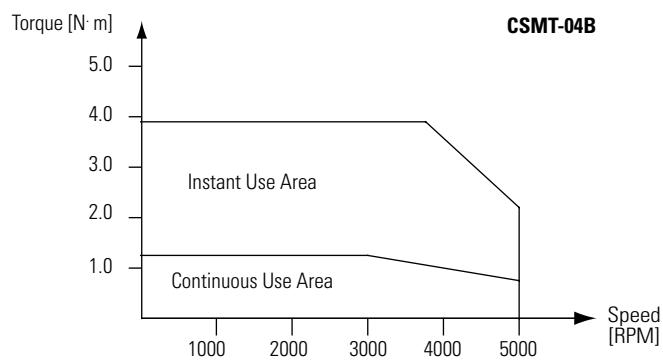
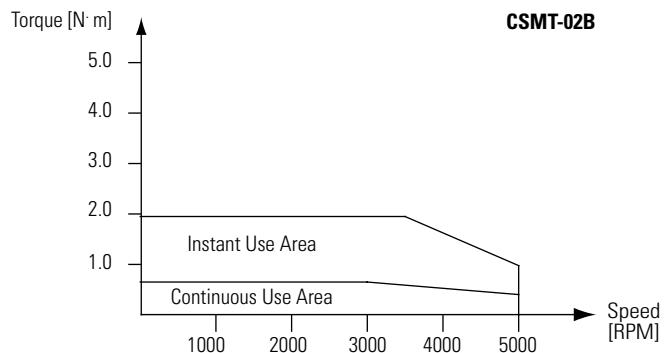
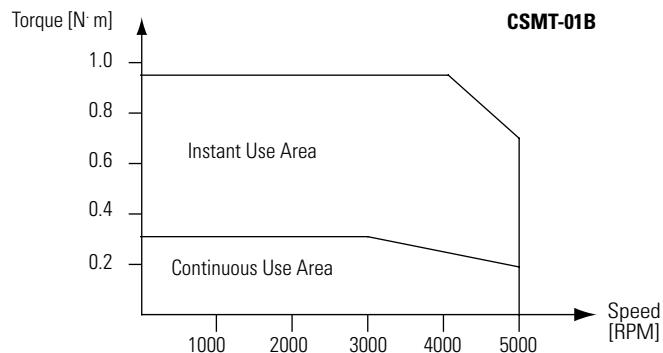
## Brake Specifications

Table 3.24 CSMT Series Motor Brake Specifications

		CSMT-								
		A3B	A5B	01B	02B	04B	06B	08B	10B	15B
Stiction Torque	N·m Kgf·cm	0.32 3.25			1.27 13		2.55 26			9.3 94
Brake Pull-in Time	ms	40			50		80			20
Brake Release Time	ms	20					50			90
Rated Voltage	VDC	24±2.4								
Power Consumption	W	5			9		9.5			17.9

## Speed Torque Curve





**CSMZ Series Motor****Common Specifications**

Table 3.25 CSMZ Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	49 m/s <sup>2</sup>
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
When Brake is Attached	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Basic Specifications**

Table 3.26 CSMZ Series Motor Basic Specification

		CSMZ-							
		A3D	A5D	01B	02B	04B	08B		
Rated Voltage	V	110/220		220					
Rated Power	W	30	50	100	200	400	750		
Rated Torque	Kgf·cm N·m	0.97 0.095	1.62 0.159	3.24 0.318	6.5 0.637	13 1.274	24.3 2.38		
Maximum Instant Torque	Kgf·cm N·m	2.9 0.284	4.9 0.48	9.7 0.95	19.5 1.911	39 3.822	73 7.154		
Rated Revolving Speed	RPM	3000							
Maximum Revolving Speed	RPM	5000						4500	
Rotor Inertia	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.016 0.016	0.026 0.025	0.063 0.062	0.17 0.17	0.37 0.36	1.34 1.31		
Rotor Inertia (When Brake is Attached)	gf·cm·s <sup>2</sup> Kg·m <sup>2</sup> ·10 <sup>-4</sup>	0.020 0.020	0.031 0.030	0.067 0.066	0.20 0.20	0.40 0.39	1.42 1.39		
Power Rate	kW/s	5.8	9.9	16.3	24.4	44.8	43.2		
Mechanical Time Constant	ms	1.8	1.2	0.77	0.63	0.54	0.45		
Electric Time Constant	ms	0.6	0.67	0.88	3.4	3.5	7.4		
Rated Current	A (rms)	1.0	1.0	1.0	1.6	2.5	4.3		

Table 3.26 CSMZ Series Motor Basic Specification

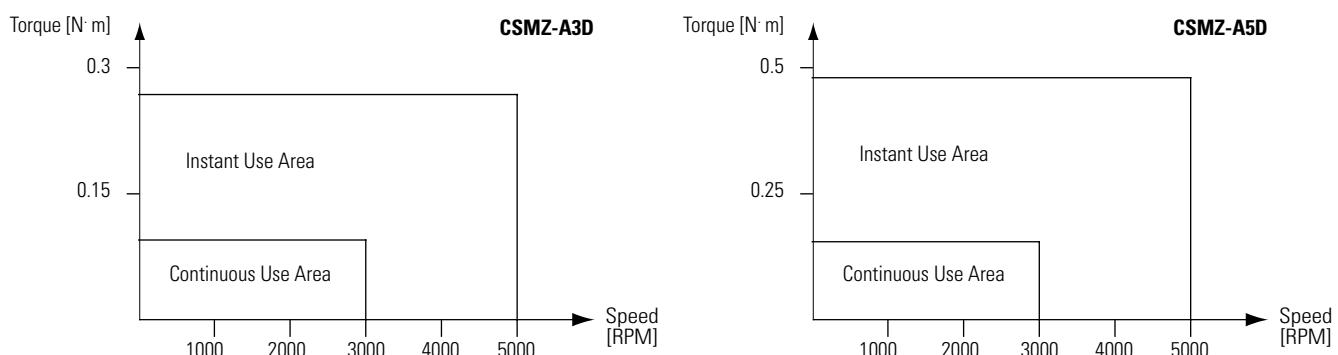
Maximum Instant Current	A (rms)	4.3	4.3	4.3	6.9	10.5	18.3
Space in Shaft Direction (Max.)	mm	0.3					
Weight	Kg	0.27	0.34	0.56	1.0	1.6	3.2
Revolving Direction	U→V→W: CW						
Color	Black						
Oil Seal	Optional Specifications						

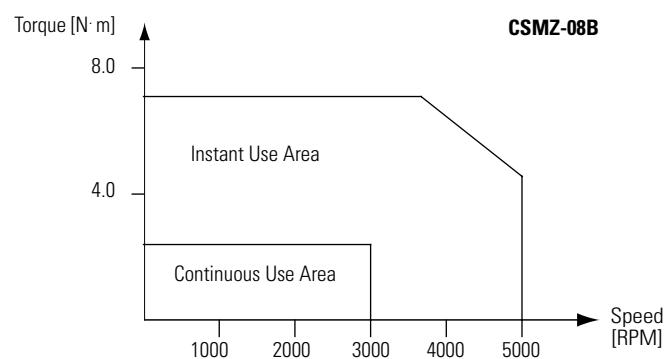
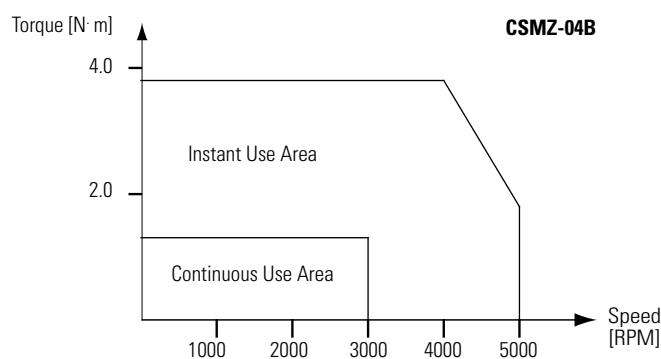
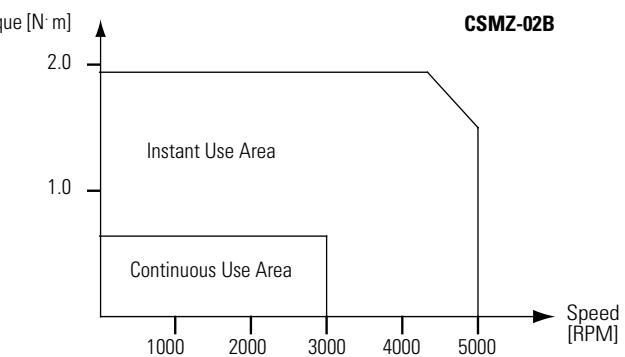
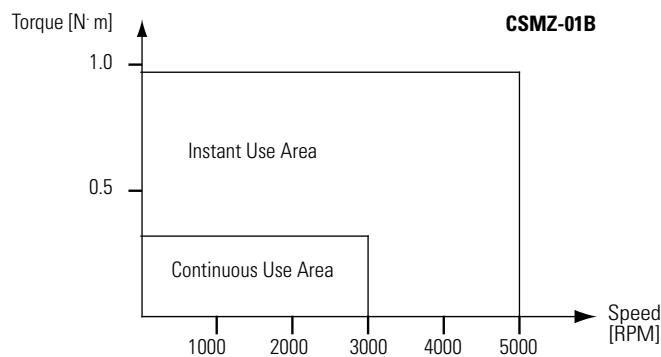
## Brake Specifications

Table 3.27 CSMZ Series Motor Brake Specifications

		CSMZ-					
		A3D	A5D	01B	02B	04B	08B
Stiction Torque	N·m Kgf·cm	0.29 or more 3		1.27 or more 13		2.45 or more 25	
Rotor Inertia	Kg·m <sup>2</sup> ·10 <sup>-4</sup> gf·cm·s <sup>2</sup>	0.003		0.03		0.09	
Brake Pull-in Time	ms	25 or less		50 or less		60 or less	
Brake Release Time	ms	20 or less		15 or less		15 or less	
Release Voltage	VDC	1 or more					
Rated Voltage	VDC	24 ± 2.4					
Rated Current	A	0.26		0.36		0.43	
Allowed Brake Energy	J Kgfm	39.2 4		137 14		196 20	
Overall Allowed Brake Energy	J Kgfm	$4.9 \times 10^3$ 500		$44.1 \times 10^3$ 4500		$147 \times 10^3$ 15000	

## Speed Torque Curve





**RSMD Series Motor****Common Specifications**

Table 3.28 RSMD Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.29 RSMD Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>			
		<b>RSMD-08B</b>	<b>RSMD-10B</b>	<b>RSMD-35B</b>	<b>RSMD-40B</b>
Stiction Torque	N·m	12	16.5	25	
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	0.45	1.2	4.7	
Armature Absorption Time	ms	100	110	160	
Armature Release Time	ms	20	50	75	
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)	2 (at 20 °C)	
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4	24 ± 2.4	
Excited Current (cool down)	DC, A	0.83	0.876	1.287	

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.

- Separate power is needed for brake. (No polarity assigned)

## Basic Specifications

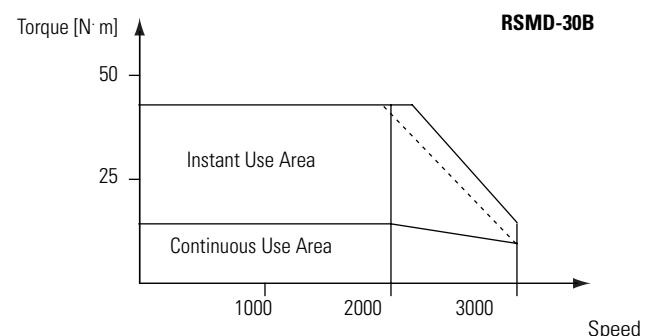
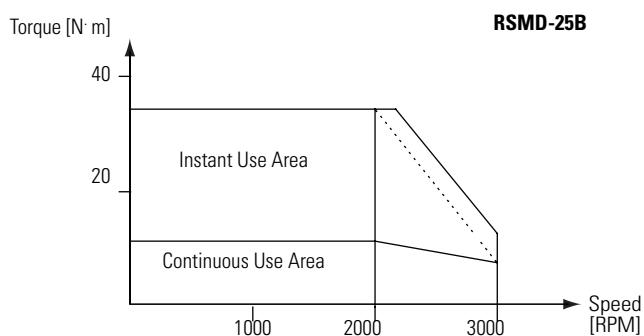
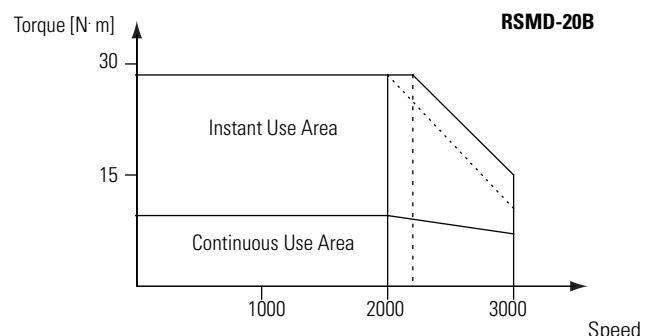
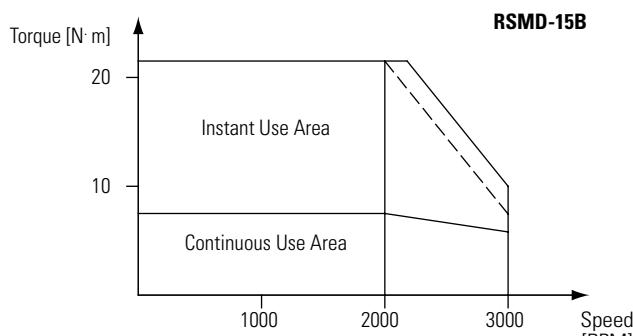
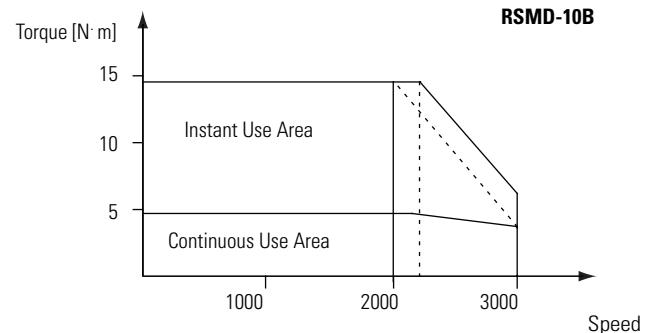
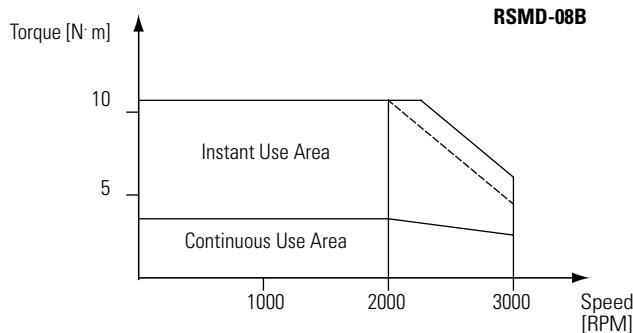
Table 3.30 RSMD Series Motor Basic Specification

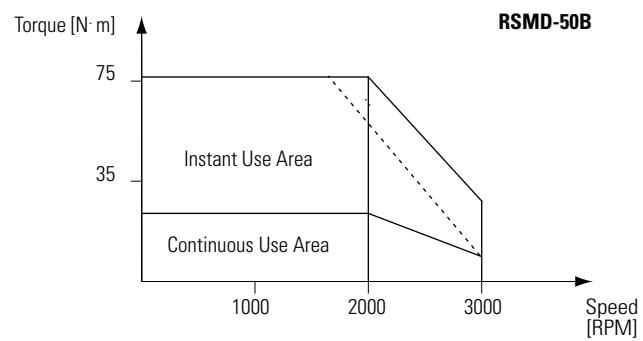
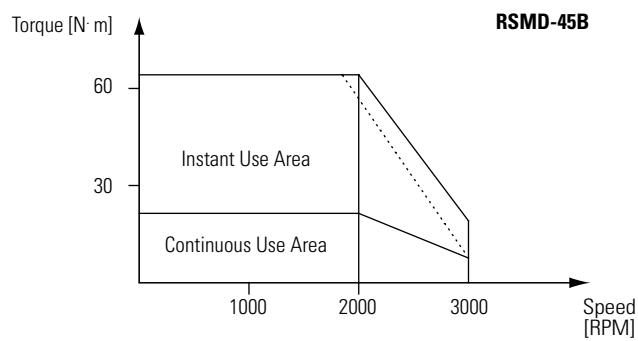
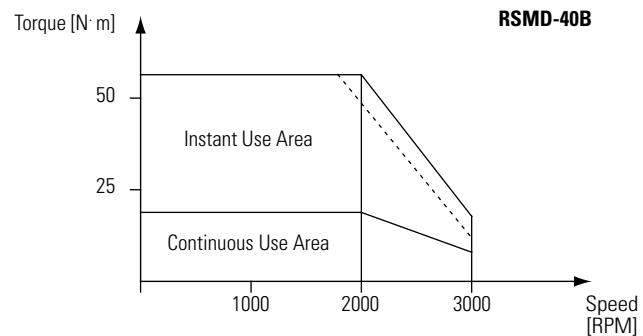
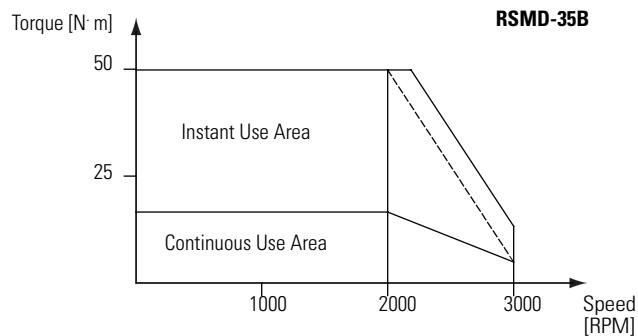
<b>Item</b>	<b>Unit</b>	<b>RSMD-</b>									
		<b>08B</b>	<b>10B</b>	<b>15B</b>	<b>20B</b>	<b>25B</b>	<b>30B</b>	<b>35B</b>	<b>40B</b>	<b>45B</b>	<b>50B</b>
Flange Size	mm	120	130	130	130	130	130	180	180	180	180
Rated Output	kW	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Rated	%	100									
Rated Revolving Speed	r/min	2000									
Maximum Revolving Speed	r/min	3000									
Rated Torque	N·m	3.58	4.77	7.15	9.55	11.9	14.3	16.7	19.1	21.5	23.9
	kgf·cm	36.5	48.6	72.9	97.4	121	146	170.4	195	219	244
Instant Maximum Torque	N·m	10.85	14.4	21.5	28.5	35.5	42.9	50.0	56.4	64.3	71.4
	kgf·cm	110.7	147	219.2	292	363	437	510.2	576	657	729
Rated Current	A(rms)	5.0	5.8	9.4	12.3	14	17.8	19.6	23.4	26.2	28.0
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	2.67	4.82	7.0	9.3	11.5	13.8	31.49	33.5	37.7	45.5
	gf·cm·sec. <sup>2</sup>	2.72	4.92	7.1	9.5	11.7	14.1	32.13	34.2	38.5	46.4
(Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	3.12	6.1	8.3	10.5	12.8	15.0	36.19	38.7	42.9	50.7
	gf·cm·sec. <sup>2</sup>	3.18	6.2	8.5	10.7	13.1	15.3	36.93	39.5	43.8	51.7
Electric Time Constant	ms	15.76	18	22	21	21	20	28.27	28.0	30	32
Mechanical Time Constant	ms	0.56	0.62	0.59	0.53	0.50	0.48	0.84	0.83	0.8	0.74
	ms (Brake)	0.65	0.78	0.697	0.60	0.56	0.52	0.97	0.96	0.9	0.83
Power Rate	kW/s	49.1	48.8	74.6	100.0	124.9	151.2	90.66	111	124.8	128.3
	kW/s (Brake)	41.94	38.6	62.9	88.6	112.2	139.4	78.9	96	109.6	115.2
Instant Maximum Current	A (o-p)	21.2	24	40	52	60	76	79.3	100	111	120
Insulation Grade	-	F									
Vibration Grade	-	V-15									
Paint Color	-	Black									
Mass	kg	4.8	6.8	8.5	10.6	12.8	14.6	16.2	19.75	21.5	25.0
	kg (Brake)	6.1	8.7	10.1	12.5	14.7	16.5	18.7	23.25	25	28.5
Operation Power Voltage	V AC	200/220									

- Characteristics above are representative figures of two-phase sine wave operation.

- Corresponding to IP65 (When an outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

## Speed Torque Curve





**RSMF Series Motor****Common Specifications**

Table 3.31 RSMF Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.32 RSMF Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>		
		<b>RSMF-04B</b>	<b>RSMF-08B</b>	<b>RSMF-25B</b>
<b>RSMF-15B</b>	<b>RSMF-35B</b>	<b>RSMF-45B</b>		
Stiction Torque	N·m	16.5	25	45
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	1.2	4.7	11
Armature Absorption Time	ms	110	160	220
Armature Release Time	ms	50	75	100
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)	2 (at 20 °C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.876	1.287	0.797

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.
- Separate power is needed for brake. (No polarity assigned)

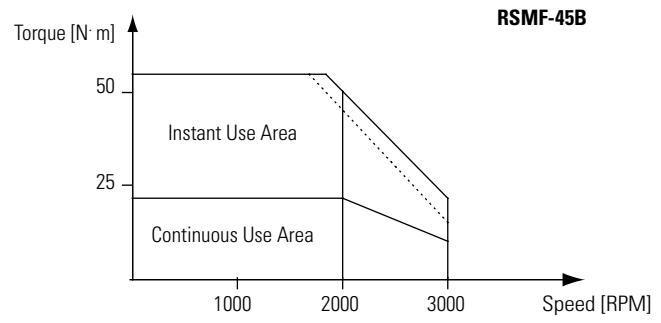
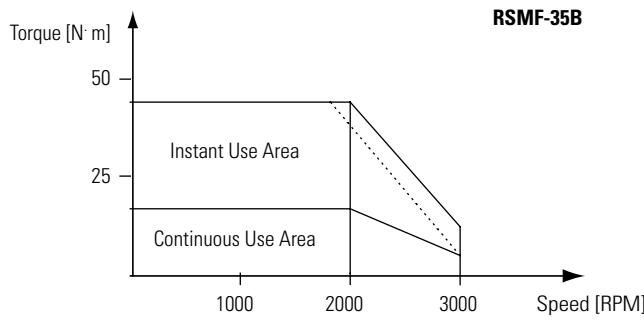
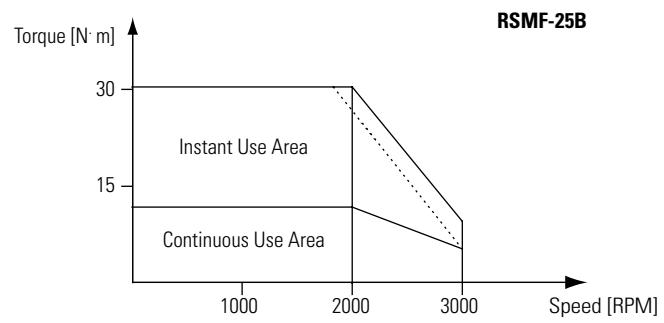
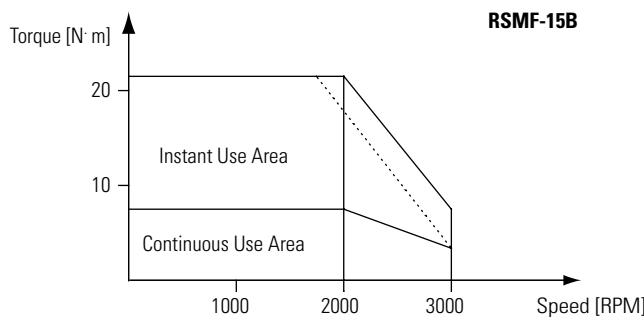
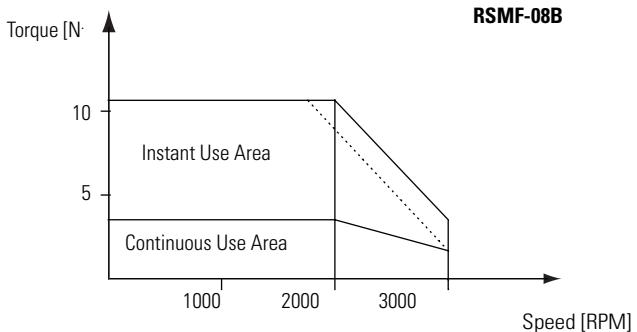
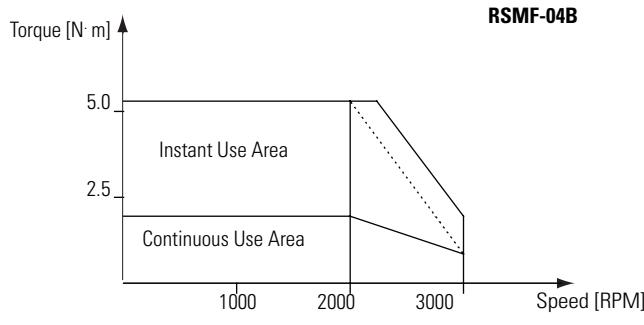
## Basic Specifications

Table 3.33 RSMF Series Motor Basic Specification

<b>Item</b>	<b>Unit</b>	<b>RSMF-</b>					
		<b>04B</b>	<b>08B</b>	<b>15B</b>	<b>25B</b>	<b>35B</b>	<b>45B</b>
Flange Size	mm	130	180	180	220	220	220
Rated Output	kW	0.4	0.75	1.5	2.5	3.5	4.5
Rated	%	100					
Rated Revolving Speed	r/min	2000					
Maximum Revolving Speed	r/min	3000					
Rated Torque	N·m	1.91	3.58	7.16	11.9	16.7	21.5
	kgf·cm	19.5	36.5	73.0	121	170	219
Instant Maximum Torque	N·m	5.3	10.7	21.5	30.4	44.1	54.9
	kgf·cm	54	109	219	310	450	560
Rated Current	A <sub>(rms)</sub>	2.8	5.0	9.5	13.4	20.0	23.5
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	2.13	9.6	18.0	33.7	42.6	58.7
	gf·cm·sec. <sup>2</sup>	2.17	9.8	18.4	34.4	43.5	59.9
Rotator Inertia (Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	3.42	14.8	23.2	45.3	54.3	70.3
	gf·cm·sec. <sup>2</sup>	3.49	15.1	23.7	46.2	55.4	71.7
Electric Time Constant	ms	14	21	25	35	41	41
Mechanical Time Constant	ms	1.1	2.1	1.4	1.2	1.0	0.8
	ms(Brake)	1.8	3.2	1.8	1.6	1.3	1.0
Power Rate	kW/s	17.5	13.6	29.0	42.6	66.5	80.1
	kW/s (Brake)	10.9	8.8	22.5	31.7	52.2	66.9
Instant Maximum Current	A (o-p)	11.9	21.2	40.3	56.9	84	99.7
Insulation Grade	-	F					
Vibration Grade	-	V-15					
Paint Color	-	Black					
Mass	kg	4.7	8.6	11.0	14.8	15.5	19.9
	kg (Brake)	6.7	10.6	14.0	17.5	19.2	24.3
Operation Power Voltage	V AC	200/220					

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

## Speed Torque Curve



**RSMH Series Motor****Common Specifications**

Table 3.34 RSMH Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.35 RSMH Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>	
		<b>RSMH-05B</b>	<b>RSMH-20B</b>
Stiction Torque	N·m	16.5	25
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	1.2	4.7
Armature Absorption Time	ms	110	160
Armature Release Time	ms	50	75
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.876	1.287

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5° degrees or less.
- Separate power is needed for brake. (No polarity assigned)

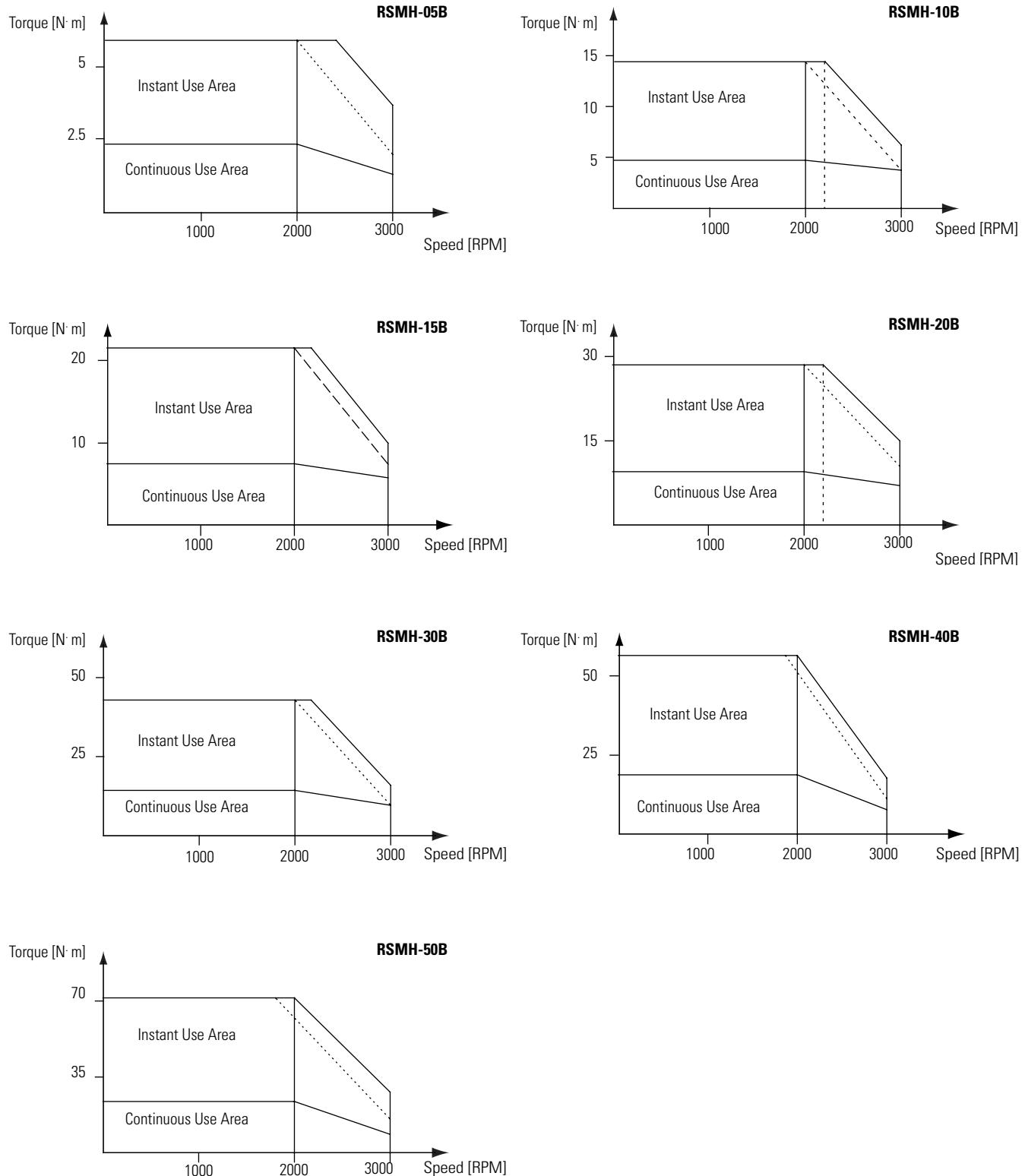
## Basic Specifications

Table 3.36 RSMH Series Motor Basic Specifications

Item	Unit	RSMH-						
		05B	10B	15B	20B	30B	40B	50B
Flange Size	mm	130	130	130	180	180	180	180
Rated Output	kW	0.5	1.0	1.5	2.0	3.0	4.0	5.0
Rated	%	100						
Rated Revolving Speed	r/min	2000						
Maximum Revolving Speed	r/min	3000						
Rated Torque	N·m	2.39	4.77	7.15	9.55	14.32	19.1	23.87
	kgf·cm	24.4	48.6	72.9	97.4	146	195	243
Instant Maximum Torque	N·m	6.0	14.4	21.5	28.5	42.9	56.4	71.4
	kgf·cm	61	147	219.2	291	437	576	729
Rated Current	A (rms)	3.2	5.6	9.4	12.3	17.8	23.4	28.0
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	14.0	26.0	42.9	62.0	94.1	120.0	170.0
	gf·cm·sec. <sup>2</sup>	14.3	26.5	43.8	63.3	96	122.4	173.5
Rotator Inertia (Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	15.2	27.2	44.1	67.9	100.0	126.0	176.0
	gf·cm·sec. <sup>2</sup>	15.5	27.80	45	69.3	102	128.60	179.6
Electric Time Constant	ms	17	18	22	26	26	30	31
Mechanical Time Constant	ms	4.8	3.4	3.5	2.5	2.9	2.6	2.6
	ms (Brake)	5.2	3.6	3.6	2.7	3.1	2.7	2.7
Power Rate	kW/s	4.1	8.9	12.2	15.0	22.2	31.1	34.1
	kW/s (Brake)	3.8	8.5	11.8	13.7	20.9	29.6	32.9
Instant Maximum Current	A (o-p)	11.5	23.8	40	51.9	75.8	100	120
Insulation Grade	-	F						
Vibration Grade	-	V-15						
Paint Color	-	Black						
Mass	kg	5.3	8.5	10	16	18.2	22	26.7
	kg (Brake)	6.9	9.5	11.6	19.5	21.7	25.5	30.2
Operation Power Voltage	V AC	200/220						

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

## Speed Torque Curve



**RSMK Series Motor****Common Specifications**

Table 3.37 RSMK Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.38 RSMK Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>	
		<b>RSMK-03B</b>	<b>RSMK-12B</b>
Stiction Torque	N·m	16.5	25
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	1.2	4.7
Armature Absorption Time	ms	110	160
Armature Release Time	ms	50	75
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.876	1.287

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.
- Separate power is needed for brake. (No polarity assigned)

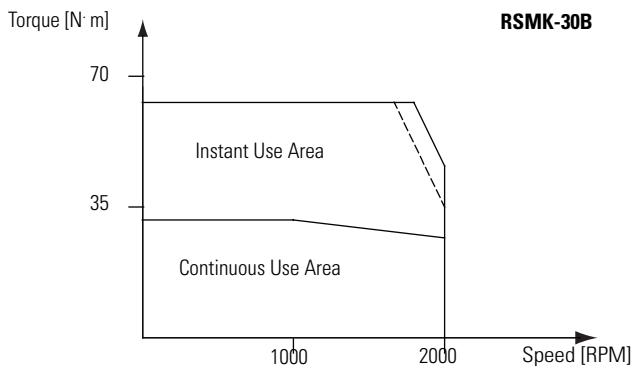
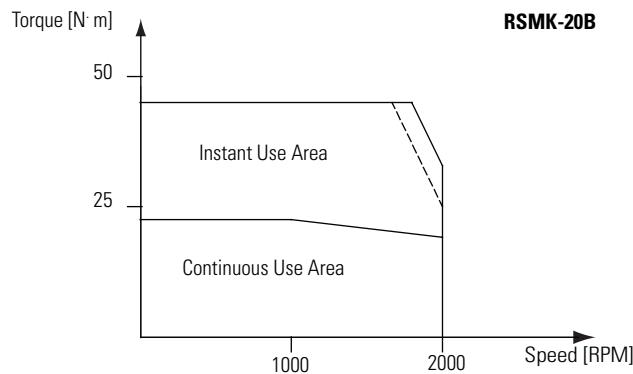
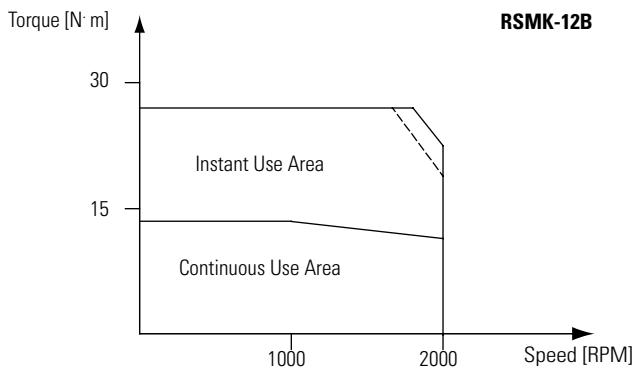
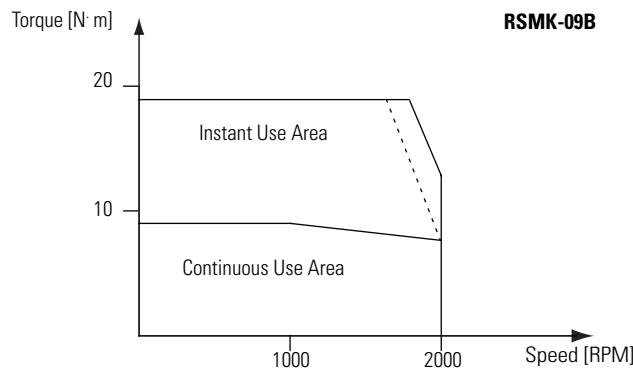
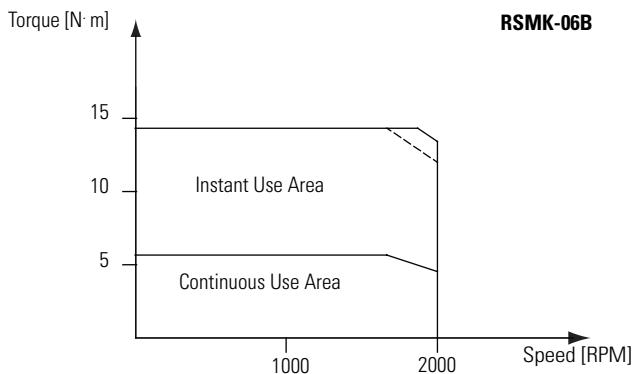
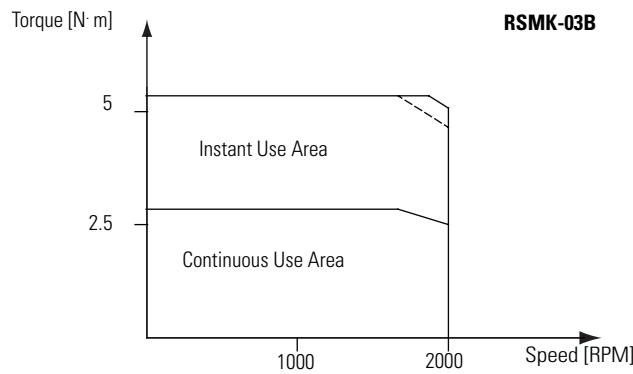
## Basic Specifications

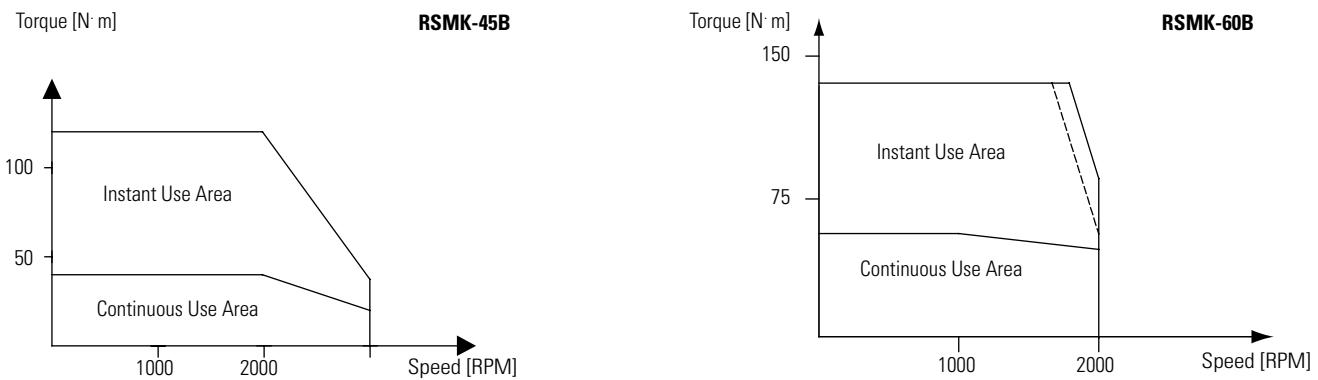
Table 3.39 RSMK Series Motor Basic Specifications

Item	Unit	RSMK-							
		03B	06B	09B	12B	20B	30B	45B	60B
Flange Size	mm	130	130	130	180	180	180	180	180
Rated Output	kW	0.3	0.6	0.9	1.2	2.0	3.0	4.5	6.0
Rated	%	100							
Rated Revolving Speed	r/min	1000							
Maximum Revolving Speed	r/min	2000							
Rated Torque	N·m	2.84	5.7	8.62	11.5	19.1	28.4	42.9	57.2
	kgfcm	29	58.2	88	117	198	290	437	583
Instant Maximum Torque	N·m	6.3	14.4	19.3	28	44	63.7	107	129
	kgfcm	64.3	146.9	197	286	449	650	1091	1315
Rated Current	A (rms)	3.5	6.2	7.6	11.6	18.5	24.0	33.0	47.0
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	2.64	4.9	7.0	30.4	35.5	55.7	80.9	99
	gf·cm·sec <sup>2</sup>	2.7	5.0	7.1	31.0	36.2	56.8	82.6	101
Rotator Inertia (Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	3.84	6.2	8.3	36.2	41.4	61.7	86.9	108
	gf·cm·sec. <sup>2</sup>	3.92	6.3	8.5	36.9	42.2	63.0	88.7	110
Electric Time Constant	ms	12.7	21	24	31	31	34.48	42	45
Mechanical Time Constant	ms	1.25	0.65	0.53	0.94	0.85	0.78	0.71	0.63
	ms (Brake)	1.81	0.82	0.63	1.12	1.0	0.86	0.77	0.68
Power Rate	kW/s	31.2	67	108	44	104	148	232	337
	kW/s (Brake)	21.4	53	91	37	89	133	216	309
Instant Maximum Current	A (o-p)	11	22	24	40.0	60	80.0	118	155
Insulation Grade	-	F							
Vibration Grade	-	V-15							
Paint Color	-	Black							
Mass	kg	4.8	6.2	8.6	15.5	17.5	25	34	41
	kg (Brake)	6.3	8	10.1	19.0	21.0	29	39.5	47
Operation Power Voltage	V <sub>AC</sub>	200/220							

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

### Speed Torque Curve





**RSML Series Motor****Common Specifications**

Table 3.40 RSML Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.41 RSML Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>	
		<b>RSML-03B</b>	<b>RSML-12B</b>
RSML-06B			<b>RSML-20B</b>
RSML-09B			<b>RSML-30B</b>
Stiction Torque	N·m	16.5	25
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	1.2	4.7
Armature Absorption Time	ms	110	160
Armature Release Time	ms	50	75
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.876	1.287

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.
- Separate power is needed for brake. (No polarity assigned)

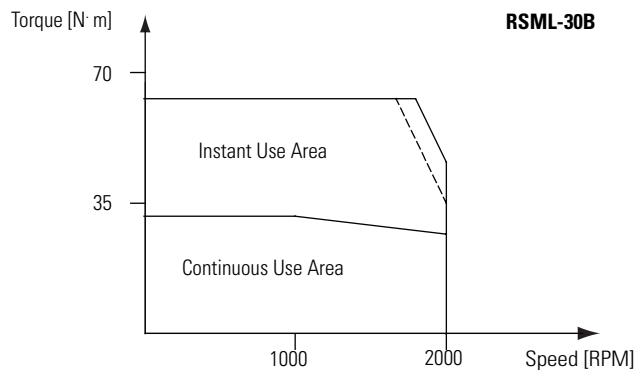
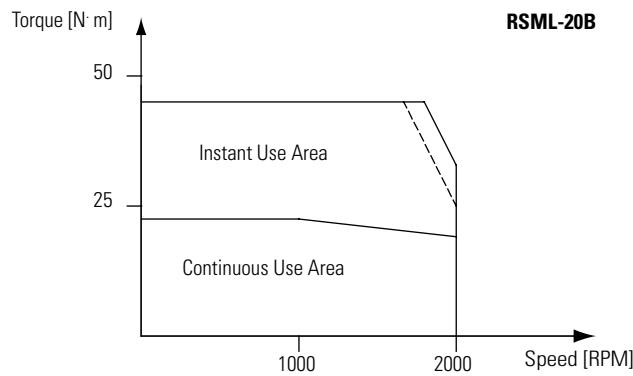
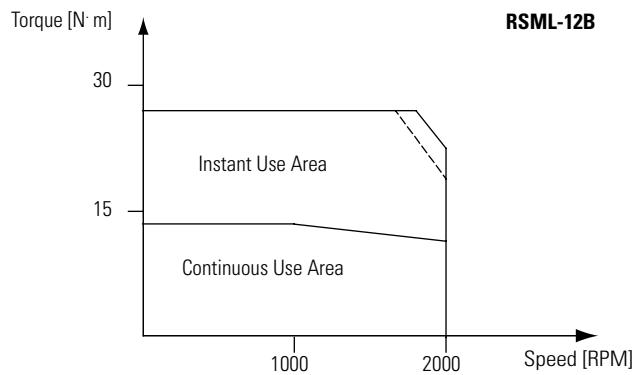
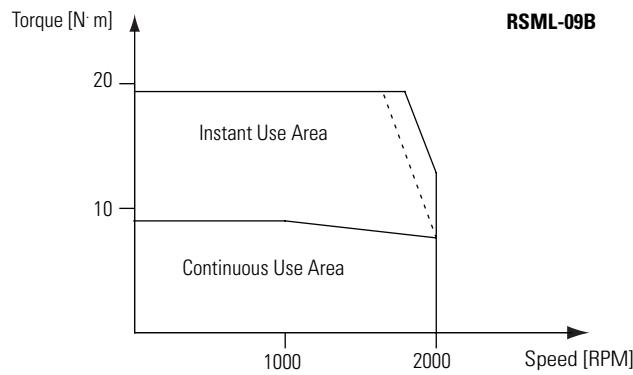
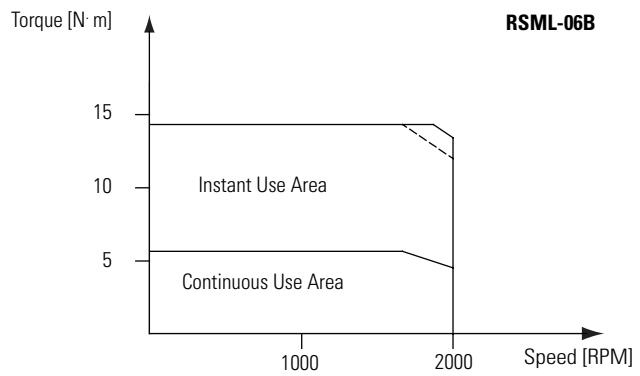
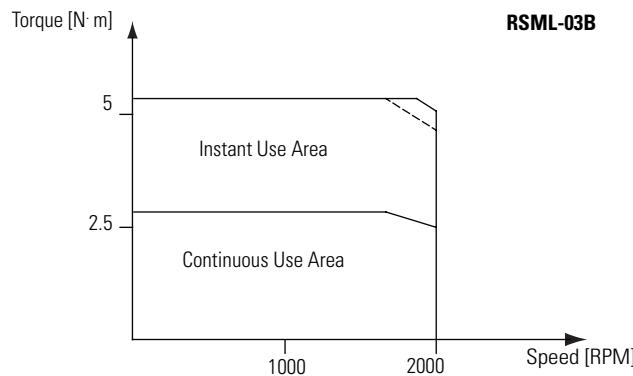
## Basic Specifications

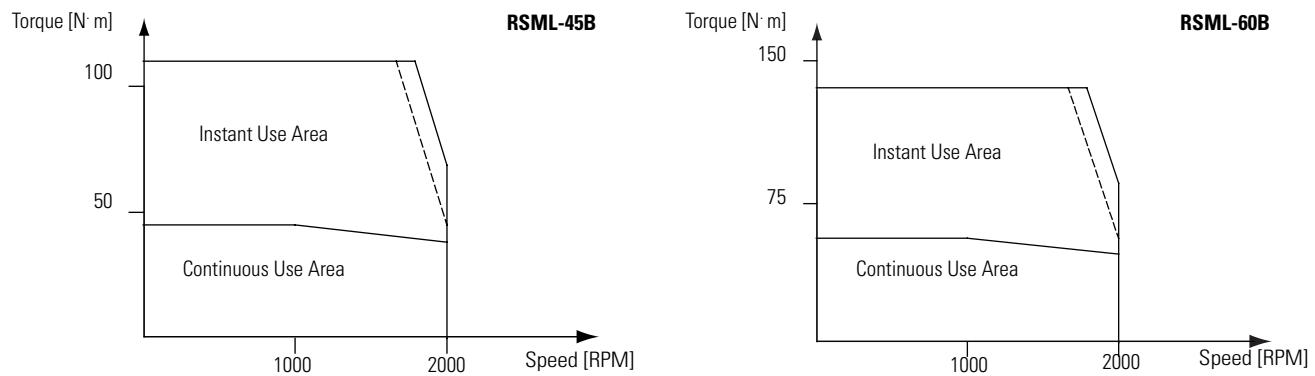
Table 3.42 RSML Series Motor Basic Specifications

<b>Item</b>	<b>Unit</b>	<b>RSML-</b>							
		<b>03B</b>	<b>06B</b>	<b>09B</b>	<b>12B</b>	<b>20B</b>	<b>30B</b>	<b>45B</b>	<b>60B</b>
Flange Size	mm	130	130	130	180	180	180	180	180
Rated Output	kW	0.3	0.6	0.9	1.2	2.0	3.0	4.5	6.0
Rated	%	100							
Rated Revolving Speed	r/min	1000							
Maximum Revolving Speed	r/min	2000							
Rated Torque	N·m	2.84	5.7	8.62	11.5	19.1	28.4	42.9	57.2
	kgfcm	29	58.2	88	117	198	290	437	583
Instant Maximum Torque	N·m	6.3	14.4	19.3	28	44	63.7	107	129
	kgfcm	64.3	146.9	197	286	449	650	1091	1315
Rated Current	A (rms)	3.5	6.2	7.6	11.6	18.5	24.0	33.0	47.0
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	14.5	23.7	39.7	63.3	96.1	131.1	200.6	250.0
	gf·cm·sec. <sup>2</sup>	14.7	24.2	40.5	64.5	97.9	133.6	204.5	255.1
Rotator Inertia (Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	15.7	25.0	40.8	69.1	102.0	137.1	206.6	256.0
	gf·cm·sec. <sup>2</sup>	16	25.5	41.6	70.4	103.9	139.8	210.6	261.2
Electric Time Constant	ms	12.7	21	24	31	31	34.5	42	45
Mechanical Time Constant	ms	6.85	3.14	3.0	1.95	2.3	1.77	1.77	1.58
	ms (Brake)	7.42	3.31	3.1	2.13	2.5	1.85	1.82	1.62
Power Rate	kW/s	5.7	14	19.1	21.3	38.8	63.9	94	133
	kW/s (Brake)	5.3	13.3	18.6	19.5	36.5	61.1	91	130
Instant Maximum Current	A (o-p)	11	21.0	24	40.0	60	80.0	118	155
Insulation Grade	-	F							
Vibration Grade	-	V-15							
Paint Color	-	Black							
Mass	kg	6.0	8.0	10.2	16.8	19.4	27.2	37.5	45
	kg (Brake)	7.5	9.6	11.7	20.3	22.9	31.2	43	51
Operation Power Voltage	V <sub>AC</sub>	200/220							

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

### Speed Torque Curve





**RSMS Series Motor****Common Specifications**

Table 3.43 RSMS Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 VAC 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.44 RSMS Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>	
		<b>RSMS-10B</b>	<b>RSMS-40B</b>
RSMS-15B			
RSMS-20B			
RSMS-25B			
RSMS-30B			
RSMS-35B			
Stiction Torque	N·m	12	16.5
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	0.45	1.2
Armature Absorption Time	ms	100	110
Armature Release Time	ms	20	50
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.83	0.876

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.
- Separate power is needed for brake. (No polarity assigned)

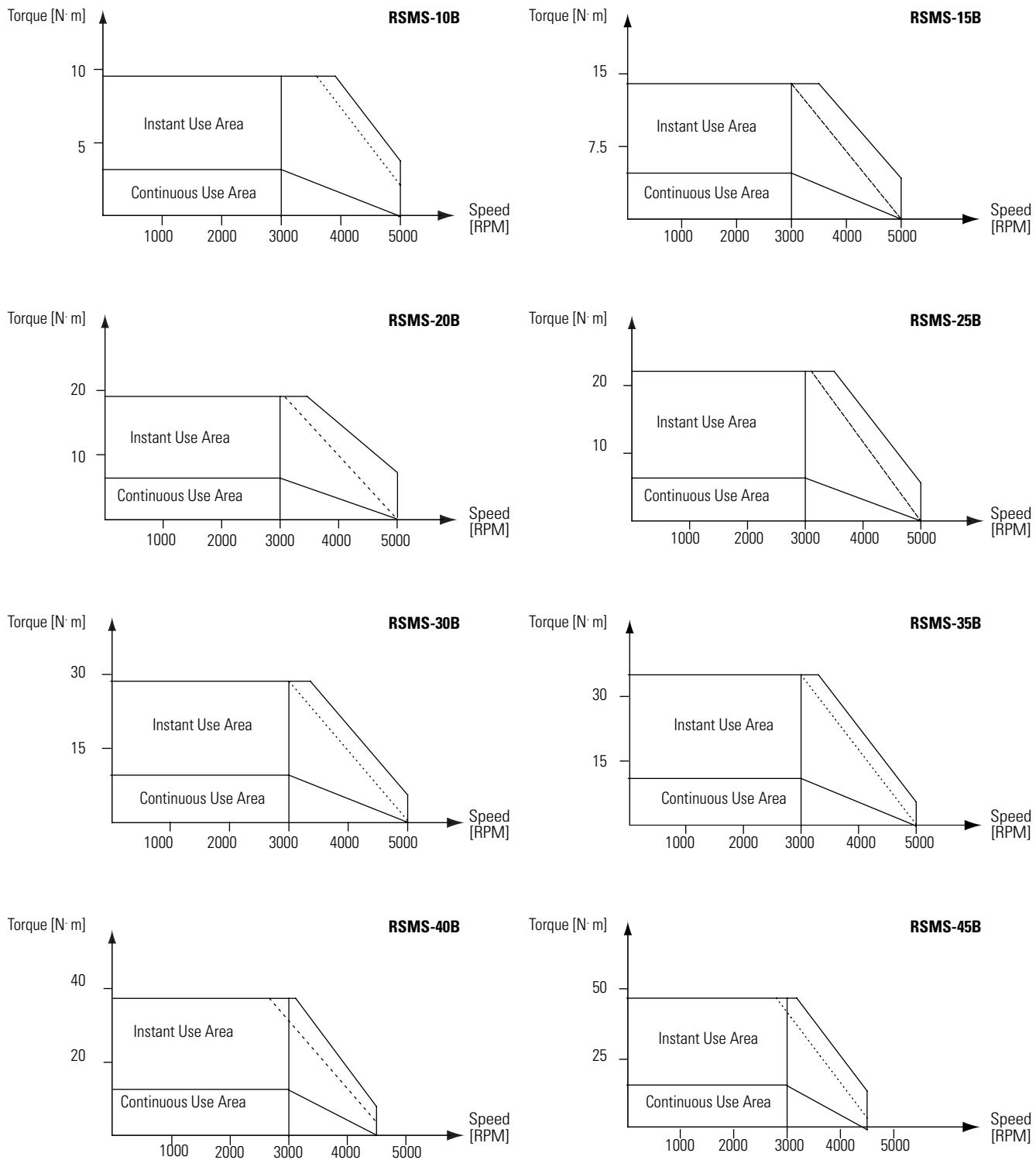
## Basic Specifications

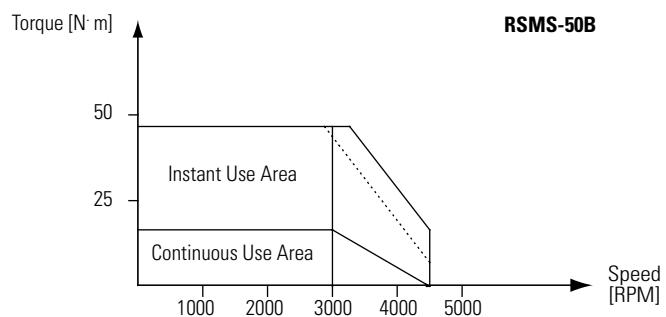
Table 3.45 RSMS Series Motor Basic Specifications

<b>Item</b>	<b>Unit</b>	<b>RSMS-</b>								
		<b>10B</b>	<b>15B</b>	<b>20B</b>	<b>25B</b>	<b>30B</b>	<b>35B</b>	<b>40B</b>	<b>45B</b>	<b>50B</b>
Flange Size	mm	100	100	100	100	120	120	130	130	130
Rated Output	kW	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Rated	%	100								
Rated Revolving Speed	r/min	3000								
Maximum Revolving Speed	r/min	5000						4500		
Rated Torque	N·m	3.18	4.77	6.37	7.96	9.54	11.14	12.7	14.3	15.9
	kgfcm	32.45	48.7	65.0	81.2	97.35	113.7	130	146	162
Instant Maximum Torque	N·m	9.5	14.5	19.24	23.8	28.59	33.3	37.9	42.9	47.6
	kgfcm	96.94	148.0	196.3	242.9	291.7	339.8	387	438	486
Rated Current	A (rms)	7.2	9.4	13.0	15.9	20	21.6	24.7	29.0	28.5
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	2.06	2.39	3.04	3.78	5.99	6.93	12.4	13.6	16.0
	gf·cm·sec <sup>2</sup>	2.1	2.44	3.10	3.86	6.11	7.07	12.7	13.9	16.3
(Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	2.5	2.84	3.49	4.23	6.44	7.38	13.7	14.9	17.3
	gf·cm·sec <sup>2</sup>	2.55	2.90	3.56	4.32	6.57	7.53	14.0	15.2	17.7
Electric Time Constant	ms	9.19	10.49	11.17	11.10	16.35	20.20	20	25.7	20
Mechanical Time Constant	ms	0.87	0.54	0.53	0.52	0.42	0.38	0.58	0.45	0.48
	ms (Brake)	1.05	0.64	0.60	0.59	0.44	0.41	0.64	0.49	0.52
Power Rate	kW/s	50.08	97.21	136.29	171.16	155.1	183	134	154	161
	kW/s (Brake)	41.3	81.81	118.72	152.95	144.3	172	121	140	149
Instant Maximum Current	A (o-p)	29.7	40.02	56	68.01	79.6	86.25	105	118	120
Insulation Grade	-	F								
Vibration Grade	-	V-15								
Paint Color	-	Black								
Mass	kg	4.5	5.1	6.5	7.5	9.3	10.9	12.9	15.1	17.3
	kg (Brake)	5.1	6.4	7.8	8.8	10.6	12.2	14.8	17.0	19.2
Operation Power Voltage	V AC	200/220								

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

## Speed Torque Curve





**RSMQ Series Motor****Common Specifications**

Table 3.46 RSMQ Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40 °C
Storage Temperature Range	-20 to +80 °C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.47 RSMQ Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>	
		<b>RSMQ-01B</b>	<b>RSMQ-02B RSMQ-04B</b>
Stiction Torque	N·m	1.69	3.25
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	0.020	0.075
Armature Absorption Time	ms	50	60
Armature Release Time	ms	15	15
Release Voltage	DC, V	2 (at 20 °C)	2 (at 20 °C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.36	0.43

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.
- Separate power is needed for brake. (No polarity assigned)

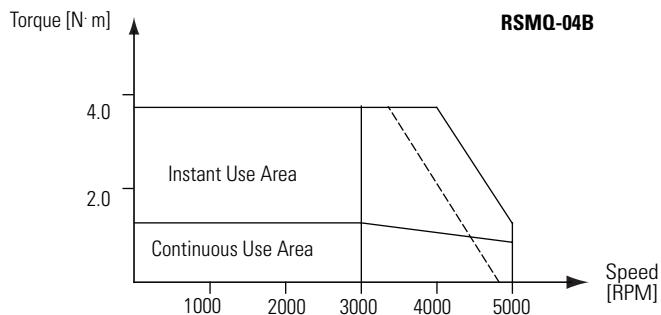
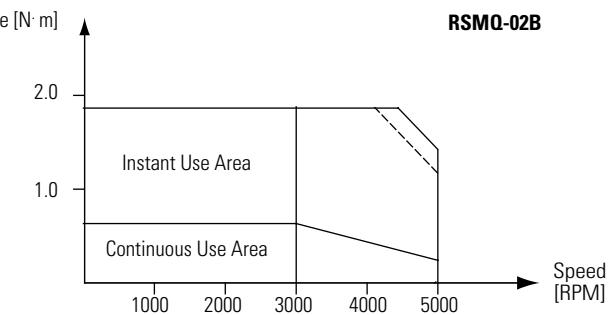
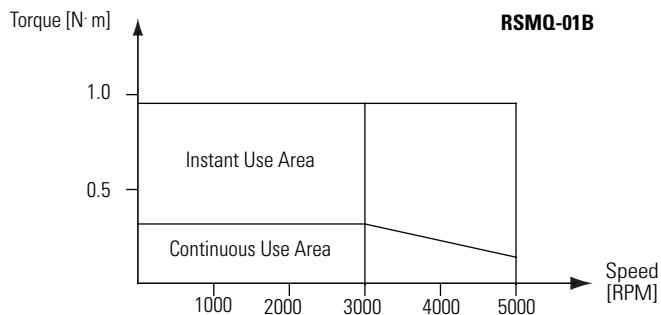
## Basic Specifications

Table 3.48 RSMQ Series Motor Basic Specifications

<b>Item</b>	<b>Unit</b>	<b>RSMQ-</b>		
		<b>01B</b>	<b>02B</b>	<b>04B</b>
Flange Size	mm	60	80	80
Rated Output	kW	0.1	0.2	0.4
Rated	%	100		
Rated Revolving Speed	r/min	3000		
Maximum Revolving Speed	r/min	5000		
Rated Torque	N·m	0.32	0.64	1.3
	kgf·cm	3.24	6.5	13
Instant Maximum Torque	N·m	0.95	1.91	3.82
	kgf·cm	9.7	19.5	39
Rated Current	A (rms)	1.0	1.6	2.5
Rotator Inertia	$\times 10^{-4}$ Kg·m <sup>2</sup>	0.11/0.10	0.36/0.35	0.62/0.61
	gf·cm·sec. <sup>2</sup>	0.11/0.10	0.37/0.36	0.63/0.62
Rotator Inertia (Brake)	$\times 10^{-4}$ Kg·m <sup>2</sup>	0.14/0.13	0.49/0.48	0.74/0.74
	gf·cm·sec. <sup>2</sup>	0.14/0.13	0.50/0.49	0.76/0.76
Electric Time Constant	ms	2.9	5.6	6.6
Mechanical Time Constant	ms	1.35/1.22	0.87/0.85	0.62/0.61
	ms (Brake)	1.71/1.56	1.17/1.15	0.74/0.74
Power Rate	kW/s	9.4/10.3	11.5/11.8	26.7/27.2
	kW/s (Brake)	7.4/8.04	8.5/8.6	22.4/22.4
Instant Maximum Current	A (o-p)	4.30	6.9	10.49
Insulation Grade	-	B		
Vibration Grade	-	V-15		
Paint Color	-	black		
Mass	kg	0.78	1.5	2.1
	kg (Brake)	1.2	2.3	3.0
Operation Power Voltage	V <sub>AC</sub>	200/220		

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

## Speed Torque Curve



**RSMZ Series Motor****Common Specifications**

Table 3.49 RSMZ Series Motor Common Specifications

<b>Item</b>	<b>Specifications</b>
Wiring Method	Y Wiring
Operating Temperature Range	0 to +40°C
Storage Temperature Range	-20 to +80°C
Insulation Resistance	500VDC 20 MΩ
Number of Poles	8 Poles
Vibration (At Rated Speed)	5 g (49 m/s <sup>2</sup> ), 10 to 50 Hz. 10 g (98 m/s <sup>2</sup> ), 30- minute Continuous Operation
Impact	98 m/s <sup>2</sup>
Time Rating	Continuous Use
Insulation Grade	B Grade
Dielectric Strength	1500 V <sub>AC</sub> 60 sec. 1800 V <sub>AC</sub> 1 sec.
Dielectric Strength (Brake)	1200 V <sub>AC</sub> 1 sec.
Excitation Method	Permanent Magnet
Mounting Method	Flange
Operating Humidity	85% or less (Non-Condensing)

**Brake Specifications**

Table 3.50 RSMZ Series Motor Brake Specifications

<b>Item</b>	<b>Unit</b>	<b>Applied Motors</b>		
		<b>RSMZ-A3B</b> <b>RSMZ-A5B</b> <b>RSMZ-A8B</b> <b>RSMZ-01B</b>	<b>RSMZ-02B</b> <b>RSMZ-04B</b>	<b>RSMZ-06B</b> <b>RSMZ-08B</b> <b>RSMZ-10B</b>
Stiction Torque	N·m	0.39	1.69	3.25
Rotor Inertia	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	0.0025	0.020	0.075
Armature Absorption Time	ms	25	50	60
Armature Release Time	ms	20	15	15
Release Voltage	DC, V	2 (at 20°C)	2 (at 20°C)	2 (at 20°C)
Excited Voltage	DC, V	24 ± 2.4	24 ± 2.4	24 ± 2.4
Excited Current (cool down)	DC, A	0.26	0.36	0.43

- Figures above (except stiction torque, release voltage and excited voltage) are representative characteristics.
- Brake backlash is 1.5 degrees or less.
- Separate power is needed for brake. (No polarity assigned)

## Basic Specifications

Table 3.51 RSMZ Series Motor Basic Specifications

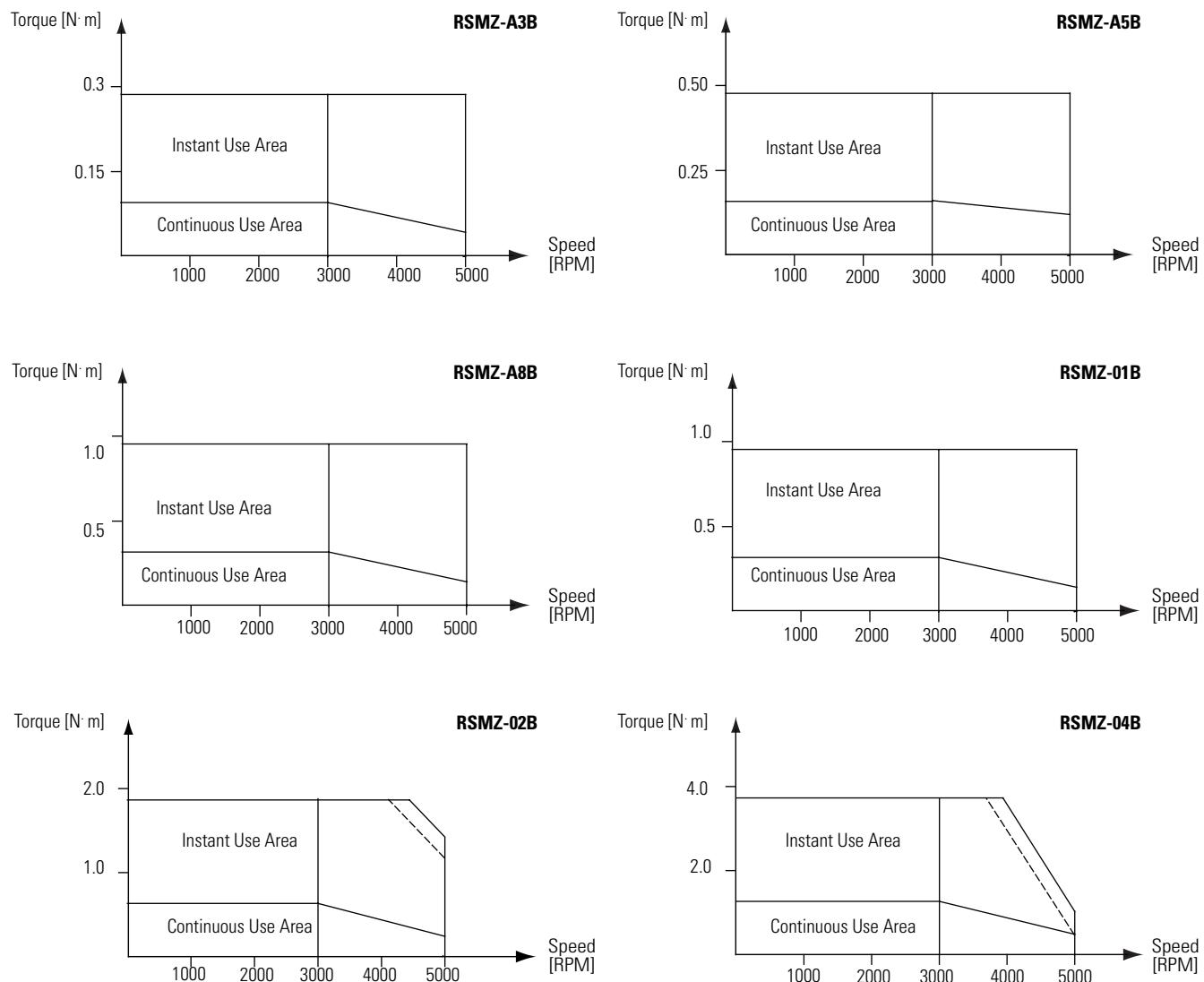
Item	Unit	RSMZ-								
		A3B	A5B	A8B	01B	02B	04B	06B	08B	10B
Flange Size	mm	40	40	40	40	60	60	80	80	80
Rated Output	kW	0.03	0.05	0.08	0.1	0.2	0.4	0.6	0.75	0.95
Rated	%	100								
Rated Revolving Speed	r/min	3000								
Maximum Revolving Speed	r/min	5000						4500	3500	
Rated Torque	N·m	0.095	0.16	0.255	0.32	0.64	1.3	1.91	2.4	3.0
	kgf cm	0.97	1.62	2.60	3.24	6.5	13	19.49	24.3	30.9
Instant Maximum Torque	N·m	0.28	0.48	0.76	0.95	1.91	3.8	5.73	7.1	9.1
	kgf cm	2.9	4.9	7.8	9.7	19.5	39	58.47	73	92.6
Rated Current	A <sub>(rms)</sub>	1.0	1.0	1.0	1.0	1.6	2.5	4.1	4.3	4.3
Rotator Inertia 2500P/R Inc. /17bit Abs.	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	0.021	0.030	0.039	0.059	0.19	0.34	0.93	1.20	1.47
		/0.015	/0.024	/0.034	/0.054	/0.18	/0.33	/0.92		
	gf·cm·sec. <sup>2</sup>	0.021	0.031	0.040	0.060	0.19	0.35	0.95	1.22	1.5
		/0.015	/0.024	/0.035	/0.055	/0.18	/0.34	/0.94		
Rotator Inertia (Brake) 2500P/R Inc. /17bit Abs.	x 10 <sup>-4</sup> Kg·m <sup>2</sup>	0.025	0.034	0.049	0.061	0.21	0.36	1.05	1.32	1.49
		/0.019	/0.029	/0.046	/0.056	/0.20	/0.35	/1.04		
	gf·cm·sec. <sup>2</sup>	0.026	0.035	0.050	0.062	0.21	0.37	1.07	1.35	1.52
		/0.019	/0.030	/0.047	/0.057	/0.20	/0.36	/1.06		
Electric Time Constant	ms	0.6	0.67	0.96	0.88	3.4	3.5	7.3	7.4	7.6
Mechanical Time Constant 2500P/R Inc. /17bit Abs.	ms	2.74	1.58	0.85	0.90	0.84	0.59	0.4	0.44	0.33
	ms (Brake)	/1.9	/1.3	/0.74	/0.82	/0.79	/0.57	/0.39		
		3.27	1.80	1.07	0.93	0.92	0.63	0.45	0.50	0.34
		/2.5	/1.5	/1.0	/0.85	/0.88	/0.61	/0.44		
Power Rate 2500P/R Inc. /17bit Abs.	kW/s	4.4 /6.2	8.7 /10.9	17.0 /19.5	17.7 /19.4	21.8 /23.0	48.7 /50.2	39.2 /39.7	48.3	62.2
	kW/s (Brake)	3.7	7.7	13.6	17.1	19.7	46.0	34.7	43.9	61.4
		/4.9	/8.9	/14.4	/18.7	/20.7	/47.4	/35.1		
Instant Maximum Current	A (o-p)	4.30	4.30	4.3	4.30	6.89	10.5	17.4	18.3	18.3
Insulation Grade	-	B								
Vibration Grade	-	V-15								

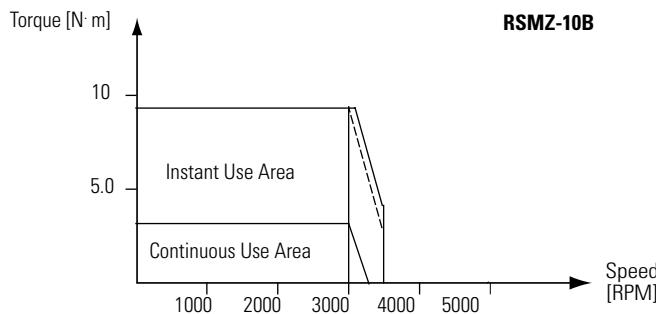
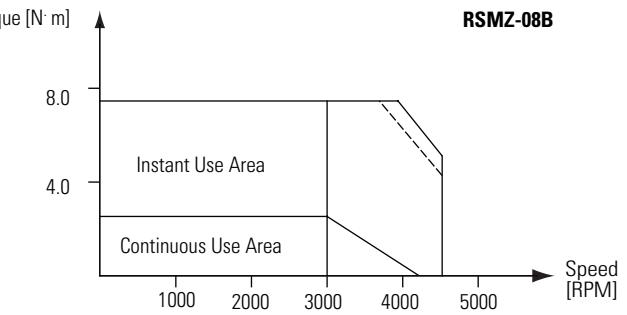
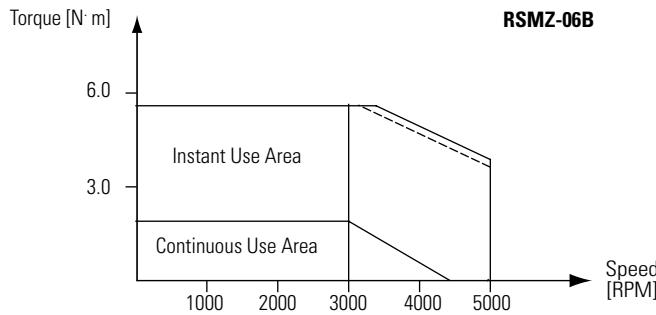
Table 3.51 RSMZ Series Motor Basic Specifications

Paint Color	-	black								
Mass	kg	0.32	0.39	0.5	0.66	1.0	1.7	2.9	3.5	4.1
	kg (Brake)	0.54	0.63	0.77	0.93	1.5	2.3	3.5	4.3	4.9

- Characteristics above are representative figures of two-phase sine wave operation.
- Corresponding to IP65 (When outgoing line is in down direction, connector part is not included.)
- Measure at 40°C ambient with temperature at 65°C or less at the center of motor frame.

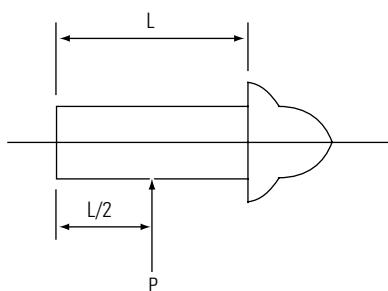
## Speed Torque Curve



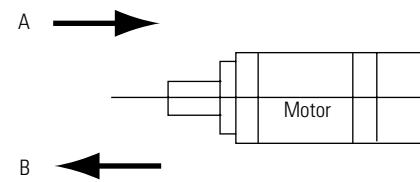


## Allowed Load on Motor Shaft

### Load Location on Motor Shaft



Radial Load ( $P$ ) Location



Thrust Load Direction

## **CSMD/F/H/K/S Series Motor**

Table 3.52 CSMD/F/H/K/S Series Motor Allowed Load on Shaft

<b>Motor</b>	<b>Assembly</b>			<b>Running</b>	
	<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>		<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>
		<b>Direction A</b>	<b>Direction B</b>		
CSMS-10 CSMD-08	686	392	490	392	147
CSMF-04	980	588	686	392	147
CSMS-15 to 35 CSMD-10 to 20 CSMH-05 to 15 CSMF-08 to 15 CSMK-03 to 09	980	588	686	490	196
CSMS-40 to 50 CSMD-25 to 30	980	588	686	784	343
CSMD-35 to 50 CSMH-20 to 50 CSMK-12 to 30	1666	784	980	784	343
CSMF-25 to 45	1862	686	686	184	294
CSMK-45 to 60	2058	980	1176	1176	490

## **CSMQ/Z Series Motor**

Table 3.53 CSMQ/Z Series Motor Allowed Load on Shaft

<b>Motor</b>	<b>Assembly</b>			<b>Running</b>	
	<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>		<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>
		<b>Direction A</b>	<b>Direction B</b>		
CSMZ-A3	147	88	117.6	49	29.4
CSMZ-A5 to 01 CSMQ-01	147	88	117.	68.6	58
CSMZ-02 to 04 CSMQ-02 to 04	392	147	196	245	98
CSMZ-08	686	294	392	392	147

## CSMR/T Series Motor

Table 3.54 CSMR/T Series Motor Allowed Load on Shaft

<b>Motor</b>	<b>Allowed Radial Load <sup>(1)</sup> (kgf)</b>	<b>Allowed Thrust Load (kgf)</b>
CSMT-A3 to A5 CSMR-01	8	4
CSMT-02 to 04 CSMR-02 to 04	20	7
CSMT-06 to 08	35	10
CSMT-10	35	10

<sup>(1)</sup> Radial load is measured 20mm away from the surface of flange.

## RSMD/F/H/K/L/S Series Motor

Table 3.55 RSMD/F/H/K/L/S Series Motor Allowed Load on Shaft

<b>Motor</b>	<b>Flange Size</b>	<b>Assembly</b>			<b>Running</b>		
		<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>		<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>	
			<b>Direction A</b>	<b>Direction B</b>		<b>Direction A</b>	<b>Direction B</b>
RSMS-10B to 25B	100	980	588	686	490	196	196
RSMD-08B	120	686	392	490	392	147	147
RSMS-30B to 35B		980	588	686	784	343	343
RSMD-10B to 20B RSMH-05B to 15B RSMK-03B to 09B RSML-03B to 09B	130	980	588	686	490	196	196
RSMD-25B to 30B RSMS-40B to 50B					784	343	343
RSMF-04B					392	147	147
RSMF-08B to 15B	180	980	588	686	490	196	196
RSMH-20B to 50B RSMD-35B to 50B RSMK-12B RSML-12B		1666	784	980	784	343	343
RSMK-20B RSML-20B					1176	490	490
RSMK-30B RSML-30B					1470		
RSMK-45B RSML-45B		2058	980	1176			
RSMK-60B RSML-60B					1764	588	588
RSMF-25B to 45B	220	1862	686	686	784	294	294

## RSMQ/Z Series Motor

Table 3.56 RSMQ/Z Series Motor Allowed Load on Shaft

<b>Motor</b>	<b>Flange Size</b>	<b>Assembly</b>			<b>Running</b>		
		<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>		<b>Allowed Radial Load (N)</b>	<b>Allowed Thrust Load (N)</b>	
			<b>Direction A</b>	<b>Direction B</b>		<b>Direction A</b>	<b>Direction B</b>
RSMZ-A3	40	147	88	117	49	29	29
RSMZ-A5, A8, 01					68	58	58
RSMQ-01	60	392	147	196	245	98	98
RSMQ-02, 04							
RSMQ-02, 04	80	686	294	392	392	147	147
RSMZ-06, 08, 10							



## Motor Diagram and Dimensions

This chapter shows diagrams, dimensions and shaft-end specifications of each servo motor series.

**NOTE**

As for diagram and dimensions of a servo drive, refer to the user manual of the servo drive.

### CSM Series Motor

### Diagram and Dimensions

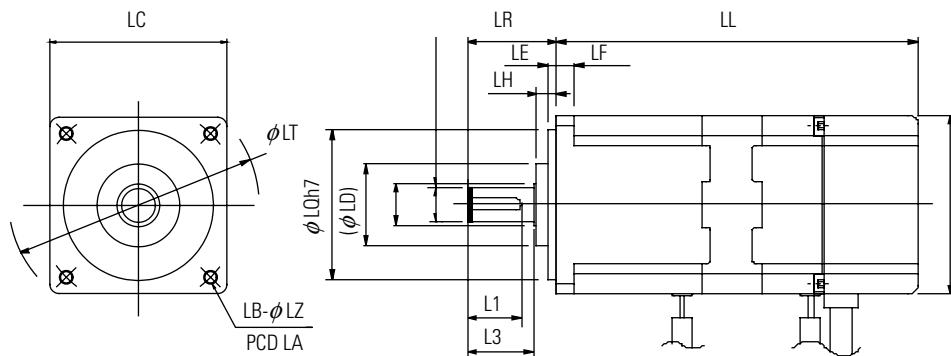


Table 4.1 CSM Series Motor Dimensions

Motor	Dimensions														
	LL		LR	LE	LF	LH	LQ	LD	L1	L3	LC	LT	LB	LZ	LA
	Brake Present	Brake Absent													
CSM-A3B	61.5	92.5	25	2.5	5	4.5	30	20	17	20	40	55	2	4.5	46
CSM-A5B	70.5	101.5													
CSM-01B	88.5	119.5													
CSM-02B	93	122.5	330	3	6	7	50	27	18	22	60	80	4	5.5	70
CSM-04B	121	150.5													
CSM-06B	125	156					70	34	23	27	80	105	4	6.5	90
CSM-08B	142	173													
CSM-10B	163	194													

## Shaft-End Specifications

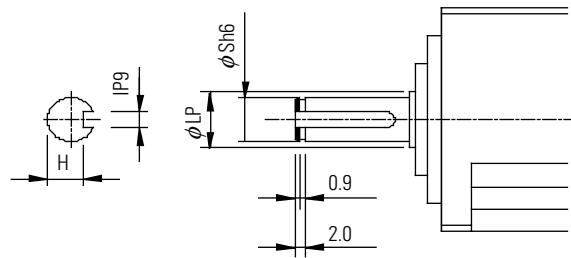


Table 4.2 CSM Series Motor Shaft-End Specifications

Motor	Dimensions			
	LP	S	H	I
CSM-A3B	9	8	6.2	3
CSM-A5B				
CSM-01B				
CSM-02B	14	12	9.5	4
CSM-04B				
CSM-06B	20	16	13	5
CSM-08B				
CSM-10B				

## CSM Series Motor - Decelerator Attached

### Diagram and Dimensions

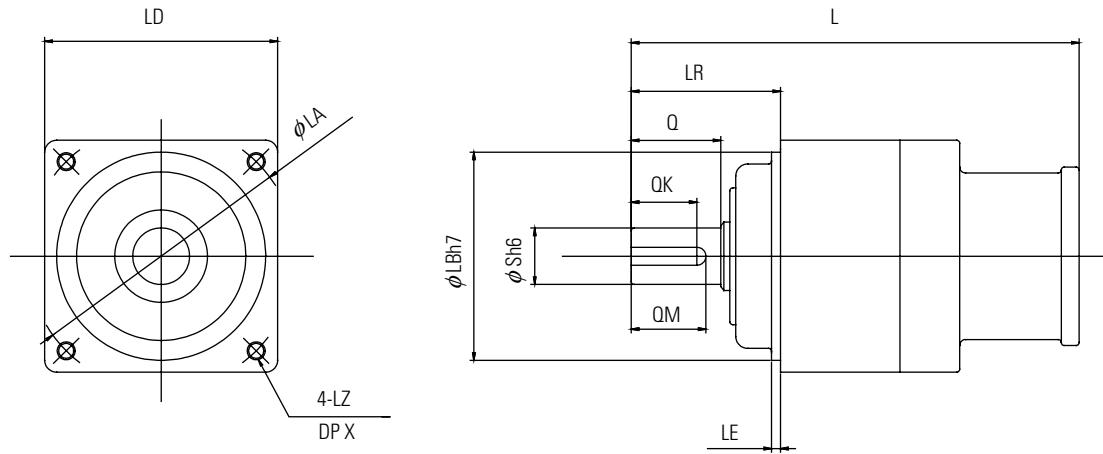


Table 4.3 CSM Series Motor - Decelerator Attached

Motor	Backlash	Speed Reduction Ratio	Dimensions														
			L	LR	LB	LA	LE	LZ	D	X							
CSM-A5B	B	1/3	99.5	32	50	60	3	M5	52	12							
		1/5															
		1/9	110														
		1/15															
		1/25															
CSM-01B	B	1/3	99.5	32	50	60	3	M5	52	12							
		1/5															
		1/9	110														
		1/15															
	C	1/25	142	50	70	90	3	M6	78	20							
CSM-02B	B	1/3	104.5	32	50	60	3	M5	52	12							
		1/5															
	C	1/9	150	50	70	90	3	M6	78	20							
		1/15															
		1/25															
CSM-04B	B	1/3	104.5	32	50	60	3	M5	52	12							
	C	1/5	139.5	50	70	90	3	M6	78	20							
		1/9	150														
		1/15															
	D	1/25	165	61	90	115	5	M8	96	20							

Table 4.3 CSM Series Motor - Decelerator Attached

<b>Motor</b>	<b>Backlash</b>	<b>Speed Reduction Ratio</b>	<b>Dimensions</b>							
			<b>L</b>	<b>LR</b>	<b>LB</b>	<b>LA</b>	<b>LE</b>	<b>LZ</b>	<b>D</b>	<b>X</b>
CSM-06B	C	1/3	143.5	50	70	90	3	M6	78	20
		1/5								
	D	1/9	171	61	90	115	5	M8	96	20
		1/15								
CSM-08B	C	1/3	143.5	50	70	90	3	M6	78	20
		1/5								
	D	1/9	171	61	90	115	5	M8	96	20
		1/15								
	E	1/25	210	75	110	135	5	M10	125	20

### Shaft-End Specifications

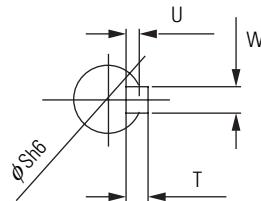


Table 4.4 CSM Series Motor - Shaft-End Specifications with Decelerator Attached

<b>Motor</b>	<b>Backlash</b>	<b>Speed Reduction Ratio</b>	<b>Dimensions</b>						
			<b>Q</b>	<b>QM</b>	<b>QK</b>	<b>S</b>	<b>WxU</b>	<b>T</b>	
CSM-A5B	B	1/3	20	18	16	12	4x2.5	4	
		1/5							
		1/9							
		1/15							
		1/25							
CSM-01B	B	1/3	20	18	16	12	4x2.5	4	
		1/5							
		1/9							
		1/15							
	C	1/25	30	26	22	19	6x3.5	6	

Table 4.4 CSM Series Motor - Shaft-End Specifications with Decelerator Attached

<b>Motor</b>	<b>Backlash</b>	<b>Speed Reduction Ratio</b>	<b>Dimensions</b>					
			<b>Q</b>	<b>QM</b>	<b>QK</b>	<b>S</b>	<b>WxU</b>	<b>T</b>
CSM-02B	B	1/3	20	18	16	12	4x2.5	4
		1/5						
	C	1/9	30	26	22	19	6x3.5	6
		1/15						
		1/25						
CSM-04B	B	1/3	20	18	16	12	4x2.5	4
	C	1/5	30	26	22	19	6x3.5	6
		1/9						
		1/15						
	D	1/25	40	35	30	24	8x4	7
CSM-06B	C	1/3	30	26	22	19	6x3.5	6
		1/5						
	D	1/9	40	35	30	24	8x4	7
		1/15						
CSM-08B	C	1/3	30	26	22	19	6x3.5	
		1/5						
	D	1/9	40	35	30	24	8x4	7
		1/15						
	E	1/25	55	52	45	32	10x5	8

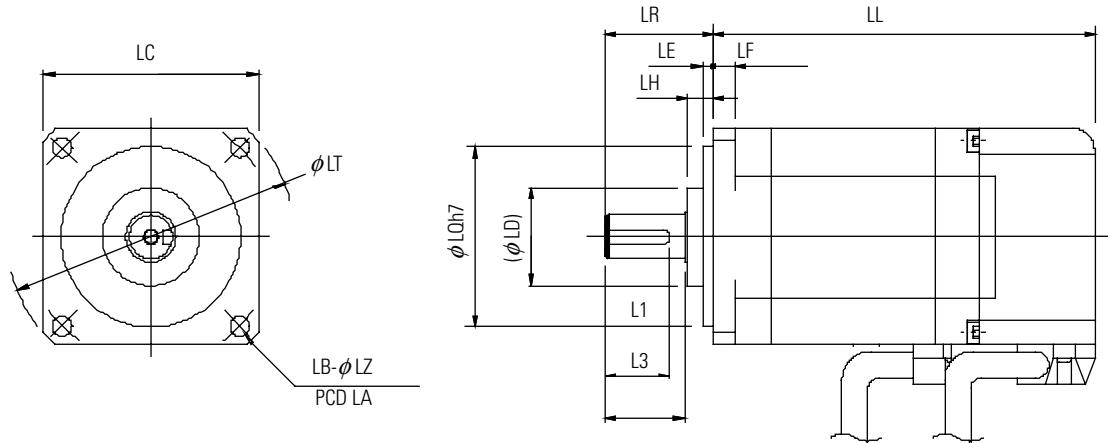
**CSMT Series Motor****Diagram and Dimensions**

Table 4.5 CSMT Series Motor Dimensions

Motor	Dimensions														
	LL		LR	LE	LF	LH	LQ	LD	L1	L3	LC	LT	LB	LZ	LA
	Brake Present	Brake Absent													
CSMT-A3B	89.1	53.5	25	2.5	5	4.5	30	20	17	20	40	55	2	4.5	46
CSMT-A5B	95.1	59.5													
CSMT-01B	109.1	73.5													
CSMT-02B	110.7	76.1	30	3	6	7	50	27	18	22	60	80	4	5.5	70
CSMT-04B	132.7	98.1													
CSMT-06B	136.3	99.7	35	3	8	7	70	34	23	27	80	105	4	6.6	90
CSMT-08B	145.3	108.7													
CSMT-10B	167.2	144.2	35	3	8	7	80	34	23	27	86	112	4	6.6	100

## Shaft-End Specifications

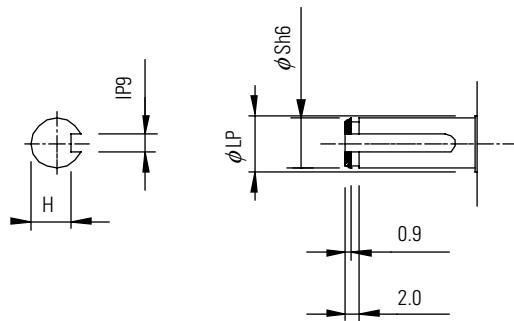


Table 4.6 CSMT Series Motor Shaft-End Specifications

Motor	Dimensions			
	Lp	S	H	I
CSMT-A3B	8.9	8	6.2	3
CSMT-A5B				
CSMT-01B				
CSMT-02B	14	12	9.5	4
CSMT-04B				
CSMT-06B	19.8	16	13	5
CSMT-08B				
CSMT-10B				

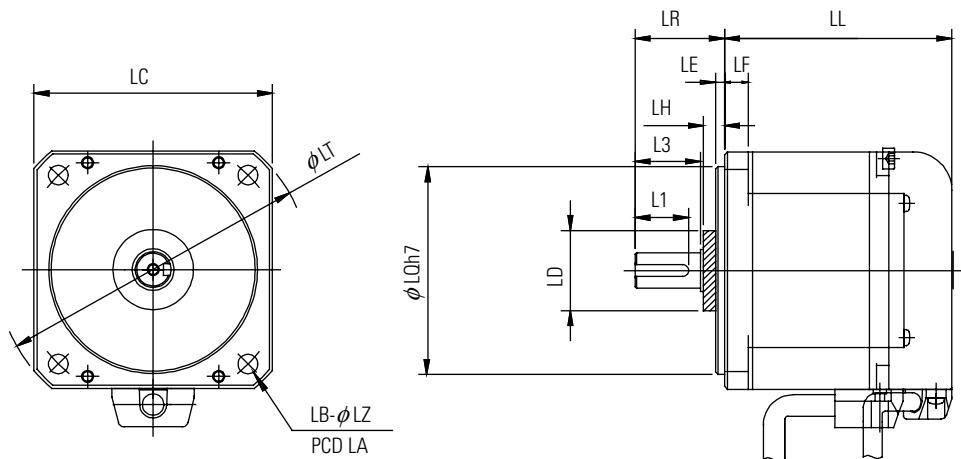
**CSMR Series Motor****Diagram and Dimensions**

Table 4.7 CSMR Series Motor Dimensions

Motor	Dimensions														
	LL		LR	LE	LF	LH	LQ	LD	L1	L3	LC	LT	LB	LZ	LA
	Brake Present	Brake Absent													
CSMR-01B	86.5	62.5	30	3	6	7	50	27	18	22	60	80	4	5.5	70
CSMR-02B	95.3	64.3	30	3	8	7	70	27	18	22	80	105	4	6.6	90
CSMR-04B	107.3	76.3													

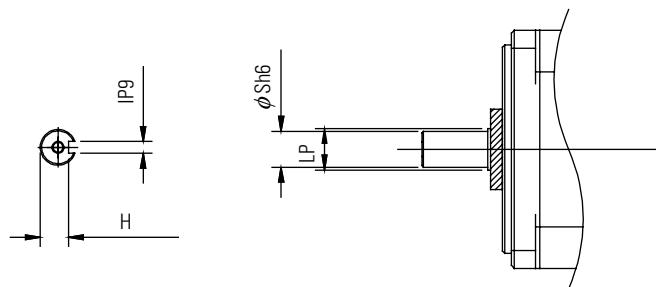
**Shaft-End Specifications**

Table 4.8 CSMR Series Motor Shaft-End Specifications

Motor	Dimensions			
	LP	S	H	I
CSMR-01B	14	12	9.5	4
CSMR-02B				
CSMR-04B				

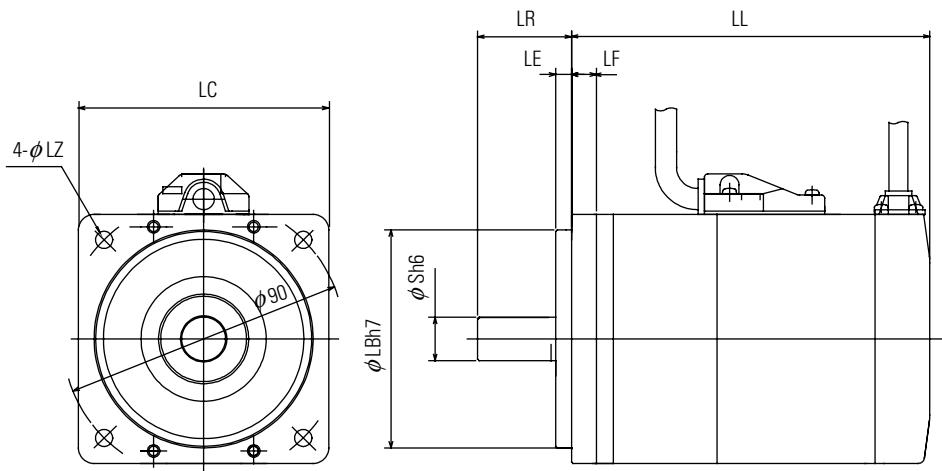
**CSMQ Series Motor****Diagram and Dimensions**

Table 4.9 CSMQ Series Motor Dimensions

Motor	Dimensions									
	LL		LR	S	LA	LB	LC	LE	LF	LZ
	Brake Present	Brake Absent								
CSMQ-01B	84	60	25	8	70	50	60	3	7	4.5
CSMQ-02B	99.5	67	30	11	90	70	80	5	8	5.5
CSMQ-04B	114.5	82	30	14	90	70	80	5	8	5.5

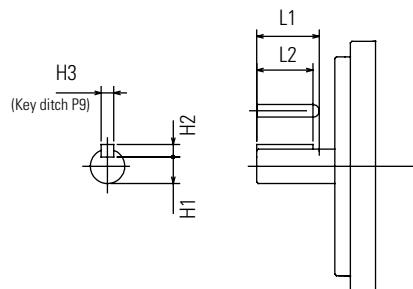
**Shaft-End Specifications**

Table 4.10 CSMQ Series Motor Shaft-End Specifications

Motor	Dimensions				
	L1	L2	H1	H2	H3
CSMQ-01B	14	12.5	6.2	3	3
CSMQ-02B	20	18	8.5	4	4
CSMQ-04B	25	22.5	11	5	5

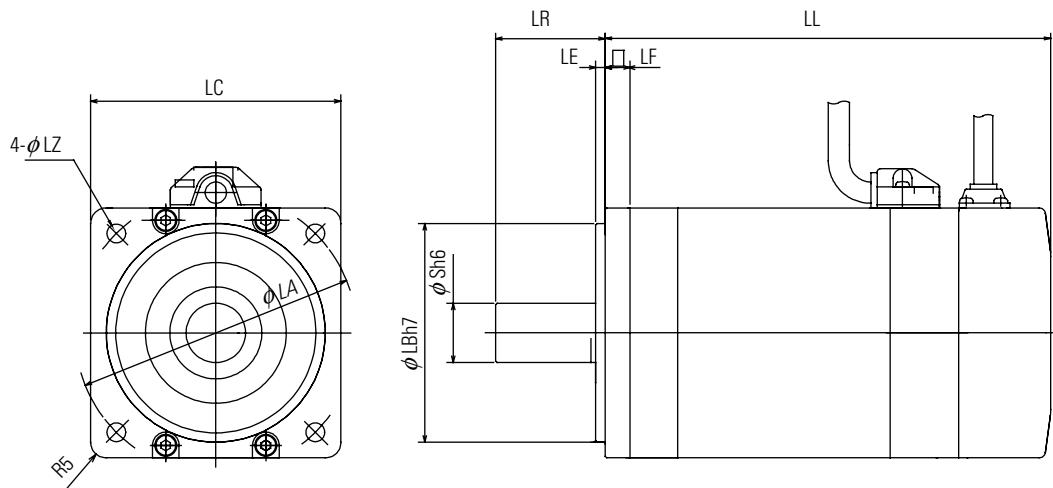
**CSMZ Series Motor****Diagram and Dimensions**

Table 4.11 CSMZ Series Motor Dimensions

Motor	Dimensions																	
	LL				LR	S	LA	LB	LC	LE	LF	LZ						
	Brake Present		Brake Absent															
	Abs.	Inc.	Abs.	Inc.														
CSMZ-A3D	122	97	90	65	25	7	45	30	38	3	6	3.4						
CSMZ-A5D	130	105	98	73	25	8	45	30	38	3	6	3.4						
CSMZ-01B	160	135	128	103	25	8	45	30	38	3	6	3.4						
CSMZ-02B	152	127	119	94	30	11	70	50	60	3	7	4.5						
CSMZ-04B	181.5	156.5	148.5	123.5	30	14	70	50	60	3	7	4.5						
CSMZ-08B	202.5	177.5	167.5	142.5	35	19	90	70	60	3	8	6						

## Shaft-End Specifications

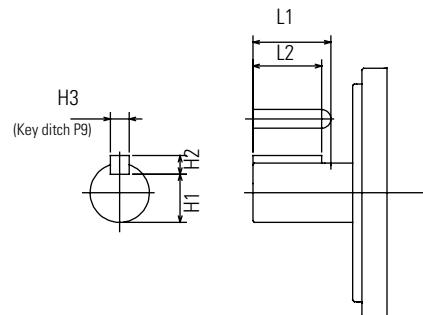


Table 4.12 CSMZ Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>L1</b>	<b>L2</b>	<b>H1</b>	<b>H2</b>	<b>H3</b>
CSMZ-A3D	13	12	5.8	2	2
CSMZ-A5D	14	12.5	6.2	3	3
CSMZ-01B	14	12.5	6.2	3	3
CSMZ-02B	20	18	8.5	4	4
CSMZ-04B	25	22.5	11	5	5
CSMZ-08B	25	22	15.5	6	6

## RSMZ/Q Series Motor Diagram and Dimensions

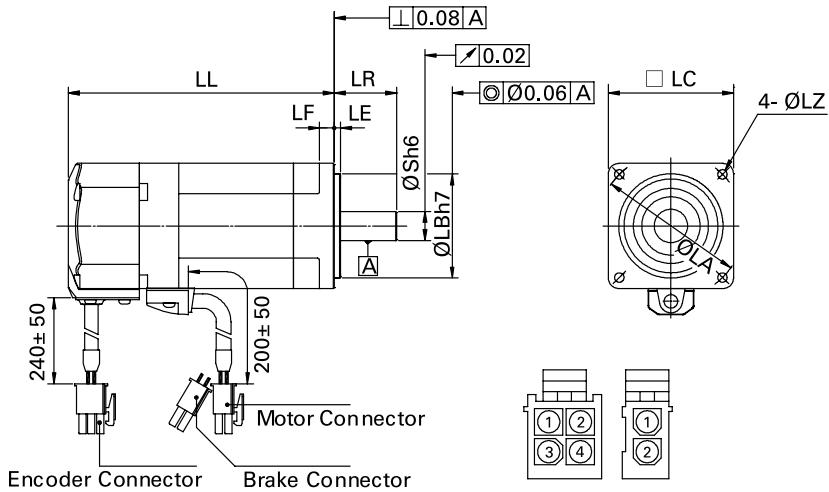


Table 4.13 RSMZ Series Motor Dimensions

Motor	Dimensions																			
	LL				LR	S	LA	LB	LC	LE	LF	LZ								
	Brake Present		Brake Absent																	
	Abs.	Inc.	Abs.	Inc.																
RSMZ-A3B	104.5	92	73.5	60	25	7	45	30	40	3	6	3.6								
RSMZ-A5B	112.5	100	81.5	68	25	8	45	30	40	3	6	3.6								
RSMZ-A8B	132.5	120	101.5	88	25	8	45	30	40	3	6	3.6								
RSMZ-01B	142.5	130	111.5	98	25	8	45	30	40	3	6	3.6								
RSMZ-02B	130.5	118	98	84.5	30	11	70	50	60	3	7	5.5								
RSMZ-04B	160	147.5	127.5	114	30	14	70	50	60	3	7	5.5								
RSMZ-06B	163	150	128	115	35	16	90	70	80	3	8	6.6								
RSMZ-08B	181	168	146	133	35	19	90	70	80	3	8	6.6								
RSMZ-10B	199	186	164	151	35	19	90	70	80	3	8	6.6								

Table 4.14 RSMQ Series Motor Dimensions

Motor	Dimensions																	
	LL				LR	S	LA	LB	LC	LE	LF	LZ						
	BRAKE 有		BRAKE 無															
	Abs.	Inc.	Abs.	Inc.														
RSMQ-01B	118	105.5	85.5	72	25	8	70	50	60	3	7	5.5						
RSMQ-02B	131	118	96	83	30	11	90	70	80	3	8	6.6						
RSMQ-04B	146	133	111	98	30	14	90	70	80	3	8	6.6						

### Shaft-End Specifications

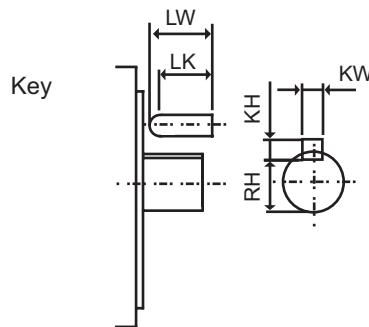


Table 4.15 RSMZ Series Motor Shaft-End Specifications

Motor	Dimensions				
	LW/ LN (D-cut)	LK	KW	KH	RH/ LP (D-cut)
RSMZ-A3B	13	12	2h9	2	5.8
RSMZ-A5B	14	12.5	3h9	3	6.2
RSMZ-A8B	14	12.5	3h9	3	6.2
RSMZ-01B	14	12.5	3h9	3	6.2
RSMZ-02B	20	18	4h9	4	8.5
RSMZ-04B	25	22.5	5h9	5	11
RSMZ-06B	25	22	6h9	6	12.5
RSMZ-08B	25	22	6h9	6	15.5
RSMZ-10B	25	22	6h9	6	15.5

Table 4.16 RSMQ Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>LW/ LN (D-cut)</b>	<b>LK</b>	<b>KW</b>	<b>KH</b>	<b>RH/ LP (D-cut)</b>
RSMQ-01B	14	12.5	3h9	3	6.2
RSMQ-02B	20	18	4h9	4	8.5
RSMQ-04B	25	22.5	5h9	5	11

## CSMD/H/K/S Series Motor Diagram and Dimensions

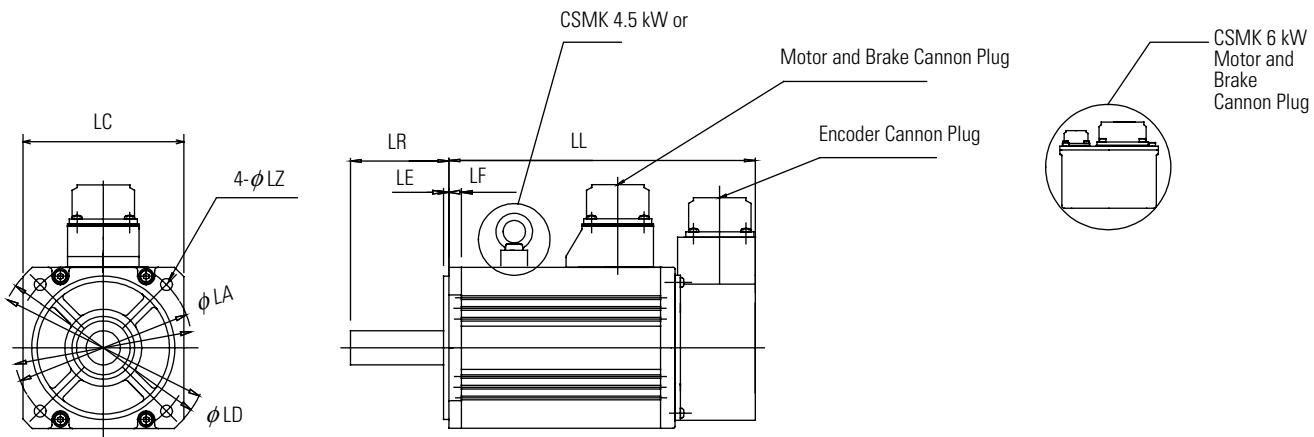


Table 4.17 CSMD/H/K/S Series Motor Dimensions

Motor	Dimensions															
	LL				LR	LA	LC	LD	LE	LF	LZ					
	Brake Present		Brake Absent													
	Abs.	Inc.	Abs.	Inc.												
CSMD-08B	198	169	173	144	55	130,145	120	162	3	10	9					
CSMD-10B	201	172	176	147	55	145	130	165	6	12	9					
CSMD-15B	226	197	201	172	55	145	130	165	6	12	9					
CSMD-20B	251	222	226	197	55	145	130	165	6	12	9					
CSMD-25B	276	247	251	222	65	145	130	165	6	12	9					
CSMD-30B	301	272	276	247	65	145	130	165	6	12	9					
CSMD-35B	283	254	258	229	65	165	150	190	3.2	18	11					
CSMD-40B	303	274	278	249	65	165	150	190	3.2	18	11					
CSMD-45B	256	227	231	222	70	200	180	233	3.2	18	13.5					
CSMD-50B	276	247	251	222	70	200	180	233	3.2	18	13.5					
CSMH-10B	226	197	201	172	70	145	130	165	6	12	9					
CSMH-15B	251	222	226	197	70	145	130	165	6	12	9					
CSMH-20B	241	212	231	187	80	200	180	233	3.2	18	13.5					
CSMH-30B	256	227	231	202	80	200	180	233	3.2	18	13.5					
CSMH-40B	281	252	256	227	80	200	180	233	3.2	18	13.5					
CSMH-50B	306	277	281	252	80	200	180	233	3.2	18	13.5					
CSMK-03B		158		133	70	145	130	165	6	12	9					
CSMK-06B		183		158	70	145	130	165	6	12	9					
CSMK-09B		208		183	70	145	130	165	6	12	9					

Table 4.17 CSMD/H/K/S Series Motor Dimensions

Motor	Dimensions										
	LL				LR	LA	LC	LD	LE	LF	LZ
	Brake Present		Brake Absent								
Abs.	Inc.	Abs.	Inc.								
CSMK-12B		195		170	80	200	176	233	3.2	18	13.5
CSMK-20B		162		190	80	200	176	233	3.2	18	13.5
CSMK-30B		208		230	80	200	176	233	3.2	18	13.5
CSMK-45B		353.5		308.5	113	200	176	233	3.2	24	13.5
CSMK-60B		393.5		348.5	113	200	176	233	3.2	24	13.5
CSMS-10B	226	197	201	172	55	100	90	120	3	7	6.6
CSMS-15B	231	202	206	177	55	115	100	135	3	10	9
CSMS-20B	256	227	231	202	55	115	100	135	3	10	9
CSMS-25B	281	252	256	227	55	115	100	135	3	10	9
CSMS-30B	268	239	243	214	55	130,145	120	162	3	10	9
CSMS-35B	288	259	263	234	55	130,145	120	162	3	10	9
CSMS-40B	291	262	266	237	65	145	130	165	6	12	9
CSMS-45B	311	282	286	257	65	145	130	165	6	12	9
CSMS-50B	331	302	306	277	65	145	130	165	6	12	9

## Shaft-End Specifications

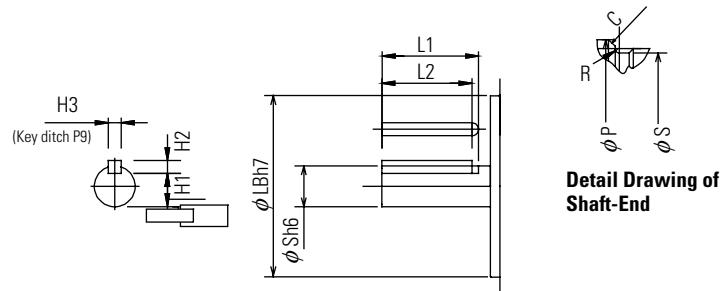


Table 4.18 CSMS/D/H/K Series Motor Shaft-End Specifications

Motor	Dimensions									
	L1	L2	S	LB	H1	H2	H3	C	R	P
CSMS-10	45	42	19	80	15.5	6	6	0.3	0.6 to 1.1	19.8
CSMS-15 to 25	45	42	19	95	15.5	6	6	0.3	0.6 to 1.1	19.8
CSMS-30, 35	45	41	22	110	18	7	8	0.5	0.6 to 1.1	24
CSMS-40 to 50	55	51	24	110	20	7	8	0.5	0.6 to 1.1	No Step
CSMD-08	45	42	19	110	15.5	6	6	0.5	0.6 to 1.1	24
CSMD-10 to 20	45	41	22	110	18	7	8	0.5	0.6 to 1.1	24
CSMD-25, 30	55	51	24	110	20	7	8	0.5	0.6 to 1.1	No Step
CSMD-35, 40	55	51	28	130	24	7	8	0.5	0.6 to 1.1	29.8
CSMD-45, 50	55	50	35	114.3	30	8	10	0.5	0.6 to 1.1	39.8
CSMH-05 to 15	45	41	22	110	18	7	8	0.5	0.6 to 1.1	24
CSMH-20 to 50	55	50	35	114.3	30	8	10	0.5	0.6 to 1.1	39.8
CSMK-03 to 09	45	41	22	110	18	7	8	0.5	0.6 to 1.1	24
CSMK-12 to 30	55	50	35	114.3	30	8	10	0.5	0.6 to 1.1	39.8
CSMK-45, 60	96	90	42	114.3	37	8	12	-	-	-

## RSMD/S/H/F Series Motor Diagram and Dimensions

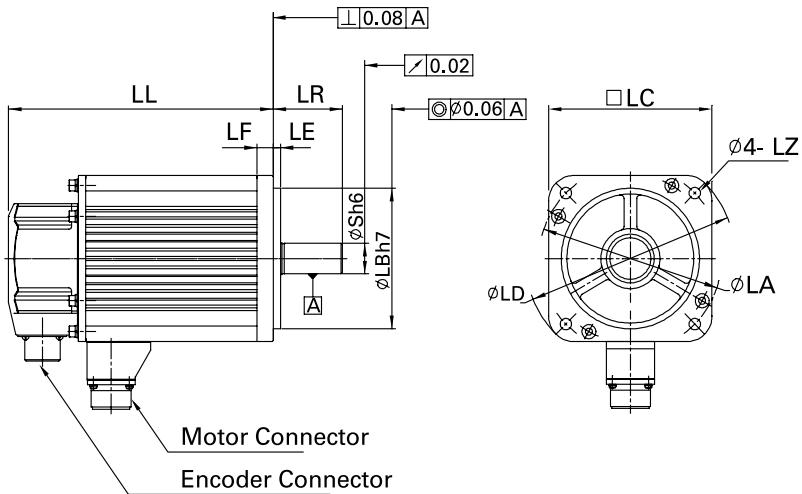


Table 4.19 RSMD Series Motor Dimensions

Motor	Dimensions												
	LL				LR	S	LA	LB	LC	LD	LE	LF	LZ
	Brake Present		Brake Absent										
	Abs.	Inc.	Abs.	Inc.									
RSMD-08B	169.5	169.5	144.5	144.5	55	19	130/145	110	120	162	3	12	9
RSMD-10B	183	183	158	158	55	22	145	110	130	165	6	12	9
RSMD-15B	208	208	183	183	55	22	145	110	130	165	6	12	9
RSMD-20B	233	233	208	208	55	22	145	110	130	165	6	12	9
RSMD-25B	258	258	233	233	65	24	145	110	130	165	6	12	9
RSMD-30B	283	283	258	258	65	24	145	110	130	165	6	12	9
RSMD-35B	223	223	198	198	65	28	200	114.3	180	230	3.2	18	13.5
RSMD-40B	228	228	203	203	65	28	200	114.3	180	230	3.2	18	13.5
RSMD-45B	238	238	213	213	70	35	200	114.3	180	230	3.2	18	13.5
RSMD-50B	258	258	233	233	70	35	200	114.3	180	230	3.2	18	13.5

Table 4.20 RSMS Series Motor Dimensions

Motor	Dimensions																					
	LL				LR	S	LA	LB	LC	LD	LE	LF	LZ									
	Brake Present		Brake Absent																			
	Abs.	Inc.	Abs.	Inc.																		
RSMS-10B	182.5	182.5	162.5	162.5	55	19	115	95	100	135	3	10	9									
RSMS-15B	207.5	207.5	187.5	187.5	55	19	115	95	100	135	3	10	9									
RSMS-20B	230.5	230.5	210.5	210.5	55	19	115	95	100	135	3	10	9									
RSMS-25B	255.5	255.5	235.5	235.5	55	19	115	95	100	135	3	10	9									
RSMS-30B	239.5	239.5	214.5	214.5	55	22	130/145	110	120	162	3	12	9									
RSMS-35B	259.5	259.5	234.5	234.5	55	22	130/145	110	120	162	3	12	9									
RSMS-40B	273	273	248	248	65	24	145	110	130	165	6	12	9									
RSMS-45B	293	293	268	268	65	24	145	110	130	165	6	12	9									
RSMS-50B	313	313	288	288	65	24	145	110	130	165	6	12	9									

Table 4.21 RSMH Series Motor Dimensions

Motor	Dimensions																					
	LL				LR	S	LA	LB	LC	LD	LE	LF	LZ									
	Brake Present		Brake Absent																			
	Abs.	Inc.	Abs.	Inc.																		
RSMH-05B	183	183	158	158	70	22	145	110	130	165	6	12	9									
RSMH-10B	208	208	183	183	70	22	145	110	130	165	6	12	9									
RSMH-15B	233	233	208	208	70	22	145	110	130	165	6	12	9									
RSMH-20B	225	225	200	200	80	35	200	114.3	180	230	3.2	18	13.5									
RSMH-30B	240	240	215	215	80	35	200	114.3	180	230	3.2	18	13.5									
RSMH-40B	255	255	230	230	80	35	200	114.3	180	230	3.2	18.0	13.5									
RSMH-50B	285	285	260	260	80	35	200	114.3	180	230	3.2	18.0	13.5									

Table 4.22 RSMF Series Motor Dimensions

<b>Motor</b>	<b>Dimensions</b>												
	<b>LL</b>				<b>LR</b>	<b>S</b>	<b>LA</b>	<b>LB</b>	<b>LC</b>	<b>LD</b>	<b>LE</b>	<b>LF</b>	<b>LZ</b>
	<b>Brake Present</b>		<b>Brake Absent</b>										
Abs.	Inc.	Abs.	Inc.										
RSMF-04B	153	153	128	128	55	19	145	110	130	165	6	12	9
RSMF-08B	160	160	135	135	55	22	200	114.3	180	230	3.2	18	13.5
RSMF-15B	180	180	155	155	65	35	200	114.3	180	230	3.2	18	13.5
RSMF-25B	177	177	146	146	65	35	235/250	200.0	220	268	4	16	13.5
RSMF-35B	186	186	155	155	65	35	235/250	200.0	220	268	4	16	13.5
RSMF-45B	202	202	171	171	70	35	235/250	200.0	220	268	4	16	13.5

## Shaft-End Specifications

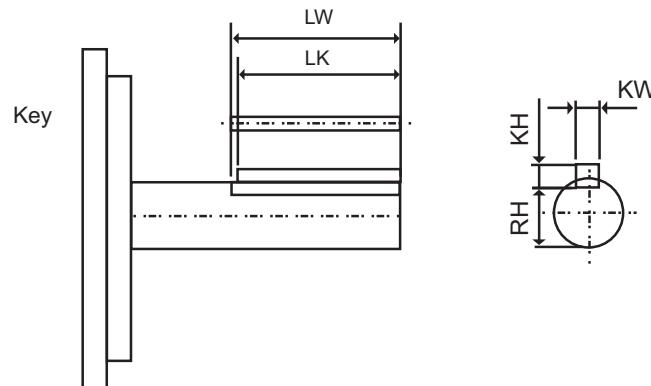


Table 4.23 RSMD Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>LW</b>	<b>LK</b>	<b>KW</b>	<b>KH</b>	<b>RH</b>
RSMD-08B	45	42	6h9	6	15.5
RSMD-10B to 20B	45	41	8h9	7	18
RSMD-25B to 30B	55	51	8h9	7	20
RSMD-35B to 40B	55	51	8h9	7	24
RSMD-45B to 50B	55	50	10h9	8	30

Table 4.24 RSMS Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>LW</b>	<b>LK</b>	<b>KW</b>	<b>KH</b>	<b>RH</b>
RSMS-10B to 25B	45	42	6h9	6	15.5
RSMS-30B to 35B	45	41	8h9	7	18
RSMS-40B to 50B	55	51	8h9	7	20

Table 4.25 RSMH Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>LW</b>	<b>LK</b>	<b>KW</b>	<b>KH</b>	<b>RH</b>
RSMH-05B to 15B	45	41	8h9	7	18
RSMH-20B to 50B	55	50	10h9	8	30

Table 4.26 RSMF Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>LW</b>	<b>LK</b>	<b>KW</b>	<b>KH</b>	<b>RH</b>
RSMF-04B	45	42	6h9	6	15.5
RSMF-08B	45	41	8h9	7	18
RSMF-15B to 45B	55	50	10h9	8	30

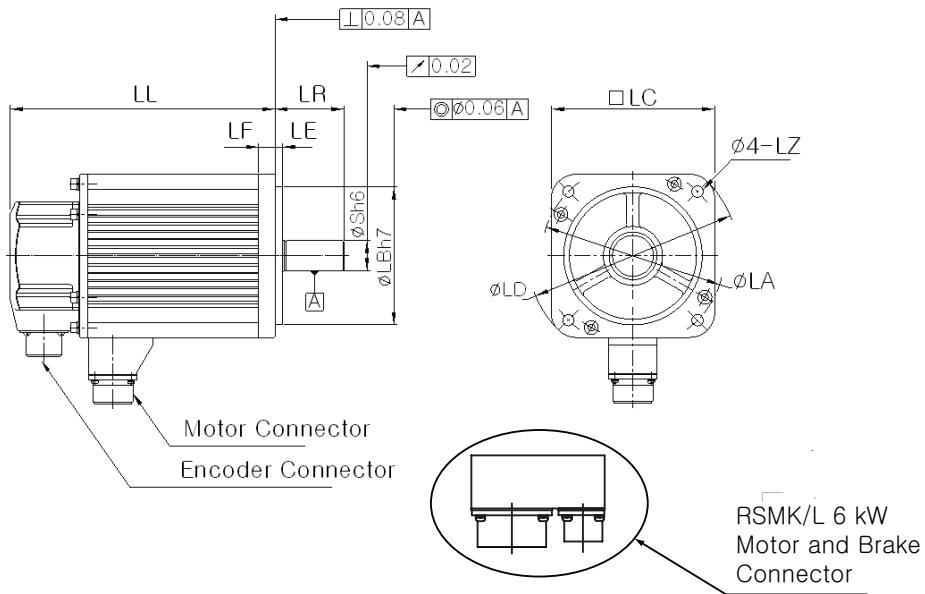
**RSMK/L Series Motor****Diagram and Dimensions**

Table 4.27 RSMK Series Motor Dimensions

Motor	Dimensions																					
	LL				LR	S	LA	LB	LC	LD	LE	LF	LZ									
	Brake Present		Brake Absent																			
	Abs.	Ins.	Abs.	Ins.																		
RSMK-03B	158	158	133	133	70	22	145	110	130	165	6	12	9									
RSMK-06B	183	183	158	158	70	22	145	110	130	165	6	12	9									
RSMK-09B	208	208	183	183	70	22	145	110	130	165	6	12	9									
RSMK-12B	208	208	183	183	80	35	200	114.3	180	230	3.2	18	13.5									
RSMK-20B	228	228	203	203	80	35	200	114.3	180	230	3.2	18	13.5									
RSMK-30B	268	268	243	243	80	35	200	114.3	180	230	3.2	18	13.5									
RSMK-45B	334.2	334.2	309.2	309.2	113	42	200	114.3	180	230	3.2	20	13.5									
RSMK-60B	389.2	389.2	364.2	364.2	113	42	200	114.3	180	230	3.2	20	13.5									

Table 4.28 RSML Series Motor Dimensions

Motor	Dimensions																			
	LL				LR	S	LA	LB	LC	LD	LE	LF	LZ							
	Brake Present		Brake Absent																	
	Abs.	Ins.	Abs.	Ins.																
RSML-03B	183	183	158	158	55	22	145	110	130	165	6	12	9							
RSML-06B	208	208	183	183	55	22	145	110	130	165	6	12	9							
RSML-09B	233	233	208	208	55	22	145	110	130	165	6	12	9							
RSML-12B	232	232	207	207	80	35	200	114.3	180	230	3.2	18	13.5							
RSML-20B	252	252	227	227	80	35	200	114.3	180	230	3.2	18	13.5							
RSML-30B	292	292	267	267	80	35	200	114.3	180	230	3.2	18	13.5							
RSML-45B	359.6	359.6	334.6	334.6	113	42	200	114.3	180	230	3.2	20	13.5							
RSML-60B	414.6	414.6	389.6	389.6	113	42	200	114.3	180	230	3.2	20	13.5							

## Shaft-End Specifications

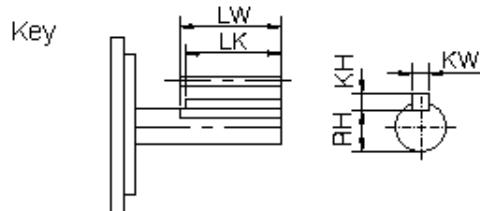


Table 4.29 RSMK Series Motor Shaft-End Specifications

Motor	Dimensions				
	LW	LK	KW	KH	RH
RSMK-03B to 09B	45	41	8h9	7	18
RSMK-12B to 30B	55	50	10h9	8	30
RSMK-45B to 60B	96	90	12h9	8	37

Table 4.30 RSML Series Motor Shaft-End Specifications

<b>Motor</b>	<b>Dimensions</b>				
	<b>LW</b>	<b>LK</b>	<b>KW</b>	<b>KH</b>	<b>RH</b>
RSML-03B to 09B	45	41	8h9	7	18
RSML-12B to 30B	55	50	10h9	8	30
RSML-45B to 60B	96	90	12h9	8	37



## Cable Specifications

This appendix describes specifications and order codes of the following cables.

- Motor 3-Phase Power Cable
- Encoder Cable
- Motor Brake Cable

**NOTE**

For specifications and order codes for the cables, refer to the user manual of the servo drive.

- I/O Cable
- Communication Cable

### **Motor 3-Phase Power Cable**

#### **Motor 3-Phase Power Cable**

Small Capacity (CSM, CSMT/R/Q/Z, RSMQ/Z)

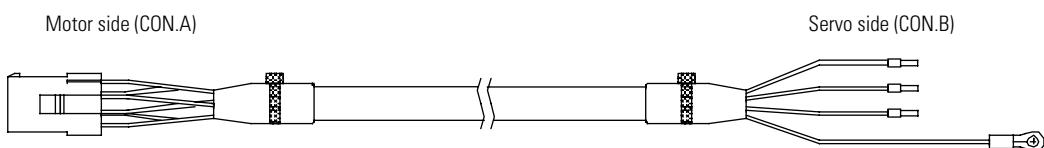


Table 5.1 Motor 3-Phase Power Cable Specifications – small capacity (CSM, CSMT/R/Q/Z, RSMQ/Z)

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Type</b>
1	U	Red	3-Core Cable
2	V	White	3-Core Cable
3	W	Black	3-Core Cable
4	FG	Yellow stripes on green background FG Wire	Solder the shield of 3-core cable

Table 5.2 Connector Specifications

Item	Description	Specifications	Manufacturer	Amount
CON.A	Housing	172159-1	AMP	1 EA
	Terminal	170362-1 (or 170366-1)	AMP	4 EA

## Large Capacity (CSMD/H/K/S, RSMS/D/H/F/K/L)

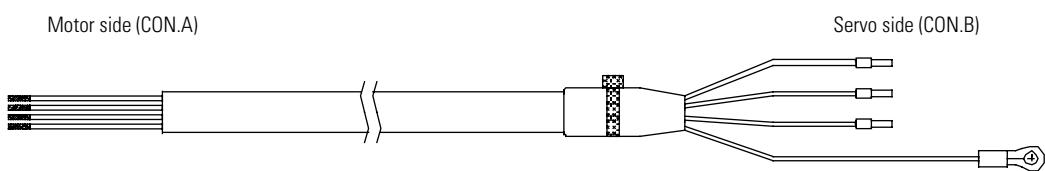
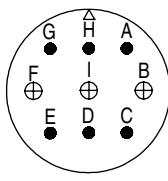


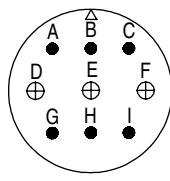
Table 5.3 Motor 3-Phase Power Cable Specifications – Large Capacity (CSMD/H/K/S, RSMS/D/H/F/K/L)

CON.A	CON.B	Color	Type
1	U	Red	3-Core Cable
2	V	White	3-Core Cable
3	W	Black	3-Core Cable
4	FG	Yellow stripes on green background FG Wire	Solder the shield of 3-core cable

## Large Capacity Motor Power Cannon Plug Specifications



MS3102A 20-18P



MS3102A 24-11P

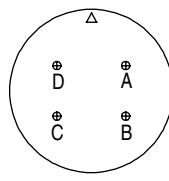
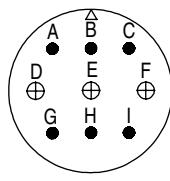
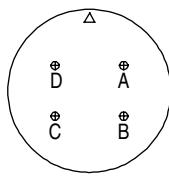
MS3102A 20-4P  
MS3102A 22-22PMS3102A 32-17P  
(for power)MS3102A 14S-2P  
(for brake)

Table 5.4 Large Capacity Motor Power Cannon Plug Specifications

<b>Motor</b>	<b>Cable Brake Present/Absent</b>	<b>Pin</b>	<b>Function</b>
CSMS-10 to 25 RSMS-10 to 25 CSMD-08 to 25 RSMD-08 to 25 CSMH-05 to 15 RSMH-05 to 15 RSMF-04 to 15 CSMK-03 to 09 RSMK-03 to 09 RSML-03 to 09	MS3102A 20-18P Valid	G H A F I B E	BR BR  U V W FG
RSMF-04 to 15	MS3102A 20-18P N/A	D C	FG  
CSMS-10 to 25 RSMS-10 to 25 CSMD-08 to 25 RSMD-08 to 25 CSMH-05 to 15 RSMH-05 to 15 CSMK-03 to 09 RSMK-03 to 09 RSML-03 to 09	MS3102A 20-4P N/A	A B C D	U V W FG
CSMS-30 to 50 RSMS-30 to 50 CSMD-30 to 50 RSMD-30 to 50 CSMH-20 to 50 RSMH-20 to 50 RSMF-25 to 45 CSMK-12 to 45 RSMK-12 to 45 RSML-12 to 45	MS3102A 24-11P Valid	A B C D E F G	BR BR  U V W FG
RSMF-25 to 45	MS3102A 24-11P N/A	H I	FG  
CSMS-30 to 50 RSMS-30 to 50 CSMD-30 to 50 RSMD-30 to 50 CSMH-20 to 50 RSMH-20 to 50 CSMK-12 to 45 RSMK-12 to 45 RSML-12 to 45	MS3102A 22-22P N/A	A B C D	U V W FG
CSMK-60 RSMK-60 RSML-60	MS3102A 32-17P (for power) N/A	A B C D E F G H I	U V W FG         

Table 5.4 Large Capacity Motor Power Cannon Plug Specifications

<b>Motor</b>	<b>Cable Brake Present/Absent</b>	<b>Pin</b>	<b>Function</b>
CSMK-60	MS3102A 14S-2P (for brake)	A	BR
RSMK-60	Available	B	BR
RSML-60		C	
		D	

## Motor 3-Phase Power Cable Order Code

Enter the following order code to buy motor 3-phase power cable.

Table 5.5 Motor 3-Phase Power Cable Order Code

<b>Motor</b>	<b>Power Cable</b>																																																																																																								
CSM CSMT CSMR CSMQ CSMZ RSMQ RSMZ	<div style="display: flex; justify-content: space-around; align-items: center;"> <span>POW-SL</span> <span>03</span> <span>P010</span> <span>F</span> <span>H</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <span>Cable Length</span> <span>Usage</span> <span>Drive in use</span> </div> <table border="1" style="margin-top: 10px; width: 100%;"> <thead> <tr> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Length</th> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Type</th> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Type</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">OH</td> <td style="text-align: center;">0.5 m</td> <td style="text-align: center;">F</td> <td style="text-align: center;">Fixed</td> <td style="text-align: center;">H</td> <td style="text-align: center;">CSD3</td> </tr> <tr> <td style="text-align: center;">01</td> <td style="text-align: center;">1 m</td> <td style="text-align: center;">M</td> <td style="text-align: center;">Movable</td> <td style="text-align: center;">A</td> <td style="text-align: center;">CSDJ, CSDP</td> </tr> <tr> <td style="text-align: center;">1H</td> <td style="text-align: center;">1.5 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">02</td> <td style="text-align: center;">2 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">⋮</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">05</td> <td style="text-align: center;">5 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">10 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">15</td> <td style="text-align: center;">15 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">20</td> <td style="text-align: center;">20 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">30</td> <td style="text-align: center;">30 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">40</td> <td style="text-align: center;">40 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">50 m</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Symbol	Length	Symbol	Type	Symbol	Type	OH	0.5 m	F	Fixed	H	CSD3	01	1 m	M	Movable	A	CSDJ, CSDP	1H	1.5 m					02	2 m					⋮						05	5 m					10	10 m					15	15 m					20	20 m					30	30 m					40	40 m					50	50 m																														
Symbol	Length	Symbol	Type	Symbol	Type																																																																																																				
OH	0.5 m	F	Fixed	H	CSD3																																																																																																				
01	1 m	M	Movable	A	CSDJ, CSDP																																																																																																				
1H	1.5 m																																																																																																								
02	2 m																																																																																																								
⋮																																																																																																									
05	5 m																																																																																																								
10	10 m																																																																																																								
15	15 m																																																																																																								
20	20 m																																																																																																								
30	30 m																																																																																																								
40	40 m																																																																																																								
50	50 m																																																																																																								
CSMD CSMS CSMH CSMK RSMS RSMD RSMH RSMF RSMK RSML	<div style="display: flex; justify-content: space-around; align-items: center;"> <span>POW-SH</span> <span>03</span> <span>P</span> <span>006</span> <span>F</span> <span>H</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <span>Cable Length</span> <span>Capacity</span> <span>Usage</span> <span>Drive in use</span> </div> <table border="1" style="margin-top: 10px; width: 100%;"> <thead> <tr> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Length</th> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Capacity</th> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Type</th> <th style="text-align: center;">Symbol</th> <th style="text-align: center;">Type</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">OH</td> <td style="text-align: center;">0.5 m</td> <td style="text-align: center;">006</td> <td style="text-align: center;">600W or less</td> <td style="text-align: center;">F</td> <td style="text-align: center;">Fixed</td> <td style="text-align: center;">H</td> <td style="text-align: center;">CSD3</td> </tr> <tr> <td style="text-align: center;">01</td> <td style="text-align: center;">1 m</td> <td style="text-align: center;">008</td> <td style="text-align: center;">800W or less</td> <td style="text-align: center;">M</td> <td style="text-align: center;">Movable</td> <td style="text-align: center;">A</td> <td style="text-align: center;">CSDJ, CSDP</td> </tr> <tr> <td style="text-align: center;">1H</td> <td style="text-align: center;">1.5 m</td> <td style="text-align: center;">015</td> <td style="text-align: center;">1500W<sup>(1)</sup></td> <td style="text-align: center;">M</td> <td style="text-align: center;">CSDM<sup>(1)</sup></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">02</td> <td style="text-align: center;">2 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">⋮</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">05</td> <td style="text-align: center;">5 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">10 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">15</td> <td style="text-align: center;">15 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">20</td> <td style="text-align: center;">20 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">30</td> <td style="text-align: center;">30 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">40</td> <td style="text-align: center;">40 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">50 m</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Symbol	Length	Symbol	Capacity	Symbol	Type	Symbol	Type	OH	0.5 m	006	600W or less	F	Fixed	H	CSD3	01	1 m	008	800W or less	M	Movable	A	CSDJ, CSDP	1H	1.5 m	015	1500W <sup>(1)</sup>	M	CSDM <sup>(1)</sup>			02	2 m							⋮								05	5 m							10	10 m							15	15 m							20	20 m							30	30 m							40	40 m							50	50 m						
Symbol	Length	Symbol	Capacity	Symbol	Type	Symbol	Type																																																																																																		
OH	0.5 m	006	600W or less	F	Fixed	H	CSD3																																																																																																		
01	1 m	008	800W or less	M	Movable	A	CSDJ, CSDP																																																																																																		
1H	1.5 m	015	1500W <sup>(1)</sup>	M	CSDM <sup>(1)</sup>																																																																																																				
02	2 m																																																																																																								
⋮																																																																																																									
05	5 m																																																																																																								
10	10 m																																																																																																								
15	15 m																																																																																																								
20	20 m																																																																																																								
30	30 m																																																																																																								
40	40 m																																																																																																								
50	50 m																																																																																																								

(1) Max. cable length is 15m.  
Factory default is 3m or 5m.

(1) Only 015 is available for CSDM.  
Max. cable length is 15m.  
Factory default is 3m or 5m.

**Encoder Cable****Encoder Cable Specifications**

Small capacity (CSM, CSMT/R/Q/Z, RSMQ/Z)

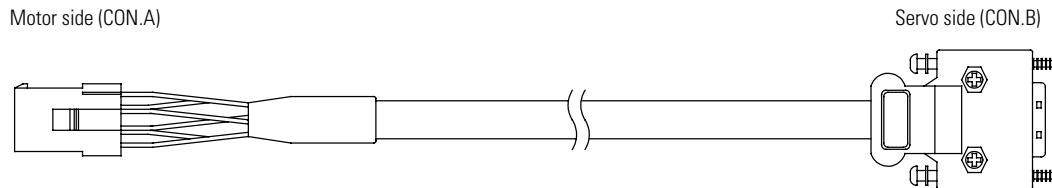


Table 5.6 9-Wire Inc. Encoder Cable: CSM, CSMT, CSMR

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
1	3	1P (White/Blue)-Blue	A	Twisted Pair
2	4	1P (White/Blue)-White	A	
3	5	2P (White/Yellow)-Yellow	B	Twisted Pair
4	6	2P (White/Yellow)-White	B	
5	7	3P (White/Green)-Green	C	Twisted Pair
6	8	3P (White/Green)-White	C	
7	20	4P (White/Red)-Red	VCC	Twisted Pair
8	1	4P (White/Red)-White	GND	
9	12/SH	Shield	FG	

Table 5.7 9-Wire RSMQ, RSMZ and 11-Wire CSMQ, CSMZ Inc. Encoder Cable.

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
1	3	1P (White/Blue)-Blue	A	Twisted Pair
2	4	1P (White/Blue)-White	A	
3	5	2P (White/Yellow)-Yellow	B	Twisted Pair
4	6	2P (White/Yellow)-White	B	
5	7	3P (White/Green)-Green	C	Twisted Pair
6	8	3P (White/Green)-White	C	
7				
8	10	5P (White/Purple)-Purple	RX	Twisted Pair RSMQ/Z No connection
9	13	5P (White/Purple)-White	/RX	
10	20	4P (White/Red)-Red	VCC	Twisted Pair
11	1	4P (White/Red)-White	GND	
12	12	Shield	FG	

Table 5.8 15-Wire Inc. Encoder Cable: CSM

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
1	3	1P (White/Blue)-Blue	A	Twisted Pair
2	4	1P (White/Blue)-White	A	
3	5	2P (White/Yellow)-Yellow	B	Twisted Pair
4	6	2P (White/Yellow)-White	B	
5	7	3P (White/Green)-Green	C	Twisted Pair
6	8	3P (White/Green)-White	C	
7	10	5P (White/Purple)-Purple	U	Twisted Pair
8	13	5P (White/Purple)-White	U	
9	14	6P (Brown/Blue)-Blue	V	Twisted Pair
10	15	6P (Brown/Blue)-Brown	V	
11	16	7P (Brown/Yellow)-Yellow	W	Twisted Pair
12	17	7P (Brown/Yellow)-Brown	W	
13	20	4P (White/Red)-Red	VCC	Twisted Pair
14	1	4P (White/Red)-White	GND	
15	12	Shield	FG	

Table 5.9 Compact Abs. Encoder Cable: CSM, CSMT, CSMR Motor

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
1	3	1P (White/Blue)-Blue	A	Twisted Pair
2	4	1P (White/Blue)-White	A	
3	5	2P (White/Yellow)-Yellow	B	Twisted Pair
4	6	2P (White/Yellow)-White	B	
5	7	3P (White/Green)-Green	C	Twisted Pair
6	8	3P (White/Green)-White	C	
7	10	5P (White/Purple)-Purple	RX	Twisted Pair
8	13	5P (White/Purple)-White	/RX	
9	11	6P (Brown/Blue)-Blue	RST	
10	12	Shield	FG	
11	18	7P (Brown/Yellow)-Yellow	BAT+	Twisted Pair
12	19	7P (Brown/Yellow)-Brown	BAT-	
13	20	4P (White/Red)-Red	VCC	Twisted Pair
14	1	4P (White/Red)-White	GND	
15	12	Shield	FG	

Table 5.10 Compact Abs. Encoder Cable: CSMQ, CSMZ, RSMQ, RSMZ Motor

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
1	3	1P (White/Blue)-Blue	A	Twisted Pair
2	4	1P (White/Blue)-White	A	
3	5	2P (White/Yellow)-Yellow	B	Twisted Pair
4	6	2P (White/Yellow)-White	B	
5	7	3P (White/Green)-Green	C	Twisted Pair
6	8	3P (White/Green)-White	C	
7	18	5P (White/Purple)-Purple	BAT+	Twisted Pair
8	19	5P (White/Purple)-White	BAT-	
9	11	6P (Brown/Blue)-Blue	RST	
10	12	Shield	FG	
11	10	7P (Brown/Yellow)-Yellow	RX	Twisted Pair
12	13	7P (Brown/Yellow)-Brown	/RX	
13	20	4P (White/Red)-Red	VCC	Twisted Pair
14	1	4P (White/Red)-White	GND	
15	12	Shield	FG	

Table 5.11 Serial Encoder

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
1	18	1P (White/Blue)-Blue	BAT+	Twisted Pair
2	19	1P (White/Blue)-White	BAT-	
3	SH	Shield	FG	
4	10	2P (White/Green)-White	SD+	Twisted Pair
5	13	3P (White/Green)-Green	SD-	
6			N.C.	
7	20	4P (White/Red)-Red	VCC	Twisted Pair
8	1	4P (White/Red)-White	GND	
9			N.C.	

Table 5.12 Connector Specifications

<b>Item</b>	<b>Description</b>	<b>Specifications</b>	<b>Manufacturer</b>	<b>Amount</b>
CON. A (CSMT, CSMR)	Housing	172161-1	AMP	1 EA
	Terminal	170361-1 (or 170365-1)	AMP	9 EA
CON. A (RSMZ, RSMQ)	Housing	172162-1	AMP	1 EA
	Terminal	170361-1 (or 170365-1)	AMP	9 EA
CON. B	Connector	10120-3000VE	3M	1 EA
	Case	10320-52F0-008	3M	1 EA

## Large Capacity (CSMD/H/K/S, RSMS/D/H/F/K/L)

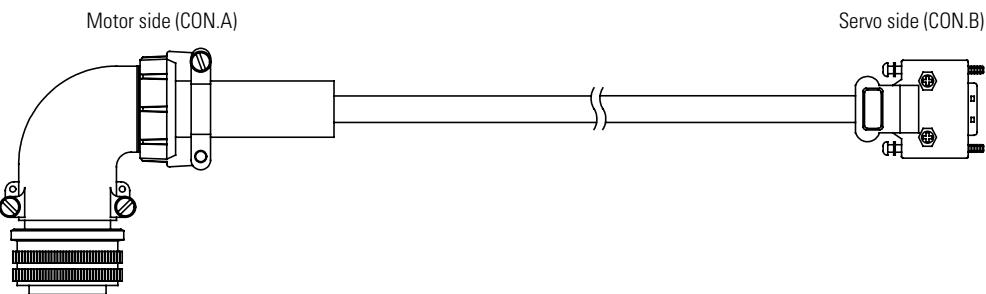


Table 5.13 9-Wire RSMS/D/H/F/K/L and 11-Wire CSMD/H/K/S Inc. Encoder Cable

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
A	3	1P (White/Blue)-Blue	A	Twisted Pair
B	4	1P (White/Blue)-White	A	
C	5	2P (White/Yellow)-Yellow	B	Twisted Pair
D	6	2P (White/Yellow)-White	B	
E	7	3P (White/Green)-Green	C	Twisted Pair
F	8	3P (White/Green)-White	C	
G	1	4P (White/Red)-White	GND	Twisted Pair
H	20	4P (White/Red)-Red	VCC	
J	12/SH	Shield	FG	
P	10	5P (White/Purple)-Purple	RX	Twisted Pair (RSM* series motors are not connected)
R	13	5P (White/Purple)-White	/RX	

Table 5.14 15-Wire Inc. Encoder Cable

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
A	3	1P (White/Blue)-Blue	A	Twisted Pair
B	4	1P (White/Blue)-White	A	
C	5	2P (White/Yellow)-Yellow	B	Twisted Pair
D	6	2P (White/Yellow)-White	B	
E	7	3P (White/Green)-Green	C	Twisted Pair
F	8	3P (White/Green)-White	C	
G	1	4P (White/Red)-Red	GND	Twisted Pair
H	20	4P (White/Red)-White	VCC	
J	12/SH	Shield	FG	
K	10	5P (White/Purple)-Purple	U	Twisted Pair
L	13	5P (White/Purple)-White	U	
M	14	6P (Brown/Blue)-Blue	V	Twisted Pair
N	15	6P (Brown/Blue)-Brown	V	
P	16	7P (Brown/Yellow)-Yellow	W	Twisted Pair
R	17	7P (Brown/Yellow)-Brown	W	

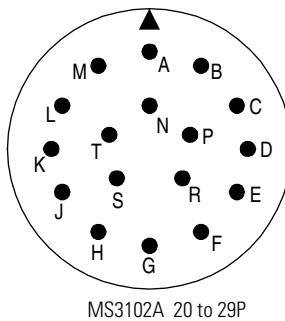
Table 5.15 Compact Abs. Encoder Cable

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
A	3	1P (White/Blue)-Blue	A	Twisted Pair
B	4	1P (White/Blue)-White	A	
C	5	2P (White/Yellow)-Yellow	B	Twisted Pair
D	6	2P (White/Yellow)-White	B	
E	7	3P (White/Green)-Green	C	Twisted Pair
F	8	3P (White/Green)-White	C	
G	1	4P (White/Red)-Red	GND	Twisted Pair
H	20	4P (White/Red)-White	VCC	
J	12/SH	Shield	FG	
K	10	5P (White/Purple)-Purple	RX	Twisted Pair
L	13	5P (White/Purple)-White	/RX	
R	11	6P (Brown/Blue)-Blue	RST	
	15		N.C.	
S	19	7P (Brown/Yellow)-Yellow	BAT-	Twisted Pair
T	18	7P (Brown/Yellow)-Brown	BAT+	

Table 5.16 17-Bit Abs. Encoder Cable

<b>CON.A</b>	<b>CON.B</b>	<b>Color</b>	<b>Function</b>	
G	1	4P (White/Red) White	GND	Twisted Pair
H	20	4P (White/Red) Red	VCC	
J	12/SH	Shield	FG	Twisted Pair
K	10	5P (White/Purple) Purple	SD	
L	13	5P (White/Purple) White	/SD	Twisted Pair
S	19	7P (Brown/Yellow) Yellow	BAT-	
T	18	7P (Brown/Yellow) Brown	BAT+	

## Large Capacity Motor Encoder Cannon Plug Specifications



MS3102A 20 to 29P

### Encoder Code Order Code

To order encoder cables, use the order code as shown below.

Table 5.17 Encoder Cable Order Code

<b>Motor</b>	<b>Power Cable</b>						
CSM CSMT CSMR	ENC-SL	03	E	CN	S	F	A
	Cable Length		Encoder Type		Usage		
	Symbol	Length	Symbol	Types	Symbol	Type	
	OH	0.5 m	AB	Compact Abs.	F	Fixed	
	01	1 m	CN	9-Wire Inc.	M	Movable <sup>(1)</sup>	
	1H	1.5 m	SN	15-Wire Inc. <sup>(1)</sup>	(1)		
	02	2 m	Number of Channels	17-Bit Serial			Movable type is not available for CSDM.
	:						
	05	5 m					
	10	10 m					
	15	15 m					
	20	20 m					
	30	30 m					
	40	40 m					
	50	50 m					

(1) CSDM does not support 15-wire rotary motor. It supports only linear motor (15-wire), and a user is responsible for the cable.

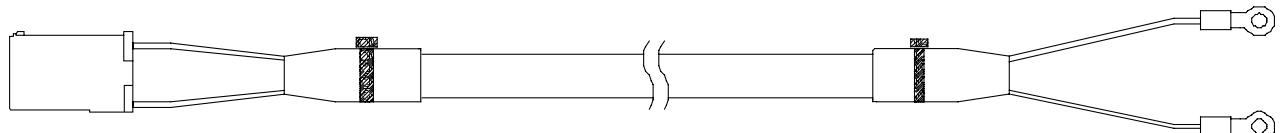
Table 5.18 Encoder Cable Order Code

<b>Motor</b>	<b>Power Cable</b>																																																																																			
CSMQ CSMZ RSMQ RSMZ	<p>The diagram shows the encoder cable order code structure. It consists of a base code "ENC-SL" followed by a length code "03", then an encoder type code "E", then an optional "CL" (for 11-wire), then an optional "S" (for 9-wire), then an optional "F" (for compact absolute), and finally an optional "A" (for linear).</p>																																																																																			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 15%;">Symbol</th> <th style="text-align: center; width: 15%;">Length</th> <th style="text-align: center; width: 15%;">Symbol</th> <th style="text-align: center; width: 15%;">Types</th> <th style="text-align: center; width: 15%;">Symbol</th> <th style="text-align: center; width: 15%;">Type</th> </tr> </thead> <tbody> <tr> <td>0H</td> <td>0.5m</td> <td>AC</td> <td>Compact Abs.</td> <td>F</td> <td>Fixed</td> </tr> <tr> <td>01</td> <td>1m</td> <td>CL</td> <td>11-Wire Inc.</td> <td>M</td> <td>Movable<sup>(1)</sup></td> </tr> <tr> <td>1H</td> <td>1.5m</td> <td>CK</td> <td>9-Wire Inc.</td> <td></td> <td></td> </tr> <tr> <td>02</td> <td>2m</td> <td>Number of Channels</td> <td>17-Bit Serial</td> <td></td> <td></td> </tr> <tr> <td>:</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>05</td> <td>5m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td>10m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>15</td> <td>15m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td>20m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>30</td> <td>30m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>40</td> <td>40m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>50</td> <td>50m</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Symbol	Length	Symbol	Types	Symbol	Type	0H	0.5m	AC	Compact Abs.	F	Fixed	01	1m	CL	11-Wire Inc.	M	Movable <sup>(1)</sup>	1H	1.5m	CK	9-Wire Inc.			02	2m	Number of Channels	17-Bit Serial			:						05	5m					10	10m					15	15m					20	20m					30	30m					40	40m					50	50m				
Symbol	Length	Symbol	Types	Symbol	Type																																																																															
0H	0.5m	AC	Compact Abs.	F	Fixed																																																																															
01	1m	CL	11-Wire Inc.	M	Movable <sup>(1)</sup>																																																																															
1H	1.5m	CK	9-Wire Inc.																																																																																	
02	2m	Number of Channels	17-Bit Serial																																																																																	
:																																																																																				
05	5m																																																																																			
10	10m																																																																																			
15	15m																																																																																			
20	20m																																																																																			
30	30m																																																																																			
40	40m																																																																																			
50	50m																																																																																			
CSMD CSMS CSMH CSMK RSMS RSMD RSMH RSMF RSMK RSML	<p>The diagram shows the encoder cable order code structure. It consists of a base code "ENC-SH" followed by a length code "03", then an encoder type code "E", then an optional "CN" (for 15-wire), then an optional "L" (for 9-wire), then an optional "F" (for compact absolute), and finally an optional "A" (for linear).</p>																																																																																			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 15%;">Symbol</th> <th style="text-align: center; width: 15%;">Length</th> <th style="text-align: center; width: 15%;">Symbol</th> <th style="text-align: center; width: 15%;">Types</th> <th style="text-align: center; width: 15%;">Symbol</th> <th style="text-align: center; width: 15%;">Type</th> </tr> </thead> <tbody> <tr> <td>0H</td> <td>0.5 m</td> <td>AB</td> <td>Compact Abs.</td> <td>F</td> <td>Fixed</td> </tr> <tr> <td>01</td> <td>1 m</td> <td>CN</td> <td>11-Wire Inc.</td> <td>M</td> <td>Movable<sup>(1)</sup></td> </tr> <tr> <td>1H</td> <td>1.5 m</td> <td>CK</td> <td>9-Wire Inc.</td> <td></td> <td></td> </tr> <tr> <td>02</td> <td>2 m</td> <td>SN</td> <td>15-Wire Inc.<sup>(1)</sup></td> <td></td> <td></td> </tr> <tr> <td>:</td> <td></td> <td>Number of Channels</td> <td>17-Bit Serial</td> <td></td> <td></td> </tr> <tr> <td>05</td> <td>5 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td>10 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>15</td> <td>15 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td>20 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>30</td> <td>30 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>40</td> <td>40 m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>50</td> <td>50 m</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Symbol	Length	Symbol	Types	Symbol	Type	0H	0.5 m	AB	Compact Abs.	F	Fixed	01	1 m	CN	11-Wire Inc.	M	Movable <sup>(1)</sup>	1H	1.5 m	CK	9-Wire Inc.			02	2 m	SN	15-Wire Inc. <sup>(1)</sup>			:		Number of Channels	17-Bit Serial			05	5 m					10	10 m					15	15 m					20	20 m					30	30 m					40	40 m					50	50 m				
Symbol	Length	Symbol	Types	Symbol	Type																																																																															
0H	0.5 m	AB	Compact Abs.	F	Fixed																																																																															
01	1 m	CN	11-Wire Inc.	M	Movable <sup>(1)</sup>																																																																															
1H	1.5 m	CK	9-Wire Inc.																																																																																	
02	2 m	SN	15-Wire Inc. <sup>(1)</sup>																																																																																	
:		Number of Channels	17-Bit Serial																																																																																	
05	5 m																																																																																			
10	10 m																																																																																			
15	15 m																																																																																			
20	20 m																																																																																			
30	30 m																																																																																			
40	40 m																																																																																			
50	50 m																																																																																			
	<p><sup>(1)</sup> CSDM does not support 15-wire rotary motor. CSDM supports only linear motor (15-wire), and a user is responsible for the cable.</p>																																																																																			

**Motor Brake Cable****Motor Brake Cable Specifications**

Small Capacity (CSM, CSMT/R/Q/Z, RSMQ/Z)

Motor Side



Large Capacity (CSMD/H/K/S, RSMS/D/H/F/K/L)

Motor Side

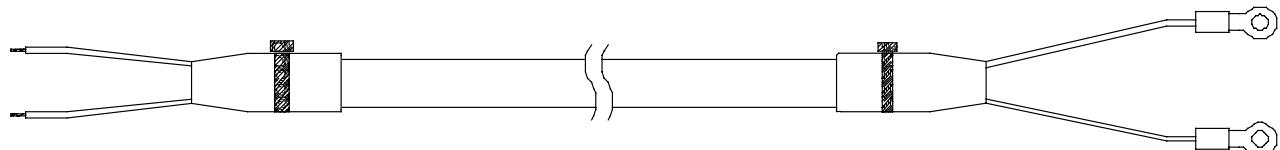


Table 5.19 Motor Brake Cable Specifications

<b>Indicator</b>	<b>Color</b>
BK+	White of 2-Core Cable
BK-	Black of 2-Core Cable

Table 5.20 Connector Specifications

<b>Item</b>	<b>Description</b>	<b>Specifications</b>	<b>Manufacturer</b>	<b>Amount</b>
CON. A	Housing	172233-1	AMP	1 EA
	Terminal	170362-1 (or 170366-1)	AMP	2 EA

Table 5.21 Brake Cable Order Code

<b>Motor</b>	<b>Power Cable</b>		
All Motors	<div style="display: flex; justify-content: space-around;"> <span>BRK-SH</span> <span>03</span> <span>BRAKF</span> </div> Cable Length		
	<b>Symbol</b>	<b>Length</b>	
	0H	0.5 m	
	01	1 m	
	1H	1.5 m	
	02	2 m	
	:		
	05	5 m	
	10	10 m	
	15	15 m <sup>(1)</sup>	
	20	20 m	
	30	30 m	
	40	40 m	
	50	50 m	

## User I/O Cable

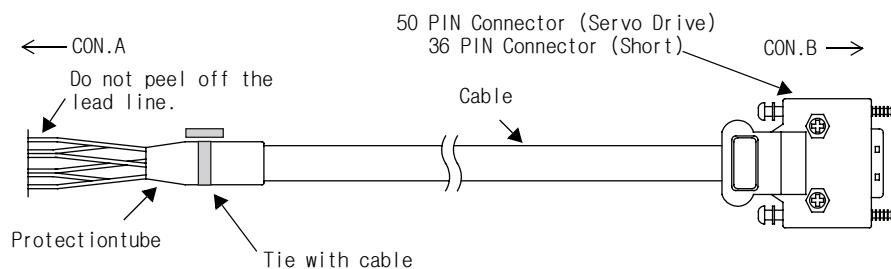


Table 5.22 I/O Cable Connection Specifications (Servo Drive)

<b>con.b</b>	<b>Wire Color</b>	<b>CON.B</b>	<b>Wire Color</b>	<b>CON.B</b>	<b>Wire Color</b>
1	Red	21	Gray/2Point	41	Orange/Light Line
2	Yellow	22	Red/3Point	42	Gray/Light Line
3	Skyblue	23	Yellow/3Point	43	Red/1Line
4	White	24	Skyblue/3Point	44	Yellow/1Line

Table 5.22 I/O Cable Connection Specifications (Servo Drive)

5	Pink	25	White/3Point	45	Skyblue/1Line
6	Orange	26	Pink/3Point	46	White/1Line
7	Gray	27	Orange/3Point	47	Pink/1Line
8	Red/1Point	28	Gray/3Point	48	Orange/1Line
9	Yellow/1Point	29	Red/4Point	49	Gray/1Line
10	Skyblue/1Point	30	Yellow/4Point	50	Shield (Green)
11	White/1Point	31	Sky blue/4Point		
12	Pink/1Point	32	White/4Point		
13	Orange/1Point	33	Pink/4Point		
14	White/1Point	34	Orange/4Point		
15	Red/2Point	35	Gray/4Point		
16	Yellow/2Point	36	Red/Light Line		
17	Skyblue/2Point	37	Yellow/Light Line		
18	White/2Point	38	Skyblue/Light Line		
19	Pink/2Point	39	White/Light Line		
20	Orange/2Point	40	Pink/Light line		

Table 5.23 Connector Specifications

Item	Description	Specifications	Manufacturer	Amount
CON. B	Connector	10150-3000VE	3M	1 EA
	Case	10350-52F0-008	3M	1 EA

Table 5.24 User I/O Cable Order Code

Motor	Power Cable														
All Motors	<div style="text-align: center;"> <span>IOC-SH</span> <span>03</span> <span>U26CNA</span>  <span>Cable Length</span>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Symbol</th> <th>Length</th> </tr> </thead> <tbody> <tr><td>0H</td><td>0.5 m</td></tr> <tr><td>01</td><td>1 m</td></tr> <tr><td>1H</td><td>1.5 m</td></tr> <tr><td>02</td><td>2 m</td></tr> <tr><td>:</td><td></td></tr> <tr><td>05</td><td>5 m<sup>(1)</sup></td></tr> </tbody> </table> <p style="text-align: right;">(1) Max. length is 5m for CSDM. Factory default is 3m and 5m.</p> </div>	Symbol	Length	0H	0.5 m	01	1 m	1H	1.5 m	02	2 m	:		05	5 m <sup>(1)</sup>
Symbol	Length														
0H	0.5 m														
01	1 m														
1H	1.5 m														
02	2 m														
:															
05	5 m <sup>(1)</sup>														

## Communication Cable

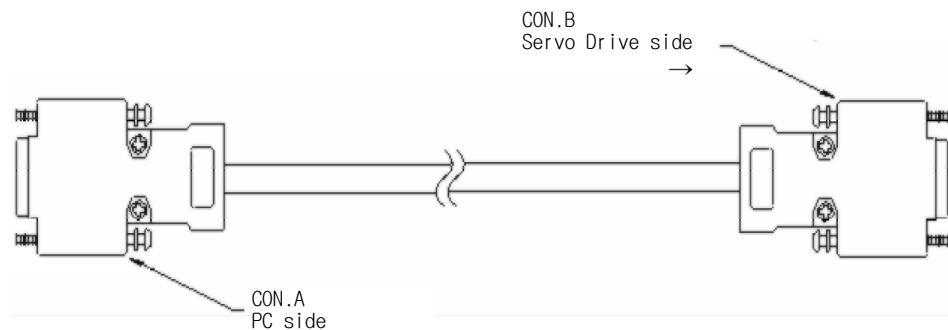


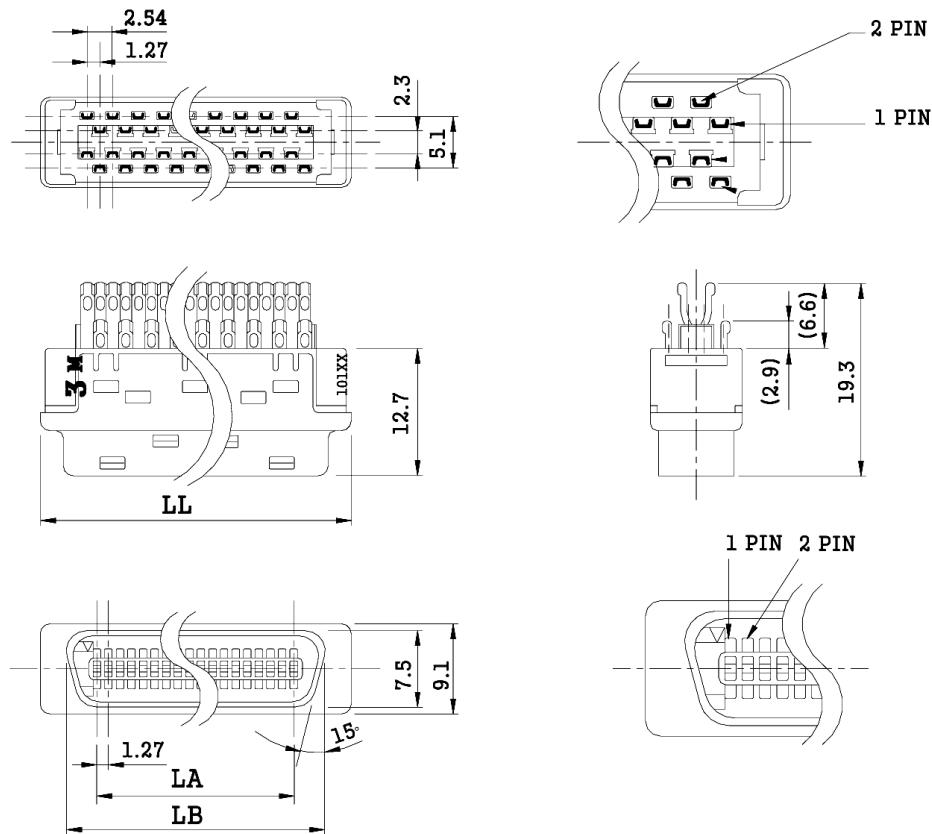
Table 5.25 Communication Cable (CON.A↔ CON.B) Connection Specifications

<b>CON.A</b>	<b>CON.B</b>	<b>Wire color</b>	<b>Function</b>
5	5	Gray	OFF_CHK
3	2	Brown	RX
2	3	Red	TX
N.C	9	Shield	P.E

Table 5.26 Connector Specifications

<b>Item</b>	<b>Description</b>	<b>Specifications</b>	<b>Manufacturer</b>	<b>Amount</b>
CON. A	Connector	17JE-13090-02 (DI) Socket Type	DDK	1 EA
CON. B	Connector	10120-3000VE	3M	1 EA
	Case	10320-52F0-008	3M	1 EA

## Cable Connector Specifications



### Order Number

- Encoder Connector (20 PIN): CON-SCONN20PIN
- I/O Connector (36 PIN) : CON-SCONN36PIN
- I/O Connector (50 PIN) : CON-SCONN50PIN

## SERCOS Cables

The specifications of SERCOS cables for CSDM SERCOS ring are shown below. The max. length is 32m.

Table 5.27 SERCOS Cable Order Code

Indoor Use (Diameter 2.2mm)	Outdoor Use (Diameter: 3.6mm, 5mm)	Length (m)
SCS_SEA1PFOCNM	SCS_SVA1PFOCNM	0.1
SCS_SEA2PFOCNM	SCS_SVA2PFOCNM	0.2
SCS_SEA3PFOCNM	SCS_SVA3PFOCNM	0.3

Table 5.27 SERCOS Cable Order Code

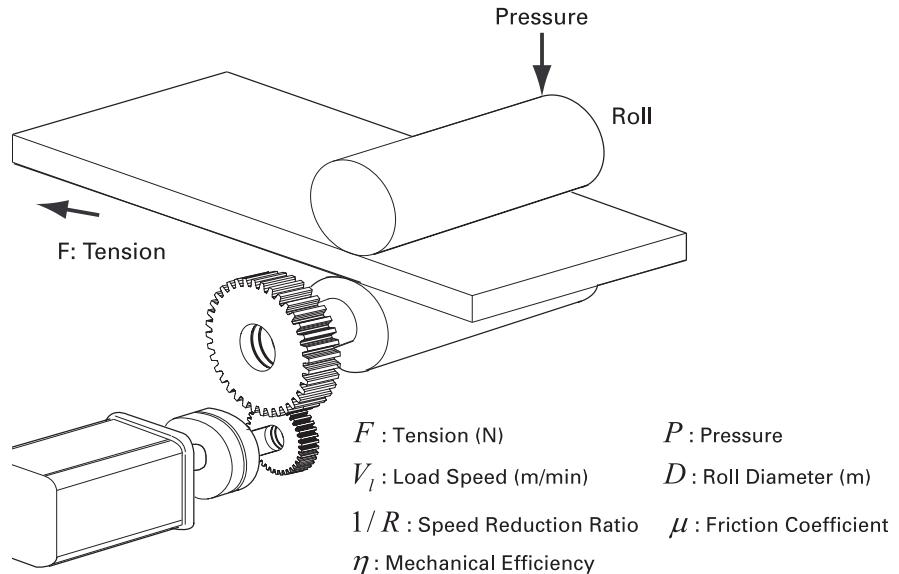
<b>Indoor Use (Diameter 2.2mm)</b>	<b>Outdoor Use (Diameter: 3.6mm, 5mm)</b>	<b>Length (m)</b>
SCS_SE01PFOCNM	SCS_SV01PFOCNM	1
SCS_SE03PFOCNM	SCS_SV03PFOCNM	3
SCS_SE05PFOCNM	SCS_SV05PFOCNM	5
SCS_SE08PFOCNM	SCS_SV08PFOCNM	8
SCS_SE10PFOCNM	SCS_SV10PFOCNM	10
SCS_SE15PFOCNM	SCS_SV15PFOCNM	15
SCS_SE20PFOCNM	SCS_SV20PFOCNM	20
SCS_SE25PFOCNM	SCS_SV25PFOCNM	25
SCS_SE32PFOCNM	SCS_SV32PFOCNM	32
SCS_SEA1PFOCNM	SCS_SVA1PFOCNM	0.1
SCS_SEA2PFOCNM	SCS_SVA2PFOCNM	0.2
SCS_SEA3PFOCNM	SCS_SVA3PFOCNM	0.3
SCS_SE01PFOCNM	SCS_SV01PFOCNM	1
SCS_SE03PFOCNM	SCS_SV03PFOCNM	3
SCS_SE05PFOCNM	SCS_SV05PFOCNM	5
SCS_SE08PFOCNM	SCS_SV08PFOCNM	8
SCS_SE10PFOCNM	SCS_SV10PFOCNM	10
SCS_SE15PFOCNM	SCS_SV15PFOCNM	15
SCS_SE20PFOCNM	SCS_SV20PFOCNM	20



## Load Calculation

### Roll Load

### Mechanical Configuration



### Movement Amount (M)

$$L_s = \frac{V_l}{60} \times \frac{2t_s - t_a - t_d}{2}$$

$$\text{if } t_a = t_d, \quad L_s = \frac{V_l}{60} \times (t_s - t_a)$$

### Motor Shaft Revolving Speed (r/min)

$$N_M = \frac{RV_l}{\pi D}$$

**Load Torque (N·m)**

$$T_L = \frac{(\mu P + F)D}{2R\eta}$$

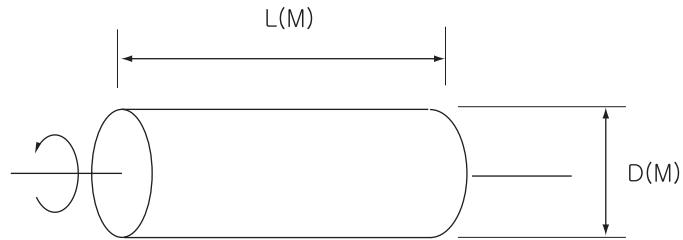
**Load Inertia Moment (Kg·m<sup>2</sup>)**

$$J_L = J_G + \frac{J_R}{R^2}$$

$J_R$ : Roll Inertia  $J_G$ : Gear, Coupling Inertia

**J<sub>R</sub>**

< Solid Cylinder >



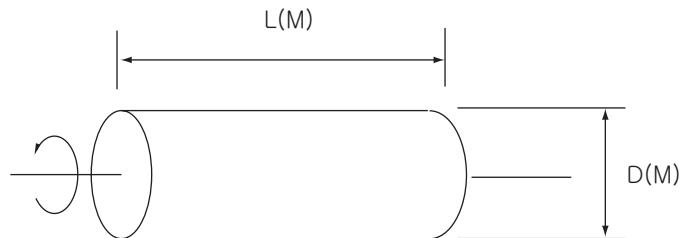
$$J_R = \frac{MD^2}{8} = \frac{\pi\rho LD^4}{32}$$

$M$ : Mass[kg],  $\rho$ : Density[kg/m<sup>3</sup>]

$\rho = 7.87 \times 10^3$  [kg/m<sup>3</sup>] : Iron

$\rho = 2.70 \times 10^3$  [kg/m<sup>3</sup>] : Aluminum

< Hollow Cylinder >



$$J_R = \frac{M(D_o^2 - D_i^2)}{8} = \frac{\pi\rho L(D_o^4 - D_i^4)}{32}$$

**Minimum Acceleration Time (s)**

$$t_{am} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} - T_L)}$$

$J_M$ : Motor Inertia,  $T_{PM}$ : Motor Maximum Torque

**Minimum Deceleration Time (s)**

$$t_{dm} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} + T_L)}$$

**Load Operation Power (W)**

$$P_o = \frac{2\pi N_M T_L}{60}$$

**Load Acceleration Power (W)**

$$P_a = \left(\frac{2\pi N_M}{60}\right)^2 \times \frac{J_L}{t_a}, \quad (t_a \leq t_{am})$$

**Acceleration Torque Required (N·m)**

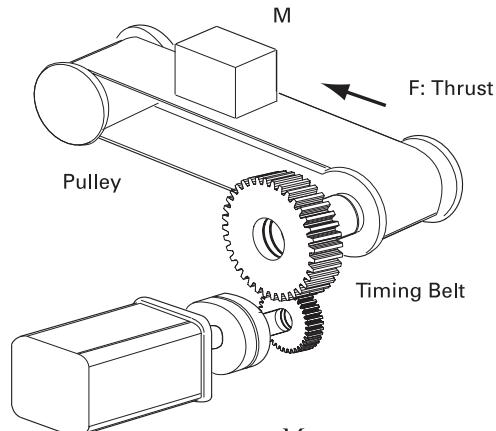
$$T_p = \frac{2\pi N_M (J_M + J_L)}{60t_a} + T_L, \quad (t_a \leq t_{am})$$

**Deceleration Torque Required (N·m)**

$$T_s = \frac{2\pi N_M (J_M + J_L)}{60t_d} - T_L, \quad (t_a \leq t_{dm})$$

**Torque Effective Value (N·m)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 (t_s - t_a - t_d) + T_s^2 t_d}{t_c}}$$

**Timing Belt Load****Mechanical Configuration** $M$  : Load Mass (kg) of Straight Movement Part     $F$  : Thrust (N) $V_l$  : Load Speed (m/min) $D$  : Pulley (m) $1/R$  : Speed Reduction Ratio $\mu$  : Friction Coefficient $\eta$  : Mechanical Efficiency**Movement Amount (m)**

$$L_s = \frac{V_l}{60} \times \frac{2t_s - t_a - t_d}{2}$$

$$\text{if } t_a = t_d, \quad L_s = \frac{V_l}{60} \times (t_s - t_a)$$

**Motor Shaft Revolving Speed (r/min)**

$$N_M = \frac{RV_l}{\pi D}$$

**Load Torque (N·m)**

$$T_L = \frac{(9.8\mu M + F)D}{2R\eta}$$

**Load Inertia Moment ( $\text{kg}\cdot\text{m}^2$ )**

$$J_L = J_W + J_G + \frac{J_P}{R^2}$$

$J_W$ : Load Inertia of Straight Movement Part    $J_P$ : Inertia of Pulley Part

$J_G$ : Gear, Coupling Inertia

$$J_W = M \left( \frac{D}{2R} \right)^2$$

**Minimum Acceleration Time (s)**

$$t_{am} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} - T_L)}$$

$J_M$ : Motor Inertia    $T_{PM}$ : Motor Maximum Torque

**Minimum Deceleration Time(s)**

$$t_{dm} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} + T_L)}$$

**Load Operation Power (W)**

$$P_o = \frac{2\pi N_M T_L}{60}$$

**Load Acceleration Power (W)**

$$P_a = \left( \frac{2\pi N_M}{60} \right)^2 \times \frac{J_L}{t_a}, \quad (t_a \leq t_{am})$$

**Acceleration Torque Required (N·m)**

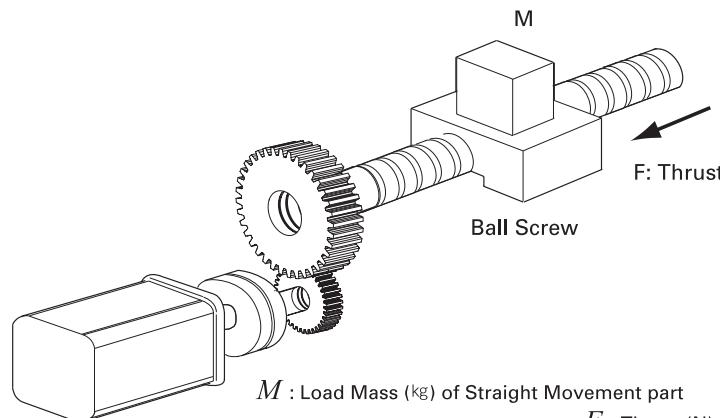
$$T_p = \frac{2\pi N_M (J_M + J_L)}{60t_a} + T_L, \quad (t_a \leq t_{am})$$

**Deceleration Torque Required (N·m)**

$$T_s = \frac{2\pi N_M (J_M + J_L)}{60t_d} - T_L, \quad (t_a \leq t_{dm})$$

**Torque Effective Value (N·m)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 (t_s - t_a - t_d) + T_s^2 t_d}{t_c}}$$

**Horizontal Ball Screw Load Machine Configuration**

*M* : Load Mass (kg) of Straight Movement part

*V<sub>l</sub>* : Load Speed (m/min)

*P<sub>B</sub>* : Ball Screw Lea

*L<sub>B</sub>* : Ball Screw Length (m)

*η* : Mechanical Efficiency

*F* : Thrust (N)

*D<sub>B</sub>* : Ball Screw

*1/R* : Speed Reduction Ratio

*μ* : Friction Coefficient

**Movement Amount (m)**

$$L_s = \frac{V_l}{60} \times \frac{2t_s - t_a - t_d}{2}$$

$$\text{if } t_a = t_d, \quad L_s = \frac{V_l}{60} \times (t_s - t_a)$$

**Motor Shaft Revolving Speed (r/min)**

$$N_M = \frac{RV_l}{P_B}$$

**Load Torque (N·m)**

$$T_L = \frac{(9.8\mu M + F)P_B}{2\pi R\eta}$$

**Load Inertia Moment (kg·m<sup>2</sup>)**

$$J_L = J_W + J_G + \frac{J_B}{R^2}$$

$J_W$ : Load Inertia of Straight Movement Part     $J_B$ : Ball Screw Inertia

$J_G$ : Gear, Coupling Inertia

$$J_W = M \left( \frac{P_B}{2\pi R} \right)^2, \quad J_B = \frac{M_B D_B^2}{8} = \frac{\pi \rho L_B D_B^4}{32}$$

$M_B$ : Ball Screw Mass[kg]

$\rho = 7.87 \times 10^3$  [ kg/m<sup>3</sup>] ; Iron

$\rho = 2.70 \times 10^3$  [ kg/m<sup>3</sup>] ; Aluminum

**Minimum Acceleration Time(s)**

$$t_{am} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} - T_L)}$$

$J_M$ : Motor Inertia,  $T_{PM}$ : Motor Maximum Torque

**Minimum Deceleration Time (s)**

$$t_{dm} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} + T_L)}$$

**Load Operation Power (W)**

$$P_o = \frac{2\pi N_M T_L}{60}$$

**Load Acceleration Power (W)**

$$P_a = \left(\frac{2\pi N_M}{60}\right)^2 \times \frac{J_L}{t_a}, \quad (t_a \leq t_{am})$$

**Acceleration Torque Required (N·m)**

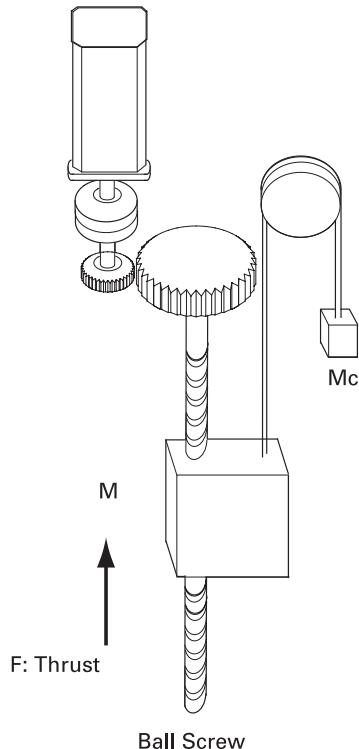
$$T_p = \frac{2\pi N_M (J_M + J_L)}{60t_a} + T_L, \quad (t_a \leq t_{am})$$

**Deceleration Torque Required (N·m)**

$$T_s = \frac{2\pi N_M (J_M + J_L)}{60t_d} - T_L, \quad (t_a \leq t_{dm})$$

**Torque Effective Value (N·m)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 (t_s - t_a - t_d) + T_s^2 t_d}{t_c}}$$

**Vertical Ball Screw Load****Mechanical Configuration**

$M$  : Load Mass (kg) of Straight Movement P:

$V_l$  : Load Speed (m/min)

$P_B$  : Ball Screw Lead (m)

$L_B$  : Ball Screw Length (m)

$\eta$  : Mechanical Efficiency

$F$  : Thrust (N)

$D_B$  : Ball Screw Diameter (m) Ball Screw

$1/R$  : Speed Reduction Ratio

$\mu$  : Friction Coefficient

$M_C$  : Mass of Counter (kg)

**Movement Amount (m)**

$$L_s = \frac{V_l}{60} \times \frac{2t_s - t_a - t_d}{2}$$

$$\text{if } t_a = t_d, \quad L_s = \frac{V_l}{60} \times (t_s - t_a)$$

**Motor Shaft Revolving Speed (r/min)**

$$N_M = \frac{RV_l}{P_B}$$

**Load Torque (N·m)**

$$T_L = \frac{\{9.8\mu(M - M_C) + F\}P_B}{2\pi R \eta}$$

**Load Inertia Moment (kg·m<sup>2</sup>)**

$$J_L = J_W + J_G + \frac{J_B}{R^2}$$

$J_W$ : Load Inertia of Straight Movement Part,  $J_B$ : Ball Screw Inertia

$J_G$ : Gear, Coupling Inertia

$$J_W = (M + M_C)(\frac{P_B}{2\pi R})^2$$

$$J_B = \frac{M_B D_B^2}{8} = \frac{\pi \rho L_B D_B^4}{32}$$

$M_B$ : Ball Screw Mass[kg]

$\rho = 7.87 \times 10^3$  [kg/m<sup>3</sup>]: Iron

$\rho = 2.70 \times 10^3$  [kg/m<sup>3</sup>]: Aluminum

**Minimum Acceleration Time (s)**

$$t_{am} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} - T_L)}$$

$J_M$ : Motor Inertia,  $T_{PM}$ : Motor Maximum Torque

**Minimum Deceleration Time(s)**

$$t_{dm} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} + T_L)}$$

**Load Operation Power (W)**

$$P_o = \frac{2\pi N_M T_L}{60}$$

**Load Acceleration Power (W)**

$$P_a = \left( \frac{2\pi N_M}{60} \right)^2 \times \frac{J_L}{t_a}, \quad (t_a \leq t_{am})$$

**Acceleration Torque Required (N·m)**

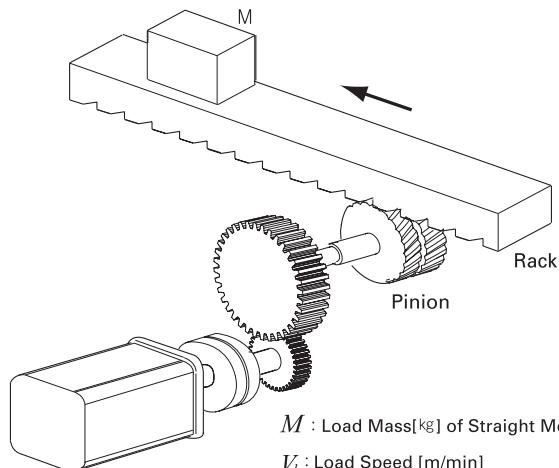
$$T_P = \frac{2\pi N_M (J_M + J_L)}{60 t_a} + T_L, \quad (t_a \leq t_{am})$$

**Deceleration Torque Required (N·m)**

$$T_S = \frac{2\pi N_M (J_M + J_L)}{60 t_d} - T_L, \quad (t_a \leq t_{dm})$$

**Torque Effective Value (N·m)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 (t_s - t_a - t_d) + T_s^2 t_d}{t_c}}$$

**Rack & Pinion Load****Mechanical Configuration**

*M* : Load Mass [kg] of Straight Movement Part   *F* : Thrust [N]

*V<sub>f</sub>* : Load Speed [m/min]

*D* : Pinion Diameter [m]

I/R : Speed Reduction Ratio

*t* : Pinion Thickness [m]

η : Mechanical Efficiency

μ : Friction Coefficient

**Movement Amount (m)**

$$L_s = \frac{V_l}{60} \times \frac{2t_s - t_a - t_d}{2}$$

$$\text{if } t_a = t_d, \quad L_s = \frac{V_l}{60} \times (t_s - t_a)$$

**Motor Shaft Revolving Speed (r/min)**

$$N_M = \frac{RV_l}{P_B}$$

**Load Torque (N·m)**

$$T_L = \frac{(9.8\mu M + F)D}{2R\eta}$$

### Load Inertia Moment ( $\text{kg}\cdot\text{m}^2$ )

$$J_L = J_W + J_G + \frac{J_P}{R^2}$$

$J_W$ : Load Inertia of Straight Movement Part     $J_P$ : Pinion Inertia

$J_G$ : Gear, Coupling Inertia

$$J_W = M \left( \frac{D}{2R} \right)^2, \quad J_P = \frac{M_p D^2}{8} = \frac{\pi \rho t D^4}{32}$$

$M_p$ : Pinion Mass[kg]

$\rho = 7.87 \times 10^3$  [kg/m³]: Iron

$\rho = 2.70 \times 10^3$  [kg/m³]: Aluminum

### Minimum Acceleration Time (s)

$$t_{am} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} - T_L)}$$

$J_M$ : Motor Inertia     $T_{PM}$ : Motor Maximum Torque

### Minimum Deceleration Time (s)

$$t_{dm} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} + T_L)}$$

### Load Operation Power (W)

$$P_o = \frac{2\pi N_M T_L}{60}$$

### Load Acceleration Power (W)

$$P_a = \left( \frac{2\pi N_M}{60} \right)^2 \times \frac{J_L}{t_a}, \quad (t_a \leq t_{am})$$

**Acceleration Torque Required (N·m)**

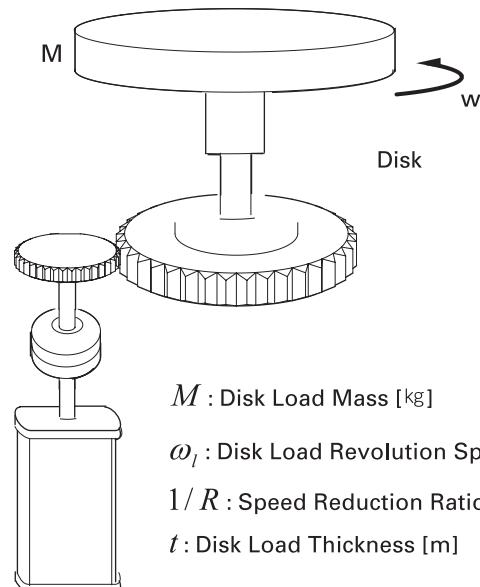
$$T_p = \frac{2\pi N_M (J_M + J_L)}{60t_a} + T_L \cdot (t_a \leq t_{am})$$

**Deceleration Torque Required (N·m)**

$$T_s = \frac{2\pi N_M (J_M + J_L)}{60t_d} - T_L \cdot (t_a \leq t_{dm})$$

**Torque Effective Value (N·m)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 (t_s - t_a - t_d) + T_s^2 t_d}{t_c}}$$

**Disk Load****Mechanical Configuration** $M$  : Disk Load Mass [kg] $T_l$  : Load Torque $\omega_l$  : Disk Load Revolution Speed [rpm]  $D$  : Disk Load Diameter [m] $1/R$  : Speed Reduction Ratio $\eta$  : Mechanical Efficiency $t$  : Disk Load Thickness [m]

**Movement Amount (rad)**

$$\theta_s = \frac{\omega_l}{60} \times \frac{2t_s - t_a - t_d}{2}$$

$$\text{if } t_a = t_d, \quad \theta_s = \frac{\omega_l}{60} \times (t_s - t_a)$$

**Motor Shaft Revolving Speed (r/min)**

$$N_M = R\omega_l$$

**Load Torque (N·m)**

$$T_L = \frac{T_l}{R}$$

**Load Inertia Moment (kg·m<sup>2</sup>)**

$$J_L = J_G + \frac{J_w}{R^2}$$

$J_w$ : Disk Load Inertia,  $J_G$ : Gear, Coupling Inertia

$$J_R = \frac{MD^2}{8} = \frac{\pi\rho t D^4}{32}$$

$$\rho = 7.87 \times 10^3 \text{ [kg/m³]; Iron}$$

$$\rho = 2.70 \times 10^3 \text{ [kg/m³]; Aluminum}$$

**Minimum Acceleration Time(s)**

$$t_{am} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} - T_L)}$$

$J_M$ : Motor Inertia    $T_{PM}$ : Motor Maximum Torque

**Minimum Deceleration Time(s)**

$$t_{dm} = \frac{2\pi N_M (J_M + J_L)}{60(T_{PM} + T_L)}$$

**Load Operation Power (W)**

$$P_o = \frac{2\pi N_M T_L}{60}$$

**Load Acceleration Power (W)**

$$P_a = \left(\frac{2\pi N_M}{60}\right)^2 \times \frac{J_L}{t_a}, \quad (t_a \leq t_{am})$$

**Acceleration Torque Required (N·m)**

$$T_p = \frac{2\pi N_M (J_M + J_L)}{60t_a} + T_L, \quad (t_a \leq t_{am})$$

**Deceleration Torque Required (N·m)**

$$T_s = \frac{2\pi N_M (J_M + J_L)}{60t_d} - T_L, \quad (t_a \leq t_{dm})$$

**Torque Effective Value (N·m)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 (t_s - t_a - t_d) + T_s^2 t_d}{t_c}}$$

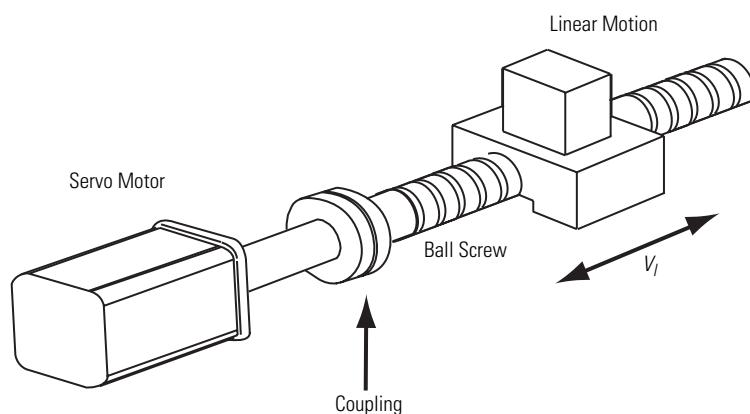


## Motor Capacity Selection

This chapter describes the process of selecting a motor suitable for the work you want citing a horizontal ball screw load system as an example.

### System Configuration

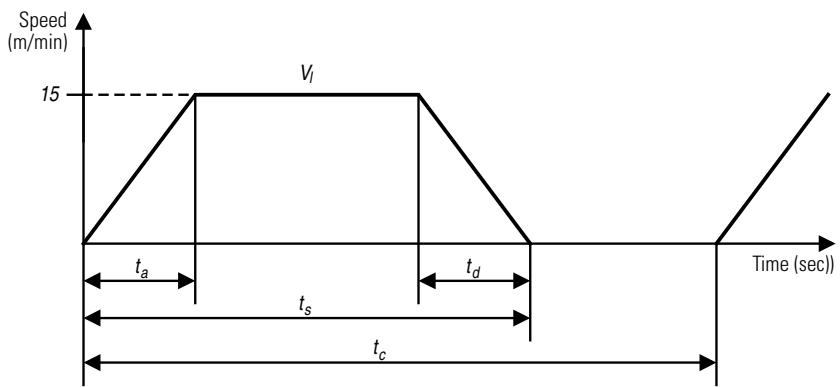
### Horizontal Ball Screw Load System



### System Configuration Condition Value

Item	Value
Load Velocity ( $V_l$ )	15 m/min
Load Mass on Linear Movement Part ( $M$ )	500 kg
Ball Screw Length( $L_B$ )	1.4 m
Ball Screw Diameter( $D_B$ )	0.04 m
Ball Screw Lead ( $P_B$ )	0.01 m
Coupling Mass ( $M_K$ )	1 kg
Coupling External Diameter ( $D_K$ )	0.06 m
Transfer Number ( $n$ )	40/min
Transfer Distance ( $\lambda$ )	0.275 m
Transfer Time ( $t_m$ )	1.2 sec. or less
Stiction Coefficient ( $\mu$ )	0.2
Mechanical Efficiency ( $\lambda$ )	0.9

## Speed Diagram



$$t = \frac{60}{n} = \frac{60}{40} = 1.5 \text{ sec}$$

Here  $t_a = t_d$

$$t_a = t_m - \frac{60 \times \lambda}{V_l} = 1.2 - \frac{60 \times 0.275}{15} = 0.1 \text{ sec}$$

## Servo Motor Selection Criteria Calculation and Review

### Selection Criteria Calculation

#### *Revolving Speed*

$$\text{Revolving Speed on Load Shaft } N_l = \frac{V_l}{P_B} = \frac{15}{0.01} = 1500 \text{ r/min}$$

As it is direct connection to coupling, decelerating rate is  $1/R = 1$

therefore,  $N_M = N_l \times R = 1500 \times 1 = 1500 \text{ r/min}$

#### *Load Torque*

$$T_l = \frac{9.8 \mu M P_B}{2\pi R \eta} = \frac{9.8 \times 0.2 \times 500 \times 0.01}{2\pi \times 1 \times 0.9} = 1.73 \text{ N.m}$$

*Load Inertia Moment*

$$\text{Linear Movement Part } J_{L1} = M \left( \frac{P_B}{2\pi R} \right)^2 = 500 \times \left( \frac{0.01}{2\pi \times 1} \right)^2 = 12.7 \times 10^{-4} \text{ kg}\cdot\text{m}^2$$

Ball Screw

$$J_B = \frac{\pi \rho L_B D_B^4}{32} = \frac{\pi}{32} \times 7.87 \times 10^3 \times 1.4 \times 0.04^4 = 27.7 \times 10^{-4} \text{ kg}\cdot\text{m}^2$$

$$\text{Coupling } J_C = \frac{1}{8} \times M_C \times D_C^2 = \frac{1}{8} \times 0.06^2 = 4.5 \times 10^{-4} \text{ kg}\cdot\text{m}^2$$

$$\text{Load Inertia Moment on Motor Shaft } J_L = J_{L1} + J_G + J_C = 44.9 \times 10^{-4} \text{ kg}\cdot\text{m}^2$$

*Load Operation Power*

$$P_O = \frac{2\pi N_M T_L}{60} = \frac{2\pi \times 1500 \times 1.73}{60} = 272 \text{ W}$$

*Load Acceleration Power*

$$P_a = \left( \frac{2\pi N_M}{60} \right)^2 \times \frac{J_L}{t_a} = \left( \frac{2\pi \times 1500}{60} \right)^2 \times \frac{44.9 \times 10^{-4}}{0.1} = 1108 \text{ W}$$

**Tentative Selection of Servo Motor**

When selecting a servo motor, the following conditions must be met.

- $J_L \leq$  Allowed Inertia Moment on Servo Drive
- Consumed Acceleration Torque = Instant Maximum Torque of Motor
- Consumed Deceleration Torque = Instant Maximum Torque of Motor
- $T_{rms}$  = Rated Torque of Motor
- $P_o + P_a = (1 \text{ to } 2) \times$  Rated Output of Motor
- Motor Shaft Revolving Speed  $N_M$  = Rated Revolving Speed of Motor

Tentatively select a servo motor based on the conditions above.  
The motor specifications are as follows..

- Rated Output CSMD-1000(W)
- Rated Revolving Speed 2000 r/min
- Rated Torque 4.8 N·m
- Instant Maximum Torque 14.4 N·m
- Motor Shaft Inertia Moment:  $6.17 \times 10^{-4}$  kg·m<sup>2</sup>
- Allowed Load Inertia Moment on Servo Drive:  $61.7 \times 10^{-4}$  kg·m<sup>2</sup>

## Review Selection Criteria of Tentatively Selected Servo Motor

### 1. Motor Side Load Inertia Moment $J_L$

$$J_L = 44.9 \times 10^{-4} \text{ kg}\cdot\text{m}^2 < \text{Allowed Load Inertia Moment on Servo Drive: } 61.7 \times 10^{-4} \text{ kg}\cdot\text{m}^2$$

### 2. Required Starting Torque (Consumed Acceleration Torque $T_p$ )

$$T_p = \frac{2\pi N_M(J_M + J_L)}{60 t_a} + T_L = \frac{2\pi \times 1500 \times (6.17 \times 44.9)}{60 \times 0.1} + 1.73$$

$$= 9.75 \text{ N}\cdot\text{m} < \text{Instant Maximum Torque of Motor}$$

### 3. Require Stopping Torque(Consumed Deceleration Torque)

$$T_s = \frac{2\pi N_M(J_M + J_L)}{60 t_a} - T_L = \frac{2\pi \times 1500 \times (6.17 \times 44.9)}{60 \times 0.1} - 1.73$$

$$= 6.29 \text{ N}\cdot\text{m} < \text{Instant Maximum Torque of Motor}$$

**4. Effective Torque (average)**

$$T_{rms} = \sqrt{\frac{T_p^2 t_a + T_L^2 t_c + T_s^2 t_d}{t_c}}$$

$$= \sqrt{\frac{9.75^2 \times 0.1 + 1.73^2 \times 10 + 6.29^2 \times 0.1}{1.5}}$$

$$= 3.31 \text{ N}\cdot\text{m} < \text{Rated Torque of Motor}$$

**5. Power**

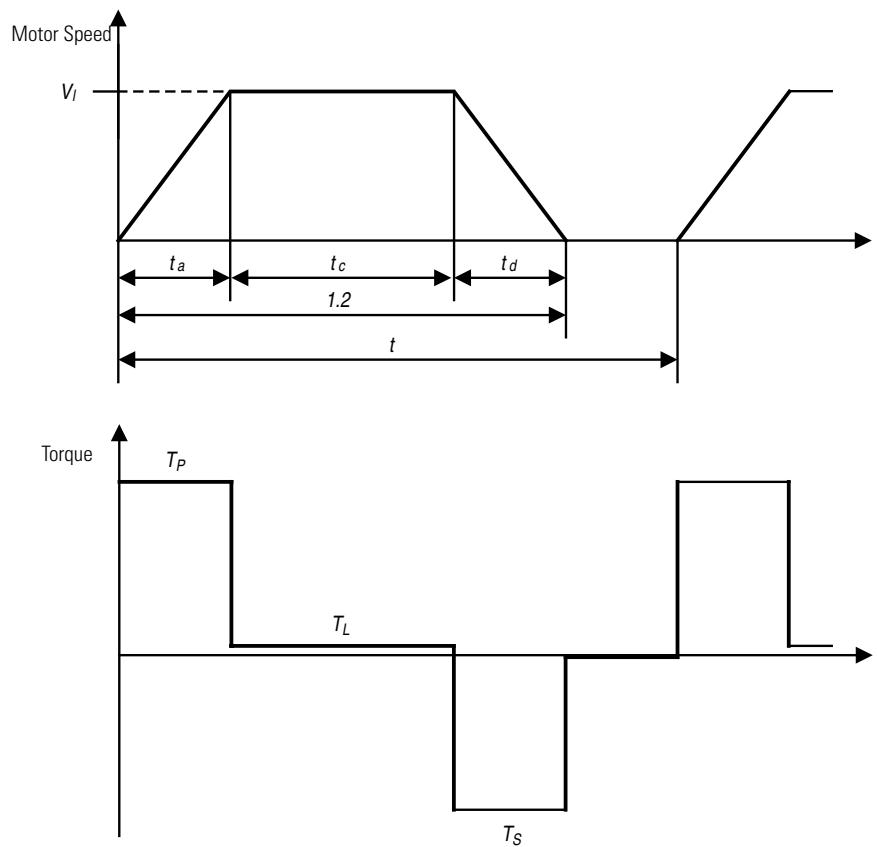
$$P_a + P_o = 1108 + 272 = 1380 \text{ W} < \text{Motor Rated Output } 1000 \text{ W X (1 to 2)}$$

**6. Revolving Speed**

$$N_M = 1500 \text{ rpm} < 2000 \text{ rpm} < \text{Rated Revolving Speed of Motor } 2000 \text{ rpm}$$

## **Final Selection of Servo Motor**

The tentatively selected servo motor should meet all criteria above to be used. Selected AC servo motor generates torque which is influenced by speed as presented below.



## Maintenance and Repair

This chapter describes how to check a servo motor, diagnose any of its malfunctions, and treat them.

### Maintenance and Repair

### Servo Motor Maintenance and Repair

AC servo motor is an assembly of mechanical components, without any abrasive part. Simple checking as follows is sufficient. Please choose when to check the system after considering the usage environment.

Table 8.1 Servo Motor Maintenance and Repair

Maintenance and Repair Item	Check Interval	Maintenance and Repair Method	Remarks
Vibration and Noise	Everyday	Use touch and hearing	Compared to normal times
Foreign substance	The moment they are found	Use a vacuum cleaner	
Insulation Resistance	1 Year	Measure with insulation resistance gauge 500V 10 MΩ or more is normal	Contact the local OEMax Distributor or sales representatives if it is lower than 10Ω after checking with insulation resistance measuring instrument.
Oil Seal	5000 Hours	Replace with a new oil seal.	Only for motor with oil seal
Comprehensive Checking	20000 hours (5 years)	Contact us	Replacement of degrading and abrasive components

#### ATTENTION

You cannot use after-sales service if you disassemble the servo motor at your discretion.



### Servo Drive Maintenance and Repair

#### NOTE

As for maintenance and repair of a servo drive, refer to the user manual of the servo drive.



# Index

## A

Allowed Load on Motor Shaft  
    CSMD/F/H/K/S Series Motor 3-59  
    CSMQ/Z Series Motor 3-59  
    CSMR/T Series Motor 3-60  
    Load Location 3-58  
    RSMD/S/H/F/K/L Series Motor 3-60  
    RSMQ/Z Series Motor 3-61

## B

Brake 3-30

## C

Cautions for Servo Motor Maintenance 8-1  
CSM Series Motor  
    Diagram and Dimensions 4-1  
    Shaft-End Specifications 4-2  
CSM Series Motor - Decelerator Attached  
    Diagram and Dimensions 4-3  
    Shaft-End Specifications 4-4  
CSMD Series Motor  
    Basic Specifications 3-2  
    Brake Specifications 3-3  
    Common Specifications 3-1  
    Speed Torque Curve 3-3  
CSMD/H/K/S Series Motor  
    Diagram and Dimensions 4-15  
    Shaft-End Specifications 4-17  
CSMF Series Motor  
    Basic Specifications 3-5  
    Brake Specifications 3-6  
    Common Specifications 3-5  
    Speed Torque Curve 3-7  
CSMH Series Motor  
    Basic Specifications 3-8  
    Brake Specifications 3-9  
    Common Specifications 3-8  
    Speed Torque Curve 3-10  
CSMK Series Motor  
    Basic Specifications 3-11  
    Brake Specifications 3-12  
    Common Specifications 3-11  
    Speed Torque Curve 3-12  
CSMQ Series Motor  
    Basic Specifications 3-14  
    Brake Specifications 3-15  
    Common Specifications 3-14  
    Diagram and Dimensions 4-9  
    Shaft-End Specifications 4-9  
    Speed Torque Curve 3-16  
CSMR Series Motor  
    Basic Specifications 3-17  
    Brake Specifications 3-18  
    Common Specifications 3-17  
    Diagram and Dimensions 4-8  
    Shaft-End Specifications 4-8  
    Speed Torque Curve 3-19  
CSMS Series Motor  
    Basic Specifications 3-20  
    Brake Specifications 3-21  
    Common Specifications 3-20  
    Speed Torque Curve 3-22  
CSMT Series Motor

Basic Specifications 3-24  
Brake Specifications 3-25  
Common Specifications 3-24  
Diagram and Dimensions 4-6  
Shaft-End Specifications 4-7  
Speed Torque Curve 3-25  
CSMZ Series Motor  
    Basic Specifications 3-27  
    Brake Specifications 3-28  
    Common Specifications 3-27  
    Diagram and Dimensions 4-10  
    Shaft-End Specifications 4-11  
    Speed Torque Curve 3-28

## D

Decelerator  
    Label 1-5  
    Model Name Marking 1-5  
Decelerator Label  
    Application Motor Capacity 1-5  
    Application Motor Type 1-5  
    Backlash Rate 1-5  
    Option 1-5  
Diagram and Dimensions 4-1  
    CSM Series Motor 4-1  
    CSM Series Motor - Decelerator Attached 4-3  
    CSMD/H/K/S Series Motor 4-15  
    CSMQ Series Motor 4-9  
    CSMR Series Motor 4-8  
    CSMT Series Motor 4-6  
    CSMZ Series Motor 4-10, 4-12  
    RSMD/S/H/F Series Motor 4-18  
    RSMK/L Series Motor 4-23  
    RSMQ/Z Series Motor 4-12

## E

Encoder Cable  
    11-Wire Inc. Type 5-6, 5-9  
    15-Wire Inc. Type 5-7, 5-10  
    9-Wire Inc. Type 5-6  
    Compact Abs. Type 5-7, 5-8, 5-10, 5-11  
    For Large Capacity (CSMD/H/K/S,  
        RSMS/D/H/F/K/L) 5-9  
    For Small Capacity (CSM, CSMT/R/Q/Z, RSMQ/Z)  
        5-6  
    Large Capacity Motor Encoder Cannon Plug  
        Specifications 5-12  
Order Code 5-12  
Serial Type 5-8  
Specifications 5-6

## M

Maintenance and Repair 8-1  
    Servo Drive 8-1  
    Servo Motor 8-1  
Motor 3-Phase Power Cable  
    For Large Capacity (CSMD/H/K/S,  
        RSMS/D/H/F/K/L) 5-2  
    For Small Capacity (CSM, CSMT/R/Q/Z, RSMQ/Z)  
        5-1  
    Large Capacity Motor Power Cannon Plug  
        Specifications 5-2  
Order Code 5-5

Specifications	5-1	Shaft-End Specifications	4-21
<b>Motor Brake Cable</b>		<b>RSMF Series Motor</b>	
For Large Capacity (CSMD/H/K/S, RSMS/D/H/F/K/L)	5-14	Basic Specifications	3-35
For Small Capacity (CSM, CSMT/R/Q/Z)	5-14	Brake Specifications	3-34
Specifications	5-14	Common Specifications	3-34
<b>Motor Capacity Selection</b>	7-1	Speed Torque Curve	3-36
Example of System Configuration	7-1	<b>RSMH Series Motor</b>	
Final Selection	7-5	Basic Specifications	3-38
Review Selection Criteria	7-4	Brake Specifications	3-37
Selection Criteria Calculation	7-2	Common Specifications	3-37
System Configuration Condition Value	7-1	Speed Torque Curve	3-39
Tentative Selection of Servo Motor	7-3	<b>RSMK Series Motor</b>	
<b>Motor Capacity Selection Criteria Calculation</b>		Basic Specifications	3-41
Load Acceleration Power	7-3	Brake Specifications	3-40
Load Inertia Moment	7-3	Common Specifications	3-40
Load Operation Power	7-3	Speed Torque Curve	3-42
Load Torque	7-2	<b>RSMK/L Series Motor</b>	
Revolving Speed	7-2	Diagram and Dimensions	4-23
<b>Motor Capacity Selection Criteria Review</b>		Shaft-End Specifications	4-24
Effective Torque (average)	7-5	<b>RSML Series Motor</b>	
Motor Side Load Inertia Moment	7-4	Basic Specifications	3-45
Power	7-5	Brake Specifications	3-44
Require Stopping Torque (Consumed deceleration torque)	7-4	Common Specifications	3-44
Required Starting Torque (Consumed acceleration torque)	7-4	Speed Torque Curve	3-46
Revolution Speed	7-5	<b>RSMQ Series Motor</b>	
<b>Motor Specifications</b>	3-1	Basic Specifications	3-53
CSMD Series Motor	3-1	Brake Specifications	3-52
CSMF Series Motor	3-5	Common Specifications	3-52
CSMH Series Motor	3-8	Speed Torque Curve	3-54
CSMK Series Motor	3-11	<b>RSMS Series Motor</b>	
CSMQ Series Motor	3-14	Basic Specifications	3-49
CSMR Series Motor	3-17	Brake Specifications	3-48
CSMS Series Motor	3-20	Common Specifications	3-48
CSMT Series Motor	3-24	Speed Torque Curve	3-50
CSMZ Series Motor	3-27	<b>RSMZ Series Motor</b>	
RSMD Series Motor	3-30	Basic Specifications	3-56
RSMF Series Motor	3-34	Brake Specifications	3-55
RSMH Series Motor	3-37	Common Specifications	3-55
RSMK Series Motor	3-40	Speed Torque Curve	3-57
RSML Series Motor	3-44	<b>RSMZ/Q Series Motor</b>	
RSMQ Series Motor	3-52	Diagram and Dimensions	4-12
RSMS Series Motor	3-48	Shaft-End Specifications	4-13
RSMZ Series Motor	3-55		
<b>O</b>		<b>S</b>	
<b>Order Code</b>		<b>Servo Drive</b>	
I/O Cable	5-1	Installation	2-5
Motor 3-Phase Power Cable	5-5	Servo Drive Specifications	3-1
<b>R</b>		<b>Servo Motor</b>	
<b>Reference</b>		Installation	2-1
CSD3 Plus Servo Drive User Manual	P-1	Installation Environment	2-5
CSD3 Series Servo Drive User Manual	P-1	Label	1-2
CSDJ Plus Servo Drive User Manual	P-1	Model Name Marking	1-2
CSDP Plus Servo Drive Operating Manual	P-1	Name of Each Part	1-1
CSDP Plus Servo Drive User Manual	P-1	<b>Servo Motor Checking Item</b>	
<b>RSMD Series Motor</b>		Comprehensive Checking	8-1
Basic Specifications	3-31	Foreign Bodies	8-1
Brake Specifications	3-30	Insulation Resistance	8-1
Common Specifications	3-30	Oil Seal	8-1
Speed Torque Curve	3-32	Vibration and Noise	8-1
<b>RSMD/S/H/F Series Motor</b>		<b>Servo Motor Label</b>	
Diagram and Dimensions	4-18	Encoder Type	1-3
		Input Voltage	1-3
		Motor Model	1-2
		Motor Shaft Key	1-4
		Motor shaft specifications	1-4
		Option	1-4
		Rated Power	1-3

---

Shaft-End Specifications	Encoder Cable 5-6
CSM Series Motor 4-2	I/O Cable 5-1
CSM Series Motor - Decelerator Attached 4-4	Motor 3-Phase Power Cable 5-1
CSMD/H/K/S Series Motor 4-17	Motor Brake Cable 5-14
CSMR Series Motor 4-9	Symbols and Notations P-2
CSMT Series Motor 4-7	Bullet Point P-2
CSMZ Series Motor 4-11	Numbering P-2
RSMD/S/H/F Series Motor 4-21	
RSMK/L Series Motor 4-24	
RSMZ/Q Series Motor 4-13	
Specifications	
Cable Specifications 5-1	
Communication Cable 5-1	

## W

Website	
OEMax Homepage	P-1





[www.rockwellautomation.co.kr](http://www.rockwellautomation.co.kr)

[www.oemax.com](http://www.oemax.com)

---

**Power, Control and Information Solutions Headquarter**

Rockwell Automation Korea Ltd., 16F, 17F, Samhwa Bldg., 144-17, Samsung-dong, Gangnam-gu, Seoul, Korea. Tel: (82) 2 2188 4448, Fax: (82) 2 564 8762

**Allen-Bradley OEMax Product Information & Service**

Korea: 447-6, Gongse-dong, Gicheung-gu, Yongin-city, Gyeonggi-do, Korea. Zip Code: 446-902 Tel: (82) 31 280 4700 Fax: (82) 31 280 4900

China: 29F, Block A, Far East Int'l Plaza, 319 XianXia Road, Changning District, Shanghai 200051, China. Tel: (86) 21 6120 6007 ext.6739