



SV680P-INT Series Servo Drive Selection Guide



Industrial
Automation



Intelligent
Elevator



New Energy
Vehicle



Industrial
Robot



Rail
Transit



Data code PS00009746A00

Preface

Introduction

Thank you for purchasing the SV680P-INT series servo drive developed by Inovance.

The SV680P-INT series servo drive is a high-end servo drive designed based on global-leading standards and high-end application needs. It is featured with high speed, high precision, high performance, and tuning-free function. Compliant with CE, UL, KC, EAC, UKCA and TUV certification requirements and top international quality standards, it is specially suitable for high-end applications,

The series offers a power range of 0.05 kW to 7.5 kW and support for Modbus and CANopen communication protocols. The drive comes with the ITune function which supports adaptive stiffness level setting, inertia auto-tuning, and vibration suppression for easy use. The drive, together with an MS1 series high-response servo motor (with ultra-low, low or medium inertia) equipped with a 23- or 26-bit single-turn/multi-turn absolute encoder, any third party servo motor, linear motor or DDR motor, serves to deliver a quiet and stable operation and accurate process control through features like fully closed-loop, internal process segment and gantry synchronization.

The drive also comes with features like safe torque off, dynamic braking, and brake output (external relay not needed) as standard and supports extension of seven kinds of functional safety features (the PINT version further offers 24V backup power) for continuous safe production. The drive aims to achieve quick and accurate position control, speed control, and torque control through high-performance solutions for automation equipment in such industries as electronic manufacturing, lithium batteries, manipulators, packaging, and machine tools.

Provides instructions on product selection, including the list of supporting components, technical data on the drive and motor, and the selection guide of cables.

Note

The speed of a rotational motor and DDR motor is in RPM and DDL motor is in mm/s. RPM is used throughout the manual. Unless otherwise specified, an RPM value is equivalent to the mm/s one.

More documents

Name	Data Code	Description
SV680P-INT Series Servo Drive Selection Guide	PS00009746	Provides instructions on product selection, including the list of supporting components, technical data on the drive and motor, and the selection guide of cables.
SV680P-INT Series Servo Drive Installation Guide	PS00009749	Presents installation of the servo drive, including installation steps, mechanical installation, and electrical installation.
SV680P-INT Series Servo Drive Hardware Guide	PS00009742	Presents electrical design guidance of the equipment, description of terminals, required certificates and standards and solutions to common EMC problems.
SV680P-INT Series Servo Drive Commissioning Guide	PS00009743	This guide describes the parameters, troubleshooting, operating panel, commissioning software, and commissioning flow and steps.
SV680P-INT Series Servo Drive Function Guide	PS00009744	Presents functions and parameters, including function overview, basic servo functions, adjustment and parameter list.

Name	Data Code	Description
SV680P-INT Series Servo Drive Communication Guide	PS00009747	Presents functions and parameters of the servo drive, including Modbus communication configuration, parameter descriptions, and communication application cases.
SV680P-INT Series Servo Drive Troubleshooting Guide	PS00009745	Introduces faults and fault levels, the troubleshooting process, warning codes and fault codes.
SV680P-INT Series Servo Drive Maintenance Guide	PS00009741	Provides instructions on maintenance and repair of the equipment.
SV680P-INT Series Servo Drive Safety Guide	PS00009740	Presents the safety function and related certifications and standards, wiring, commissioning process, troubleshooting, and functions.
SV680P-INT Series Servo Drive Manual Package	PS00009748	Provides information on selection, installation, commissioning, function, troubleshooting and parameters of the equipment.

Revision History

Date	Version	Description
August 2023	A00	First release

Access to the Guide

This guide is not delivered with the product. You can obtain the PDF version in the following way:

- Do keyword search at <http://www.inovance.com>.
- Scan the QR code on the equipment to acquire more.
- Scan the QR code below to install the app, where you can search for and download manuals.



Warranty

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. You will be charged for any repair work after the warranty period expires.

Within the warranty period, maintenance fee will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or abnormal voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance fee is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

For details, see the Product Warranty Card.

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1 Selection

Servo motor				Servo drive SV680-INT series			
Models without brake	Models with Brake	Flange Size (mm)	Capacity (kW)	Voltage Class (V)	Size	Recommended Drive Model	No.
MS1H1 ($n_N=3000\text{rpm}$, $n_{\max}=7000\text{rpm}$)							
MS1H1-05B30CB-A3/A6/ S630Z-INT	MS1H1-05B30CB-A3/A6/ S632Z-INT	40	0.05	Single-phase/ Three-phase 200V	A	S1R6	00002
MS1H1-10B30CB-A3/A6/ S630Z-INT	MS1H1-10B30CB-A3/A6/ S632Z-INT	40	0.1	Single-phase/ Three-phase 200V			
MS1H1-20B30CB-A3/A6/ S630R-INT	MS1H1-20B30CB-A3/A6/ S632R-INT	60	0.2	Single-phase/ Three-phase 200V			
MS1H1-40B30CB-A3/A6/ S630R-INT	MS1H1-40B30CB-A3/A6/ S632R-INT	60	0.4	Single-phase/ Three-phase 200V	C	S2R8	00003
MS1H1-55B30CB-A3/A6/ S630R-INT	-	80	0.55	Single-phase/ Three-phase 200V		S5R5	00005
MS1H1-75B30CB-A3/A6/ S630R-INT	MS1H1-75B30CB-A3/A6/ S632R-INT	80	0.75	Single-phase/ Three-phase 200V	C	S5R5	00005
MS1H1-10C30CB-A3/A6/ S630R-INT	MS1H1-10C30CB-A3/A6/ S632R-INT	80	1.0	Single-phase/ Three-phase 200V		S7R6	00006
MS1H2 ($n_N=3000\text{rpm}$, $n_{\max}=6000\text{rpm}$)							
MS1H2-10C30CB-A3/A6/ S631R-INT	MS1H2-10C30CB-A3/A6/ S634R-INT	100	1.0	Single-phase/ Three-phase 200V	C	S7R6	00006
MS1H2-10C30CD-A3/A6/ S631R-INT	MS1H2-10C30CD-A3/A6/ S634R-INT	100	1.0	Three-phase 400V		T3R5	10001
MS1H2-15C30CB-A3/A6/ S631R-INT	MS1H2-15C30CB-A3/A6/ S634R-INT	100	1.5	Single-phase/ Three-phase 200V	D	S012	00007
MS1H2-15C30CD-A3/A6/ S631R-INT	MS1H2-15C30CD-A3/A6/ S634R-INT	100	1.5	Three-phase 400V	C	T5R4	10002
MS1H2-20C30CB-A3/A6/ S631R-INT	MS1H2-20C30CB-A3/A6/ S634R-INT	100	2.0	Three-phase 200V	E	S018	00008
MS1H2-20C30CD-A3/A6/ S631R-INT	MS1H2-20C30CD-A3/A6/ S634R-INT	100	2.0	Three-phase 400V	D	T8R4	10003
MS1H2-25C30CB-A3/A6/ S631R-INT	MS1H2-25C30CB-A3/A6/ S634R-INT	100	2.5	Three-phase 200V	E	S022	00009

Selection

Servo motor				Servo drive SV680-INT series			
Models without brake	Models with Brake	Flange Size (mm)	Capacity (kW)	Voltage Class (V)	Size	Recommended Drive Model	No.
MS1H2-25C30CD-A3/A6/ S631R-INT	MS1H2-25C30CD-A3/A6/ S634R-INT	100	2.5	Three-phase 400V	D	T8R4	10003
MS1H2-30C30CB-A3/A6/ S631R-INT	MS1H2-30C30CB-A3/A6/ S634R-INT	130	3.0	Three-phase 200V	E	S022	00009
MS1H2-30C30CD-A3/A6/ S631R-INT	MS1H2-30C30CD-A3/A6/ S634R-INT	130	3.0	Three-phase 400V	D	T012	10004
MS1H2-40C30CB-A3/A6/ S631R-INT	MS1H2-40C30CB-A3/A6/ S634R-INT	130	4.0	Three-phase 200V	E	S027	00010
MS1H2-40C30CD-A3/A6/ S631R-INT	MS1H2-40C30CD-A3/A6/ S634R-INT	130	4.0	Three-phase 400V		T017	10005
MS1H2-50C30CB-A3/A6/ S631R-INT	MS1H2-50C30CB-A3/A6/ S634R-INT	130	5.0	Three-phase 200V		S027	00010
MS1H2-50C30CD-A3/A6/ S631R-INT	MS1H2-50C30CD-A3/A6/ S634R-INT	130	5.0	Three-phase 400V		T021	10006
MS1H3 ($n_N=1500\text{rpm}$, $n_{\max}=4500\text{rpm}$)							
MS1H3-85B15CB-A3/A6/ S631R-INT	MS1H3-85B15CB-A3/A6/ S634R-INT	130	0.85	Single-phase/ Three-phase 200V	C	S7R6	00006
MS1H3-85B15CD-A3/A6/ S631R-INT	MS1H3-85B15CD-A3/A6/ S634R-INT	130	0.85	Three-phase 400V		T3R5	10001
MS1H3-13C15CB-A3/A6/ S631R-INT	MS1H3-13C15CB-A3/A6/ S634R-INT	130	1.3	Single-phase/ Three-phase 200V	D	S012	00007
MS1H3-13C15CD-A3/A6/ S631R-INT	MS1H3-13C15CD-A3/A6/ S634R-INT	130	1.3	Three-phase 400V	C	T5R4	10002
MS1H3-18C15CB-A3/A6/ S631R-INT	MS1H3-18C15CB-A3/A6/ S634R-INT	130	1.8	Three-phase 200V	E	S018	00008
MS1H3-18C15CD-A3/A6/ S631R-INT	MS1H3-18C15CD-A3/A6/ S634R-INT	130	1.8	Three-phase 400V	D	T8R4	10003
MS1H3-29C15CB-A3/A6/ S631R-INT	MS1H3-29C15CB-A3/A6/ S634R-INT	180	2.9	Three-phase 200V	E	S022	00009
MS1H3-29C15CD-A3/A6/ S631R-INT	MS1H3-29C15CD-A3/A6/ S634R-INT	180	2.9	Three-phase 400V	D	T012	10004
MS1H3-44C15CB-A3/A6/ S631R-INT	MS1H3-44C15CB-A3/A6/ S634R-INT	180	4.4	Three-phase 200V	E	S027	00010
MS1H3-44C15CD-A3/A6/ S631R-INT	MS1H3-44C15CD-A3/A6/ S634R-INT	180	4.4	Three-phase 400V	E	T017	10005
MS1H3-55C15CD-A3/A6/ S631R-INT	MS1H3-55C15CD-A3/A6/ S634R-INT	180	5.5	Three-phase 400V		T021	10006
MS1H3-75C15CD-A3/A6/ S631R-INT	MS1H3-75C15CD-A3/A6/ S634R-INT	180	7.5	Three-phase 400V		T026	10007

Servo motor				Servo drive SV680-INT series			
Models without brake	Models with Brake	Flange Size (mm)	Capacity (kW)	Voltage Class (V)	Size	Recommended Drive Model	No.
MS1H4 ($n_N=3000\text{rpm}$, $n_{max}=7000\text{rpm}$)							
MS1H4-10B30CB-A3/A6/ S630Z-INT	MS1H4-10B30CB-A3/A6/ S632Z-INT	40	0.1	Single-phase/ Three-phase 200V	A	S1R6	00002
MS1H4-20B30CB-A3/A6/ S631R-INT	MS1H4-20B30CB-A3/A6/ S634R-INT	60	0.2	Single-phase/ Three-phase 200V		S1R6	00002
MS1H4-40B30CB-A3/A6/ S631R-INT	MS1H4-40B30CB-A3/A6/ S634R-INT	60	0.4	Single-phase/ Three-phase 200V		S2R8	00003
MS1H4-55B30CB-A3/A6/ S631R-INT	-	80	0.55	Single-phase/ Three-phase 200V	C	S5R5	00005
MS1H4-75B30CB-A3/A6/ S631R-INT	MS1H4-75B30CB-A3/A6/ S634R-INT	80	0.75	Single-phase/ Three-phase 200V		S5R5	00005
MS1H4-10C30CB-A3/A6/ S631R-INT	MS1H4-10C30CB-A3/A6/ S634R-INT	80	1.0	Single-phase/ Three-phase 200V	C	S7R6	00006

2 SV680P-INT series

2.1 Product Information

2.1.1 Model and Nameplate

Model description

SV680 P S 2R8 I - GINT
① ② ③ ④ ⑤ ⑥

<p>① Product series SV680: SV680 general-purpose servo drive</p>	<p>④ Rated Output Current</p> <p>S: 200 V to 240 V</p> <p style="margin-left: 20px;">1R6: 1.6 A 2R8: 2.8A 5R5: 5.5A 7R6: 7.6A 012: 12.0A 018: 18.0A 022: 22.0A 027: 27.0A</p> <p>T: 380 V to 480 V</p> <p style="margin-left: 20px;">3R5: 3.5A 5R4: 5.4A 8R4: 8.4A 012: 12.0A 017: 17.0A 021: 21.0A 026: 26.0A</p>	<p>⑤ Model configuration I: Standard type S: Functional safety type</p>
<p>② Product type N: EtherCAT P: Pulse type + CANopen communication type</p>		<p>⑥ Model configuration GINT: General (global version) PINT: Backup power supply (global version)</p>
<p>③ Voltage Class S: 200 V to 240 V T: 380 V to 480 V</p>		

Nameplate

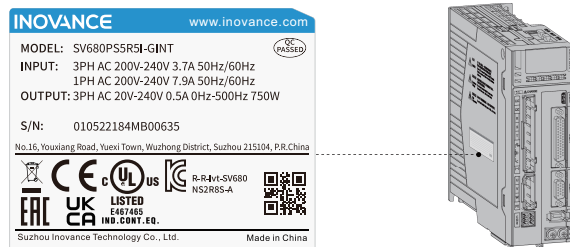


Figure 2-1 Nameplate

Encryption of the production serial number

01050202 4 P 7 00001
 ① ② ③ ④ ⑤

<p>① Internal code Article material code</p>	<p>③ Year 9: 2009 A: 2010 ... P: 2022 ... Note: I/L/O/Q is not used.</p>	<p>⑤ Lot number 00001: 1st in current month 00002: 2nd in current month 00003: 3rd in current month ... Range: 00001 to 99999</p>
<p>② Manufacturer code 4: Suzhou Inovance</p>	<p>④ Month 1: January 2: February ... A: October B: November C: December</p>	

Example: The S/N 010502024P700001 indicates the drive is manufactured in July, 2022.

2.1.2 Components

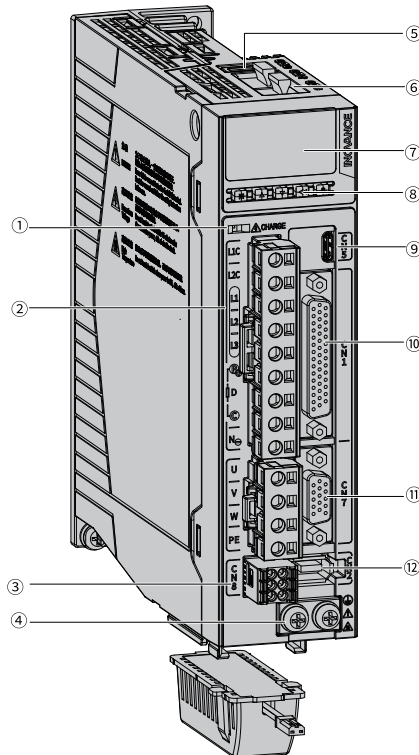


Figure 2-2 Servo drive components

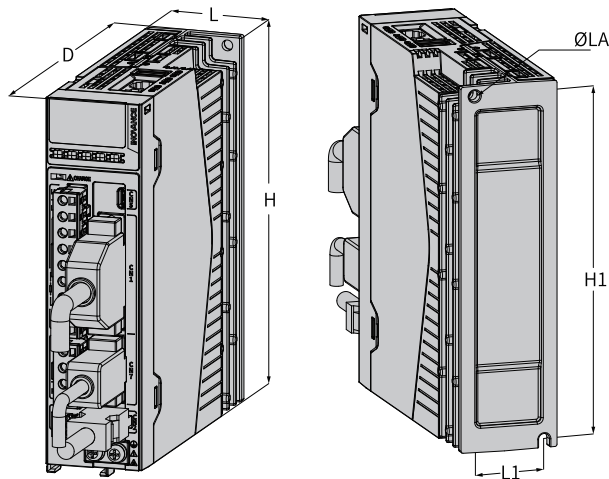
Table 2-1 Description of servo drive components

No.	Name	Description
①	CHARGE (bus voltage indicator)	Indicates the electric charge is present in the bus capacitor. When the indicator turns on, charges possibly still exist in the internal capacitor of the servo unit, even if the power supply of the main circuit is OFF. To prevent electric shock, do not touch the power terminals when this indicator lights up.
②	Main circuit terminal	See section “Description of Main Circuit Terminals” in the Hardware Guide.
③	CN8 (brake and PTC input terminal)	Connected to brake and motor temperature feedback.
④	Servo drive grounding terminal	Connected to the grounding terminal of the power supply for grounding purpose.
⑤	CN6 (STO safety function terminal)	Connected to external functional safety signal for functional safety purpose.
⑥	CN3, CN4 (communication terminals)	Connected to RS485 host controllers in parallel.
⑦	5-digit LED display	The 5-digit 8-segment LED display is used to show servo system's running state and parameter setting.
⑧	Keys	M: Used to switch parameters in sequence. ▲: Increases the value of the blinking bit. ▲: Decreases the value of the blinking bit. ◀◀: Used to shift the blinking bit leftwards (Hold down: Turning to the next page when the displayed number exceeds five digits). S: Saves modifications and enters the next menu.
⑨	CN5 (communication terminals)	Supports online upgrade and background commissioning when the drive is powered on. In USB mode, the terminal only supports download and upload of parameters, and driver firmware update; The terminal uses USB power supply. If there is a fault that cannot be completely reset, disconnect the USB power supply and drive control power, and then power on again.
⑩	CN1 (control terminal)	Used by reference input signals and other I/O signals.
⑪	CN7 (encoder feedback terminal)	Supports communication encoder and pulse encoder. Supports gantry synchronization.
12	CN2 (encoder feedback terminal)	Supports communication-type encoders. Supports gantry synchronization.

Note

The built-in regenerative resistor or jumper bar is not available in models S1R6 and S2R8. If an external regenerative resistor is needed for these models, connect it between terminals P⊕ and C.

2.1.3 Product Dimensions



SIZE	L	H	D	L1	H1	D1	ØLA	Tightening Torque	Weight
	Unit: mm (in.)							Unit: (N·m)	Unit: (kg)
A	45.5 (1.79)	170 (6.69)	150 (5.91)	33 (1.30)	161 (6.34)	75 (2.95)	2-M4	1.2	0.96
C	55±1 (2.17±0.04)	170 (6.69)	173±1 (6.81±0.04)	44 (1.73)	160 (6.30)	75 (2.95)	2-M4	1.2	1.3
D	80±1 (3.15±0.04)	170 (6.69)	183 (7.20)	71 (2.80)	160 (6.30)	75 (2.95)	3-M4	1.2	1.8
E	90 (3.54)	250 (9.84)	230 (9.06)	78 (3.07)	241 (9.47)	75 (2.95)	4-M4	1.2	3.6

2.2 Specifications

2.2.1 Electrical Specifications

- Single-phase 200V drive

Item	Size A		Size C		Size D
Servo Drive Model	S1R6	S2R8	S5R5	S7R6	S012
Drive Power (kW)	0.2	0.4	0.75	1.0	1.5
Max. applicable motor capacity (kW)	0.2	0.4	0.75	1.0	1.8
Power supply equipment capacity (kVA)	1.4	2.8	4.6	6.0	8.0
Continuous output current (Arms)	1.6	2.8	5.5	7.6	12.0
Max. output current (Arms)	5.8	10.1	16.9	23.0	32.0

Item		Size A		Size C		Size D		
Main circuit	Continuous input current (Arms)	2.3	4.0	7.9	9.6	12.8		
	Main circuit power supply	Single-phase 200 VAC-240 VAC, -10% to +10%, 50 Hz/60 Hz						
	Energy Loss (W)[1]	12	23.8	38.2	47.32	69.84		
Control circuit	Control circuit power supply	Single-phase 200 VAC-240 VAC, -10% to +10%, 50 Hz/60 Hz						
	Energy Loss (W)[2]	16						
Control circuit backup power circuit ^[3]	Power input range	24 VDC, -15% to +15%						
	Power of external power supply	≥ 50 W						
Braking resistor	Resistance (Ω)	Optional	Optional	50	25	25		
	Resistor power (W)	Optional	Optional	50	80	80		
	Min resistance of external resistor (Ω)	40	40	40	20	15		
	Max. braking energy absorbed by capacitor (J)	9.3	18.59	32.42	32.42	47.68		
	Braking resistor	All models in the series support built-in and external braking resistors. But Size A does not come with a built-in braking resistor as standard						
Cooling mode		Natural ventilation			Air cooling			
Overvoltage class		III						

- Three-phase 200V drive

Item		Size A		Size C		Size D	Size E		
Servo Drive Model		S1R6	S2R8	S5R5	S7R6	S012	S018	S022	S027
Drive Power (kW)		0.2	0.4	0.75	1.0	1.5	2.0	2.5	5.0
Max. applicable motor capacity (kW)		0.2	0.4	0.75	1.0	1.8	2.0	2.5	5.0
Power supply equipment capacity (kVA)		1.21	2.42	3.84	5.05	6.68	8.33	10.42	20.08
Continuous output current (Arms)		1.6	2.8	5.5	7.6	12.0	18.0	22.0	27.0
Max. output current (Arms)		5.8	10.1	16.9	23.0	32.0	45	55	67.5
Main circuit	Continuous input current (Arms)	1.1	2.3	4.4	5.1	8.0	8.7	11.0	23.8
	Main circuit power supply	3-phase 200 VAC-240 VAC, -10% to +10%, 50 Hz/60 Hz							
	Energy Loss (W)[1]	12	23.8	38.2	47.32	69.84	120	125	200
Control circuit	Control circuit power supply	Single-phase 200 VAC-240 VAC, -10% to +10%, 50 Hz/60 Hz							
	Energy Loss (W)[2]	16							
Control circuit backup power circuit ^[3]	Power input range	24 VDC, -15% to +15%							
	Power of external power supply	≥ 50 W							

Item		Size A		Size C		Size D	Size E		
Braking resistor	Resistance (Ω)	Optional	Optional	50	25	25	20	20	20
	Resistor power (W)	Optional	Optional	50	80	80	100	100	100
	Min resistance of external resistor (Ω)	40	40	40	20	15	20	20	20
	Max. braking energy absorbed by capacitor (J)	9.3	18.59	32.42	32.42	47.68	78.19	114.43	114.43
	Braking resistor	All models in the series support built-in and external braking resistors. But Size A does not come with a built-in braking resistor as standard					Built-in and external resistor is supported		
Cooling mode		Natural ventilation		Air cooling					
Overvoltage class		III							

- Three-phase 400V drive

Item		Size C		Size D		Size E		
Servo Drive Model		T3R5	T5R4	T8R4	T012	T017	T021	T026
Drive Power (kW)		1.0	1.5	2.0	3.0	5.0	6.0	7.5
Max. applicable motor capacity (kW)		1.0	1.5	2.0	3.0	4.4	5.5	7.5
Power supply equipment capacity (kVA)		6.05	9.08	10.23	15.15	22.25	25.0	31.25
Continuous output current (Arms)		3.5	5.4	8.4	12.0	17.0	21.0	26.0
Max. output current (Arms)		11.0	14.0	20.0	30.0	42.5	52.5	65.0
Main circuit	Continuous input current (Arms)	2.4	3.6	5.6	8.0	12.0	16.0	21.0
	Main circuit power supply	3-phase 380 VAC–480 VAC, -10% to +10%, 50 Hz/60 Hz						
	Energy Loss (W)[1]	39.5	63.25	94.82	135.47	187.62	228.28	258.63
Control circuit	Control circuit power supply	Single-phase 380 VAC–480 VAC, -10% to +10%, 50 Hz/60 Hz						
	Energy Loss (W)[2]	16						
Control circuit backup power circuit ^[3]	Power input range	24 VDC, -15% to +15%						
	Power of external power supply	≥ 50 W						
Braking resistor	Resistance (Ω)	100	100	50	50	35	35	35
	Resistor power (W)	80	80	80	80	100	100	100
	Min resistance of external resistor (Ω)	80	60	45	40	35	25	25
	Max. braking energy absorbed by capacitor (J)	28.23	34.28	50.41	50.41	82.67	120.98	120.98
	Braking resistor	Built-in braking resistor						
Cooling mode		Air cooling						
Overvoltage class		III						

Note

- [1] Main circuit energy loss refers to the energy loss under rated output current of the servo drive.
 - [2] Control circuit energy loss refers to the energy loss under rated input current of the servo drive.
 - [3] This power supply is only applicable to PINT models with backup power.
 - Select the external regenerative resistor according to actual operating conditions.
-

2.2.2 Technical Specifications

Item		Description			
General Specifications	Control mode	IGBT PWM control, sine wave current drive mode			
		200V, 400V: Single-phase/Three-phase full bridge rectification			
	Encoder feedback	<p>The drive supports Inovance 23-bit/26-bit multi-turn absolute encoders and functional safety encoders (the drive must be of the functional safety type). For other supported encoder types, see section "Commissioning Items" in the commissioning guide.</p> <p>You can use the Inovance 23-bit multi-turn absolute encoder as an incremental encoder if you remove the battery.</p>			
	Conditions for use	Operating/Storage temperature [1]	0°C to 55°C (average load ratio not exceeding 80% in ambient temperatures between 45°C to 55°C) (non freezing)/ -40°C to 70°C		
		Operating/Storage humidity	Below 90% RH (no condensation)		
		Vibration resistance	Operation: <ul style="list-style-type: none"> • 5 Hz–8.4 Hz: 3.5 mm displacement • 8.4 Hz–200 Hz: 1g 		
			Product package: <ul style="list-style-type: none"> • 5 Hz–100 Hz: 0.01g²/Hz • 200 Hz: 0.001g²/Hz • Grms = 1.14 g 		
		Impact resistance	19.6 m/s ²		
		IP rating	IP20		
			Note: excluding terminals (IP00)		
Pollution degree		PD2			
Altitude	<p>The maximum altitude is 2000 m.</p> <ul style="list-style-type: none"> • For altitudes not higher than 1000 m, derating is not required • Derating is required for altitudes above 1000 m (derate 1% for every additional 100 m) • For altitudes above 2000 m, contact Inovance 				
Speed/Torque control mode	Per for mance	Speed change ratio [2]	Load change ratio	Below 0.5% at 0–100% load (under rated speed)	
			Voltage change ratio	0.5% at rated voltage ± 10% (under rated speed)	
			Temperature change ratio	Below 0.5% at 25 ± 25°C (under rated speed)	
	Speed control range	1:10000 (Under the rated torque load, the servo drive keeps running as long as the lower limit of the speed control range is not exceeded.)			
	Torque control accuracy	±1%			
	Soft startup time setting	0s to 65s (Acceleration and deceleration can be set separately.)			
	Input signal	Speed reference	Analog input signal; digital input signal; DI signal combination is used to achieve selection of speed 0 to 15		
		CANopen communication mode	PV mode		
		Torque reference	Analog input signal; digital input signal		
		CANopen communication mode	PT mode		

Item			Description	
Position control mode	Performance	Feedforward compensation	0% to 100.0% (resolution: 0.1%)	
		Timing window	1-65535 encoder unit	
	Input signal	Pulse reference	Input pulse form	Three forms: direction+pulse, phase A + phase B quadrature pulse, CW/ CCW pulse
			Input form	Differential input; open collector
		Input pulse frequency	Differential input: single: 4 Mpps, quadrature: 8 Mpps, pulse width \geq 0.125 us Open collector: max. single pulse frequency: 200 Kpps, pulse width must not be less than 2.5 us	
		Power supply for built-in open collector [3]	+24 V (built-in 2.4 k Ω resistor)	
		Multi-position reference selection	Position 0 to position 15 selectable through DI signal combination (Other terminals can be assigned with this function.)	
		CANopen communication mode	PP mode/HM mode/IP mode	
	Position output	Output mode		Phase A, phase B: differential output
				Phase Z: differential output or open collector output
	Frequency division ratio	Any frequency division		
Input and output signal	DI signal	DI signal function assignment	8 DIs DI1 to DI6: Max. input frequency is 1 kHz (decreasing when current limit resistance is greater than 2.4 k Ω); DI7 to DI8: signal input hardware delay is less than 1 ms (current limit resistance is 2.4 k Ω) The DI functions are as follows: Servo enable, alarm reset, gain switching, reference switching, mode switching, zero clamp enable, position reference inhibit, pulse reference inhibit, forward overtravel, reverse overtravel, speed limit, torque limit, forward and reverse jog, step enable, hand wheel switching, electronic gear selection, reference direction setting, home switch, homing enable, current position as home, emergency stop, multi-position, interrupt positioning, position deviation clearing, positioning and command completion signal clearing	
		DO signal	Output signal function selection	5 DOs. With-load capacity: 50 mA; Voltage range: 5 V to 30 V The DO function is as follows: Servo ready, motor rotation signal, zero speed signal, speed consistent, speed attained, torque attained, positioning completed, positioning proximity, torque limit, speed limit, braking, warning output, fault output, warning or fault output, interrupt positioning completed, homing completed, electrical homing completed, enable completed, comparison output, communication forced output, and EDM output
			Analog input signal	AI1 voltage input: 16-bit, -10 V to +10 V; max. allowable voltage: \pm 12 V AI2 voltage input: 12-bit, -10 V to +10 V; max. allowable voltage: \pm 12 V
		Analog output signal	AO1 voltage output range: -10 V to +10 V	

Item		Description	
Built-in features	Stop at limit switch	The servo drive stops immediately when P-OT or N-OT is active	
	Electronic gear ratio	$0.001 \leq B/A \leq 26843545.6$	
	Protective functions	Including protections against overcurrent, overvoltage, undervoltage, overload, main circuit detection error, heatsink overheat, power phase loss, overspeed, encoder error, CPU error, and parameter error	
	Safety Function	Type	STO (standard)/SS1/SBC/SOS/SS2/SLS/SDI/SSM ^[4] , supports 24 V backup power.
		Applicable standard	IEC 61800-5-2:2016
	LED display	Main circuit CHARGE indicator, 5-digit LED display	
	Vibration Suppression	5 notches (including two adaptive notches) available, 50 Hz to 8000Hz	
	Usability functions	One-key parameter tuning, adaptive parameter tuning, intelligent parameter tuning, speed observer, and model tracking	
	Communication function	Software commissioning	Type_C
		Multi-station communication	ModBus (RS485 interface), CANopen
		Number of multi-station communication axes	Up to 32 For RS485, and up to 127 for CANopen
		Axis address setting	No physical knob, set through the software
		Description	Including status display, user parameter setting, monitored value display, fault tracing display, JOG and auto-tuning, speed/torque reference signal observation, and communication and motion control command setting
Others	Gain tuning, alarm log, JOG		

Note

- [1] Install the servo drive within the allowable ambient temperature range. When it is installed inside a control cabinet, the temperature inside the cabinet must also be within this range.
- [2] The speed change ratio is defined by the following formula: Speed change ratio = (No-load speed - Full-load speed) ÷ Rated speed x 100%.
- The voltage change and temperature change may result in amplifier deviation, which causes the calculated resistance value to change. Such change will be reflected by the speed change. Speed changes caused by the voltage change and the temperature change will be indicated respectively by a percentage to the rated speed.
- [3] The internal open collector power supply is not electrically insulated from the control circuit in the servo drive.
- [4] For S models only. For details, see the Function Guide.

2.2.3 Dynamic Brake Characteristics

According to the motor model, initial speed and load inertia, the dynamic braking distance can be estimated. The approximate value of the dynamic braking distance can be calculated by the following formula. For the accurate value, please use the dynamic braking calculation function provided by our software.

Maximum braking distance s (turn) is:

$$s = \frac{V_0}{60} (t_e + (\tau_1 + \tau_2 V_0^2) (1 + \frac{J_L}{J_M}))$$

The coefficient is as follows:

$$\tau_1 = \frac{2R_s J}{3p_n^2 \Psi_f^2} = \frac{10000\pi^2 R_s J}{9K_e^2}$$
$$\tau_2 = \frac{\pi^2 L_d^2 J}{4050R_s \Psi_f^2} = \frac{100L_d^2 \pi^4 P_n^2 J}{243R_s K_e^2}$$
$$\Psi_f = \frac{\sqrt{6}K_e}{100\pi P_n}$$

- V_0 : Maximum feedback speed
- t_e : Dynamic brake program and relay delay
- J_L : Load moment of inertia
- J_M : Motor moment of inertia
- P_n : Number of motor pole pairs
- R_s : Stator resistance (Ω)
- L_q, L_d : q-axis inductance (mH), d-axis inductance (mH).

2.2.4 Load Moment of Inertia

The load moment of inertia represents the inertia of the load. The larger the load moment of inertia is, the weaker the responsiveness is. An excessively high inertia may result in unstable motion. The allowable load moment of inertia () of the motor is restricted. This value is provided strictly as a guideline and results depend on the motor driving conditions.

An overvoltage warning may occur during deceleration if the load moment of inertia exceeds the allowable value. For servo drives with a built-in regenerative resistor, an overload alarm may be present. In case of such warnings, take one of the following measures:

- Reduce the torque limit values.
- Reduce the deceleration rate.
- Reduce the maximum speed.
- Install an external braking resistor if the warning cannot be cleared using the above measures.



- Drives below 400 W does not provide a built-in braking resistor.
 - Even you use a built-in resistor, the energy generated in some conditions will exceed the allowable capacity loss (W) of the resistor. Therefore, an external braking resistor is required.
-

3 MS1 motor

3.1 Product Information

3.1.1 Model and Nameplate

3.1.1.1 Model and Nameplate

Model description

MS1 H1 - 75B 30C B A3 3 1 R - *

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<p>① MS1 series servo motor</p>	<p>② Inertia and Capacity</p> <p>H1: low inertia, small capacity H2: low inertia, medium capacity H3: medium inertia, medium capacity H4: medium inertia, small capacity</p>	<p>③ Rated Power (W)</p> <p>One letter and two digits B: x 10 C: x 100 Example: 75B: 750W</p>
<p>④ Rated speed (rpm)</p> <p>One letter and two digits B: x 10 C: x 100 Example: 30C: 3,000 rpm</p>	<p>⑤ Voltage Class (V)</p> <p>B: 220 D: 380</p>	<p>⑥ Encoder Type</p> <p>One letter and one digit A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder of functional safety type A3: 23-bit multi-turn absolute encoder</p>
<p>⑦ Shaft Connection Mode</p> <p>3: Solid shaft, with key and threaded hole</p>	<p>⑧ Brake, Reducer and Oil Sealing ^[1]</p> <p>0: No oil sealing and brake 1: With oil sealing but no brake 2: No oil sealing but with brake 4: With oil sealing and brake</p>	<p>⑨ Series</p> <p>R: R version</p> <p>⑩ Non-standard Features</p> <p>INT: global version</p>

Note

- [1] The standard configuration of the motor in flange size 40 does not include the oil seal. Motors of other models carry the oil seal as standard.

Nameplate

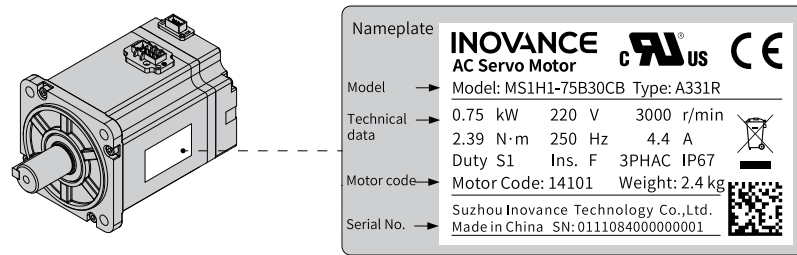






Figure 3-1 Model and Nameplate

3.1.2 Motor Models

Motor type		Rated Output Capacity (kW)	Rated speed (max. speed) (RPM)	Encoder	IP rating of the enclosure
Low inertia, small capacity	 MS1H1	0.05, 0.1, 0.2, 0.4, 0.55, 0.75, 1.0	3000 (7000)	A6: 26-bit multi-turn absolute encoder	IP67
Low inertia, medium capacity	 MS1H2	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0	3000 (6000)	A6: 26-bit multi-turn absolute encoder	IP67
Medium inertia, medium capacity	 MS1H3	0.85, 1.3, 1.8, 2.9, 4.4, 5.5, 7.5	1500 (4500)	A6: 26-bit multi-turn absolute encoder	IP67
Medium inertia, small capacity	 MS1H4	0.1, 0.2, 0.4, 0.55, 0.75, 1.0	3000 (7000)	A6: 26-bit multi-turn absolute encoder	IP67

3.1.3 Components

Motor (Flange sizes 40&60&80)

- Servo motors with terminal box

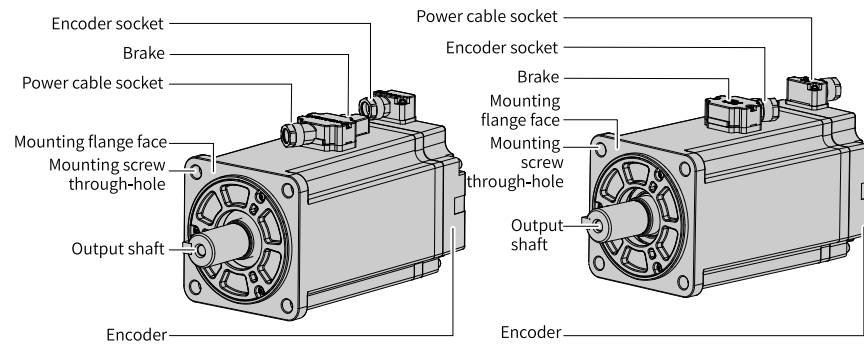


Figure 3-2 Components of motors with terminal box (left: front outlet; right: rear outlet)

• Servo motors with flying leads

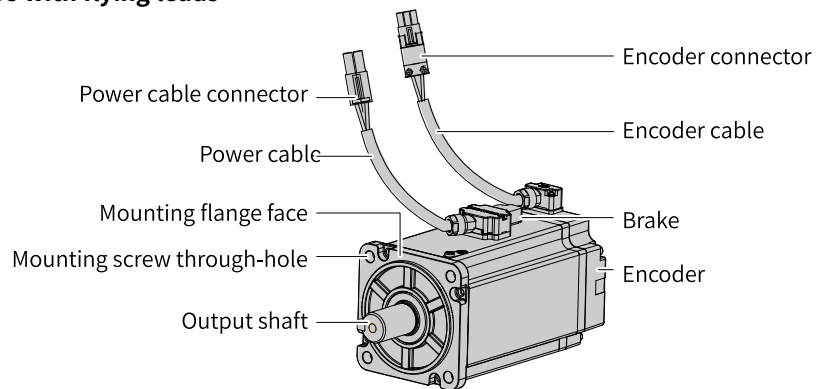


Figure 3-3 Components of motors with flying leads

Motor (Flange sizes 100&130&180)

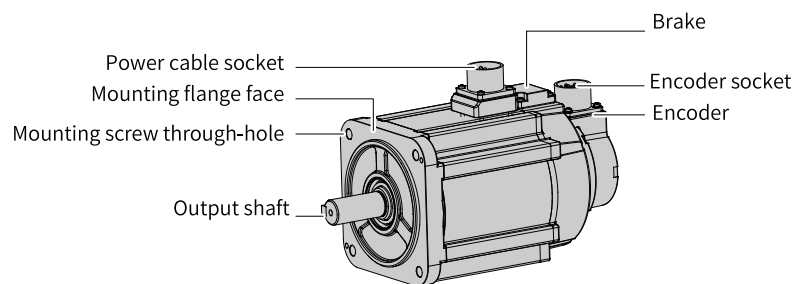
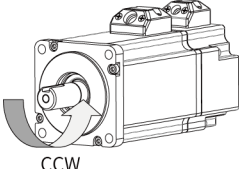


Figure 3-4 Components of servo motors in flange sizes 100/130/180

3.2 Specifications

3.2.1 Mechanical Characteristics

Item	Description
Duty type	S1(Continuous duty)
Vibration level ^[1]	V15
Insulation resistance	500 VDC, above 10 MΩ
Excitation mode	Permanent magnetic
Installation method	Flange type

Item		Description
Heat resistance level		F
Insulation voltage		1500 VAC, 1 min (220 V class) 1800 VAC, 1 min (380 V class)
IP rating of the enclosure		IP67 (excluding shaft opening and flying leads type motor connectors)
Direction of rotation		Rotates counterclockwise when viewed from the shaft extension side with the forward run command.  CCW
Operating conditions	Ambient temperature	0°C to 40°C (non-freezing) (Derate based on the derating curve for temperatures above 40°C.)
	Ambient humidity	20%–80% (no condensation)
	Installation location	<ul style="list-style-type: none"> • Free from corrosive or explosive gases • Well ventilated and with minimum amount of dust, waste and moisture • Convenient for inspection and cleanup • Derating required only for altitudes above 1000 m “3.2.3 Derating Characteristics” on page 27 • Away from sources that may generate strong magnetic field • Away from heating sources such as a heating stove • Use the motor with oil seal in places with grinding fluid, oil mist, iron powders or cuttings. • The oil seal is only dust-proof. It cannot withstand the intrusion of oil in a long term. • No applicable to vacuum environment • Not applicable to inching condition, which may result in stuck • The motor with brake may generate a pattering sound. • Coupler type and installation alignment requirements • The system should avoid continuous operation at natural frequency. Exceeding the allowable vibration value may damage the system.
Storage environment	Observe the following requirements for keeping a de-energized motor. <ul style="list-style-type: none"> • Temperature: -20°C to +60°C (non-freezing) • Humidity: 20% to 80% RH (no condensation) 	
Shock resistance ^[2]	Shock acceleration (taking flange side as standard)	490 m/s ²
	Times of shock	2
Vibration resistance ^[3]	Vibration acceleration (taking flange side as standard)	49 m/s ²

Note

- [1] Vibration level V15 indicates that the vibration amplitude is less than 15 μm when a single servo motor rotates at rated values.
- [2] The resistance for shock in the vertical direction when the servo motor is mounted with the shaft in a horizontal position is shown in the preceding table.
- [3] For a servo motor shaft mounted horizontally, the vibration resistance level in the up/down, left/right, and front/rear directions is shown in the preceding table.
- The strength of the vibration that the servo motor can withstand depends on the application. Check the vibration acceleration rate applied to the servo motor through the actual product.

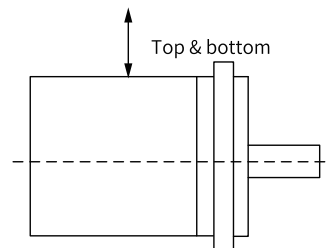


Figure 3-5 Shock applied on the motor

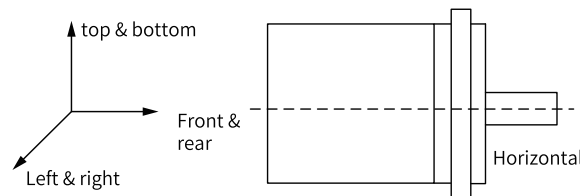


Figure 3-6 Vibration applied on the motor

3.2.2 Overload Characteristics

The equipment is compliant with NEC and CEC requirements and equipped with protective functions against overload and overtemperature.

For effective protection of different load motors, set the motor overload protection gain according to the motor overload capacity. Use the default gains in general conditions, however, when one of the following condition occurs, change the gains based on the temperature rise condition of the motor:

- The motor operates in environments with high temperature.
- The motor is in cyclic motion featuring a short motion cycle and frequent acceleration/ deceleration.
- The thermal overload protection only occurs during continuous operation. In this case, power off the drive to check the motor temperature.

The motor overload protection curve is shown in the following figure.

- **MS1H1/MS1H4**

Load ratio (%)	Operating time (s)
120	230
130	80
140	40
150	30
160	20

Load ratio (%)	Operating time (s)
170	17
180	15
190	12
200	10
210	8.5
220	7
230	6
240	5.5
250	5
300	3
350	2

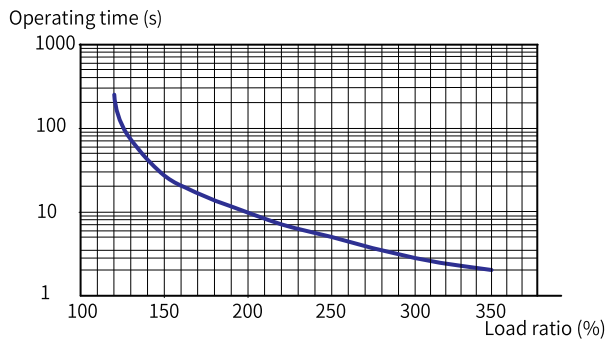


Figure 3-7 MS1H1 and MS1H4 series motor overload curves

Note

The maximum torque of MS1H1 and MS1H4 models is 3.5 times the rated torque.

● **MS1H2/MS1H3**

Load ratio (%)	Operating time (s)
115	6000
121.4	2000
127.8	1000
134.2	800
140.6	500
147	300
153.4	150
159.8	100
166.2	80
172.6	60
179.0	50
185.4	45
191.8	40
198.2	36
204.6	32
211.0	28
217.4	23
223.8	22
230.2	19
236.6	18
243.0	15

Load ratio (%)	Operating time (s)
249.4	14
255.8	13
262.2	11
268.6	10
275.0	9
281.4	8
287.8	7
294.2	6

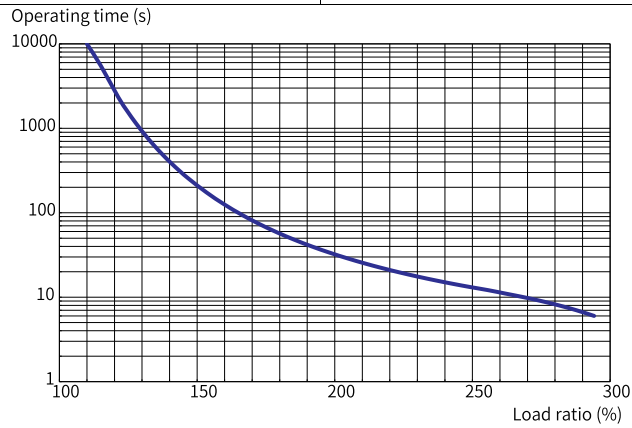


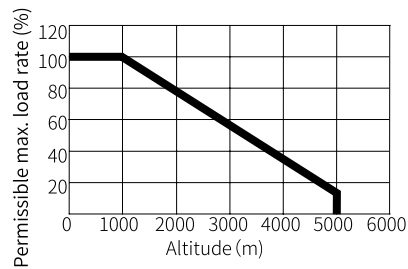
Figure 3-8 MS1H2 and MS1H3 series motor overload curves

Note

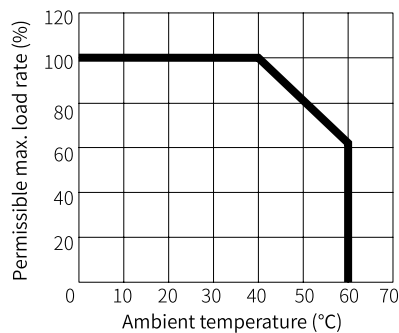
- The maximum torque of H2 models is three times the rated torque.
- The maximum torque of H3 models is 2.5 times the rated torque.

3.2.3 Derating Characteristics

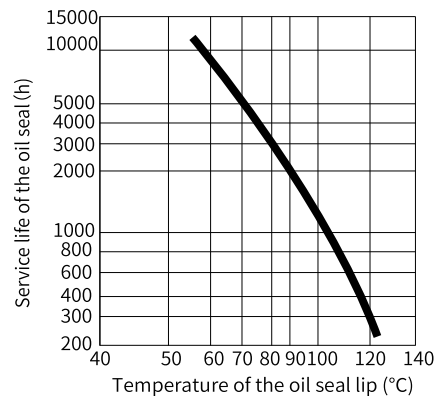
- **Altitude-based derating curve**



- **Temperature-based derating curve**



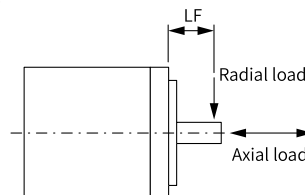
3.2.4 Temperature Curve of the Oil Seal



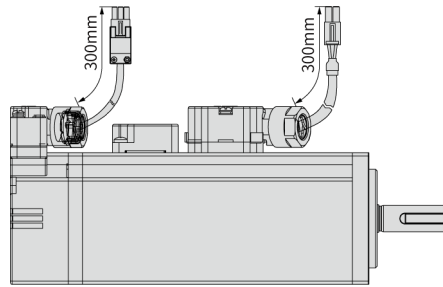
3.3 Selection Instructions

- Description of torque-speed characteristics curves:
 - Technical data and torque/speed characteristic values in the following tables are applicable to motors working with Inovance servo drives with the armature coil temperature being 20°C.
 - Continuous working area: refers to a series of states in which the motor can operate safely and continuously, and the actual torque must be located in this area.
 - Short-time working area: refers to a series of states in which the motor can run in a short time when the actual torque is greater than the rated torque.
- The characteristic parameter values are obtained in cases where the motor is installed with the following heatsink:
 - MS1H1/MS1H4: 250 × 250 × 6 (mm) (aluminum)
 - MS1H2-10C to 25C: 400 × 400 × 20 (mm) (steel)
 - MS1H2-30C to 50C: 400 × 400 × 20 (mm) (steel)
 - MS1H3-85B to 18C: 400 × 400 × 20 (mm) (steel)
 - MS1H3-29C to 55C: 550 × 550 × 30 ((mm) (aluminum)
 - MS1H3-75C: 700 × 700 × 30 (mm) (aluminum)

- Radial and axial loads of the motor:



- Dimensions of flying leads type motors
The 40/60/80-flange flying leads type motor (with “-S”) provides a drain wire of about 300 mm long, as shown in the following figure.



- MS1H3 (130-flange and 180-flange) comes with a key slot. When the operating speed is above 3000 rpm, the motor must run with the key. If you need to run the motor without the key, you can ask for customization from Inovance.

Note

- The data in the () is the value of the servo motor with the brake.
- The motor with oil seal must be derated by 10% during use.
- It is recommended that the cross sectional area of brake cables is above 0.5 mm².
- The brake must not share the power supply with other electrical devices. This is to prevent a malfunction of the brake due to a drop in the voltage or current when other electrical devices work in tandem.
- The holding brake cannot be used for braking purpose.
- The release time and operation time of the brake depend on the discharge circuit. Be sure to confirm the operation delay of your equipment before use.
- You need to prepare the 24 VDC power supply yourself.
- The tightening tension for terminal screws must be between **0.19 N·m to 0.21 N·m**, exceeding of which may damage the terminal.

3.4 Low inertia, small capacity

3.4.1 MS1H1-05B30CB-A3/A6/S63*Z

Motor specifications		Torque-Speed characteristics
Flange size (mm)	40	
Inertia, capacity	Low inertia, small capacity	
Rated power (kW)	0.05	
Rated voltage	220	
Rated torque (N·m)	0.16	
Maximum torque (N·m)	0.56	
Rated current (Arms)	1.3	
		Heatsink-based derating curve

Motor specifications			Torque-Speed characteristics	
Maximum current (Arms)	4.70			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.026		
	Motor with brake	0.028		

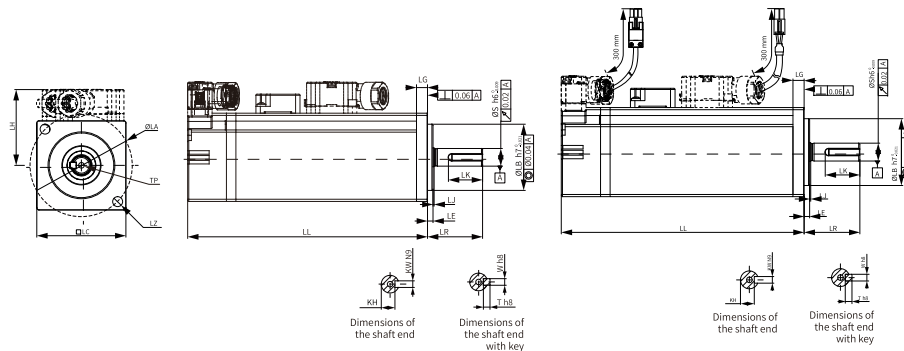
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω)(±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.1	94.4	0.25	≤ 40	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	78	54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
65.4 (96)	40	25±0.3	46	2-Ø4.5	34.3	5	2.5 ± 0.5	0.5±0.35
S	LB	TP	LK	KH	KW	W	T	Weight (kg)
8	Ø30h7 ⁰ -0.021	M3x6	15.5	6.2- ⁰ 0.1	3	3	3	0.39 (0.50)

3.4.2 MS1H1-10B30CB-A3/A6/S63*Z

Motor specifications		Torque-Speed characteristics	
Flange size (mm)	40		
Inertia, capacity	Low inertia, small capacity		
Rated power (kW)	0.1		
Rated voltage	220		
Rated torque (N·m)	0.32		
Maximum torque (N·m)	1.12		
Rated current (Arms)	1.3		
		Heatsink-based derating curve	

Motor specifications			Torque-Speed characteristics	
Maximum current (Arms)	4.70			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.26			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.041		
	Motor with brake	0.043		

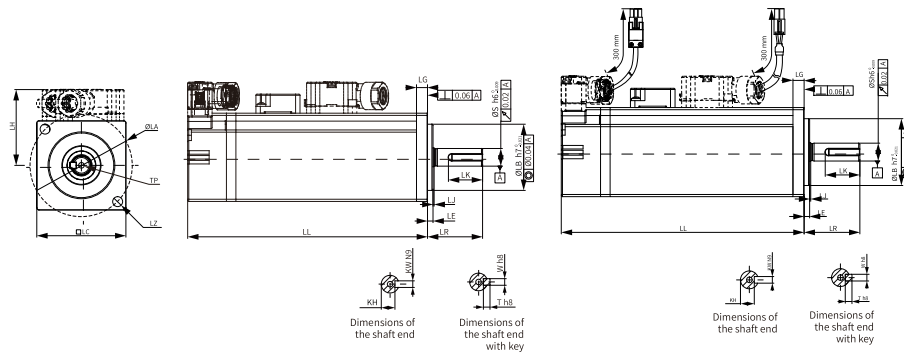
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.1	94.4	0.25	≤ 40	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	78	54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
78.4 (110)	40	25±0.3	46	2-Ø4.5	34.3	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	KW	W	T	Weight (kg)
8	Ø30h7 ⁰ -.0021	M3x6	15.5	6.2- ⁰ 0.1	3	3	3	0.45 (0.64)

3.4.3 MS1H1-20B30CB-A3/A6/S63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	60			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.2			
Voltage (V)	220			
Rated torque (N·m)	0.64			
Maximum torque (N·m)	2.24			
Rated current (Arms)	1.5		Heatsink-based derating curve	
Maximum current (Arms)	5.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.46			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.094		
	Motor with brake	0.106		

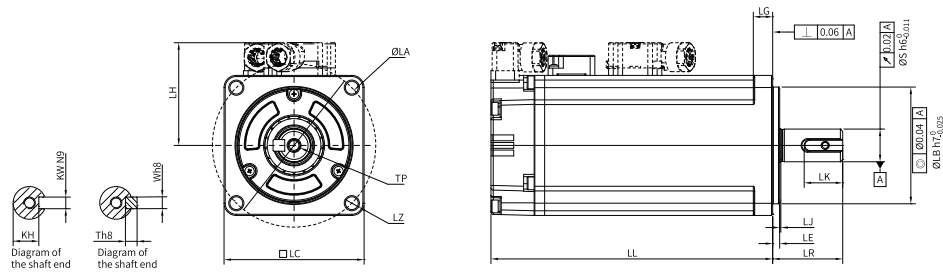
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	245	74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	75.5 (103)	30±0.5	70	4- Ø 5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø50h7 ⁰ _{-0.025}	14	M5x8	16.5	11 ⁰ _{-0.1}	5	5	5	0.80 (1.17)

3.4.4 MS1H1-40B30CB-A3/A6/S63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	60			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.4			
Voltage (V)	220			
Rated torque (N·m)	1.27			
Maximum torque (N·m)	4.45			
Rated current (Arms)	2.5		Heatsink-based derating curve	
Maximum current (Arms)	9.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.53			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.145		
	Motor with brake	0.157		

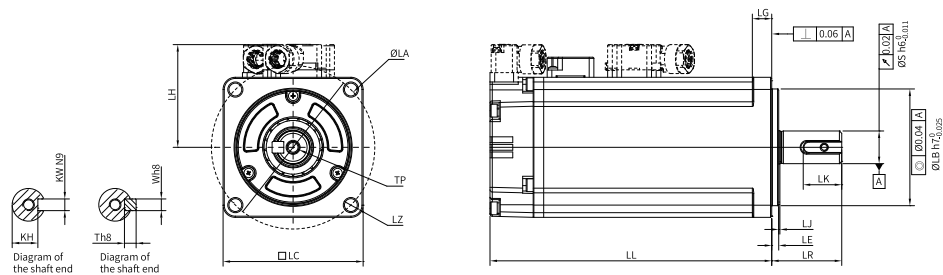
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	245	74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	93 (121)	30±0.5	70	4-Ø 5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø50h7 ⁰ _{-0.025}	14	M5x8	16.5	11 ⁰ _{-0.1}	5	5	5	1.11 (1.48)

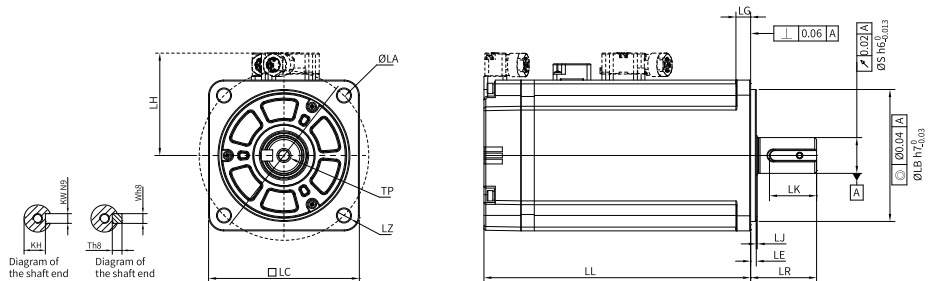
3.4.5 MS1H1-75B30CB-A3/A6/S63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.55			
Voltage (V)	220			
Rated torque (N·m)	1.75			
Maximum torque (N·m)	6.13			
Rated current (Arms)	3.9		Heatsink-based derating curve	
Maximum current (Arms)	15			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.49			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.55		
	Motor with brake	-		

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	25±0.5	90	4-Ø7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø70h7 ⁰ _{-0.03}	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	1.88

3.4.6 MS1H1-10C30CB-A3/A6/S63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	11.13			
Rated current (Arms)	6.2		Heatsink-based derating curve	
Maximum current (Arms)	24			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.46			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.82		
	Motor with brake	0.87		

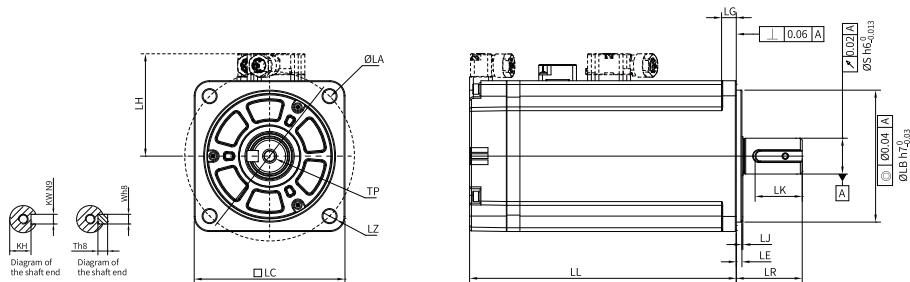
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
3.2	24	10	57.6	0.42	≤ 60	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	119.2 (153.4)	25 ± 0.5	90	4- Ø 7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø 70h7 ⁰ _{-0.03}	19	M6 × 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.61 (3.27)

3.5.2 MS1H2-10C30CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	1.0			
Voltage (V)	380			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	9.54			
Rated current (Arms)	3.3			
Maximum current (Arms)	11			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	1.07			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78		
	Motor with brake	2.6		

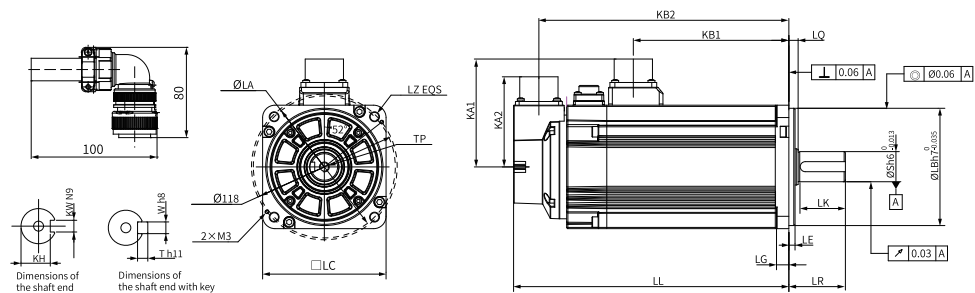
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	144 (172)	45±1	115	4-Ø7	88	75	73	123.5 (151.5)	10	5±0.3
LQ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5±0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	3.85 (4.9)

3.5.3 MS1H2-15C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	1.5			
Voltage (V)	220			
Rated torque (N·m)	4.9			
Maximum torque (N·m)	14.7			
Rated current (Arms)	8.6			
Maximum current (Arms)	32			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	0.62			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35		
	Motor with brake	3.17		

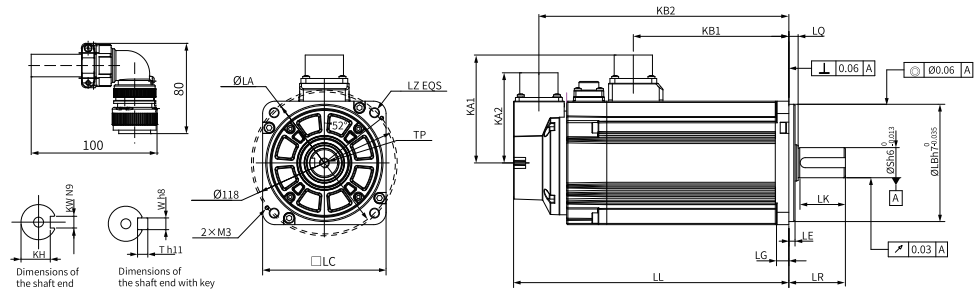
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45 ± 1	115	4-Ø7	88	92	73	140.5 (168.5)	10	5 ± 0.3
LQ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5 ± 0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	4.65 (5.75)

3.5.4 MS1H2-15C30CD-A63*R

Motor specifications			Torque-Speed characteristics			
Flange size (mm)	100					
Inertia, capacity	Low inertia, medium capacity					
Rated power (kW)	1.5					
Voltage (V)	380					
Rated torque (N·m)	4.9					
Maximum torque (N·m)	14.7					
Rated current (Arms)	4.2					
Maximum current (Arms)	14					
Rated speed (rpm)	3000					
Maximum speed (rpm)	6000					
Torque coefficient (N·m/Arms)	1.28		<th colspan="2">Heatsink-based derating curve</th>		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35				
	Motor with brake	3.17				

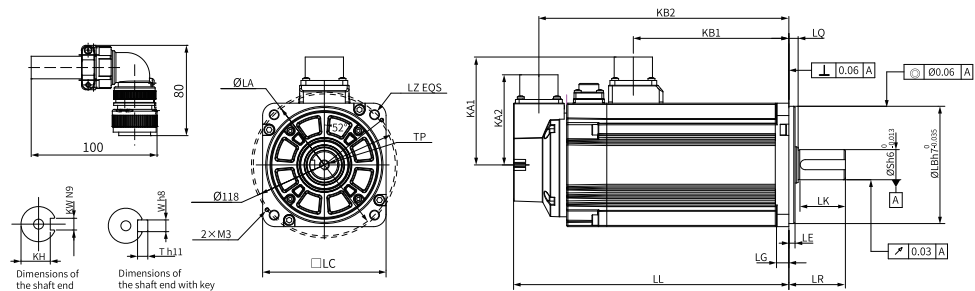
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45±1	115	4-Ø7	88	92	73	140.5 (168.5)	10	5±0.3
LQ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5±0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	4.65 (5.75)

3.5.5 MS1H2-20C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	2.0			
Voltage (V)	220			
Rated torque (N·m)	6.36			
Maximum torque (N·m)	19.1			
Rated current (Arms)	11.3		Heatsink-based derating curve	
Maximum current (Arms)	42			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	0.60			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92		
	Motor with brake	3.74		

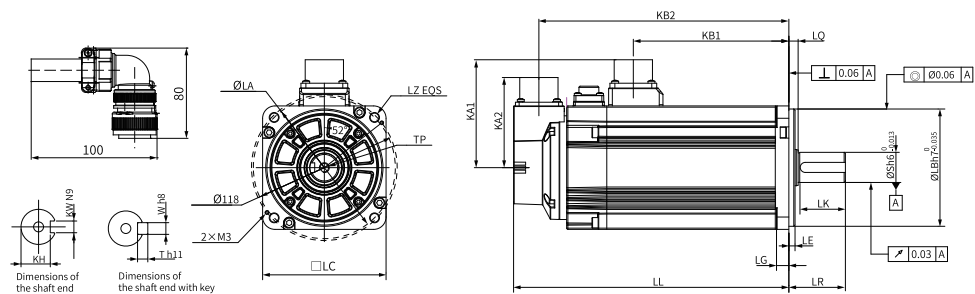
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45 ± 1	115	4-Ø7	88	108	73	156.5 (184.5)	10	5 ± 0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5 ± 0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	5.5 (6.55)

3.5.6 MS1H2-20C30CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	2.0			
Voltage (V)	380			
Rated torque (N·m)	6.36			
Maximum torque (N·m)	19.1			
Rated current (Arms)	5.6			
Maximum current (Arms)	20			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	1.19			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92		
	Motor with brake	3.74		

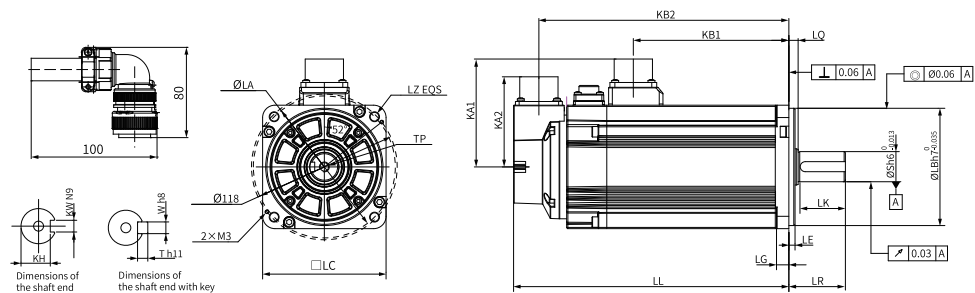
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45±1	115	4-Ø7	88	108	73	156.5 (184.5)	10	5±0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5±0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	5.5 (6.55)

3.5.7 MS1H2-25C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	2.5			
Voltage (V)	220			
Rated torque (N·m)	7.96			
Maximum torque (N·m)	23.9			
Rated current (Arms)	14.7			
Maximum current (Arms)	53			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	0.60			
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49		
	Motor with brake	4.3		

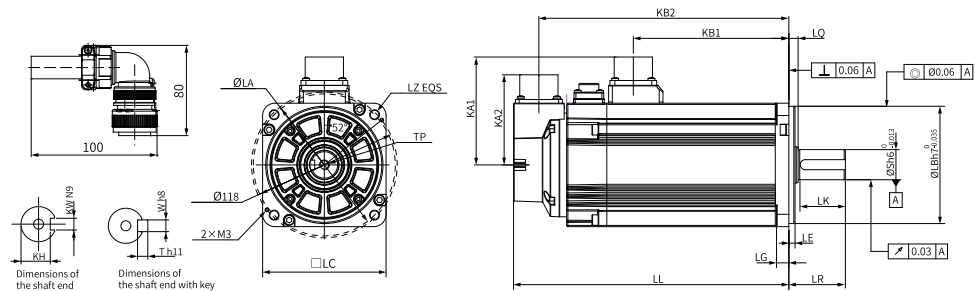
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45 ± 1	115	4-Ø7	88	126	73	174.5 (202.5)	10	5 ± 0.3
LQ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5 ± 0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	6.3 (7.35)

3.5.8 MS1H2-25C30CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	2.5			
Voltage (V)	380			
Rated torque (N·m)	7.96			
Maximum torque (N·m)	23.9			
Rated current (Arms)	7.2			
Maximum current (Arms)	26			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	1.18			
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49		
	Motor with brake	4.3		

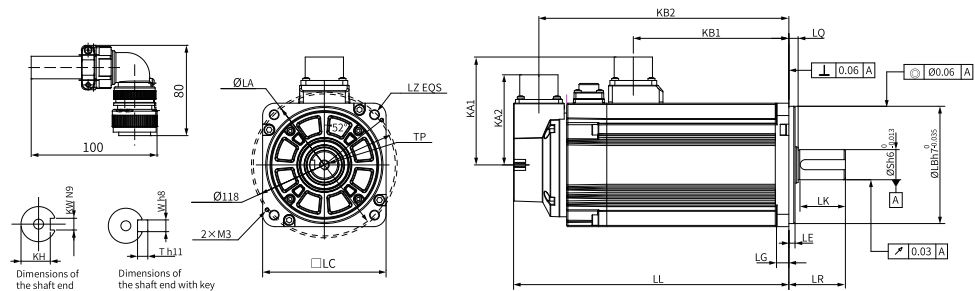
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
8	24	17.6	32.73	0.73	≤ 100	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45±1	115	4-Ø7	88	126	73	174.5 (202.5)	10	5±0.3
LQ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
7.5±0.75	Ø95h7 ⁰ -0.035		24	M8x16	36	20 ⁰ -0.2	8	8	7	6.3 (7.35)

3.5.9 MS1H2-30C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	3.0			
Voltage (V)	220			
Rated torque (N·m)	9.8			
Maximum torque (N·m)	24.5			
Rated current (Arms)	16.6			
Maximum current (Arms)	55			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	0.67			
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4		
	Motor with brake	9.38		

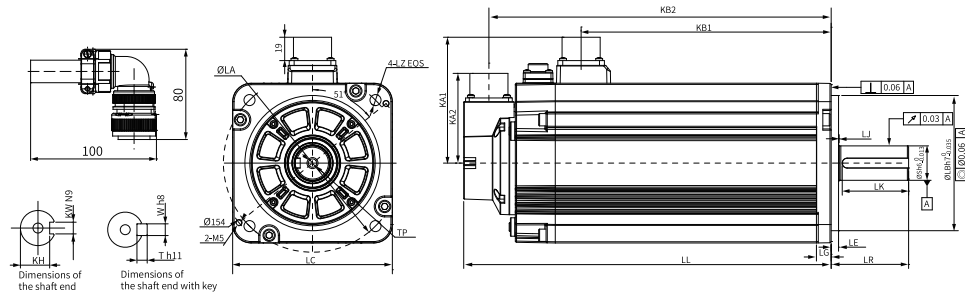
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	1176	392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63±1	145	4-Ø9	102.4	127.5	73	177.5 (202.5)	12	6±0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
0.5±0.75	Ø110h7 ⁰ _{-0.035}		28	M8 × 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)

3.5.10 MS1H2-30C30CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130		<p>— A Continuous duty zone — B Intermittent duty zone</p>	
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	3.0			
Voltage (V)	380			
Rated torque (N·m)	9.8			
Maximum torque (N·m)	29.4			
Rated current (Arms)	8.9			
Maximum current (Arms)	29			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	1.25		<p>Max. allowable load rate (%)</p> <p>Heatsink dimensions (mm)</p>	
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4		
	Motor with brake	9.38		

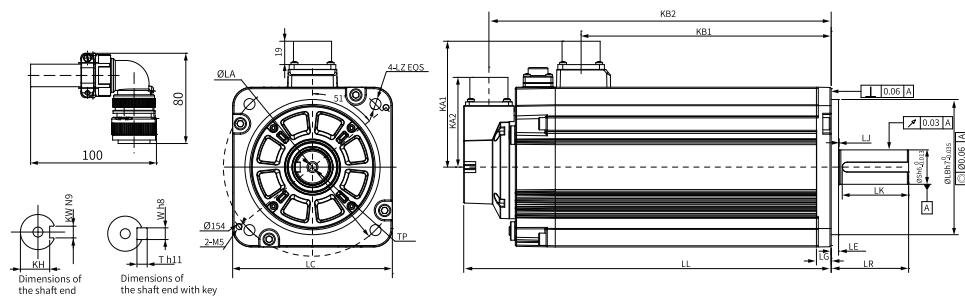
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	1176	392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63±1	145	4-Ø9	102.4	127.5	73	177.5 (202.5)	12	6±0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
0.5±0.75	Ø110h7 ⁰ _{-0.035}		28	M8 × 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)

3.5.11 MS1H2-40C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	4.0			
Voltage (V)	220			
Rated torque (N·m)	12.6			
Maximum torque (N·m)	31.5			
Rated current (Arms)	22			
Maximum current (Arms)	67.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	0.65			
Rotor moment of inertia (kg·cm ²)	Motor without brake	9		
	Motor with brake	11.98		

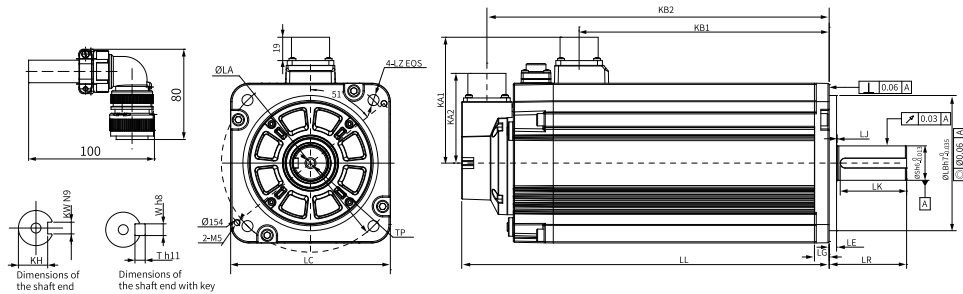
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	1176	392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63±1	145	4-Ø9	102.4	165.5	73	215.5 (240.5)	12	6±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø110h7 ⁰ _{-0.035}	28	M8 × 20	54	24 ⁰ _{-0.2}	8	8	7	13.2 (15.1)	

3.5.12 MS1H2-40C30CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	4.0			
Voltage (V)	380			
Rated torque (N·m)	12.6			
Maximum torque (N·m)	37.8			
Rated current (Arms)	13.5			
Maximum current (Arms)	42.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	1.06			
Rotor moment of inertia (kg·cm ²)	Motor without brake	9		
	Motor with brake	11.98		

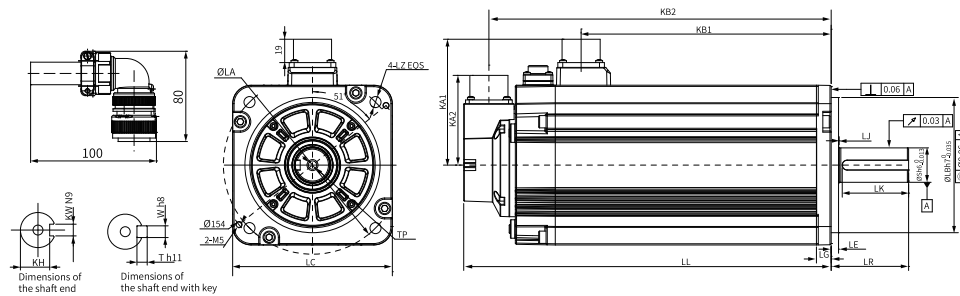
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	1176	392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63 ± 1	145	4-Ø9	102.4	165.5	73	215.5 (240.5)	12	6 ± 0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
0.5 ± 0.75	Ø110h7 ⁰ _{-0.035}		28	M8 × 20	54	24 ⁰ _{-0.2}	8	8	7	13.2 (15.1)

3.5.13 MS1H2-50C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	5.0			
Voltage (V)	220			
Rated torque (N·m)	15.8			
Maximum torque (N·m)	39.5			
Rated current (Arms)	22			
Maximum current (Arms)	67.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	0.81			
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6		
	Motor with brake	14.58		

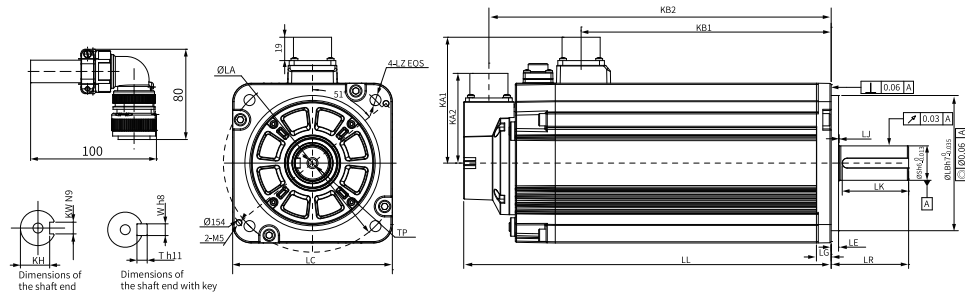
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	1176	392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63±1	145	4-Ø9	102.4	203.5	73	253.5 (278.5)	12	6±0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
0.5±0.75	Ø110h7 ⁰ _{-0.035}		28	M8 × 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)

3.5.14 MS1H2-50C30CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	5.0			
Voltage (V)	380			
Rated torque (N·m)	15.8			
Maximum torque (N·m)	47.4			
Rated current (Arms)	17			
Maximum current (Arms)	52.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/Arms)	1.04			
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6		
	Motor with brake	14.58		

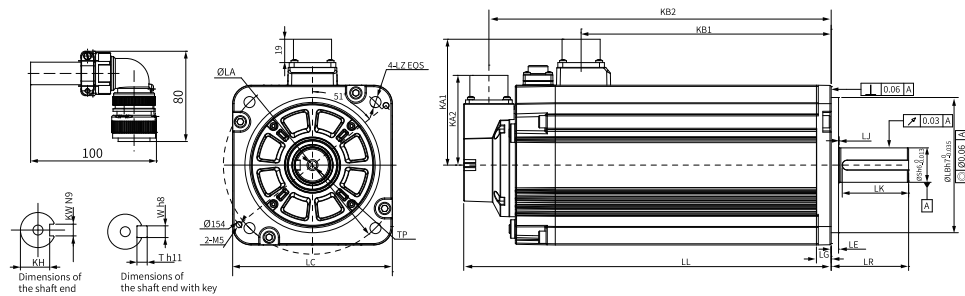
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	1176	392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63±1	145	4-Ø9	102.4	203.5	73	253.5 (278.5)	12	6±0.3
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
0.5±0.75	Ø110h7 ⁰ _{-0.035}		28	M8 × 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)

3.6 Medium Inertia and Small Capacity (MS1H4)

3.6.1 MS1H4-10B30CB-A63*Z

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated output (kW)	0.1			
Voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (Arms)	1.3			
Maximum current (Arms)	4.70			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.26			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.102		
	Motor with brake	0.104		

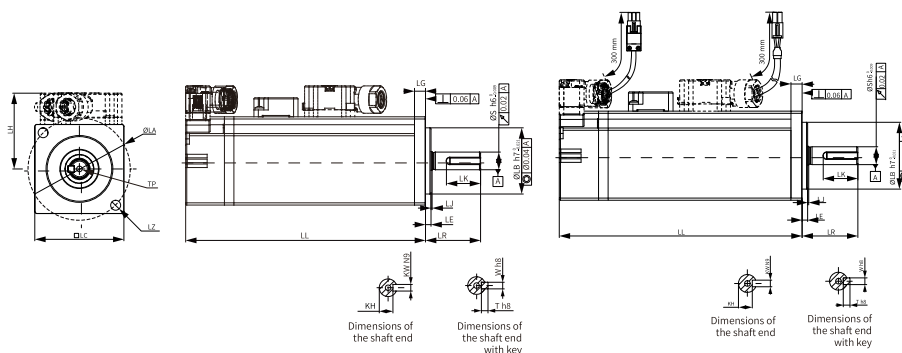
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.1	94.4	0.25	≤ 40	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	78	54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
91 (121.5)	40	25±0.5	46	2-Ø4.5	34.3	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	Ø30h7 ⁰ _{-0.021}	M3x6	15.5	6.2 ⁰ _{-0.1}	3	3	3	0.45 (0.64)

3.6.2 MS1H4-20B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	60			
Inertia, capacity	Medium inertia, low capacity			
Rated power (kW)	0.2			
Voltage (V)	220			
Rated torque (N·m)	0.64			
Maximum torque (N·m)	2.24			
Rated current (Arms)	1.3			
Maximum current (Arms)	5.3			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.46			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.22		
	Motor with brake	0.23		

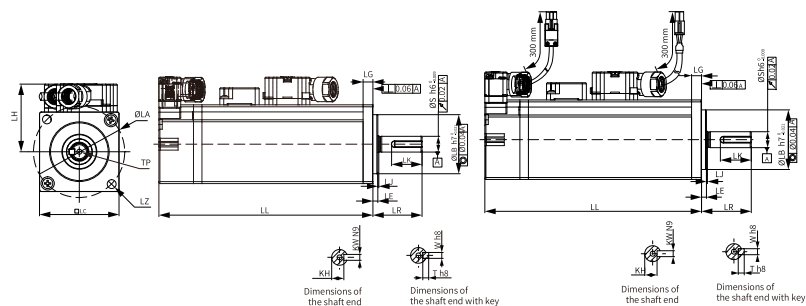
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	245	74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	73.5 (101.1)	30±0.5	70	4-Ø 5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø50h7 ⁰ -0.025	14	M5x8	16.5	11 ⁰ -0.1	5	5	5	0.78 (1.16)

3.6.3 MS1H4-40B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	60			
Inertia, capacity	Medium inertia, low capacity			
Rated power (kW)	0.4			
Voltage (V)	220			
Rated torque (N·m)	1.27			
Maximum torque (N·m)	4.45			
Rated current (Arms)	2.4		Heatsink-based derating curve	
Maximum current (Arms)	9.2			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.53			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.43		
	Motor with brake	0.44		

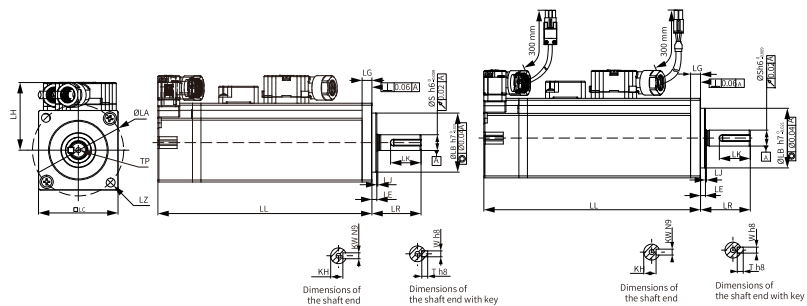
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	245	74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	92 (119.8)	30±0.5	70	4- Ø 5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø50h7 ⁰ _{-0.025}	14	M5x8	16.5	11 ⁰ _{-0.1}	5	5	5	1.11 (1.48)

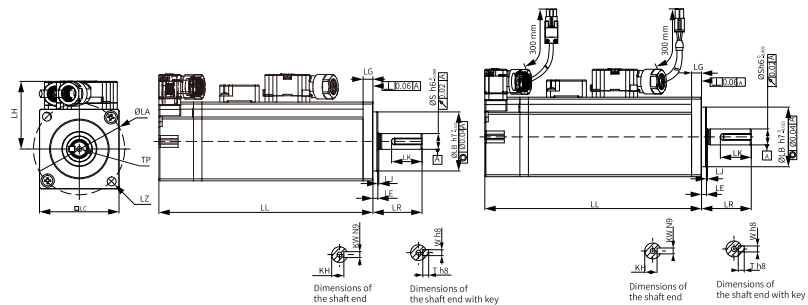
3.6.4 MS1H4-55B30CB-A63*R

Motor specifications		Torque-Speed characteristics		
Flange size (mm)	80			
Inertia, capacity	Medium inertia, low capacity			
Rated power (kW)	0.55			
Voltage (V)	220			
Rated torque (N·m)	1.75			
Maximum torque (N·m)	6.13			
Rated current (Arms)	3.3	Heatsink-based derating curve		
Maximum current (Arms)	13.2			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.49			
Rotor moment of inertia (kg·cm ²)	Motor without brake			1.12
	Motor with brake			-

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	25±0.5	90	4-Ø7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø70h7 ⁰ -0.03	19	M6 x 20	26	15.5 ⁰ -0.1	6	6	6	1.85

3.6.5 MS1H4-75B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Medium inertia, low capacity			
Rated power (kW)	0.75			
Voltage (V)	220			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.37			
Rated current (Arms)	4.4			
Maximum current (Arms)	16.9			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.46		
	Motor with brake	1.51		

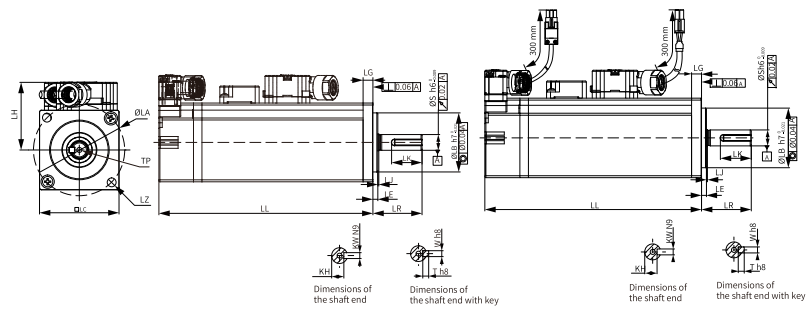
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
3.2	24	10	57.6	0.42	≤ 60	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35±0.5	90	4-Ø7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø70h7 ⁰ _{-0.03}	19	M6×20	26	15.5 ⁰ _{-0.1}	6	6	6	2.18 (2.82)

3.6.6 MS1H4-10C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Medium inertia, low capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	11.13			
Rated current (Arms)	6.5			
Maximum current (Arms)	24			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.46			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.87		
	Motor with brake	1.97		

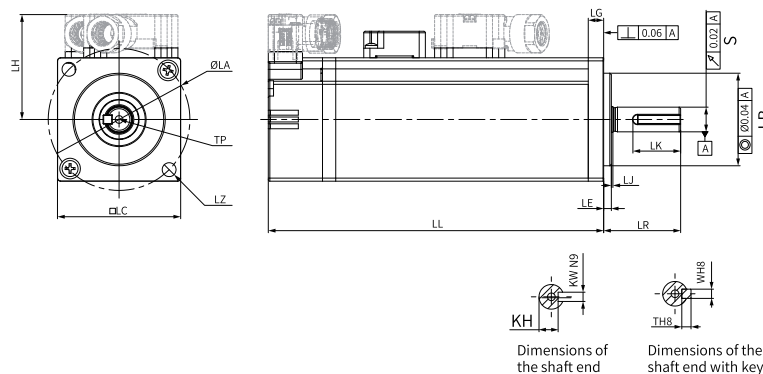
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
3.2	24	10	57.6	0.42	≤ 60	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	118.7 (153.2)	25 ± 0.5	90	4- Ø 7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø 70h7 ⁰ _{-0.03}	19	M6 × 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.55 (2.9)

3.7 Low Inertia and Small Capacity (MS1H1)

3.7.1 MS1H1-05B30CB-A63*Z

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.05			
Rated voltage	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated current (Arms)	1.3			
Maximum current (Arms)	4.70			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.026		
	Motor with brake	0.028		

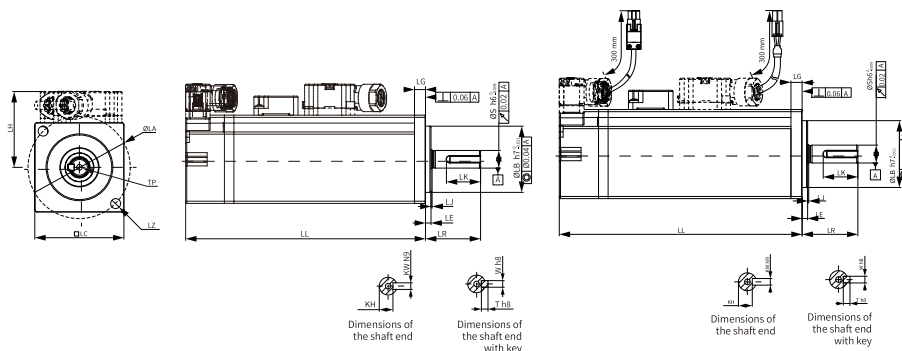
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω)(±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.1	94.4	0.25	≤ 40	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	78	54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
65.4 (96)	40	25±0.3	46	2-Ø4.5	34.3	5	2.5 ± 0.5	0.5±0.35
S	LB	TP	LK	KH	KW	W	T	Weight (kg)
8	Ø30h7 ⁰ -0.021	M3x6	15.5	6.2- ⁰ 0.1	3	3	3	0.39 (0.50)

3.7.2 MS1H1-10B30CB-A63*Z

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.1			
Rated voltage	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (Arms)	1.3			
Maximum current (Arms)	4.70			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.26			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.041		
	Motor with brake	0.043		

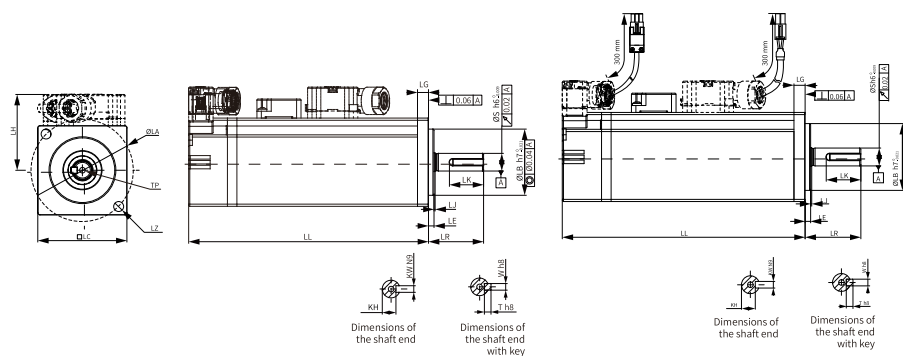
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω)(±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.1	94.4	0.25	≤ 40	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	78	54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
78.4 (110)	40	25±0.3	46	2-Ø4.5	34.3	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	KW	W	T	Weight (kg)
8	Ø30h7 ⁰ -0.021	M3x6	15.5	6.2- ⁰ 0.1	3	3	3	0.45 (0.64)

3.7.3 MS1H1-20B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	60			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.2			
Voltage (V)	220			
Rated torque (N·m)	0.64			
Maximum torque (N·m)	2.24			
Rated current (Arms)	1.5			
Maximum current (Arms)	5.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.46			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.094		
	Motor with brake	0.106		

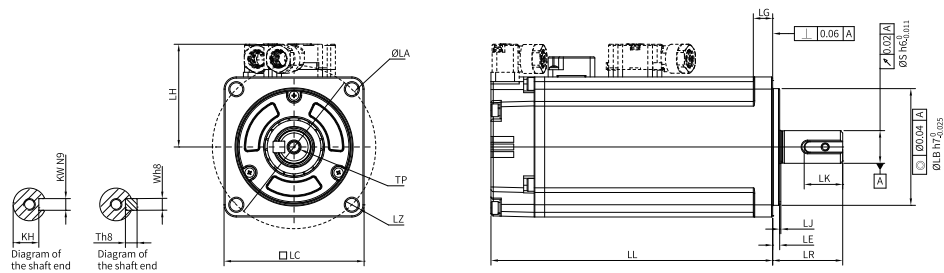
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	245	74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	75.5 (103)	30±0.5	70	4- Ø 5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø50h7 ⁰ _{-0.025}	14	M5x8	16.5	11 ⁰ _{-0.1}	5	5	5	0.80 (1.17)

3.7.4 MS1H1-40B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	60			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.4			
Voltage (V)	220			
Rated torque (N·m)	1.27			
Maximum torque (N·m)	4.45			
Rated current (Arms)	2.5			
Maximum current (Arms)	9.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.53		Heatsink-based derating curve 	
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.145		
	Motor with brake	0.157		

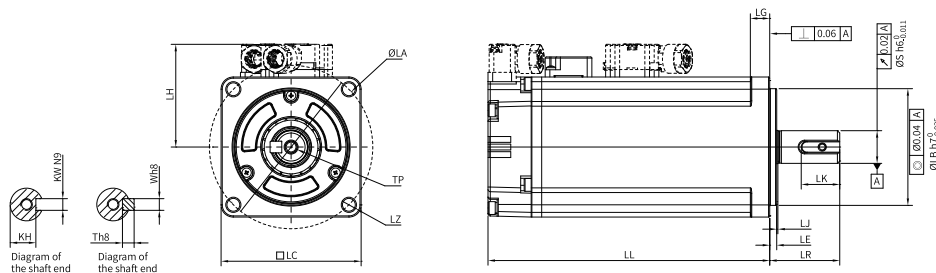
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1.5

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	245	74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	93 (121)	30±0.5	70	4-Ø 5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø50h7 ⁰ -0.025	14	M5x8	16.5	11 ⁰ -0.1	5	5	5	1.11 (1.48)

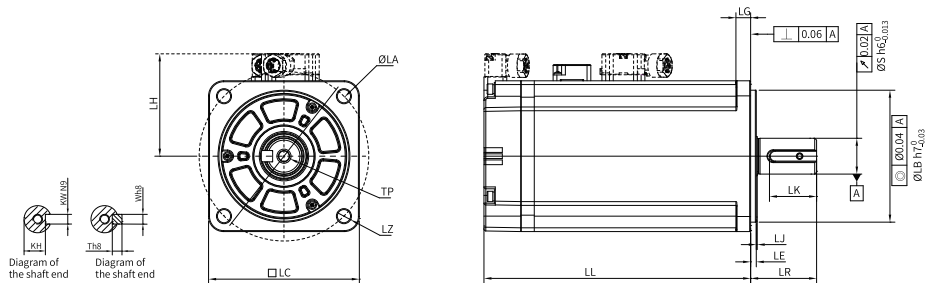
3.7.5 MS1H1-55B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.55			
Voltage (V)	220			
Rated torque (N·m)	1.75			
Maximum torque (N·m)	6.13			
Rated current (Arms)	3.9			
Maximum current (Arms)	15			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.49			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.55		
	Motor with brake	-		

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	25±0.5	90	4- Ø 7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø70h7 ⁰ _{-0.03}	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	1.88

3.7.6 MS1H1-75B30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.75			
Voltage (V)	220			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.37			
Rated current (Arms)	4.4		Heatsink-based derating curve	
Maximum current (Arms)	16.9			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.68		
	Motor with brake	0.71		

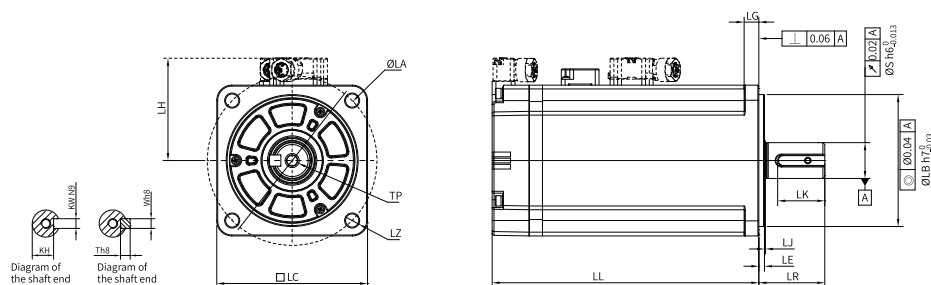
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
3.2	24	10	57.6	0.42	≤ 60	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35±0.5	90	4-Ø7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø70h7 ⁰ _{-0.03}	19	M6×20	26	15.5 ⁰ _{-0.1}	6	6	6	2.22 (2.88)

3.7.7 MS1H1-10C30CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	11.13			
Rated current (Arms)	6.2			
Maximum current (Arms)	24			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/Arms)	0.46			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.82		
	Motor with brake	0.87		

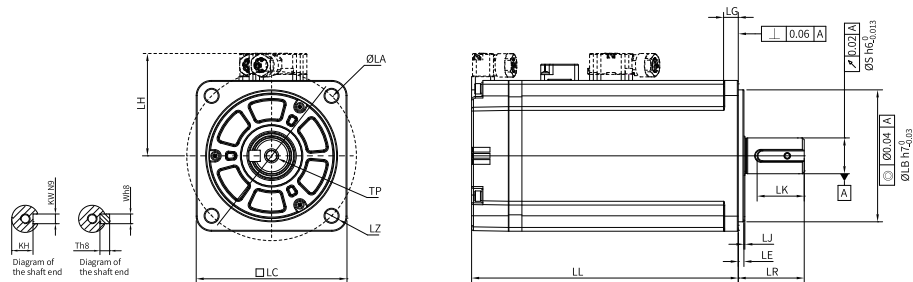
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
3.2	24	10	57.6	0.42	≤ 60	≤ 40	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	392	147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	119.2 (153.4)	25±0.5	90	4- Ø 7	54	7.5	3 ± 0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
Ø 70h7 ⁰ _{-0.03}	19	M6 × 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.61 (3.27)

3.8 Medium Inertia and Medium Capacity (MS1H3)

3.8.1 MS1H3-85B15CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	0.85			
Voltage (V)	220			
Rated torque (N·m)	5.39			
Maximum torque (N·m)	13.5			
Rated current (Arms)	6.6			
Maximum current (Arms)	17.2			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	0.93			
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56		
	Motor with brake	15.8		

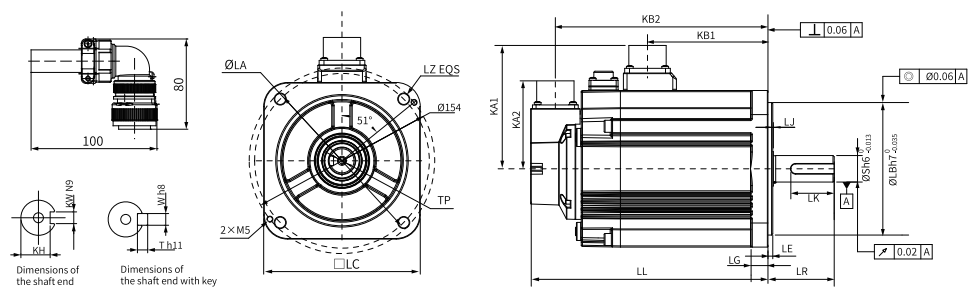
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4-Ø9	103	70	73	121.5 (146.5)	14	4
LJ	LB		S	TP	LK	KH	KW	W	T	Weight (kg)
0.5±0.75	Ø110h7 ⁰ -0.035		22	M6 × 20	36	18 ⁰ -0.2	8	8	7	5.8 (7.7)

3.8.2 MS1H3-85B15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130		<p>— A Continuous duty zone — B Intermittent duty zone</p>	
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	0.85			
Voltage (V)	380			
Rated torque (N·m)	5.39			
Maximum torque (N·m)	13.5			
Rated current (Arms)	3.5			
Maximum current (Arms)	8.5			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.84		<p>Max. allowable load rate (%)</p> <p>Heatsink dimensions (mm)</p>	
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56		
	Motor with brake	15.8		

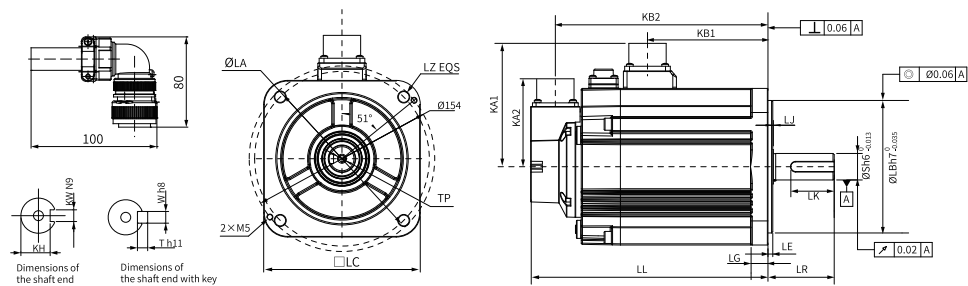
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4-Ø9	103	70	73	121.5 (146.5)	14	4
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø110h7 ⁰ _{-0.035}	22	M6 × 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)	

3.8.3 MS1H3-13C15CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	1.3			
Voltage (V)	220			
Rated torque (N·m)	8.34			
Maximum torque (N·m)	20.85			
Rated current (Arms)	10.5			
Maximum current (Arms)	27.3			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	0.89			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25		
	Motor with brake	21.5		

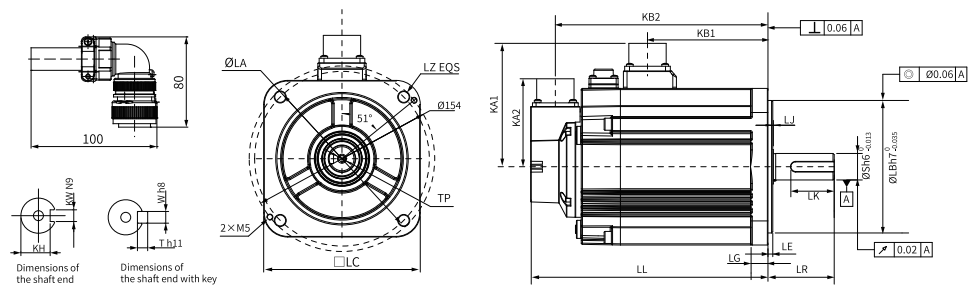
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55±1	145	4-Ø9	103	85	73	136.5 (161.5)	14	4
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø110h7 ⁰ _{-0.035}	22	M6 × 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)	

3.8.4 MS1H3-13C15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	1.3			
Voltage (V)	380			
Rated torque (N·m)	8.34			
Maximum torque (N·m)	20.85			
Rated current (Arms)	5.1			
Maximum current (Arms)	12.6			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.85			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25		
	Motor with brake	21.5		

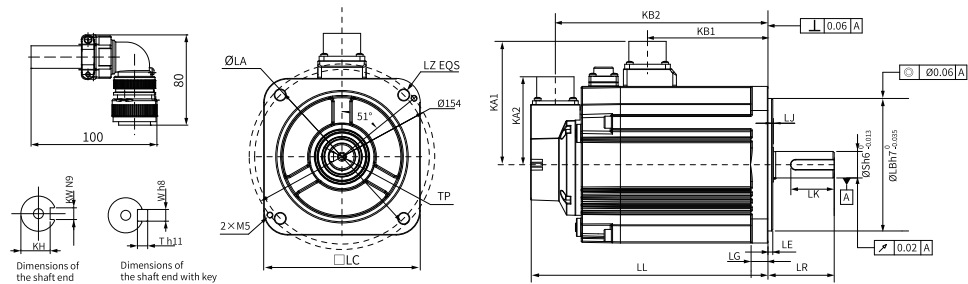
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55±1	145	4-Ø9	103	85	73	136.5 (161.5)	14	4
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø110h7 ⁰ _{-0.035}	22	M6 × 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)	

3.8.5 MS1H3-18C15CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	1.8			
Voltage (V)	220			
Rated torque (N·m)	11.5			
Maximum torque (N·m)	28.75			
Rated current (Arms)	11.9			
Maximum current (Arms)	32.2			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.05			
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9		
	Motor with brake	27.2		

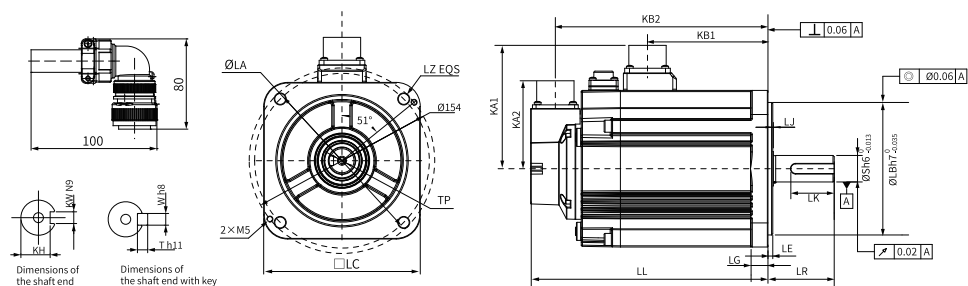
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4-Ø9	103	100	73	151.5 (176.5)	14	4
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø110h7 ⁰ _{-0.035}	22	M6 × 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)	

3.8.6 MS1H3-18C15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	130			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	1.8			
Voltage (V)	380			
Rated torque (N·m)	11.5			
Maximum torque (N·m)	28.75			
Rated current (Arms)	6.75		Heatsink-based derating curve	
Maximum current (Arms)	17.7			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.87			
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9		
	Motor with brake	27.2		

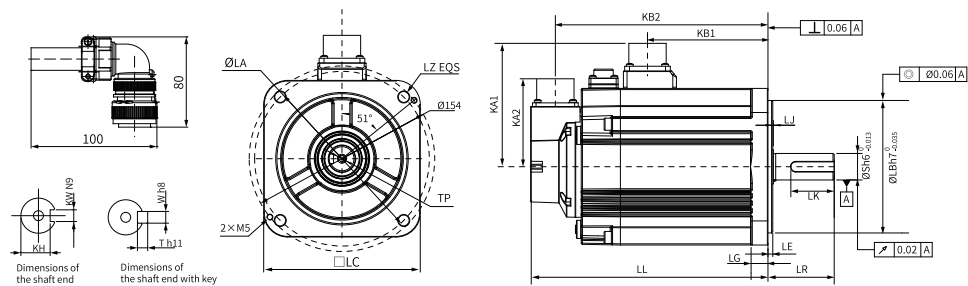
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	686	196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4-Ø9	103	100	73	151.5 (176.5)	14	4
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø110h7 ⁰ _{-0.035}	22	M6 × 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)	

3.8.7 MS1H3-29C15CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	180		<p>— A Continuous duty zone — B Intermittent duty zone</p>	
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	2.9			
Voltage (V)	220			
Rated torque (N·m)	18.6			
Maximum torque (N·m)	46.5			
Rated current (Arms)	18			
Maximum current (Arms)	52.5			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.16			
Rotor moment of inertia (kg·cm ²)	Motor without brake	44.7		
	Motor with brake	52.35		

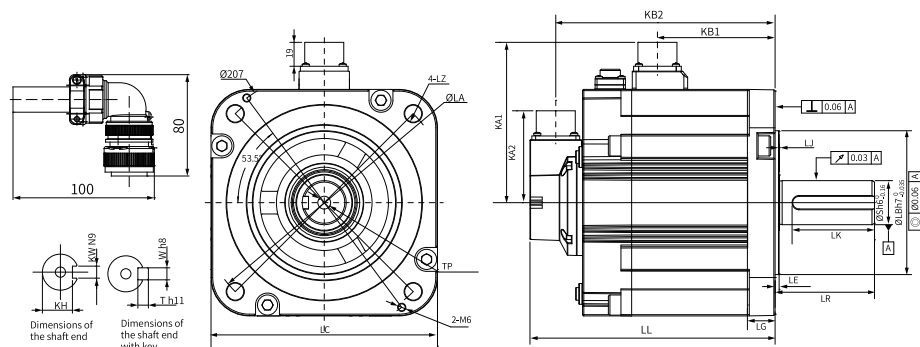
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
50	24	31	18.58	1.29	≤ 200	≤ 100	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	1470	490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79±1	200	4-Ø13.5	127.4	93.5	73	140.5 (174.3)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø114.3h7 ⁰ _{-0.035}	35	M12x25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)	

3.8.8 MS1H3-29C15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	180		<p>The graph shows two duty zones: A (Continuous) and B (Intermittent). Zone A starts at 4500 rpm for 0-10 Nm torque and drops to 1500 rpm at 20 Nm. Zone B starts at 4500 rpm for 0-20 Nm torque and drops to 1500 rpm at 45 Nm.</p>	
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	2.9			
Voltage (V)	380			
Rated torque (N·m)	18.6			
Maximum torque (N·m)	46.5			
Rated current (Arms)	10.5			
Maximum current (Arms)	29.75			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.94		<p>The graph shows a linear relationship between heatsink dimensions and the maximum allowable load rate. As heatsink dimensions increase from 100 mm to 600 mm, the load rate increases from approximately 60% to 100%.</p>	
Rotor moment of inertia (kg·cm ²)	Motor without brake	44.7		
	Motor with brake	52.35		

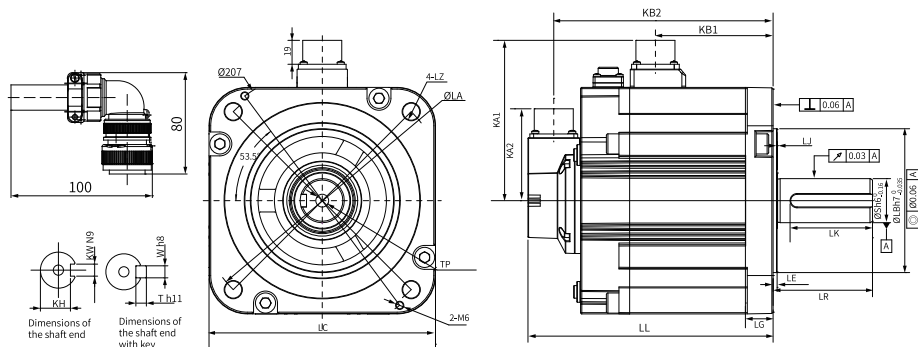
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC) ±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
50	24	31	18.58	1.29	≤ 200	≤ 100	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	1470	490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79±1	200	4-Ø13.5	127.4	93.5	73	140.5 (174.3)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø114.3h7 ⁰ _{-0.035}	35	M12x25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)	

3.8.9 MS1H3-44C15CB-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	180			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	4.4			
Voltage (V)	220			
Rated torque (N·m)	28.4			
Maximum torque (N·m)	71.1			
Rated current (Arms)	25.5			
Maximum current (Arms)	67			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.25			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9		
	Motor with brake	72.55		

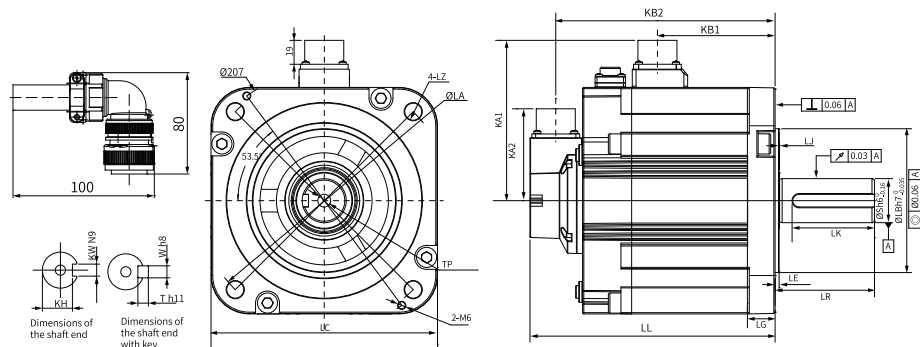
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
50	24	31	18.58	1.29	≤ 200	≤ 100	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	1470	490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79±1	200	4-Ø13.5	127.4	117	73	164 (197.8)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø114.3h7 ⁰ _{-0.035}	35	M12x25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.9)	

3.8.10 MS1H3-44C15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	180			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	4.4			
Voltage (V)	380			
Rated torque (N·m)	28.4			
Maximum torque (N·m)	71.1			
Rated current (Arms)	16			
Maximum current (Arms)	42			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.96			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9		
	Motor with brake	72.55		

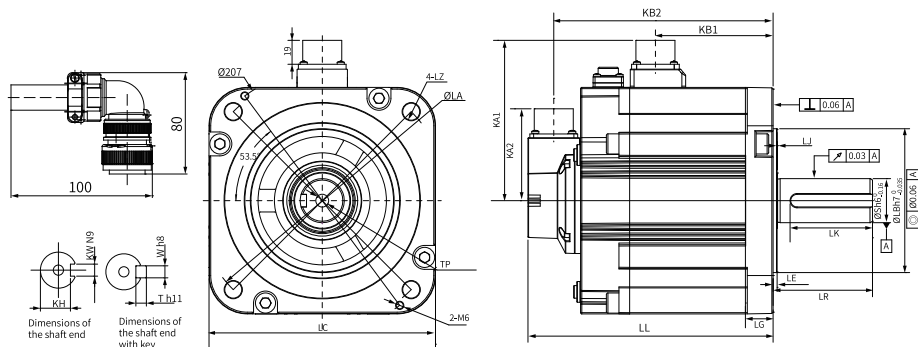
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
50	24	31	18.58	1.29	≤ 200	≤ 100	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	1470	490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79±1	200	4-Ø13.5	127.4	117	73	164 (197.8)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø114.3h7 ⁰ _{-0.035}	35	M12x25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.6)	

3.8.11 MS1H3-55C15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	180			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	5.5			
Voltage (V)	380			
Rated torque (N·m)	35			
Maximum torque (N·m)	87.6			
Rated current (Arms)	20.7			
Maximum current (Arms)	52			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	1.92			
Rotor moment of inertia (kg·cm ²)	Motor without brake	86.9		
	Motor with brake	94.55		

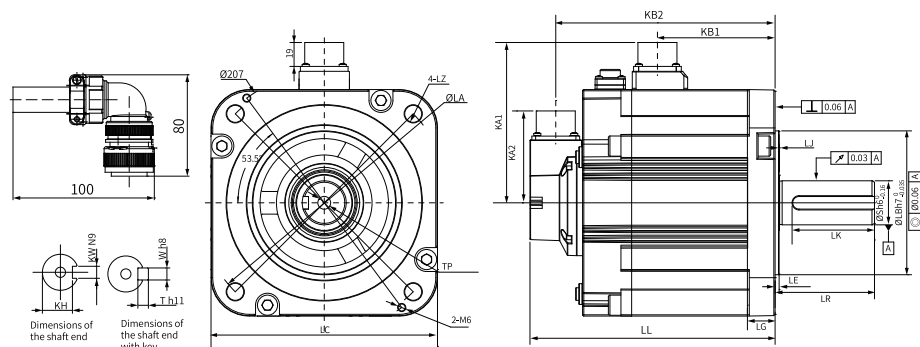
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
50	24	31	18.58	1.29	≤ 200	≤ 100	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	1764	588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	208 (241.8)	113±1	200	4-Ø13.5	127.4	140.5	73	187.5 (221.3)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø114.3h7 ⁰ _{-0.035}	42	M16x32	97	37 ⁰ _{-0.2}	12	12	8	21.7 (25.9)	

3.8.12 MS1H3-75C15CD-A63*R

Motor specifications			Torque-Speed characteristics	
Flange size (mm)	180			
Inertia, capacity	Medium inertia, medium capacity			
Rated power (kW)	7.5			
Voltage (V)	380			
Rated torque (N·m)	48			
Maximum torque (N·m)	119			
Rated current (Arms)	25			
Maximum current (Arms)	65			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/Arms)	2.13			
Rotor moment of inertia (kg·cm ²)	Motor without brake	127.5		
	Motor with brake	135.15		

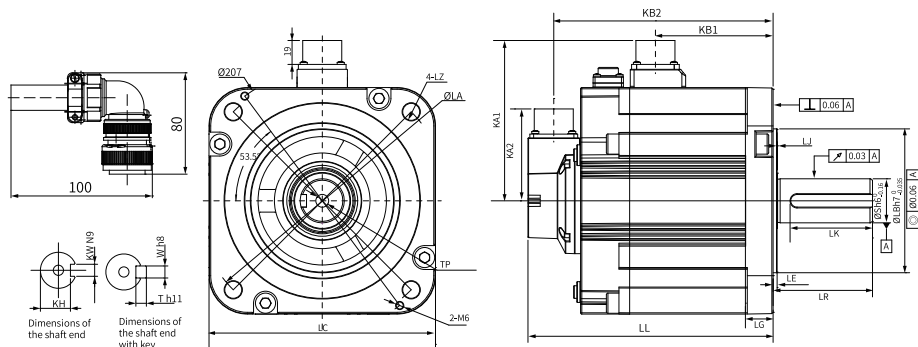
Electrical specifications of the motor with brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω) (±7%)	Exciting current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
50	24	31	18.58	1.29	≤ 200	≤ 100	≤ 1

Allowable load

LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	1764	588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	255 (288.8)	113±1	200	4-Ø13.5	127.4	187.5	73	234.5 (234.5)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	KW	W	T	Weight (kg)	
0.5±0.75	Ø114.3h7 ⁰ _{-0.035}	42	M16x32	97	37 ⁰ _{-0.2}	12	12	8	29 (33.2)	

4 Options

4.1 Option List

Type	Name	Installation Position	Applicable Drive Model	Function
Peripheral Electrical Components	Fuse and circuit breaker	Input side of the drive	All models	To comply with EN 61800-5-1 and UL61800-5-1 standards, install a fuse/circuit breaker on the input side of the servo drive to prevent accidents caused by short circuit in the internal circuit.
	AC input reactor	Input side of the drive		It is used to eliminate the higher harmonics of the input side effectively and improve the power factor of the input side.
	EMC filter	Input side of the drive		It is used to reduce external conduction and radiation interference of the drive.
	Magnetic ring and ferrite clamp	Output side of the drive		Reduces interferences to the outside and the bearing current.
		Signal cable		Improves the anti-interference performance of signals.

4.2 Cables

4.2.1 Model Number of Cables

Power cable

S6-L-M 0 0 0 - 3.0 -ZJ - INT
① ②③④ ⑤ ⑥ ⑦

① Cable Type S6-L-B/M: motion control power cable B: with brake M: without brake	③ Cable Size (mm²) 0: frame sizes 25/40/60/80 1: frame sizes 100/130/180 (drive rated current < 13 A) 2: frame size 180 (drive rated current > 13 A)	⑤ Cable Length (m) 3.0: 3 m 5.0: 5 m 10.0: 10 m
② Connector type at drive side 0: U-shaped cable lug 1: Needle-shaped cable lug	④ Connector type at motor side 1: 9-core military-spec connector 2: 6-core military-spec connector 7: SDC-06T series connector (front outgoing)	⑥ Special requirements ZJ: with shield bracket ⑦ Special requirements INT: global version ^[1]

Note

[1]: The material of the global version cables complies with CE and UL certification.

Model number of encoder cables

S6-L-P 1 2 1 - 3.0 - INT
 ① ② ③ ④ ⑤ ⑥

① Cable Type S6-L-P: Motion control encoder cable	③ Encoder 2: Multi-turn absolute	⑤ Cable Length (m) 3.0: 3 m 5.0: 5m 10.0: 10m
② Connector type at drive side 1: USB	④ Connector type at motor side 1: 9-core military-spec connector 4: SDC-06T series connector (front outgoing)	⑥ Special requirements INT: global version ^[1]

Note

[1]: The material of the global version cables complies with CE and UL certification.

Model number of communication cables

S6N-L-T 00 - 3.0
 ① ② ③

① Cable Type S6-L-T: Motion control communication cable S6N-L-T: IS620F Motion Control Encoder Cable (only for servo drive PC communication cable)	② Cable type 00: Servo drive PC communication cable 01: Servo drive network communication cable (CAN&485) 02: Servo drive and PLC communication cable 03: Servo drive termination resistor cable 04: Servo drive network communication cable (EtherCAT)	③ Cable Length (m) 3.0: 3 m 5.0: 5m 10.0: 10m
---	---	---

4.2.2 Cable Type

Fixed cables

Do not bend or move fixed cables during use. Bending or moving fixed cables may damage the cables and lead to a series of cable-related faults such as poor contact. Secure fixed cables through fixed binding. Certain bending radius must be available for the cables to prevent stress.

Flexible cables

Flexible cables can move along with cable carriers without a high risk of abrasion.

Note

- Do not twist or wind the cables in the drag chain.
 - Ensure cables can move freely within the bending radius. Relative movement must be allowed between cables or between cables and the guiding device.
 - Cables in the drag chain can be fixed or bundled through the two unmovable ends of the drag chain.
-

Oil-resistant cables

Oil-resistant cables apply to applications requiring shielded power cables, such as machine tools, cutting fluids, and cutting compounds.

Note

- For motors with terminal box, if the encoder cable is longer than 25 m, S6-C24 cable kit is required. Contact Inovance sales staff for details on the cable length.
 - For motors with flying leads, contact Inovance sales staff for encoder cables longer than 25 m.
-

4.2.3 Cable Selection

Power cable

Motor Model		Cable Model	L Cable Length (mm)	Tolerance (T) (mm)	Illustration
MS1H1/ MS1H4 motor	Power cable for motor without brake	S6-L-M107-3.0-INT	3000	(-30.30)	
		S6-L-M107-5.0-INT	5000	(-30.30)	
		S6-L-M107-10.0-INT	10000	(-30.30)	
		S6-L-M107-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-M107-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-M107-10.0-ZJ-INT	10000	(-20.20)	
	Brake	S6-L-B107-3.0-INT	3000	(-30.30)	
		S6-L-B107-5.0-INT	5000	(-30.30)	
		S6-L-B107-10.0-INT	10000	(-30.30)	
		S6-L-B107-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-B107-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-B107-10.0-ZJ-INT	10000	(-20.20)	
MS1H2 motor rated 3 kW or below/ MS1H3 motor rated 1.8 kW or below	Power cable for motor without brake	S6-L-M111-3.0-INT	3000	(-30.30)	
		S6-L-M111-5.0-INT	5000	(-30.30)	
		S6-L-M111-10.0-INT	10000	(-30.30)	
		S6-L-M111-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-M111-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-M111-10.0-ZJ-INT	10000	(-20.20)	
	Brake	S6-L-B111-3.0-INT	3000	(-30.30)	
		S6-L-B111-5.0-INT	5000	(-30.30)	
		S6-L-B111-10.0-INT	10000	(-30.30)	
		S6-L-B111-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-B111-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-B111-10.0-ZJ-INT	10000	(-20.20)	

Motor Model		Cable Model	L Cable Length (mm)	Tolerance (T) (mm)	Illustration
MS1H2 motor rated 4 kW/5 kW	Power cable for motor without brake	S6-L-M011-3.0-INT	3000	(-30.30)	
		S6-L-M011-5.0-INT	5000	(-30.30)	
		S6-L-M011-10.0-INT	10000	(-30.30)	
		S6-L-M011-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-M011-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-M011-10.0-ZJ-INT	10000	(-20.20)	
	Brake	S6-L-B011-3.0-INT	3000	(-30.30)	
		S6-L-B011-5.0-INT	5000	(-30.30)	
		S6-L-B011-10.0-INT	10000	(-30.30)	
		S6-L-B011-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-B011-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-B011-10.0-ZJ-INT	10000	(-20.20)	

Options

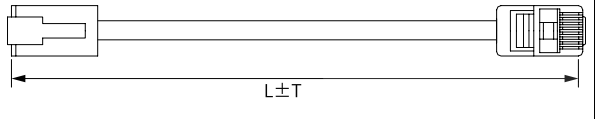
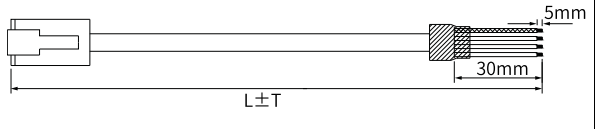
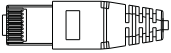
Motor Model		Cable Model	L Cable Length (mm)	Tolerance (T) (mm)	Illustration
MS1H3 motor rated 2.9 kW	Power cable for motor without brake	S6-L-M112-3.0-INT	3000	(-30.30)	
		S6-L-M112-5.0-INT	5000	(-30.30)	
		S6-L-M112-10.0-INT	10000	(-30.30)	
		S6-L-M112-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-M112-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-M112-10.0-ZJ-INT	10000	(-20.20)	
	Brake	S6-L-B112-3.0-INT	3000	(-30.30)	
		S6-L-B112-5.0-INT	5000	(-30.30)	
		S6-L-B112-10.0-INT	10000	(-30.30)	
		S6-L-B112-3.0-ZJ-INT	3000	(-20.20)	
		S6-L-B112-5.0-ZJ-INT	5000	(-20.20)	
		S6-L-B112-10.0-ZJ-INT	10000	(-20.20)	

Motor Model		Cable Model	L Cable Length (mm)	Tolerance (T) (mm)	Illustration	
MS1H3 motor rated 4.4 kW or above	Power cable for motor without brake	S6-L-M022-3.0-INT	3000	(-30.30)		
		S6-L-M022-5.0-INT	5000	(-30.30)		
		S6-L-M022-10.0-INT	10000	(-30.30)		
		S6-L-M022-3.0-ZJ-INT	3000	(-20.20)		
		S6-L-M022-5.0-ZJ-INT	5000	(-20.20)		
		S6-L-M022-10.0-ZJ-INT	10000	(-20.20)		
	Brake	S6-L-B022-3.0-INT	3000	(-30.30)		
		S6-L-B022-5.0-INT	5000	(-30.30)		
		S6-L-B022-10.0-INT	10000	(-30.30)		
		S6-L-B022-3.0-ZJ-INT	3000	(-20.20)		
		S6-L-B022-5.0-ZJ-INT	5000	(-20.20)		
		S6-L-B022-10.0-ZJ-INT	10000	(-20.20)		

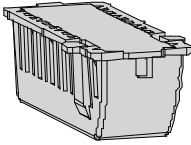
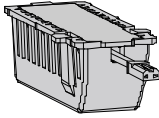
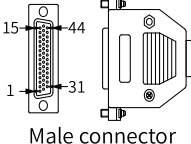
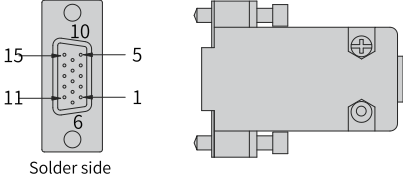
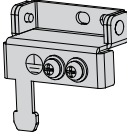
Encoder cable

Motor Model		Cable Model	L Cable Length (mm)	Tolerance (T) (mm)	Illustration
MS1H1/ MS1H4 motor	Multi-turn absolute encoder cable	S6-L-P124-3.0-INT	3000	(-30.30)	
		S6-L-P124-5.0-INT	5000	(-30.50)	
		S6-L-P124-10.0-INT	10000	(-30.80)	
MS1H2/ MS1H3 motor	Multi-turn absolute encoder cable	S6-L-P121-3.0-INT	3000	(-30.30)	
		S6-L-P121-5.0-INT	5000	(-30.50)	
		S6-L-P121-10.0-INT	10000	(-30.80)	

Communication cables

Cable Name	Cable Model	Cable Length (mm)	Tolerance (T) (mm)	Illustration
Servo drive network communication cable	S6-L-T04-0.3	300	(-10.10)	
Servo drive to host controller communication cable	S6-L-T02-2.0	2000	(-20.20)	
Servo drive termination resistor connector	S6-L-T03-0.0	-	-	

Connector Kit

Name	Model	Outline Drawing
Battery box kit (without battery)	S6-C4A-NB	
Battery kit (with battery)	S6-C4A	
CN1 terminal (DB44)	S6-C7	 Male connector
CN7 terminal (DB15)	S6-C6	 Solder side
Shield bracket	S6-C25 (optional for SIZE A to SIZE C)	
	S6-C27 (optional for SIZE D to SIZE E)	

4.2.4 Cable Connectors

Power cable connector (motor side)

Table 4-1 Power cable connector (servo motor side)

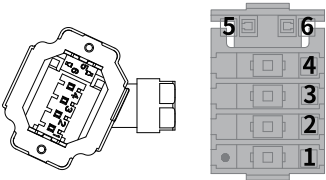
Flange Size [1]	Illustration	Pin Layout		
		Pin No.	Signal Name	Color
40 60 80	 <p>Black 6-pin connector</p>	1	PE	Yellow/Green
		2	W	Red
		3	V	Black
		4	U	White
		5	Brake (polarity insensitive)	Brown
		6		Blue

Table 4-2 Power cable connector (servo motor side)

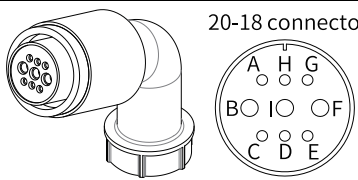
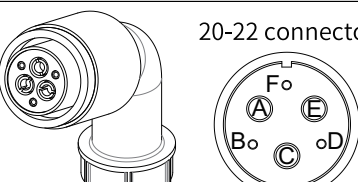
Flange Size [1]	Illustration	Pin Layout		
		Pin No.	Signal Name	Color
100 130	 <p>20-18 connector MIL-DTL-5015 series 3108E20-18S military-spec connector</p>	B	U	Blue
		I	V	Black
		F	W	Red
		G	PE	Yellow/Green
		C	Brake (polarity insensitive)	Red
		E		Black

Table 4-3 Power cable connector (servo motor side)

Flange Size [1]	Illustration	Pin Layout		
		Pin No.	Signal Name	Color
180	 <p>20-22 connector MIL-DTL-5015 series 3108E20-22S military-spec connector</p>	A	U	Blue
		C	V	Black
		E	W	Red
		F	PE	Yellow/Green
		B	Brake (polarity insensitive)	Red
		D		Black

Note

- [1] The flange size refers to the width of the mounting flange.
- Power cable colors are subject to the actual product. All cable colors mentioned in this guide refer to Inovance cable colors.

Encoder cable connector

Table 4-4 Encoder cable connector of motors

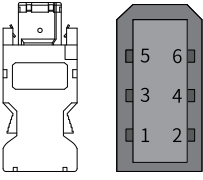
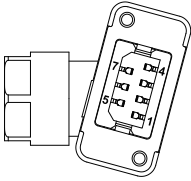
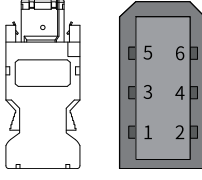
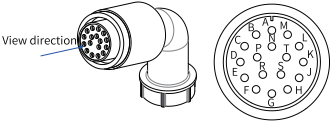
Motor Frame Size ^[1]	Illustration		Pin Layout			
			Pin No.	Signal Name	Color	Type
40	Ser vo drive side	 <p>6-pin male (right side as the connecting side)</p>	1	+5V	Red	Twisted pair
			2	GND	Orange	
			5	PS+	Blue	Twisted pair
			6	PS-	Purple	
			Enclosure	PE	-	-
			60 80	Mo tor side	 <p>7-pin connector</p>	1
2	PS-	Purple				
3	DC+	Brown				Twisted pair
4	DC-	Black				
5	+5V	Red				Twisted pair
6	GND	Orange				
7	PE	-				-

Table 4-5 Encoder cable connector of motors

Motor Frame Size ^[1]	Illustration		Pin Layout				
			Pin No.	Signal Name	Color	Type	
100 130 180	To the connector CN2	Ser vo drive side	 <p>6-pin male (right side as the connecting side)</p>	1	+5V	Red	Twisted pair
				2	GND	Orange	
				5	PS+	Blue	Twisted pair
				6	PS-	Purple	
				Enclosure	PE	-	-
				Mo tor side	 <p>20-29 connector</p>	A	PS+
		B	PS-			Purple	
		E	Battery (+)			Brown	-
		F	Battery (-)			Black	
		G	+5V	Red	-		
H	GND	Orange					
J	Shield	-	-				

Note

[1]: The flange size refers to the width of the mounting flange (in mm).

4.3 Peripheral Electrical Components

4.3.1 Fuse

To prevent accidents caused by short circuit, install a fuse on the input side of the drive.

Table 4-6 List of recommended fuses

Servo drive SV680-INT series			Recommended Fuse		
Size	AC Drive Model	Rated Input Current (A)	Manufacturer	Rated Current (A)	AC Drive Model
Single-phase 200V					
Size A	S1R6	2.3	Bussmann	5	FWP-5B
	S2R8	4.0		10	FWP-10B
Size C	S5R5	7.9		20	FWP-20B
	S7R6	9.6		20	FWP-20B
Size D	S012	12.8		20	FWP-20B
Three-phase 200V					
Size A	S1R6	1.1	Bussmann	5	FWP-5B
	S2R8	2.3		5	FWP-5B
Size C	S5R5	4.4		15	FWP-15B
	S7R6	5.1		15	FWP-15B
Size D	S012	8.0		20	FWP-20B
Size E	S018	8.7		20	FWP-20B
	S022	11.0		50	FWP-50C
	S027	23.8		50	FWP-50C
Three-phase 400V					
Size C	T3R5	2.4	Bussmann	5	FWP-5B
	T5R4	3.6		10	FWP-10B
Size D	T8R4	5.6		15	FWP-15B
	T012	8.0		20	FWP-20B
Size E	T017	12.0		35	FWP-35B
	T021	16.0		35	FWP-35B
	T026	21.0		40	FWP-40B

4.3.2 Electromagnetic Contactor

Table 4-7 Recommended electromagnetic contactor models

Servo drive SV680-INT series			Recommended Contactor		
Size	AC Drive Model	Rated Input Current (A)	Manufacturer	Current (A)	AC Drive Model
Single-phase 200 V					
Size A	S1R6	2.3	Schneider	9	LC1 D09
	S2R8	4.0		9	LC1 D09
Size C	S5R5	7.9		9	LC1 D09
	S7R6	9.6		12	LC1 D12
Size D	S012	12.8		18	LC1 D18
Three-phase 200 V					

Servo drive SV680-INT series			Recommended Contactor		
Size	AC Drive Model	Rated Input Current (A)	Manufacturer	Current (A)	AC Drive Model
Size A	S1R6	1.1	Schneider	9	LC1 D09
	S2R8	2.3			
Size C	S5R5	4.4			
	S7R6	5.1			
Size D	S012	8.0		9	LC1 D09
Size E	S018	8.7		12	LC1 D12
	S022	11.0		25	LC1 D25
	S027	23.8			
Three-phase 400 V					
Size C	T3R5	2.4	Schneider	9	LC1 D09
	T5R4	3.6		9	LC1 D09
Size D	T8R4	5.6		9	LC1 D09
	T012	8.0		9	LC1 D09
Size E	T017	12.0		18	LC1 D18
	T021	16.0		18	LC1 D18
	T026	21.0		25	LC1 D25

4.3.3 Breaker

Table 4-8 Recommended circuit breaker models

Servo drive SV680-INT series			Recommended Circuit Breaker		
Size	AC Drive Model	Rated Input Current (A)	Manufacturer	Current (A)	AC Drive Model
Single-phase 200 V					
Size A	S1R6	2.3	Schneider	4	OSMC32N2D4
	S2R8	4.0		6	OSMC32N2D6
Size C	S5R5	7.9		16	OSMC32N2D16
	S7R6	9.6		16	OSMC32N2D16
Size D	S012	12.8		20	OSMC32N2D20
Three-phase 200 V					
Size A	S1R6	1.1	Schneider	4	OSMC32N3D4
	S2R8	2.3		6	OSMC32N3D6
Size C	S5R5	4.4		16	OSMC32N3D16
	S7R6	5.1		16	OSMC32N3D16
Size D	S012	8.0		16	OSMC32N3D16
Size E	S018	8.7		20	OSMC32N3D20
	S022	11.0		25	OSMC32N3D25
	S027	23.8		32	OSMC32N3D32
Three-phase 400 V					
Size C	T3R5	2.4	Schneider	4	OSMC32N3D4
	T5R4	3.6		6	OSMC32N3D6
Size D	T8R4	5.6		10	OSMC32N3D10
	T012	8.0		16	OSMC32N3D16
Size E	T017	12.0		20	OSMC32N3D20
	T021	16.0		25	OSMC32N3D25
	T026	21.0		32	OSMC32N3D32

Note

- For UL-compliant products, see section "UL/cUL Certification" in the Hardware Guide for recommended fuse/circuit breaker models.
- This table only lists the recommended models. You can also use fuses/circuit breakers of the same specifications from other manufacturers that comply with UL North America certification.

If a residual current device (RCD) is needed, select the RCD according to the following requirements:

- Use a B-type RCD because the drive may generate DC leakage current in the protective conductor.
- For each drive, use an RCD whose tripping current is not lower than 100 mA to prevent RCD malfunction due to high-frequency leakage current generated by the drive.
- When multiple drives are connected in parallel and share one RCD, select an RCD whose tripping current is not lower than 300 mA.
- Use Chint or Schneider RCDs (recommended).

4.3.4 AC input reactor**EMC filter selection**

An AC input reactor is optional and mainly used to reduce harmonics in the input current. Install an external reactor as needed in actual applications. The following table lists the recommended manufacturers and models of input reactors.

Table 4-9 AC input reactor model selection

Servo drive SV680-INT series			Applicable Reactor	Inductance (mH)
Size	AC Drive Model	Rated Input Current (A)		
Three-phase 200 V				
Size A	S1R6	1.1	MD-ACL-10-5-4T	5
	S2R8	2.3	MD-ACL-10-5-4T	5
Size C	S5R5	4.4	MD-ACL-10-5-4T	5
	S7R6	5.1	MD-ACL-10-5-4T	5
Size D	S012	8.0	MD-ACL-10-5-4T	5
Size E	S018	8.7	MD-ACL-15-3-4T	3
	S022	11.0	MD-ACL-15-3-4T	3
	S027	23.8	MD-ACL-40-1.45-4T	1.45
Three-phase 400 V				
Size C	T3R5	2.4	MD-ACL-10-5-4T	5
	T5R4	3.6	MD-ACL-10-5-4T	5
Size D	T8R4	5.6	MD-ACL-10-5-4T	5
	T012	8.0	MD-ACL-10-5-4T	5
Size E	T017	12.0	MD-ACL-15-3-4T	3
	T021	16.0	MD-ACL-40-1.45-4T	1.45
	T026	21.0	MD-ACL-40-1.45-4T	1.45

Dimensions

- Inovance input reactors

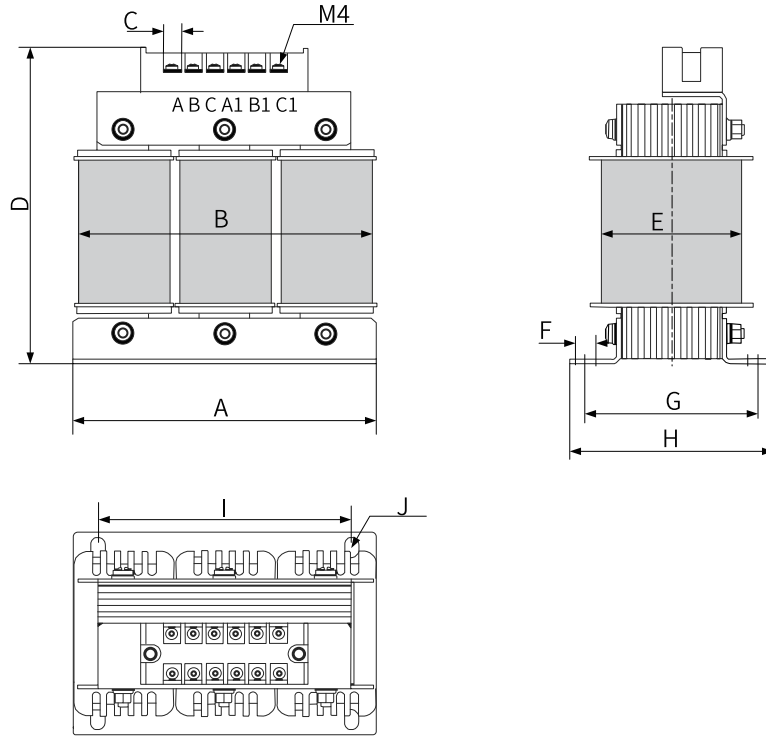


Figure 4-1 Dimensions of 10 A to 15 A AC input reactors

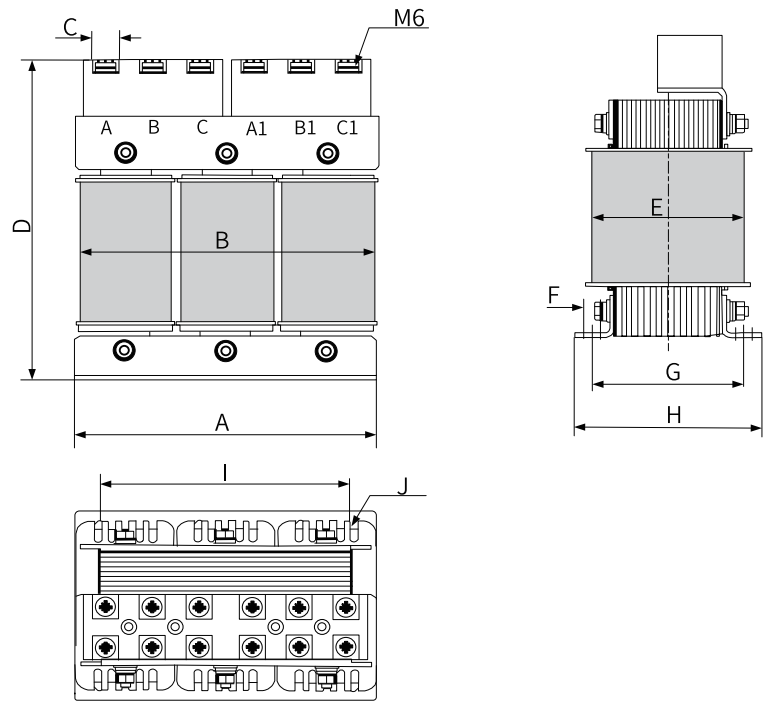


Figure 4-2 Dimensions of 40 A (1.45 mH) AC input reactors

Table 4-10 Dimensions of Inovance AC input reactors (unit: mm)

AC Drive Model	A	B	C	D	E	F	G	H	I	J
MD-ACL-10-5-4T	150±2	155	8	160	80	10	85±2	100±2	125±1	Φ7 x 10
MD-ACL-15-3-4T	150±2	155	8	160	80	10	85±2	100±2	125±1	Φ7 x 10
MD-ACL-40-1.45-4T	180±2	185	16	200	105	10	95±2	117±2	150±1	Φ7 x 10

4.3.5 EMC filter

EMC filter selection

To comply with EN IEC 61800-3 requirements in terms of radiated and conducted emission, install an EMC filter listed in the following table. You can select FN 2090 and FN 3287 series EMC filters manufactured by Schaffner. Select the EMC filter according to the rated input current of the drive, as shown in the following table.

Table 4–11 Standard EMC filter model and appearance



Filter Model		Appearance
Schaffner	FN 2090 series	
	FN 3287 series	

Table 4–12 Filter model selection (Schaffner)

Servo drive SV680-INT series			Applicable Filter
Size	AC Drive Model	Rated Input Current (A)	
Single-phase 200 V			
Size A	S1R6	2.3	FN 2090-3-06
	S2R8	4.0	FN 2090-4-06
Size C	S5R5	7.9	FN 2090-8-06
	S7R6	9.6	FN 2090-10-06
Size D	S012	12.8	FN 2090-16-06
Three-phase 200 V			
Size A	S1R6	1.1	FN 3287-10-44-C28-R65
	S2R8	2.3	FN 3287-10-44-C28-R65
Size C	S5R5	4.4	FN 3287-10-44-C28-R65
	S7R6	5.1	FN 3287-10-44-C28-R65
Size D	S012	8.0	FN 3287-10-44-C28-R65
Size E	S018	8.7	FN 3287-10-44-C28-R65
	S022	11.0	FN 3287-16-44-C33-R65
	S027	23.8	FN 3287-25-33-C33-R65
Three-phase 400 V			
Size C	T3R5	2.4	FN 3287-10-44-C28-R65
	T5R4	3.6	FN 3287-10-44-C28-R65

Servo drive SV680-INT series			Applicable Filter
Size	AC Drive Model	Rated Input Current (A)	
Size D	T8R4	5.6	FN 3287-10-44-C28-R65
	T012	8.0	FN 3287-10-44-C28-R65
Size E	T017	12.0	FN 3287-16-44-C33-R65
	T021	16.0	FN 3287-16-44-C33-R65
	T026	21.0	FN 3287-25-33-C33-R65

Dimensions

- Dimensions of Schaffner FN 2090 series filters

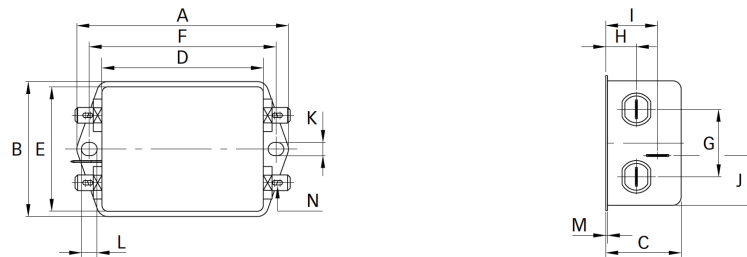


Figure 4-3 Dimensions of FN 2090 series filters (unit: mm)

Table 4-13 Dimensions of FN 2090 series filters (unit: mm)

Rated Current (A)	A	B	C	D	E	F	G	H	I	J	K	L	M	N
3	85	54	30.3	64.8	49.8	75	27	12.3	20.8	19.9	5.3	6.3	0.7	6.3 x 0.8
4														
6														
8	113.5±1	57.5±1	45.4±1	94±1	56	103	25	12.4	32.4	15.5	4.4	6	1	6.3 x 0.8

- Dimensions of Schaffner FN 3287 series filters

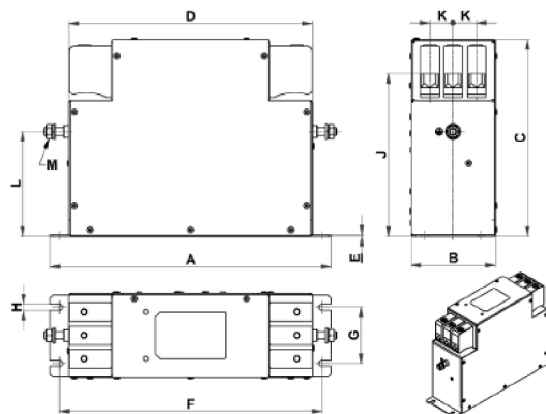


Figure 4-4 Dimension drawing of FN 3287 series filters (unit: mm)

Table 4–14 Dimensions of FN 3287 series filters (unit: mm)

Rated Current (A)	A	B	C	D	E	F	G	H	J±2	K	L±1	M
10	180	40	112	153	0.8	170	20	4.5	94	11	68	M5
16	200	45	112	170	0.8	185	25	5.4	102	11	76	M5
25	205	45	132	173	0.8	190	25	5.4	113	13	83	M5

4.3.6 Magnetic Ring and Magnetic Buckle

The magnetic ring is intended to be installed on the input or output side of the drive. Install the magnetic ring as close to the drive as possible. Installing the magnetic ring on the input side can suppress the noise in the input power supply system of the drive. When it is installed on the output side, it can reduce the interference generated by the drive to external devices and can reduce the bearing current.

In applications with leakage current and signal cable interference, install a magnetic ring or a ferrite clamp.

EMC filter selection

- Amorphous magnetic ring: featuring high permeability when the frequency is within 1 MHz and excellent anti-interference performance, but not as low-cost as the ferrite clamp. See for details. “[Dimensions](#)” on page 92.
- Ferrite clamp: featuring a good interference suppression performance within a frequency band above 1MHz, applicable to low-power servo drives and signal cables, low-cost and easy to install

Magnetic Ring and Ferrite Clamp		Appearance
Magnetic ring	DY644020H	
	DY805020H	
Ferrite clamp	DYR-130-B	

Dimensions

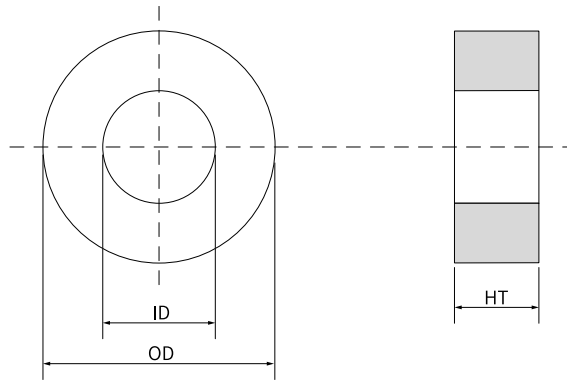


Figure 4-5 Dimensions of the magnetic ring

Table 4-15 Dimensions of the magnetic ring

Model	Size (OD×ID×HT) (mm)
DY644020H	64 × 40 × 20
DY805020H	80 × 50 × 20

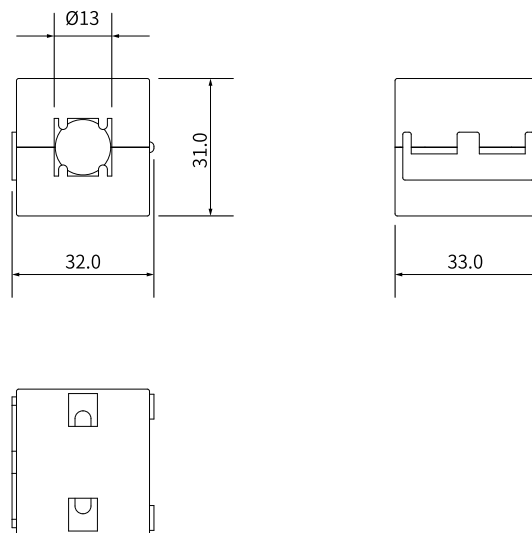


Figure 4-6 Dimensions of the ferrite clamp

Table 4-16 Dimensions of the ferrite clamp

Model	Size (Length × OD × ID) (mm)
DYR-130-B	32.0 × 31 × 13

4.4 Shield bracket

To reduce electromagnetic interference, an EMC bracket and clamp are used with the drive cables.

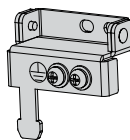


Figure 4-7 Shield bracket

4.5 Absolute Encoder Batteries

EMC filter selection

Select an appropriate battery according to the following table.

Table 4-17 Description of the absolute encoder battery

Specification	Item	Rating			Condition
		Min.	Typical Value	Max.	
Output: 3.6 V, 2500 mAh	External battery voltage (V)	3.2	3.6	5	In standby state ^[1]
	Circuit fault voltage (V)	-	2.6	-	In standby state
	Battery alarm voltage (V)	2.85	3	3.15	-
	Current consumed by the circuit (uA)	-	2	-	In normal operation ^[2]
		-	10	-	In standby state, shaft at standstill
		-	80	-	In standby state, shaft rotating
	Ambient temperature (°C)	0	-	40	Same as the motor.
Storage temperature (°C)	-20	-	60		

The preceding values are obtained under an ambient temperature of 20°C.

Note

- [1]: The "standby state" means the encoder counts the multi-turn data by using the power from the external battery when the servo drive power supply is not switched on. In this case, data transceiving stops.
- [2]: During normal operation, the absolute encoder supports one-turn or multi-turn data counting and transceiving. Power on the servo drive after connecting the absolute encoder properly. The encoder starts data transceiving after a short delay of about 5s upon power-on. The motor speed must be lower than or equal to 10 rpm during transition from the standby state to the normal operation state (upon power-on). Otherwise, Er.740 (Encoder fault) may occur. In this case, you need to power off and on the servo drive again.

5 Certification and Standard Requirements

CE Certification

Directive	Standard	
EMC Directive 2014/30/EU	Servo drive	EN 61800-3
	Servo motor	EN 61800-6-2
		EN 61800-6-4
		EN 55011
Low Voltage Directive 2014/35/EU	Servo drive	EN 61800-5-1
	Servo motor	EN 60034-1 EN 60034-5
RoHS Directive 2011/65/EU	Servo drive	EN 50581
	Servo motor	

UL/cUL certification

Certification	Standard	
UL/cUL certification	Servo drive	UL61800-5-1 C22.2 No.274-17
	Servo motor	UL 1004-1 UL 1004-6 CSA C22.2 No. 100-14

Note

The drive complies with the latest version of directives and standards for CE and UL/cUL certifications.

KC Certification

Note

SV680XXXXX-PINT is not KC-certified.

Certification	Standard	
KC Certification	Servo drive	KN 61800-3 (Ver 2014.06) (IEC 61800-3 Ver 2012.03)

Others

The SV680-INT series servo drive meets the requirements of EAC, UKCA and functional safety certification.

6 Service and Support

Downloads

More product manuals, leaflets, brochures, certificates, 2D/3D drawings and other information can be downloaded in the following ways:

Do keyword search under “Service and Support-After-sales Service” at <https://www.inovance.com>“”.

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