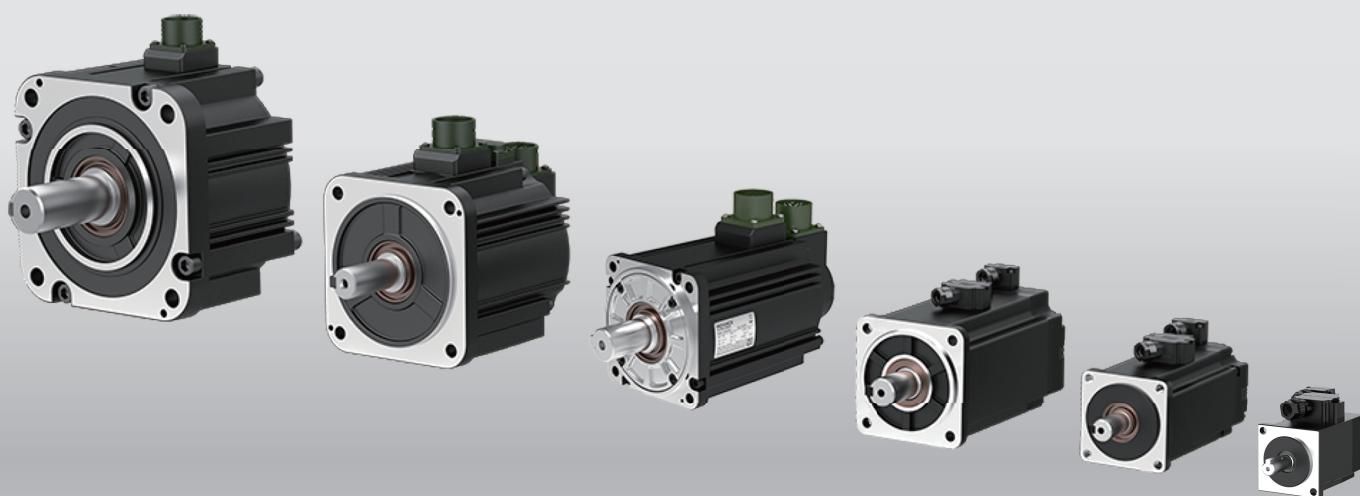




MS1-R Series Servo Motor Selection Guide



Industrial
Automation



Intelligent
Elevator



New Energy
Vehicle



Industrial
Robot



Rail
Transit



Data code PS00004605B01

Preface

Introduction

Thank you for purchasing the MS1-R series servo motor.

As the latest generation of servo motors developed by Inovance, the MS1-R series servo motor carries a power range from 0.05 kW to 7.5 kW, with frame sizes ranging from 40 mm to 180 mm. It offers multiple types of inertia and speed configurations, with different types of encoders configured as required by customers.

It is used for accurate position control, speed control, and torque control in industries including semiconductors, lithium batteries, silicon, machine tools, mobile phones, printing and packaging, pharmacy, textile, and display.

This user guide presents motor information, model selection instructions, and motor wiring methods. Contact Inovance for detailed information on the motor function and performance.

Documents provided by Inovance are subject to change without notice due to continuous product improvement.

Note

- The drawings in the user guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.
- The drawings in the user guide are shown for descriptions only and may not match the product you purchased.
- The user guide is subject to change without notice due to product upgrade, specification modifications as well as efforts to improve the accuracy and convenience of the user guide.

More information

Data name	Data code	Description
MS1-R Series Servo Motor Selection Guide	PS00004605	Describes product information, general specifications, motor selection, cable selection, certification categories and standards of the product.
MS1-R Series Servo Motor Installation Guide	PS00005407	Describes the installation of the motor, including motor installation flowcharts, wiring, unpacking and handling, mechanical installation, electrical installation.

Revision History

Date	Version	Description
December 2024	B01	• Updated the length for frame size 40. • Made minor corrections.
November 2023	B00	Updated the selection list.
November 2023	A06	• Updated the selection list. • Updated descriptions for MS1H1-05B30CB, MS1H1-10B30CB, MS1H4-05B30CB, and MS1H4-10B30CB.
July 2023	A05	Added some models and related information.
June 2023	A04	• Updated model selection list and motor list. • Updated model selection section. • Updated descriptions for product characteristics.

Date	Version	Description
September 2022	A03	• Updated the selection list. • Updated some rating specifications and corresponding torque-speed characteristic curves for MS1H2 and MS1H3 motors. • Updated weight and brake electrical specifications for MS1H2 and MS1H3 motors. • Updated weight and brake electrical specifications for MS1H2 and MS1H3 motors. • Updated the dimension drawings for motors in frame size 40. • Added related data of motors with A3/T3 encoder.
July 2022	A02	• Updated the selection list. • Updated components description drawings. • Updated rated current and maximum current value of some models in MS1H2. • Updated torque-speed characteristic curves for MS1H2-25C30CD, MS1H2-20C30CD, MS1H2-15C30CD, MS1H3-44C15CB, MS1H3-44C15CD, MS1H3-29C15CB, and MS1H1-20B30CB.
May 2022	A01	• Updated torque-speed characteristic curves for MS1H3-44C15CB and MS1H3-44C15CD. • Optimized model selection descriptions.
March 2022	A00	Initial release

Access to the Guide

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

- Do keyword search under Service and Support at www.inovance.com.
- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install My Inovance app, where you can search for and download user guides.



Questions about the user guide

- Contact us if you have any questions or suggestions for this manual.
- The data and consistency of the contents in this manual have been reviewed as required. However, variance cannot be precluded entirely. The necessary revision will be made in the subsequent versions.

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1 Model Selection List

1.1 Motor model Selection List

Motor with 26-bit encoder

Motor				Drive SV680*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class (V)	Size	Model	No.
MS1H1 ($n_N = 3000$ rpm, $n_{max} = 7000$ rpm) series ratings							
MS1H1-05B30CB-A6/S630R	MS1H1-05B30CB-A6/S632R	40	0.05	Single-phase/Three-phase 220 V	A	S1R6	00002
MS1H1-10B30CB-A6/S630R	MS1H1-10B30CB-A6/S632R	40	0.1	Single-phase/Three-phase 220 V			
MS1H1-20B30CB-A6/S631R	MS1H1-20B30CB-A6/S634R	60	0.2	Single-phase/Three-phase 220 V			
MS1H1-40B30CB-A6/S631R	MS1H1-40B30CB-A6/S634R	60	0.4	Single-phase/Three-phase 220 V		S2R8	00003
MS1H1-55B30CB-A6/S631R	-	80	0.55	Single-phase/Three-phase 220 V	C	S5R5	00005
MS1H1-75B30CB-A6/S631R	MS1H1-75B30CB-A6/S634R	80	0.75	Single-phase/Three-phase 220 V		S5R5	00005
MS1H1-10C30CB-A6/S631R	MS1H1-10C30CB-A6/S634R	80	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2 ($n_N = 3000$ rpm, $n_{max} = 6000$ rpm) series ratings							
MS1H2-10C30CB-A6/S631R	MS1H2-10C30CB-A6/S634R	100	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2-10C30CD-A6/S631R	MS1H2-10C30CD-A6/S634R	100	1.0	Three-phase 380 V		T3R5	10001
MS1H2-15C30CB-A6/S631R	MS1H2-15C30CB-A6/S634R	100	1.5	Single-phase/Three-phase 220 V	D	S012	00007
MS1H2-15C30CD-A6/S631R	MS1H2-15C30CD-A6/S634R	100	1.5	Three-phase 380 V	C	T5R4	10002
MS1H2-20C30CB-A6/S631R	MS1H2-20C30CB-A6/S634R	100	2.0	Three-phase 220 V	E	S018	00008
MS1H2-20C30CD-A6/S631R	MS1H2-20C30CD-A6/S634R	100	2.0	Three-phase 380 V	D	T8R4	10003
MS1H2-25C30CB-A6/S631R	MS1H2-25C30CB-A6/S634R	100	2.5	Three-phase 220 V	E	S022	00009
MS1H2-25C30CD-A6/S631R	MS1H2-25C30CD-A6/S634R	100	2.5	Three-phase 380 V	D	T012	10004
MS1H2-30C30CB-A6/S631R	MS1H2-30C30CB-A6/S634R	130	3.0	Three-phase 220 V	E	S022	00009
MS1H2-30C30CD-A6/S631R	MS1H2-30C30CD-A6/S634R	130	3.0	Three-phase 380 V	D	T012	10004

Model Selection List

Motor				Drive SV680*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class (V)	Size	Model	No.
MS1H2-40C30CB-A6/S631R	MS1H2-40C30CB-A6/S634R	130	4.0	Three-phase 220 V	E	S027	00010
MS1H2-40C30CD-A6/S631R	MS1H2-40C30CD-A6/S634R	130	4.0	Three-phase 380 V		T017	10005
MS1H2-50C30CB-A6/S631R	MS1H2-50C30CB-A6/S634R	130	5.0	Three-phase 220 V		S027	00010
MS1H2-50C30CD-A6/S631R	MS1H2-50C30CD-A6/S634R	130	5.0	Three-phase 380 V		T021	10006
MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series ratings							
MS1H3-85B15CB-A6/S631R	MS1H3-85B15CB-A6/S634R	130	0.85	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H3-85B15CD-A6/S631R	MS1H3-85B15CD-A6/S634R	130	0.85	Three-phase 380 V		T3R5	10001
MS1H3-13C15CB-A6/S631R	MS1H3-13C15CB-A6/S634R	130	1.3	Single-phase/Three-phase 220 V	D	S012	00007
MS1H3-13C15CD-A6/S631R	MS1H3-13C15CD-A6/S634R	130	1.3	Three-phase 380 V	C	T5R4	10002
MS1H3-18C15CB-A6/S631R	MS1H3-18C15CB-A6/S634R	130	1.8	Three-phase 220 V	E	S018	00008
MS1H3-18C15CD-A6/S631R	MS1H3-18C15CD-A6/S634R	130	1.8	Three-phase 380 V	D	T8R4	10003
MS1H3-29C15CB-A6/S631R	MS1H3-29C15CB-A6/S634R	180	2.9	Three-phase 220 V	E	S022	00009
MS1H3-29C15CD-A6/S631R	MS1H3-29C15CD-A6/S634R	180	2.9	Three-phase 380 V	D	T012	10004
MS1H3-44C15CB-A6/S631R	MS1H3-44C15CB-A6/S634R	180	4.4	Three-phase 220 V	E	S027	00010
MS1H3-44C15CD-A6/S631R	MS1H3-44C15CD-A6/S634R	180	4.4	Three-phase 380 V	E	T017	10005
MS1H3-55C15CD-A6/S631R	MS1H3-55C15CD-A6/S634R	180	5.5	Three-phase 380 V		T021	10006
MS1H3-75C15CD-A6/S631R	MS1H3-75C15CD-A6/S634R	180	7.5	Three-phase 380 V		T026	10007
MS1H4 (n _N = 3000 rpm, n _{max} =7000 rpm) series ratings							
MS1H4-05B30CB-A6/S630R	MS1H4-05B30CB-A6/S632R	40	0.05	Single-phase/Three-phase 220 V	A	S1R6	00002
MS1H4-10B30CB-A6/S630R	MS1H4-10B30CB-A6/S632R	40	0.1	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-05B30CB-A6/S631R	MS1H4-05B30CB-A6/S634R	40	0.05	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-10B30CB-A6/S631R	MS1H4-10B30CB-A6/S634R	40	0.1	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-20B30CB-A6/S631R	MS1H4-20B30CB-A6/S634R	60	0.2	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-40B30CB-A6/S631R	MS1H4-40B30CB-A6/S634R	60	0.4	Single-phase/Three-phase 220 V		S2R8	00003
MS1H4-55B30CB-A6/S631R	-	80	0.55	Single-phase/Three-phase 220 V	C	S5R5	00005
MS1H4-75B30CB-A6/S631R	MS1H4-75B30CB-A6/S634R	80	0.75	Single-phase/Three-phase 220 V		S5R5	00005

Motor				Drive SV680*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class (V)	Size	Model	No.
MS1H4-10C30CB-A6/S631R	MS1H4-10C30CB-A6/S634R	80	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006

Note

Models of drives:

- S: 220 V voltage class
- T: 380 V voltage class
- 1R6: 1.6 A rated output current, 2R8: 2.8 A rated output current..., 026: 26 A rated output current, 027: 27 A rated output current

Motor with 23-bit encoder

Motor				Drive SV670*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H1 ($n_N = 3000$ rpm, $n_{max} = 7000$ rpm) series ratings							
MS1H1-05B30CB-A330R	MS1H1-05B30CB-A332R	40	0.05	Single-phase/Three-phase 220 V	A	S1R6	00002
MS1H1-10B30CB-A330R	MS1H1-10B30CB-A332R	40	0.1	Single-phase/Three-phase 220 V			
MS1H1-20B30CB-A331R	MS1H1-20B30CB-A334R	60	0.2	Single-phase/Three-phase 220 V		S2R8	00003
MS1H1-40B30CB-A331R	MS1H1-40B30CB-A334R	60	0.4	Single-phase/Three-phase 220 V			
MS1H1-55B30CB-A331R	-	80	0.55	Single-phase/Three-phase 220 V	C	S5R5	00005
MS1H1-75B30CB-A331R	MS1H1-75B30CB-A334R	80	0.75	Single-phase/Three-phase 220 V		S5R5	00005
MS1H1-10C30CB-A331R	MS1H1-10C30CB-A334R	80	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2 ($n_N = 3000$ rpm, $n_{max} = 6000$ rpm) series ratings							
MS1H2-10C30CB-A331R	MS1H2-10C30CB-A334R	100	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2-10C30CD-A331R	MS1H2-10C30CD-A334R	100	1.0	Three-phase 380 V		T3R5	10001
MS1H2-15C30CB-A331R	MS1H2-15C30CB-A334R	100	1.5	Single-phase/Three-phase 220 V	D	S012	00007
MS1H2-15C30CD-A331R	MS1H2-15C30CD-A334R	100	1.5	Three-phase 380 V	C	T5R4	10002

Model Selection List

Motor				Drive SV670*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H2-20C30CB-A331R	MS1H2-20C30CB-A334R	100	2.0	Three-phase 220 V	E	S018 ^[1]	00008
MS1H2-20C30CD-A331R	MS1H2-20C30CD-A334R	100	2.0	Three-phase 380 V	D	T8R4	10003
MS1H2-25C30CB-A331R	MS1H2-25C30CB-A334R	100	2.5	Three-phase 220 V	E	S022	00009
MS1H2-25C30CD-A331R	MS1H2-25C30CD-A334R	100	2.5	Three-phase 380 V	D	T012 ^[2]	10004
MS1H2-30C30CB-A331R	MS1H2-30C30CB-A334R	130	3.0	Three-phase 220 V	E	S022	00009
MS1H2-30C30CD-A331R	MS1H2-30C30CD-A334R	130	3.0	Three-phase 380 V	D	T012	10004
MS1H2-40C30CB-A331R	MS1H2-40C30CB-A334R	130	4.0	Three-phase 220 V	E	S027	00010
MS1H2-40C30CD-A331R	MS1H2-40C30CD-A334R	130	4.0	Three-phase 380 V	E	T017	10005
MS1H2-50C30CB-A331R	MS1H2-50C30CB-A334R	130	5.0	Three-phase 220 V		S027	00010
MS1H2-50C30CD-A331R	MS1H2-50C30CD-A334R	130	5.0	Three-phase 380 V		T021 ^[3]	10006
MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series ratings							
MS1H3-85B15CB-A331R	MS1H3-85B15CB-A334R	130	0.85	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H3-85B15CD-A331R	MS1H3-85B15CD-A334R	130	0.85	Three-phase 380 V		T3R5	10001
MS1H3-13C15CB-A331R	MS1H3-13C15CB-A334R	130	1.3	Single-phase/Three-phase 220 V	D	S012	00007
MS1H3-13C15CD-A331R	MS1H3-13C15CD-A334R	130	1.3	Three-phase 380 V	C	T5R4	10002
MS1H3-18C15CB-A331R	MS1H3-18C15CB-A334R	130	1.8	Three-phase 220 V	D	S012	00007
MS1H3-18C15CD-A331R	MS1H3-18C15CD-A334R	130	1.8	Three-phase 380 V	D	T8R4	10003
MS1H3-29C15CB-A331R	MS1H3-29C15CB-A334R	180	2.9	Three-phase 220 V	E	S022	00009
MS1H3-29C15CD-A331R	MS1H3-29C15CD-A334R	180	2.9	Three-phase 380 V	D	T012	10004
MS1H3-44C15CB-A331R	MS1H3-44C15CB-A334R	180	4.4	Three-phase 220 V	E	S027	00010
MS1H3-44C15CD-A331R	MS1H3-44C15CD-A334R	180	4.4	Three-phase 380 V	E	T017	10005
MS1H3-55C15CD-A331R	MS1H3-55C15CD-A334R	180	5.5	Three-phase 380 V		T021	10006
MS1H3-75C15CD-A331R	MS1H3-75C15CD-A334R	180	7.5	Three-phase 380 V		T026	10007
MS1H4 (n _N = 3000 rpm, n _{max} =7000 rpm) series ratings							

Motor				Drive SV670*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H4-05B30CB-A330R	MS1H4-05B30CB-A332R	40	0.05	Single-phase/Three-phase 220 V	A	S1R6	00002
MS1H4-10B30CB-A330R	MS1H4-10B30CB-A332R	40	0.1	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-05B30CB-A331R	MS1H4-05B30CB-A334R	40	0.05	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-10B30CB-A331R	MS1H4-10B30CB-A334R	40	0.1	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-20B30CB-A331R	MS1H4-20B30CB-A334R	60	0.2	Single-phase/Three-phase 220 V		S1R6	00002
MS1H4-40B30CB-A331R	MS1H4-40B30CB-A334R	60	0.4	Single-phase/Three-phase 220 V		S2R8	00003
MS1H4-55B30CB-A331R	-	80	0.55	Single-phase/Three-phase 220 V	C	S5R5	00005
MS1H4-75B30CB-A331R	MS1H4-75B30CB-A334R	80	0.75	Single-phase/Three-phase 220 V		S5R5	00005
MS1H4-10C30CB-A331R	MS1H4-10C30CB-A334R	80	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006

Note

- [1] See the torque-speed characteristics curves of this model for S012 drives.
- [2] See the torque-speed characteristics curves of this model for T8R4 drive.
- [3] See the torque-speed characteristics curves of this model for T017 drives.

Motor with 23-bit encoder

Motor				Drive SV660*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H1 ($n_N = 3000$ rpm, $n_{max} = 7000$ rpm) series ratings							
MS1H1-05B30CB-A330R	MS1H1-05B30CB-A332R	40	0.05	Single-phase 220 V	A	S1R6	00002
MS1H1-10B30CB-A330R	MS1H1-10B30CB-A332R	40	0.1	Single-phase 220 V			
MS1H1-20B30CB-A331R	MS1H1-20B30CB-A334R	60	0.2	Single-phase 220 V		S2R8	00003
MS1H1-40B30CB-A331R	MS1H1-40B30CB-A334R	60	0.4	Single-phase 220 V			
MS1H1-55B30CB-A331R	-	80	0.55	Single-phase 220 V	B	S5R5	00005
MS1H1-75B30CB-A331R	MS1H1-75B30CB-A334R	80	0.75	Single-phase 220 V		S5R5	00005

Model Selection List

Motor				Drive			
				SV660*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H1-10C30CB-A331R	MS1H1-10C30CB-A334R	80	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2 (n _N = 3000 rpm, n _{max} = 6000 rpm) series ratings							
MS1H2-10C30CB-A331R	MS1H2-10C30CB-A334R	100	1.0	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2-10C30CD-A331R	MS1H2-10C30CD-A334R	100	1.0	Three-phase 380 V		T3R5	10001
MS1H2-15C30CB-A331R	MS1H2-15C30CB-A334R	100	1.5	Single-phase/Three-phase 220 V	D	S012	00007
MS1H2-15C30CD-A331R	MS1H2-15C30CD-A334R	100	1.5	Three-phase 380 V	C	T5R4	10002
MS1H2-20C30CB-A331R	MS1H2-20C30CB-A334R	100	2.0	Single-phase/Three-phase 220 V	D	S012	00007
MS1H2-20C30CD-A331R	MS1H2-20C30CD-A334R	100	2.0	Three-phase 380 V	D	T8R4	10003
MS1H2-25C30CD-A331R	MS1H2-25C30CD-A334R	100	2.5	Three-phase 380 V	D	T012 ^[1]	10004
MS1H2-30C30CD-A331R	MS1H2-30C30CD-A334R	130	3.0	Three-phase 380 V	D	T012	10004
MS1H2-40C30CD-A331R	MS1H2-40C30CD-A334R	130	4.0	Three-phase 380 V	E	T017	10005
MS1H2-50C30CD-A331R	MS1H2-50C30CD-A334R	130	5.0	Three-phase 380 V		T021 ^[2]	10006
MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series ratings							
MS1H3-85B15CB-A33*R	MS1H3-85B15CB-A334R	130	0.85	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H3-85B15CD-A331R	MS1H3-85B15CD-A334R	130	0.85	Three-phase 380 V		T3R5	10001
MS1H3-13C15CB-A331R	MS1H3-13C15CB-A334R	130	1.3	Single-phase/Three-phase 220 V	D	S012	00007
MS1H3-13C15CD-A331R	MS1H3-13C15CD-A334R	130	1.3	Three-phase 380 V	C	T5R4	10002
MS1H3-18C15CB-A331R	MS1H3-18C15CB-A334R	130	1.8	Single-phase/Three-phase 220 V	D	S012	00007
MS1H3-18C15CD-A331R	MS1H3-18C15CD-A334R	130	1.8	Three-phase 380 V	D	T8R4	10003
MS1H3-29C15CD-A331R	MS1H3-29C15CD-A334R	180	2.9	Three-phase 380 V	D	T012	10004
MS1H3-44C15CD-A331R	MS1H3-44C15CD-A334R	180	4.4	Three-phase 380 V	E	T017	10005
MS1H3-55C15CD-A331R	MS1H3-55C15CD-A334R	180	5.5	Three-phase 380 V		T021	10006
MS1H3-75C15CD-A331R	MS1H3-75C15CD-A334R	180	7.5	Three-phase 380 V		T026	10007
MS1H4 (n _N = 3000 rpm, n _{max} =7000 rpm) series ratings							

Motor				Drive SV660*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H4-05B30CB-A330R	MS1H4-05B30CB-A332R	40	0.05	Single-phase 220 V	A	S1R6	00002
MS1H4-10B30CB-A330R	MS1H4-10B30CB-A332R	40	0.1	Single-phase 220 V		S1R6	00002
MS1H4-05B30CB-A331R	MS1H4-05B30CB-A334R	40	0.05	Single-phase 220 V		S1R6	00002
MS1H4-10B30CB-A331R	MS1H4-10B30CB-A334R	40	0.1	Single-phase 220 V		S1R6	00002
MS1H4-20B30CB-A331R	MS1H4-20B30CB-A334R	60	0.2	Single-phase 220 V		S1R6	00002
MS1H4-40B30CB-A331R	MS1H4-40B30CB-A334R	60	0.4	Single-phase 220 V		S2R8	00003
MS1H4-55B30CB-A331R	-	80	0.55	Single-phase 220 V	B	S5R5	00005
MS1H4-75B30CB-A331R	MS1H4-75B30CB-A334R	80	0.75	Single-phase 220 V		S5R5	00005
MS1H4-10C30CB-A331R	MS1H4-10C30CB-A334R	80	1.0	Single-phase/Three-phase 220 V		S7R6	00006

Note

- [1] See the torque-speed characteristics of this model for T8R4 drives.
- [2] See the torque-speed characteristics of this model for T017 drives.

Motor with 18-bit encoder

Motor				Drive SV630*****			
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
Ratings of MS1H1 (n_N =3000 rpm, n_{max} =6000 rpm) series motors							
MS1H1-05B30CB-T330R	MS1H1-05B30CB-T332R	40	0.05	Single-phase 220 V	A	S1R6	00002
MS1H1-10B30CB-T330R	MS1H1-10B30CB-T332R	40	0.1	Single-phase 220 V		S1R6	00002
Ratings of MS1H2 (n_N =3000 rpm, n_{max} =6000 rpm/5000 rpm) series motors							
MS1H2-10C30CB-T331R	MS1H2-10C30CB-T334R	100	1	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H2-10C30CD-T331R	MS1H2-10C30CD-T334R	100	1	Three-phase 380 V		T3R5	10001
MS1H2-15C30CB-T331R	MS1H2-15C30CB-T334R	100	1.5	Single-phase/Three-phase 220 V	D	S012	00007
MS1H2-15C30CD-T331R	MS1H2-15C30CD-T334R	100	1.5	Three-phase 380 V	C	T5R4	10002
MS1H2-20C30CB-T331R	MS1H2-20C30CB-T334R	100	2	Single-phase/Three-phase 220 V	D	S012	00007
MS1H2-20C30CD-T331R	MS1H2-20C30CD-T334R	100	2	Three-phase 380 V	D	T8R4	10003
MS1H2-25C30CD-T331R	MS1H2-25C30CD-T334R	100	2.5	Three-phase 380 V	D	T012 ^[1]	10004
MS1H2-30C30CD-T331R	MS1H2-30C30CD-T334R	130	3	Three-phase 380 V	D	T012	10004

Model Selection List

Motor				Drive			
SV630*****							
Models without brake	Models with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Model	No.
MS1H2-40C30CD-T331R	MS1H2-40C30CD-T334R	130	4	Three-phase 380 V	E	T017	10005
MS1H2-50C30CD-T331R	MS1H2-50C30CD-T334R	130	5	Three-phase 380 V	E	T021 ^[2]	10006
Ratings of MS1H3 (n _N =1500 rpm, n _{max} =3000 rpm) motors							
MS1H3-85B15CB-T331R	MS1H3-85B15CB-T334R	130	0.85	Single-phase/Three-phase 220 V	C	S7R6	00006
MS1H3-85B15CD-T331R	MS1H3-85B15CD-T334R	130	0.85	Three-phase 380 V		T3R5	10001
MS1H3-13C15CB-T331R	MS1H3-13C15CB-T334R	130	1.3	Single-phase/Three-phase 220 V	D	S012	00007
MS1H3-13C15CD-T331R	MS1H3-13C15CD-T334R	130	1.3	Three-phase 380 V	C	T5R4	10002
MS1H3-18C15CB-T331R	MS1H3-18C15CB-T334R	130	1.8	Single-phase/Three-phase 220 V	D	S012	00007
MS1H3-18C15CD-T331R	MS1H3-18C15CD-T334R	130	1.8	Three-phase 380 V	D	T8R4	10003
MS1H3-29C15CD-T331R	MS1H3-29C15CD-T334R	180	2.9	Three-phase 380 V	D	T012	10004
MS1H3-44C15CD-T331R	MS1H3-44C15CD-T334R	180	4.4	Three-phase 380 V	E	T017	10005
MS1H3-55C15CD-T331R	MS1H3-55C15CD-T334R	180	5.5	Three-phase 380 V		T021	10006
MS1H3-75C15CD-T331R	MS1H3-75C15CD-T334R	180	7.5	Three-phase 380 V		T026	10007
Ratings of MS1H4 (n _N =3000 rpm, n _{max} =6000 rpm) series motors							
MS1H4-05B30CB-T330R	MS1H4-05B30CB-T332R	40	0.05	Single-phase 220 V	A	S1R6	00002
MS1H4-10B30CB-T330R	MS1H4-10B30CB-T332R	40	0.1	Single-phase 220 V		S1R6	00002
MS1H4-05B30CB-T331R	MS1H4-05B30CB-T334R	40	0.05	Single-phase 220 V			
MS1H4-10B30CB-T331R	MS1H4-10B30CB-T334R	40	0.1	Single-phase 220 V			
MS1H4-20B30CB-T331R	MS1H4-20B30CB-T334R	60	0.2	Single-phase 220 V			
MS1H4-40B30CB-T331R	MS1H4-40B30CB-T334R	60	0.4	Single-phase 220 V		S2R8	00003
MS1H4-55B30CB-T331R	-	80	0.55	Single-phase 220 V	B	S5R5	00005
MS1H4-75B30CB-T331R	MS1H4-75B30CB-T334R	80	0.75	Single-phase 220 V		S5R5	00005
MS1H4-10C30CB-T331R	MS1H4-10C30CB-T334R	80	1	Single-phase/Three-phase 220 V		S7R6	00006

Note

- [1] See the torque-speed characteristics of this model for T8R4 drives.
- [2] See the torque-speed characteristics of this model for T017 drives.

Table 1-1 Relationship between servo drive and motor encoder

Drive model	Encoder type	Reference
SV680****I	A6: 26-bit multi-turn absolute encoder	SV680P Series Drive Selection Guide SV680N Series Drive Selection Guide
SV680*****S	S6: 26-bit absolute multi-turn encoder (functional safety type)	
SV670****I	A3: 23-bit multi-turn absolute encoder	SV670P Series Drive Selection Guide SV670N Series Drive Selection Guide
SV660****I	A3: 23-bit multi-turn absolute encoder	SV660P Series Drive Selection Guide SV660N Series Drive Selection Guide SV660F Series Drive Selection Guide
SV630****I	T3: 18-bit multi-turn absolute encoder	SV630P Series Drive Selection Guide SV630N Series Drive Selection Guide

Note

- Drive models S018, S022, and S027 are only available for SV670 and SV680 series servo drives.
- Servo motors match different series of servo drives, and the maximum speed and maximum torque output of the motor vary slightly. See the servo drive selection guide for details.
- Servo motors designed to work with 23-bit or 26-bit encoders share the same dimensions. For servo motors designed to work with 18-bit encoders, the height of the encoder aviation connector increases by 1 mm.

1.2 Comparison of MS1-R Series Motor and MS1-Z Series Motor

Frame size (mm)	Models without brake		Models with brake	
	MS1-Z series motor model	MS1-R series motor model	MS1-Z series motor model	MS1-R series motor model
40	MS1H1-05B30CB-A330Z	MS1H4-05B30CB-A330R	MS1H1-05B30CB-A332Z	MS1H4-05B30CB-A332R
	MS1H1-10B30CB-A330Z	MS1H4-10B30CB-A330R	MS1H1-10B30CB-A332Z	MS1H4-10B30CB-A332R
	MS1H4-10B30CB-A330Z		MS1H4-10B30CB-A332Z	
	MS1H1-05B30CB-T330Z	MS1H4-05B30CB-T330R	MS1H1-05B30CB-T332Z	MS1H4-05B30CB-T332R
	MS1H1-10B30CB-T330Z	MS1H4-10B30CB-T330R	MS1H1-10B30CB-T332Z	MS1H4-10B30CB-T332R
60	MS1H1-20B30CB-A331Z	MS1H4-20B30CB-A331R	MS1H1-20B30CB-A334Z	MS1H4-20B30CB-A334R
	MS1H1-40B30CB-A331Z	MS1H4-40B30CB-A331R	MS1H1-40B30CB-A334Z	MS1H4-40B30CB-A334R
	MS1H4-40B30CB-A331Z		MS1H4-40B30CB-A334Z	
	MS1H1-20B30CB-A331Z-S	MS1H4-20B30CB-A331R-S	MS1H1-20B30CB-A334Z-S	MS1H4-20B30CB-A334R-S
	MS1H1-40B30CB-A331Z-S	MS1H4-40B30CB-A331R-S	MS1H1-40B30CB-A334Z-S	MS1H4-40B30CB-A334R-S
	MS1H4-40B30CB-A331Z-S		MS1H4-40B30CB-A334Z-S	
	MS1H1-20B30CB-T331Z	MS1H4-20B30CB-T331R	MS1H1-20B30CB-T334Z	MS1H4-20B30CB-T334R
	MS1H1-40B30CB-T331Z	MS1H4-40B30CB-T331R	MS1H1-40B30CB-T334Z	MS1H4-40B30CB-T334R
	MS1H4-40B30CB-T331Z		MS1H4-40B30CB-T334Z	
	MS1H1-20B30CB-T331Z X6	MS1H4-20B30CB-T331R	MS1H1-20B30CB-T334Z X6	MS1H4-20B30CB-T334R
	MS1H1-40B30CB-T331Z X6	MS1H4-40B30CB-T331R	MS1H1-40B30CB-T334Z X6	MS1H4-40B30CB-T334R
	MS1H4-40B30CB-T331Z X6		MS1H4-40B30CB-T334Z X6	
	-	MS1H4-20B30CB-T331R-S	-	MS1H4-20B30CB-T334R-S
	-	MS1H4-40B30CB-T331R-S	-	MS1H4-40B30CB-T334R-S

Model Selection List

Frame size (mm)	Models without brake		Models with brake	
	MS1-Z series motor model	MS1-R series motor model	MS1-Z series motor model	MS1-R series motor model
80	MS1H1-55B30CB-A331Z	MS1H4-55B30CB-A331R	-	-
	MS1H1-75B30CB-A331Z	MS1H4-75B30CB-A331R	MS1H1-75B30CB-A334Z	MS1H4-75B30CB-A334R
	MS1H4-75B30CB-A331Z	MS1H4-75B30CB-A331R	MS1H4-75B30CB-A334Z	
	MS1H1-10C30CB-A331Z	MS1H4-10C30CB-A331R	-	MS1H4-10C30CB-A334R
	MS1H1-55B30CB-A331Z-S	MS1H4-55B30CB-A331R-S	-	-
	MS1H1-75B30CB-A331Z-S	MS1H4-75B30CB-A331R-S	MS1H1-75B30CB-A334Z-S	MS1H4-75B30CB-A334R-S
	MS1H4-75B30CB-A331Z-S	MS1H4-75B30CB-A331R-S	MS1H4-75B30CB-A334Z-S	
	MS1H1-10C30CB-A331Z-S	MS1H4-10C30CB-A331R-S	-	MS1H4-10C30CB-A334R-S
	MS1H1-55B30CB-T331Z	MS1H4-55B30CB-T331R	-	-
	MS1H1-75B30CB-T331Z	MS1H4-75B30CB-T331R	MS1H1-75B30CB-T334Z	MS1H4-75B30CB-T334R
	MS1H4-75B30CB-T331Z	MS1H4-75B30CB-T331R	MS1H4-75B30CB-T334Z	
	MS1H1-10C30CB-T331Z	MS1H4-10C30CB-T331R	-	MS1H4-10C30CB-T334R
	MS1H1-55B30CB-T331Z X6	MS1H4-55B30CB-T331R	-	-
	MS1H1-75B30CB-T331Z X6	MS1H4-75B30CB-T331R	MS1H1-75B30CB-T334Z X6	MS1H4-75B30CB-T334R
	MS1H4-75B30CB-T331Z X6	MS1H4-75B30CB-T331R	MS1H4-75B30CB-T334Z X6	
	MS1H1-10C30CB-T331Z X6	MS1H4-10C30CB-T331R	-	-
	-	MS1H4-55B30CB-T331R-S	-	-
	MS1H1-75B30CB-T331Z-S	MS1H4-75B30CB-T331R-S	-	MS1H4-75B30CB-T334R-S
	-	MS1H4-10C30CB-T331R-S	-	MS1H4-10C30CB-T334R-S

Note

- The R version of the H4 inertia model is used to replace the Z version of the H1 and H4 inertia models. The inertia of the H4 model of R version is different from that of the Z version.
- The H1 model, the ultra-small inertia motor added to the frame sizes 40, 60, and 80 of R version (T3 model is not available for frame sizes 60/80), is mainly used for fast point-to-point motion control applications.

Frame size (mm)	Models without brake		Models with brake	
	MS1-Z series motor model	MS1-R series motor model	MS1-Z series motor model	MS1-R series motor model
100	MS1H2-10C30CB-A331Z	MS1H2-10C30CB-A331R	MS1H2-10C30CB-A334Z	MS1H2-10C30CB-A334R
	MS1H2-10C30CD-A331Z	MS1H2-10C30CD-A331R	MS1H2-10C30CD-A334Z	MS1H2-10C30CD-A334R
	MS1H2-15C30CB-A331Z	MS1H2-15C30CB-A331R	MS1H2-15C30CD-A334Z	MS1H2-15C30CD-A334R
	MS1H2-15C30CD-A331Z	MS1H2-15C30CD-A331R	MS1H2-15C30CB-A334Z	MS1H2-15C30CB-A334R
	MS1H2-20C30CD-A331Z	MS1H2-20C30CD-A331R	MS1H2-20C30CD-A334Z-S4	MS1H2-20C30CD-A334R
	MS1H2-25C30CD-A331Z	MS1H2-25C30CD-A331R	MS1H2-25C30CD-A334Z-S4	MS1H2-25C30CD-A334R
	MS1H2-10C30CB-T331Z	MS1H2-10C30CB-T331R	MS1H2-10C30CB-T334Z	MS1H2-10C30CB-T334R
	MS1H2-10C30CD-T331Z	MS1H2-10C30CD-T331R	MS1H2-10C30CD-T334Z	MS1H2-10C30CD-T334R
	MS1H2-15C30CB-T331Z	MS1H2-15C30CB-T331R	MS1H2-15C30CD-T334Z	MS1H2-15C30CD-T334R
	MS1H2-15C30CD-T331Z	MS1H2-15C30CD-T331R	MS1H2-15C30CB-T334Z	MS1H2-15C30CB-T334R
	-	MS1H2-20C30CB-T331R	-	MS1H2-20C30CB-T334R
	MS1H2-20C30CD-T331Z	MS1H2-20C30CD-T331R	MS1H2-20C30CD-T334Z-S4	MS1H2-20C30CD-T334R
	MS1H2-25C30CD-T331Z	MS1H2-25C30CD-T331R	MS1H2-25C30CD-T334Z-S4	MS1H2-25C30CD-T334R
130	MS1H2-30C30CD-A331Z	MS1H2-30C30CD-A331R	MS1H2-30C30CD-A334Z-S4	MS1H2-30C30CD-A334R
	MS1H2-40C30CD-A331Z	MS1H2-40C30CD-A331R	MS1H2-40C30CD-A334Z-S4	MS1H2-40C30CD-A334R
	MS1H2-50C30CD-A331Z	MS1H2-50C30CD-A331R	MS1H2-50C30CD-A334Z-S4	MS1H2-50C30CD-A334R
	MS1H2-30C30CD-T331Z	MS1H2-30C30CD-T331R	MS1H2-30C30CD-T334Z-S4	MS1H2-30C30CD-T334R
	MS1H2-40C30CD-T331Z	MS1H2-40C30CD-T331R	MS1H2-40C30CD-T334Z-S4	MS1H2-40C30CD-T334R
	MS1H2-50C30CD-T331Z	MS1H2-50C30CD-T331R	MS1H2-50C30CD-T334Z-S4	MS1H2-50C30CD-T334R
	MS1H3-85B15CB-A331Z	MS1H3-85B15CB-A331R	MS1H3-85B15CB-A334Z	MS1H3-85B15CB-A334R
	MS1H3-85B15CD-A331Z	MS1H3-85B15CD-A331R	MS1H3-85B15CD-A334Z	MS1H3-85B15CD-A334R
	MS1H3-13C15CB-A331Z	MS1H3-13C15CB-A331R	MS1H3-13C15CB-A334Z	MS1H3-13C15CB-A334R
	MS1H3-13C15CD-A331Z	MS1H3-13C15CD-A331R	MS1H3-13C15CD-A334Z	MS1H3-13C15CD-A334R
	MS1H3-18C15CB-A331Z	MS1H3-18C15CB-A331R	-	MS1H3-18C15CB-A334R
	MS1H3-18C15CD-A331Z	MS1H3-18C15CD-A331R	MS1H3-18C15CD-A334Z	MS1H3-18C15CD-A334R
	MS1H3-85B15CB-T331Z X6	MS1H3-85B15CB-T331R	MS1H3-85B15CB-T334Z X6	MS1H3-85B15CB-T334R
	MS1H3-85B15CD-T331Z X6	MS1H3-85B15CD-T331R	MS1H3-85B15CD-T334Z X6	MS1H3-85B15CD-T334R
	MS1H3-13C15CB-T331Z X6	MS1H3-13C15CB-T331R	MS1H3-13C15CB-T334Z X6	MS1H3-13C15CB-T334R
	MS1H3-13C15CD-T331Z X6	MS1H3-13C15CD-T331R	MS1H3-13C15CD-T331Z X6	MS1H3-13C15CD-T331R
	MS1H3-18C15CD-T331Z X6	MS1H3-18C15CD-T331R	MS1H3-13C15CD-T334Z X6	MS1H3-13C15CD-T334R
	MS1H3-85B15CB-T331Z	MS1H3-85B15CB-T331R	MS1H3-18C15CD-T334Z X6	MS1H3-18C15CD-T334R
	MS1H3-85B15CD-T331Z	MS1H3-85B15CD-T331R	MS1H3-85B15CB-T334Z	MS1H3-85B15CB-T334R
	MS1H3-85B15CD-T334Z	MS1H3-85B15CD-T334R	MS1H3-85B15CD-T334Z	MS1H3-85B15CD-T334R
	MS1H3-13C15CB-T331Z	MS1H3-13C15CB-T331R	MS1H3-13C15CB-T334Z	MS1H3-13C15CB-T334R
	MS1H3-13C15CD-T331Z	MS1H3-13C15CD-T331R	MS1H3-13C15CD-T334Z	MS1H3-13C15CD-T334R
	-	MS1H3-18C15CB-T331R	-	MS1H3-18C15CB-T334R
	MS1H3-18C15CD-T331Z	MS1H3-18C15CD-T331R	MS1H3-18C15CD-T334Z	MS1H3-18C15CD-T334R
180	MS1H3-29C15CD-A331Z	MS1H3-29C15CD-A331R	MS1H3-29C15CD-A334Z	MS1H3-29C15CD-A334R
	MS1H3-44C15CD-A331Z	MS1H3-44C15CD-A331R	MS1H3-44C15CD-A334Z	MS1H3-44C15CD-A334R
	MS1H3-55C15CD-A331Z	MS1H3-55C15CD-A331R	MS1H3-55C15CD-A334Z	MS1H3-55C15CD-A334R
	MS1H3-75C15CD-A331Z	MS1H3-75C15CD-A331R	MS1H3-75C15CD-A334Z	MS1H3-75C15CD-A334R
	MS1H3-29C15CD-T331Z	MS1H3-29C15CD-T331R	MS1H3-29C15CD-T334Z	MS1H3-29C15CD-T334R
	MS1H3-44C15CD-T331Z	MS1H3-44C15CD-T331R	MS1H3-44C15CD-T334Z	MS1H3-44C15CD-T334R
	MS1H3-55C15CD-T331Z	MS1H3-55C15CD-T331R	MS1H3-55C15CD-T334Z	MS1H3-55C15CD-T334R
	MS1H3-75C15CD-T331Z	MS1H3-75C15CD-T331R	MS1H3-75C15CD-T334Z	MS1H3-75C15CD-T334R

2 Product Information

2.1 Product Characteristics

- **Small size**
 - Small size with high torque output
 - Mounting flange, output shaft, and aviation connectors compatible with last generation of motors
- **High speed**
 - Maximum speed of MS1H1 and MS1H4 (frame sizes 40/60/80) improved from 6000 rpm to 7000 rpm
 - Maximum speed of MS1H2 models improved from 5000 rpm to 6000 rpm
 - Maximum speed of MS1H3 (frame sizes 130/180) motors improved from 3000 rpm to 4500 rpm
 - Speed of motors with 23-bit/26-bit encoders improved greatly
- **Low temperature rise rate**
 - Optimized electromagnetic circuits to reduce the temperature rise rate
 - Frame sizes 40, 60 and 80: Temperature rise reduced by 20K compared with previous generation of motors
- **High stiffness**

Stiffness improved by 5 levels for typical models
- **Wide applicability**
 - Ultra-low inertia models (with 26-bit/23-bit encoder) are available for frame sizes 40/60/80, meeting the demands of quick jog control applications.
 - 220 V models are available for frame sizes 100/130/180.
 - Regular 26-bit absolute multi-turn absolute encoders and those of functional safety type are available to meet high accuracy requirements.
- **High energy-saving performance**

Inovance motors of 550 W to 7.5 kW meet the energy efficiency requirements of GB30253-Level 1 in China.

2.2 Model and Nameplate

Model description

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

① MS1 series servo motor	② Inertia and capacity H1: low inertia, small capacity H2: low inertia, medium capacity H3: medium inertia, medium capacity H4: medium inertia, small capacity	③ Rated power (W) One letter and two digits B: x 10 C: x 100 Example: 75B: 750 W
④ Rated speed (rpm) One letter and two digits B: x 10 C: x 100 Example: 30C: 3,000 rpm	⑤ Voltage class (V) B: 220 D: 380	⑥ Encoder type 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 T3: 18-bit multi-turn absolute encoder
⑦ Shaft Connection Mode 1: Plain shaft 3: Solid shaft, with key and threaded hole	⑧ Brake and oil seal 0: Without oil seal or brake 1: With oil seal but no brake 2: With brake but no oil seal 4: With oil seal and brake	⑨ Series R: R version ⑩ Non-standard functions _: Standard S: Flying leads type ZJ: Optimized torque fluctuation (non-standard) ZL: Optimized performance for tension pivot arm inching at small angle (non-standard) - **: Other non-standard function

Nameplate description

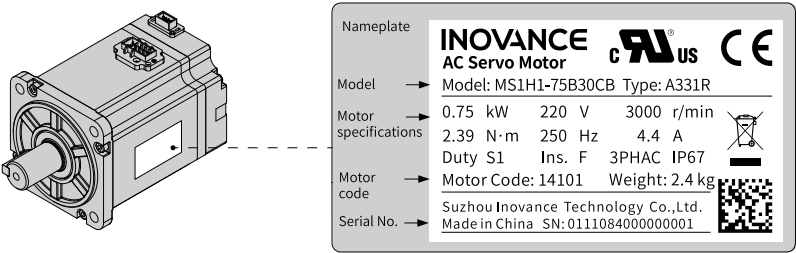


Figure 2-1 Nameplate

2.3 Components

Motor (frame size 40)

- **Terminal-type servo motor**

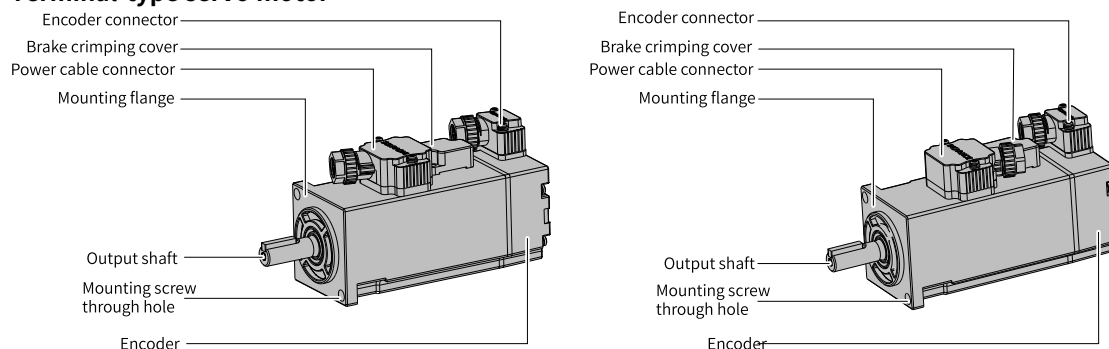


Figure 2-2 Components of a terminal-type servo motor (Left: motor with front cable outlet; Right: motor with rear cable outlet)

- **Flying leads type servo motors**

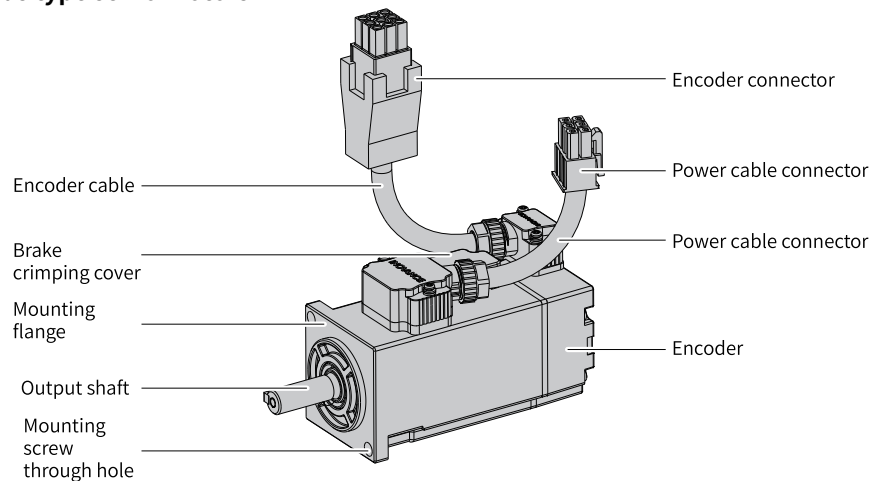


Figure 2-3 Components of flying leads type motors

Note

- For 50 W terminal type models, use rear outlet for power cables.
- For 100 W models, if the mounting flange face is internally stepped type, only terminal-type models can be used, which are equipped with power cables with rear outlet.

Motor (frame sizes 60/80)

- **Terminal-type servo motor**

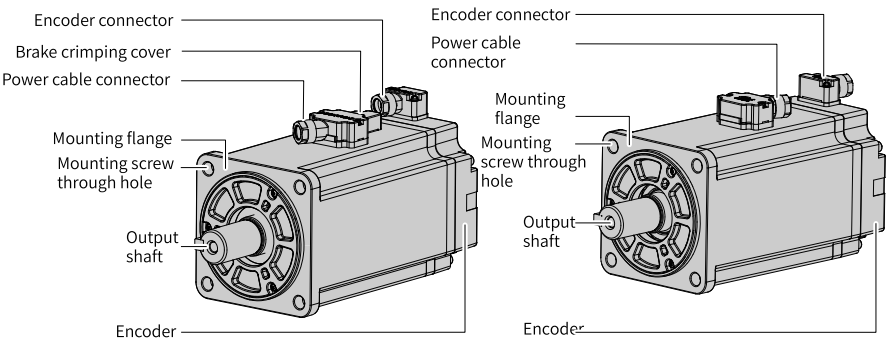


Figure 2-4 Components of a terminal-type servo motor (Left: motor with front cable outlet; Right: motor with rear cable outlet)

• Flying leads type servo motors

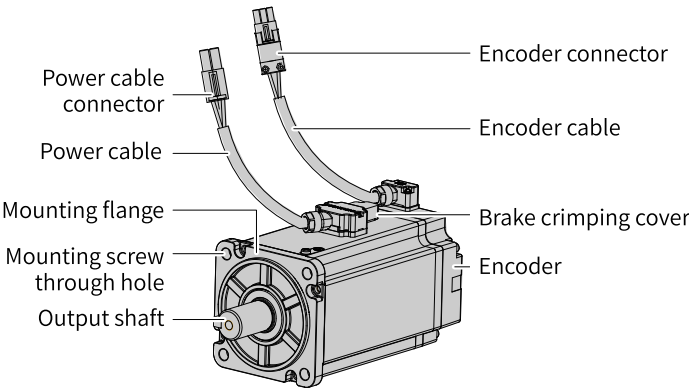


Figure 2-5 Components of flying leads type motors

Motor (frame sizes 100/130/180)

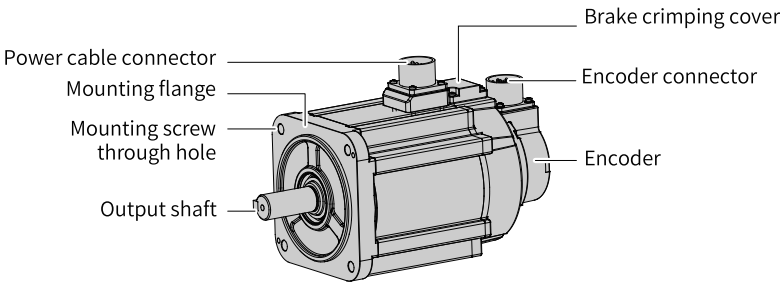


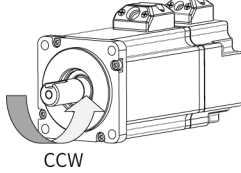
Figure 2-6 Components of servo drives in frame sizes 100/130/180

2.4 Motor Models

Motor type		Rated output capacity (kW)	Encoder
Low inertia, small capacity	MS1H1 	0.05, 0.1, 0.2, 0.4, 0.55, 0.75, 1.0	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 T3: 18-bit multi-turn absolute encoder
Low inertia, medium capacity	MS1H2 	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0	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 T3: 18-bit multi-turn absolute encoder
Medium inertia Medium capacity	MS1H3 	0.85, 1.3, 1.8, 2.9, 4.4, 5.5, 7.5	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 T3: 18-bit multi-turn absolute encoder
Medium inertia small capacity	MS1H4 	0.05, 0.1, 0.2, 0.4, 0.55, 0.75, 1.0	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 T3: 18-bit multi-turn absolute encoder

3 Product Specifications

3.1 Mechanical Characteristics

Item		Description
Duty cycle		S1 (Continuous duty)
Vibration level ^[1]		V15
Insulation resistance		500 VDC, above 10 MΩ
Excitation mode		Permanent magnetic
Mounting method		Flange
Thermal class		F (155)
Insulation voltage		1500 VAC for 1 min (220 V class) 1800 VAC for 1 min (380 V class)
Degree of protection		IP67 (excluding shaft opening and flying leads type motor connectors)
Direction of rotation		Rotates counterclockwise (CCW) when viewed from the shaft extension side with the forward run command from drive side.  CCW
Ambient condition	Ambient temperature	0°C to 40°C (non-frozen) (Derate based on the derating curve for temperatures above 40°C.)
	Ambient humidity	20% to 80% (without condensation)
	Installation location	• Free from corrosive or explosive gases • Well ventilated and with minimum amount of dust, waste and moisture. • Convenient for inspection and cleanup. • Derating is required only for installation altitudes higher than 1000 m. “3.3 Derating Characteristics” on page 27 • Away 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 for a long term. • Not applicable to vacuum environment • Not applicable to inching (not full-turn) ^[2] and may be stuck • The motor with brake may generate a pattering sound. • In upstream applications of the motor, ensure the force applied on the shaft end is lower than the allowable axial force and radial force of the motor. • 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 storing a de-energized motor. • Storage temperature: -20°C to +60°C (non-freezing) • Storage humidity: 20% to 80% RH (without condensation)
Shock resistance ^{[3] [5]}	Shock acceleration (taking flange side as standard)	490 m/s ²
	Number of shocks	2

Item		Description
Vibration resistance ^{[4][5]}	Vibration acceleration (taking flange side as standard)	Radial 49 m/s ² Axial 24.5 m/s ²

Note

- [1] Vibration grade V15 indicates that the amplitude of vibration is less than 15 μm when a single servo motor rotates at its rated value.
- [2] For applications that require the motor shaft to swing back and forth at a certain angle, contact Inovance.
- [3] 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.
- [4] The vertical, side-to-side, and front-to-back resistance for vibration in three directions when the servo motor is mounted with the shaft in a horizontal position is shown in the preceding table.
- [5] The vibration intensity applied on the motor is affected by the transmission structure, alignment accuracy, mounting conditions, and external vibration. These factors may enhance the vibration applied on the motor. When the maximum allowable vibration limit is exceeded, the motor may fail. Therefore, take necessary measures to limit resonance.
- The vibration intensity applied on the motor varies with applications.

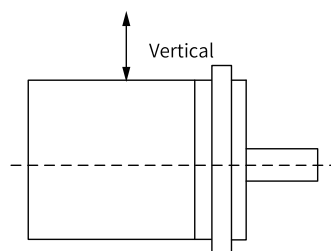


Figure 3-1 Shock applied on the motor

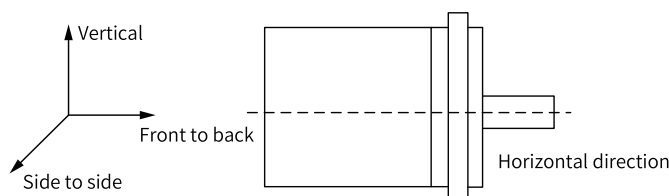


Figure 3-2 Vibration applied on the motor

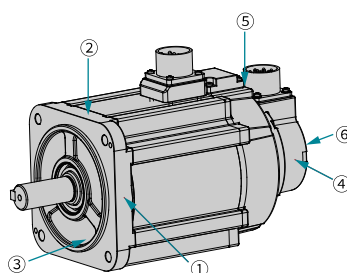


Figure 3-3 Maximum allowable vibration limit of the motor

Direction	Measuring point	Limit value (10 Hz to 2000 Hz)
Radial	①②	49 m/s ²
	④⑤	49 m/s ²
Axial	③	24.5 m/s ²
	⑥	24.5 m/s ²

Note

The preceding vibration/shock standards cannot be applied for a long term. For long-term application needs, contact Inovance.

3.2 Overload Characteristics

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

The following overload protection curve applies to hot start at an ambient temperature of 40°C, which cannot guarantee continuous duty under 100%+ output. During use, keep the effective torque of the load within the continuous duty zone.

To protect different load motors, set the motor overload protection gain based on the overload capacity of the motor. 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 works in the environment with high ambient temperature.
- The motor is in cyclic motion featuring a short motion cycle and frequent acceleration/ deceleration.
- Overload thermal protection only occurs during continuous energized operation. You need to check the motor temperature when the drive is powered off.

Motor overload protection curve is as follows:

- **MS1H1/H4 (frame sizes 40/60/80)**

Load ratio (%)	Operating time (s)
120	230
130	80
140	40
150	30
160	20
170	17
180	15
190	12
200	10
210	8.5
220	7
230	6
240	5.5
250	5
300	3
350	2

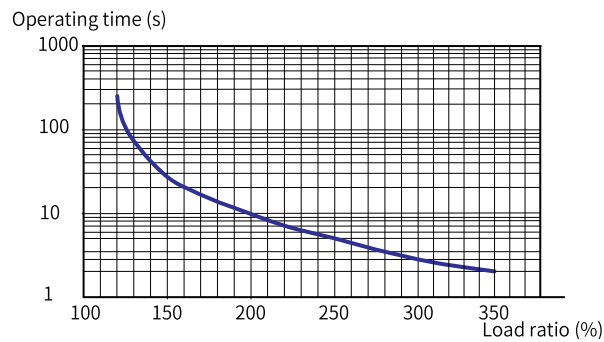


Figure 3-4 MS1H1/H4 (frame sizes 40/60/80) series motor overload curve

Note

The maximum torque of H1 and H4 models is the rated torque x 3.5.

• MS1H2/MS1H3

Load ratio (%)	Operating time (s)
115	6000
120	2533
125	1226
130	915
135	769
140	527
145	352
150	221
155	128
160	99
165	83
170	67
175	55
180	49
185	45
190	41
195	38
200	34
205	31
210	28
215	24
220	22
225	21
230	19
235	18
240	16
245	14
250	13
255	12
260	11
265	10
270	9

Load ratio (%)	Operating time (s)
275	9
280	8
285	7
290	6
295	5
300	5

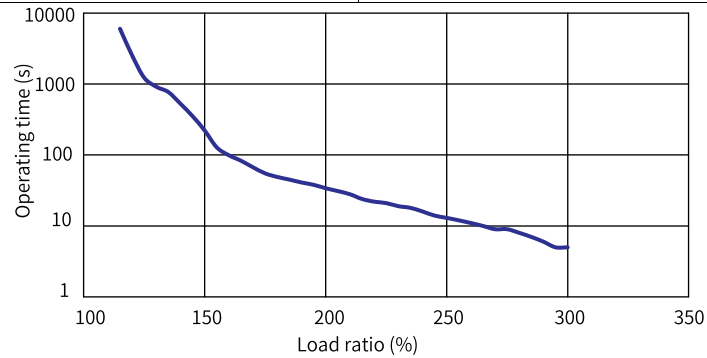


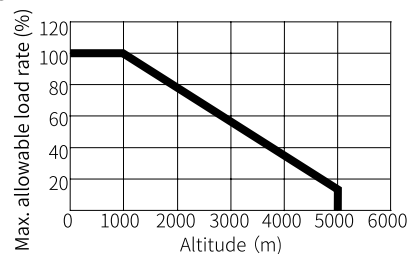
Figure 3-5 Overload curve of MS1H2 and MS1H3 series motors

Note

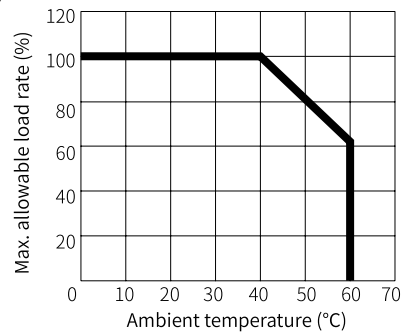
- The maximum torque of H2 models is the rated torque x 3.
- The maximum torque of H3 models is the rated torque x 2.5.

3.3 Derating Characteristics

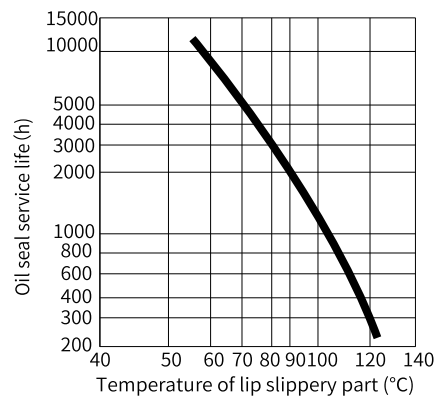
• Altitude-based derating curve



• Temperature-based derating curve



3.4 Temperature Curve of the Oil Seal



3.5 Load Moment of Inertia

The load moment of inertia represents the ratio of load inertia to the rotor inertia. The higher the load inertia ratio, the weaker the responsiveness will be. An excessively high inertia ratio can result in unstable operation. The permissible load inertia ratio of the servo motor is limited. The value is a general standard and varies according to the driving conditions of the servo motor.

An overvoltage alarm may occur during deceleration if the load moment of inertia exceeds the allowable value. For servo drives with a built-in braking resistor, an overload alarm may be present. In case of such alarms, 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 alarm cannot be cleared using the above measures.



Caution

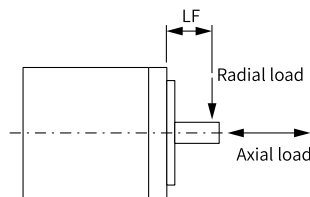
- For the built-in braking resistor of the drive, see Components.
 - Even you use a built-in resistor, the energy generated in some regenerative conditions may exceed the allowable capacity loss (W) of the resistor. In this case, an external braking resistor is required.
-

4 Motor Selection

4.1 Model Selection

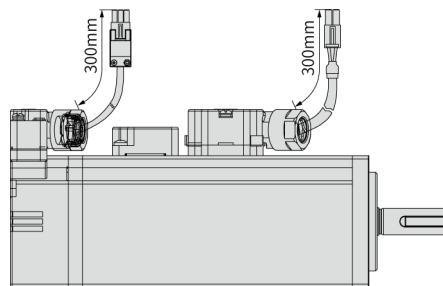
- Description of torque-speed characteristics curves:
 - Technical data and torque/speed characteristic values in the following tables are applicable to motors working with Inovance servo drives with the armature coil temperature being 20°C.
 - Continuous working area: Refers to a series of states in which the motor can operate safely and continuously, and the actual torque must be located in this area.
 - Intermittent duty zone: 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 values are obtained in cases where the motor is installed with the following heatsink (unit: mm):
 - Frame sizes 40/60/80: 250 x 250 x 6 (aluminum)
 - Frame sizes 100/130: 400 x 400 x 20 (steel)
 - Frame size 180: 550 x 550 x 30 (aluminum)

- Radial and axial loads of the motor:



- Dimensions of flying leads type motors

Flying leads type motors with frame sizes 40/60/80 (model ended with “-S”) provide a drain wire of about 300 mm in length, as shown in the following figure.



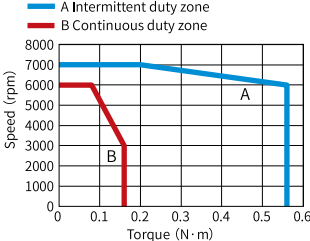
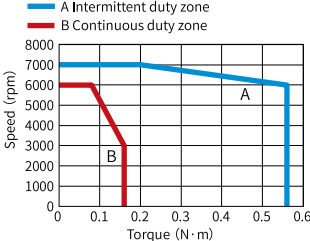
- The MS1H3 (frame sizes 130/180) model comes with a keyway. When the operating speed is above 3000 rpm, the motor must run with the keyway. If you need to run the motor without the keyway at speeds higher than 3000 rpm, contact Inovance.

Note

- Values inside the parentheses in sections 4.2 to 4.5 are parameters of the servo motor with brake.
 - The motor with oil seal must be derated by 10% during use.
 - Use your own DC power supply for 24 V power supply of the brake. For the cable connecting the DC power supply to the motor brake, it is recommended to use cables with a diameter of 0.2 mm² or above for motors with low power of 750 W or below. It is recommended to use cables with a diameter of 0.8 mm² or above for motors with a power of 750 W or above. The brake cannot share the power supply with other appliances to prevent the voltage or current from falling due to the simultaneous operation of other electrical appliances, which may result in brake malfunction.
 - The brake apply time and release time vary with the discharge circuit. Check the actual action delay of the product during use. The holding brake cannot be used for braking purpose.
-

4.2 MS1H1 Series Motor with Low Inertia and Small Capacity

4.2.1 MS1H1-05B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.05			
Rated voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated current (A)	1.2		Torque-Speed characteristics 	
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.018±10%		
	Motor with brake	0.0208±10%		

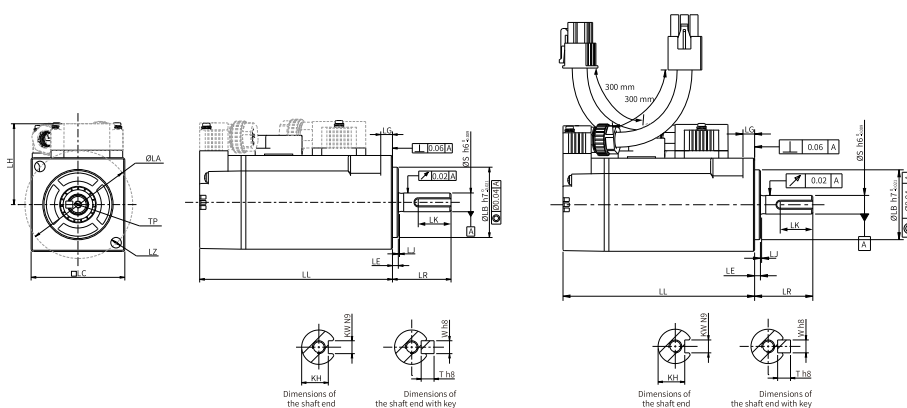
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

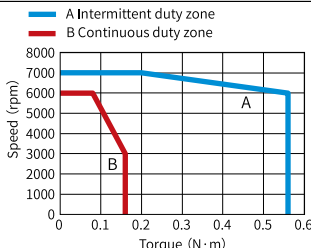
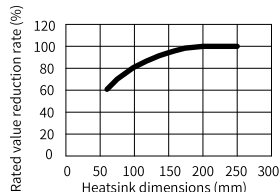
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	≤ 78	≤ 54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
54.5 (81.8)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.26 (0.43)

4.2.2 MS1H1-05B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.05			
Rated voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated current (A)	1.2		Heatsink-based derating curve	
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.018±10%		
	Motor with brake	0.0208±10%		

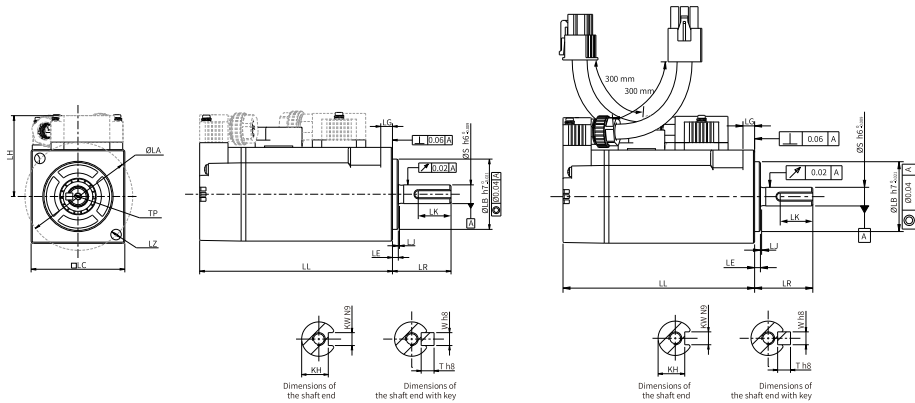
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 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
54.5 (81.8)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.26 (0.43)

4.2.3 MS1H1-05B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia and capacity	Low inertia, small capacity			
Rated power (kW)	0.05			
Rated voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated current (A)	1.2		Heatsink-based derating curve	
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	0.018±10%		
	Motor with brake	0.0208±10%		

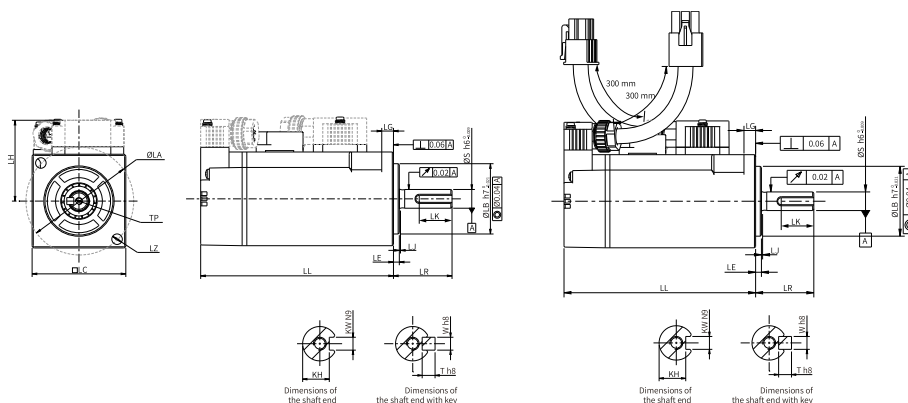
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

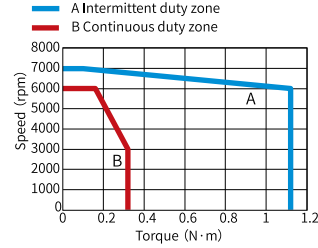
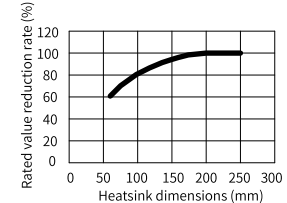
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	≤ 78	≤ 54

Product dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
54.5 (81.8)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.26 (0.43)

4.2.4 MS1H1-10B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.1			
Rated voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (A)	1.2		Heatsink-based derating curve	
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.30			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.0316±10%		
	Motor with brake	0.0345±10%		

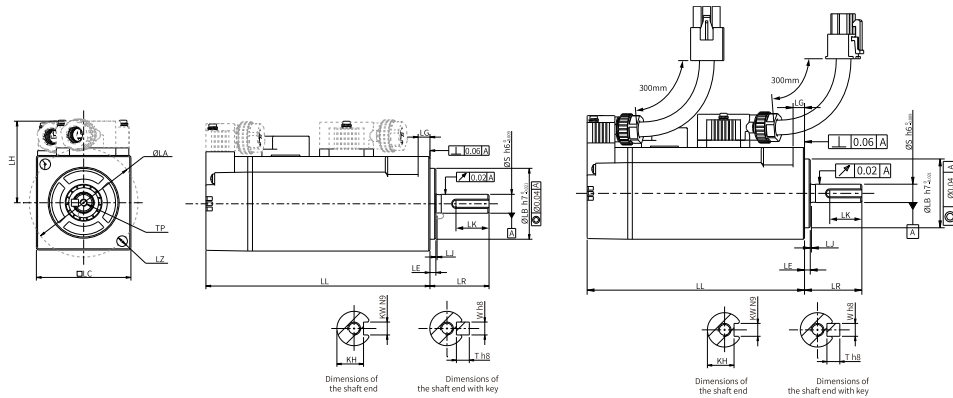
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

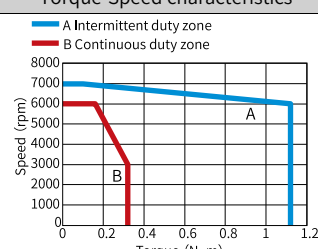
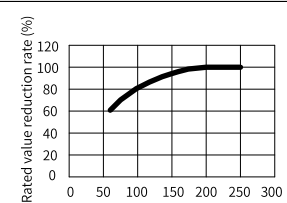
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	≤ 78	≤ 54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
67 (94.3)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.35 (0.52)

4.2.5 MS1H1-10B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.1			
Rated voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (A)	1.2		Heatsink-based derating curve	
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.30			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.0316±10%		
	Motor with brake	0.0345±10%		

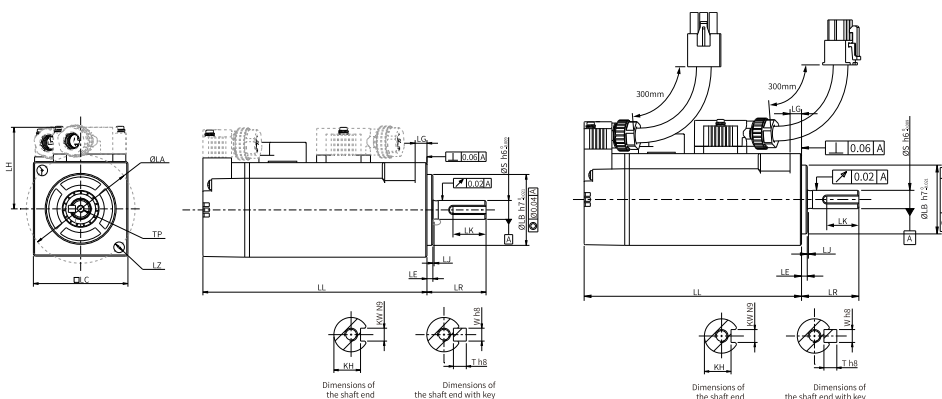
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 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
67 (94.3)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.35 (0.52)

4.2.6 MS1H1-10B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40		Speed (rpm) Torque (N·m) A Intermittent duty zone B Continuous duty zone	
Inertia and capacity	Low inertia, small capacity			
Rated power (kW)	0.1			
Rated voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (A)	1.2		Heatsink-based derating curve	
Maximum current (A)	4.8		Rated value reduction rate (%) Heatsink dimensions (mm)	
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.30			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	0.0316±10%		
	Motor with brake	0.0345±10%		

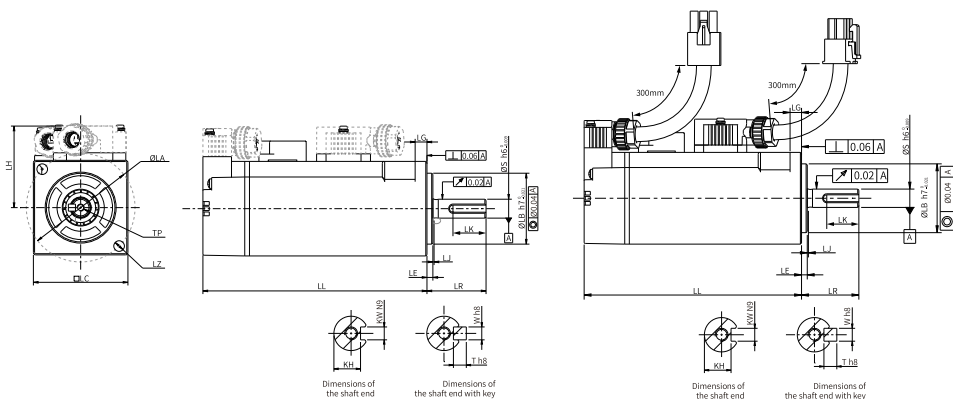
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

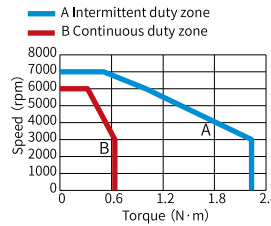
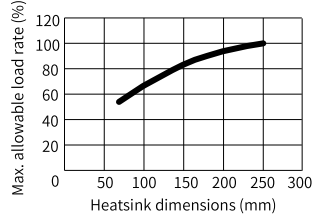
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	≤ 78	≤ 54

Product dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	LJ
67 (94.3)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.35 (0.52)

4.2.7 MS1H1-20B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	1.5		Heatsink-based derating curve	
Maximum current (A)	5.3			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.51			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.094±10%		
	Motor with brake	0.106±10%		

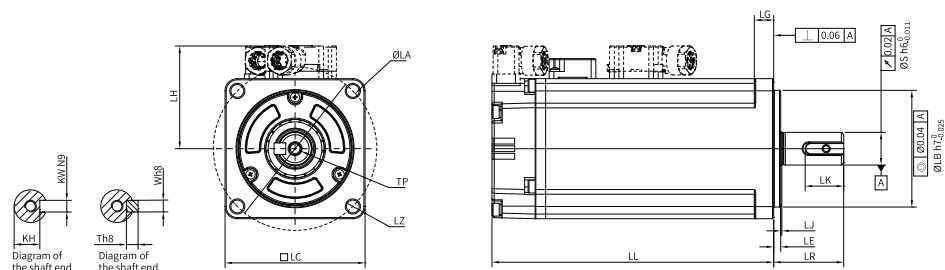
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1

Allowable load

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

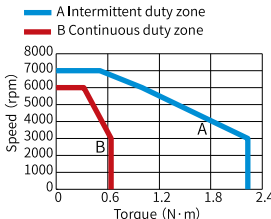
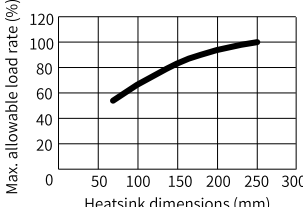
Dimensions (mm)



Motor Selection

LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	75.5 (103)	30±0.5	70	4 x ϕ5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
ϕ50h7 ⁰ _{-0.025}	14	M5 x 12	16.5	11 ⁰ _{-0.1}	5	5	5	0.80 (1.17)

4.2.8 MS1H1-20B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	1.5		Heatsink-based derating curve	
Maximum current (A)	5.3			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.51			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.094±10%		
	Motor with brake	0.106±10%		

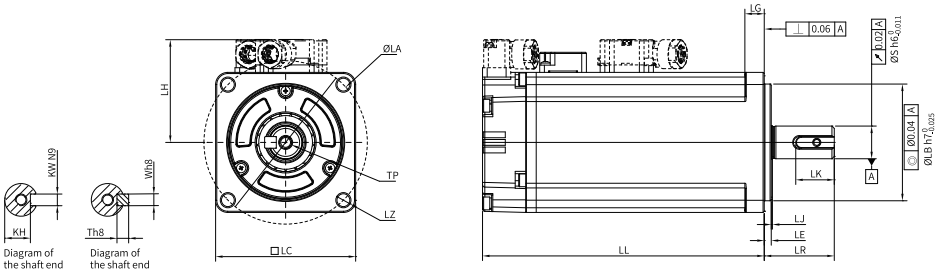
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1

Allowable load

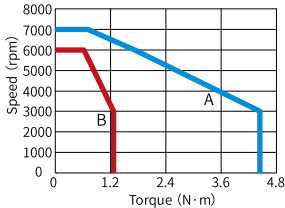
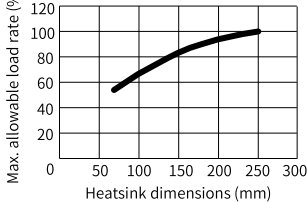
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	75.5 (103)	30±0.5	70	4 x φ5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ50h7 ⁰ _{-0.025}	14	M5 x 12	16.5	11 ⁰ _{-0.1}	5	5	5	0.80 (1.17)

4.2.9 MS1H1-40B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	2.5		Heatsink-based derating curve	
Maximum current (A)	9.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.57			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.145±10%		
	Motor with brake	0.157±10%		

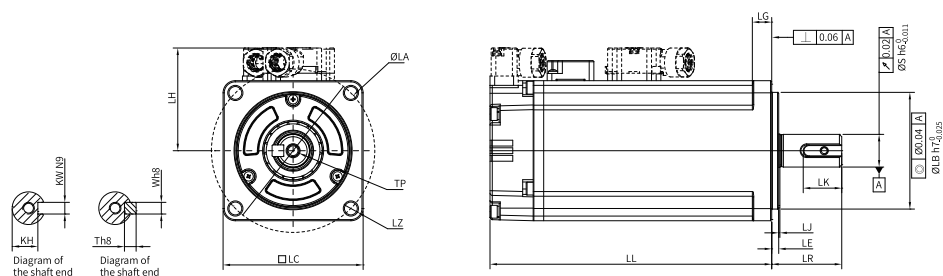
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1

Allowable load

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

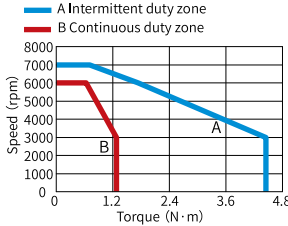
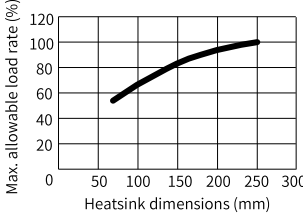
Dimensions (mm)



Motor Selection

LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	93 (121)	30±0.5	70	4 x ϕ5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
ϕ50h7 ⁰ _{-0.025}	14	M5 x 12	16.5	11 ⁰ _{-0.1}	5	5	5	1.11 (1.48)

4.2.10 MS1H1-40B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	2.5			
Maximum current (A)	9.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.57			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.145±10%		
	Motor with brake	0.157±10%		

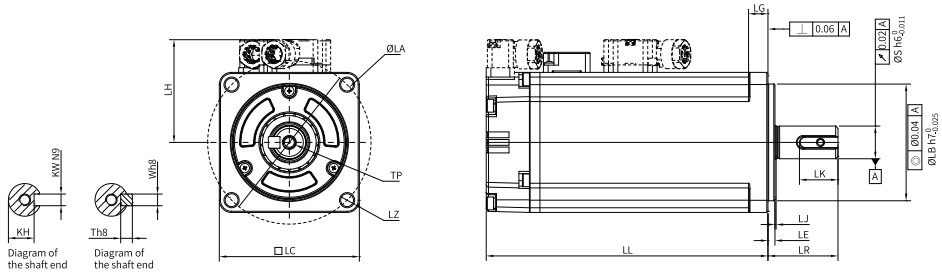
Electrical specifications of the brake

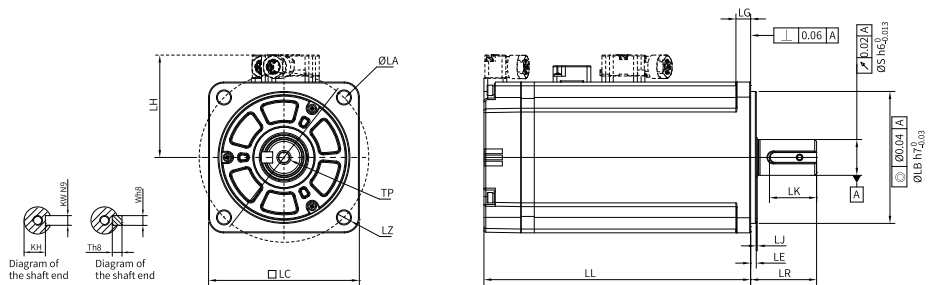
Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
1.5	24	7.6	75.79	0.32	≤ 60	≤ 20	≤ 1

Allowable load

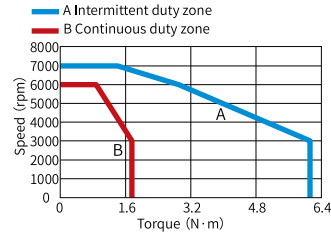
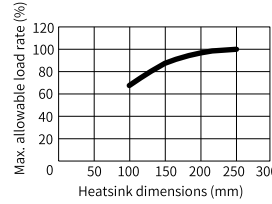
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)





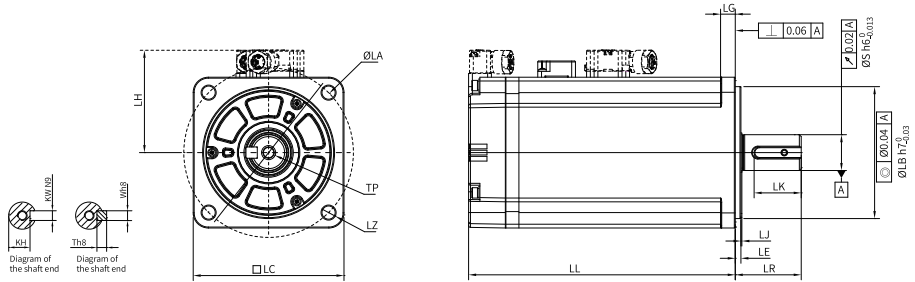
4.2.12 MS1H1-55B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	3.9		Heatsink-based derating curve	
Maximum current (A)	15			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.51			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.55±10%		
	Motor with brake	-		

Allowable load

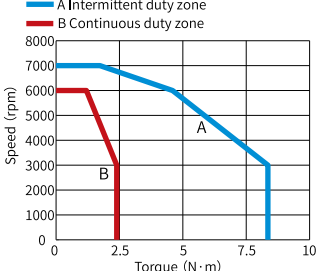
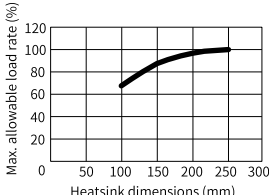
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35 ± 0.5	90	4 x $\phi 7$	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 70h7^0_{-0.03}$	19	M6 x 20	25	15.5 ⁰ _{-0.1}	6	6	6	1.88

4.2.13 MS1H1-75B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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)	8.36			
Rated current (A)	4.4		Heatsink-based derating curve	
Maximum current (A)	16.9			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.62			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.68±10%		
	Motor with brake	0.71±10%		

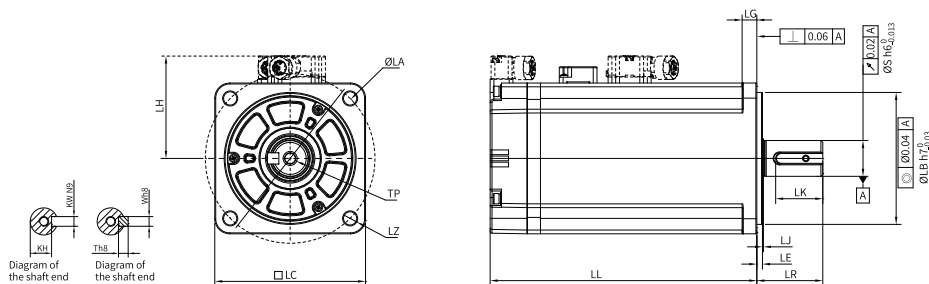
Electrical specifications of the brake

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

Allowable load

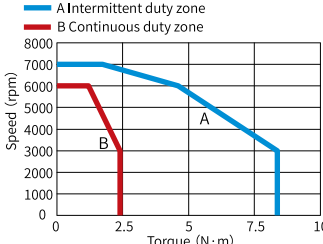
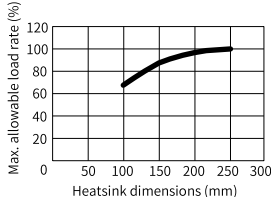
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ _{-0.03}	19	M6 x 20	25	15.5 ⁰ _{-0.1}	6	6	6	2.22 (2.88)

4.2.14 MS1H1-75B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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)	8.36			
Rated current (A)	4.4		Heatsink-based derating curve	
Maximum current (A)	16.9			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.62			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.68±10%		
	Motor with brake	0.71±10%		

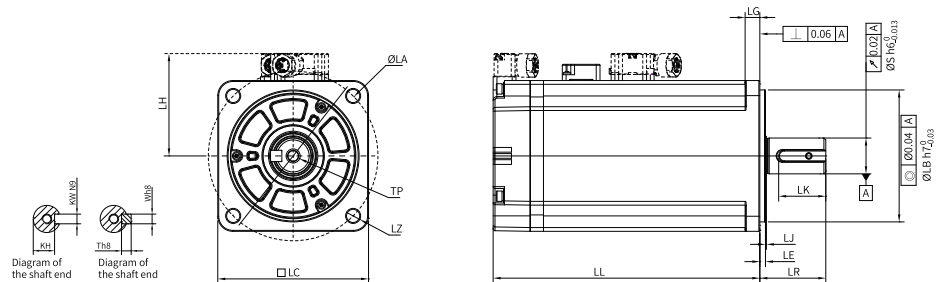
Electrical specifications of the brake

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

Allowable load

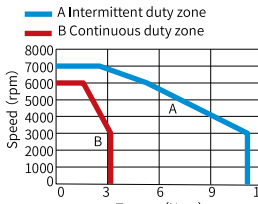
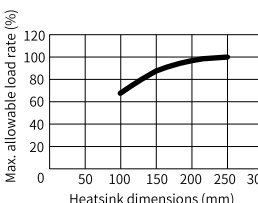
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ -0.03	19	M6 x 20	25	15.5 ⁰ -0.1	6	6	6	2.22 (2.88)

4.2.15 MS1H1-10C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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)	11.1			
Continuous current (Arms)	6.2			
Maximum current (Arms)	24			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N · m/Arms)	0.59			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.82±10%		
	Motor with brake	0.87±10%		

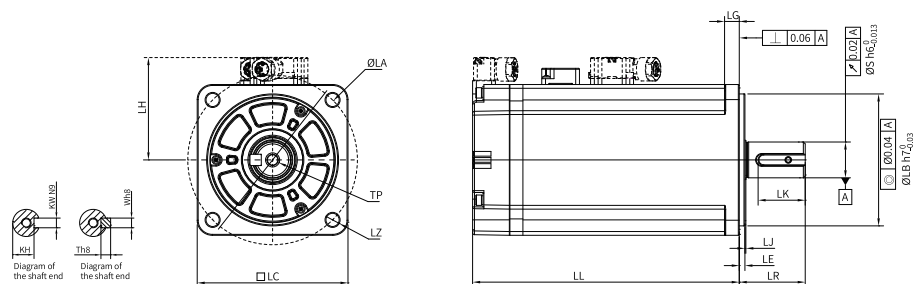
Electrical specifications of the brake

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

Allowable load

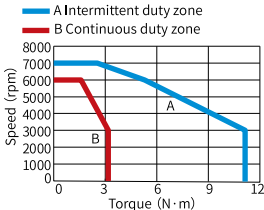
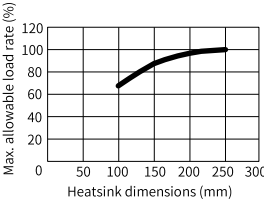
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	119.2 (153.4)	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ _{-0.03}	19	M6 x 20	25	15.5 ⁰ _{-0.1}	6	6	6	2.61 (3.27)

4.2.16 MS1H1-10C30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	6.2			
Maximum current (A)	24		Heatsink-based derating curve	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.59			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.82±10%		
	Motor with brake	0.87±10%		

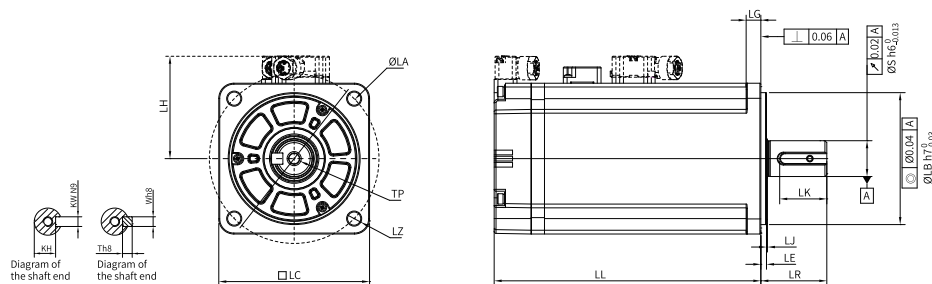
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil Resistance (Ω) ± 7%	Excitation 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

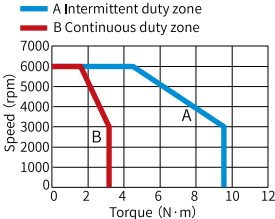
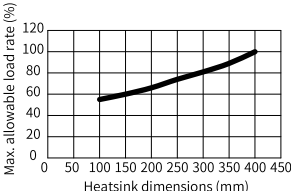
Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	119.2 (153.4)	35 ± 0.5	90	4 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ -0.03	19	M6 x 20	25	15.5 ⁰ -0.1	6	6	6	2.61 (3.27)

4.3 MS1H2 Series Motor with Low Inertia and Small Capacity

4.3.1 MS1H2-10C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	9.54		Heatsink-based derating curve 	
Rated current (A)	6.4			
Maximum current (A)	23			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.54			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78±10%		
	Motor with brake	2.6±10%		

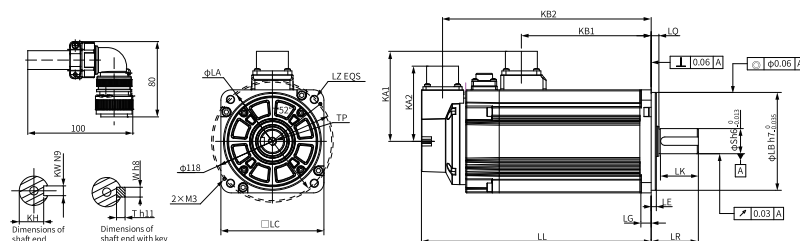
Electrical specifications of the brake

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

Allowable load

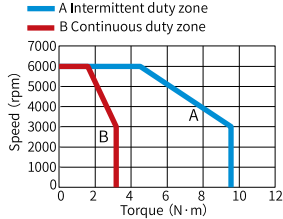
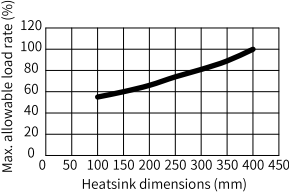
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	144 (172)	45 ± 1	115	4 x φ7	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	φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	3.85 (4.9)

4.3.2 MS1H2-10C30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia, capacity	Low inertia, medium capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	9.54		Heatsink-based derating curve 	
Rated current (A)	6.4			
Maximum current (A)	23			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.54			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78±10%		
	Motor with brake	2.6±10%		

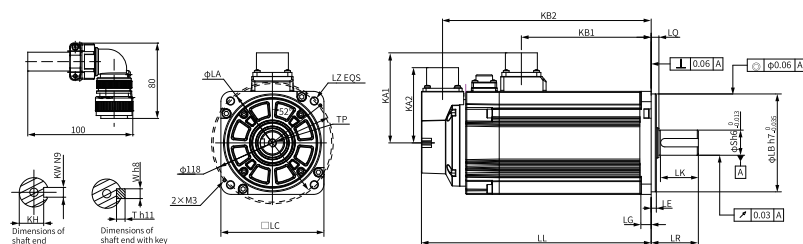
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil Resistance (Ω) ± 7%	Excitation 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 × φ7	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	φ95h7 ⁰ _{-0.035}	24	M8 × 16	36	20 ⁰ _{-0.2}	8	8	7	3.85 (4.9)	

4.3.3 MS1H2-10C30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia and capacity	Low inertia, medium capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	9.54			
Rated current (A)	6.4			
Maximum current (A)	23			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.54			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	1.78±10%		
	Motor with brake	2.6±10%		

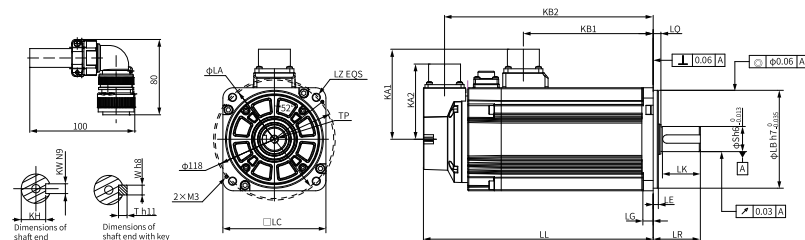
Electrical specifications of the brake

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

Allowable load

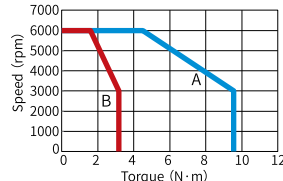
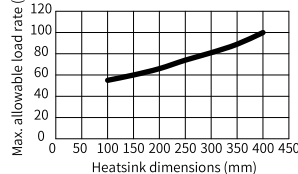
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	144 (172)	45 ± 1	115	4 x φ7	88	75	74	123.5 (151.5)	10	5 ± 0.3
LQ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5 ± 0.75	φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	3.85 (4.9)

4.3.4 MS1H2-10C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	3.3		Heatsink-based derating curve	
Maximum current (A)	11			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.07			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78±10%		
	Motor with brake	2.6±10%		

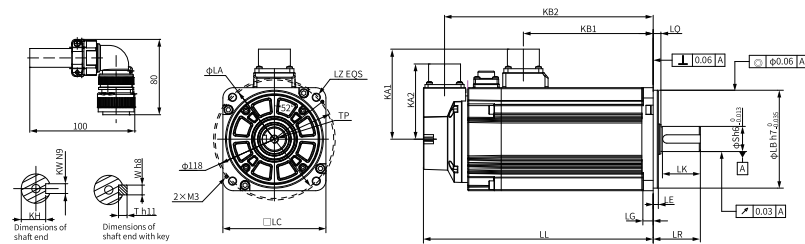
Electrical specifications of the brake

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

Allowable load

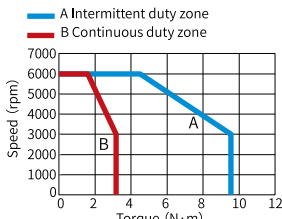
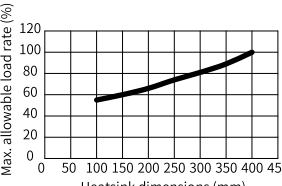
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	144 (172)	45±1	115	4 x φ7	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	φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	3.85 (4.9)

4.3.5 MS1H2-10C30CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	3.3			
Maximum current (A)	11			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.07			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78±10%		
	Motor with brake	2.6±10%		

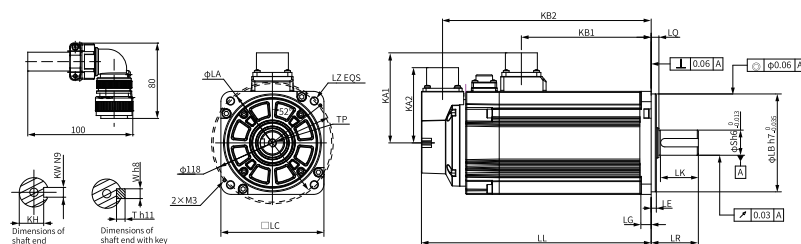
Electrical specifications of the brake

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

Allowable load

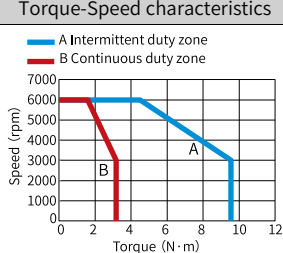
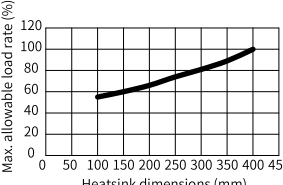
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	144 (172)	45 ± 1	115	4 × Φ7	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	Φ95h7 ⁰ _{-0.035}		24	M8 × 16	36	20 ⁰ _{-0.2}	8	8	7	3.85 (4.9)

4.3.6 MS1H2-10C30CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia and 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 (A)	3.3			
Maximum current (A)	11		Heatsink-based derating curve 	
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.07			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	1.78±10%		
	Motor with brake	2.6±10%		

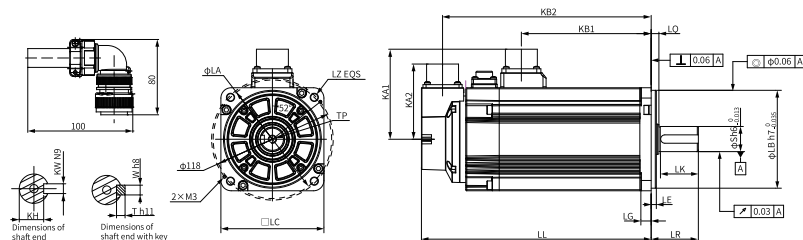
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 7%	Excitation 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

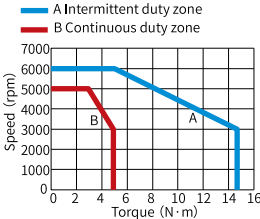
Product dimensions (mm)

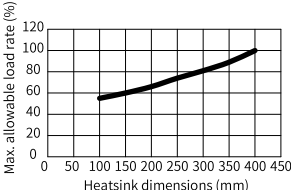


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	144 (172)	45 ± 1	115	4 × φ7	88	75	74	123.5 (151.5)	10	5 ± 0.3
LQ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5 ± 0.75	φ95h7 ⁰ _{-0.035}		24	M8 × 16	36	20 ⁰ _{-0.2}	8	8	7	3.85 (4.9)

4.3.7 MS1H2-15C30CB-A6/S63*R

Motor specifications		Torque-Speed characteristics	
Frame 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 (A)	8.6		
Maximum current (A)	32		
Rated speed (rpm)	3000		
Maximum Speed (rpm)	6000		
Torque coefficient (N·m/A)	0.62		
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35±10%	
	Motor with brake	3.17±10%	

Torque-Speed characteristics	
	

Heatsink-based derating curve	
	

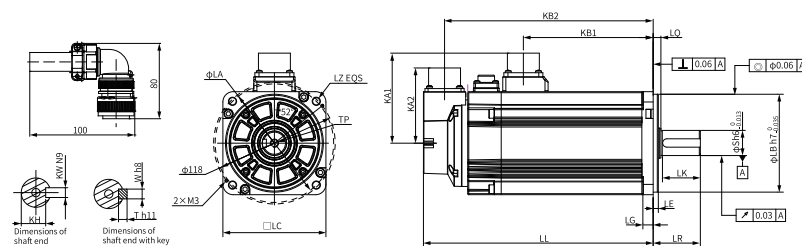
Electrical specifications of the brake

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

Allowable load

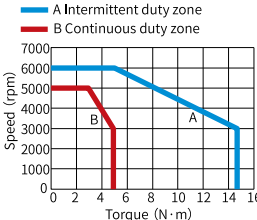
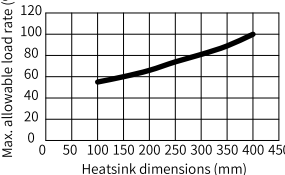
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45±1	115	4 x Φ7	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	Φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	4.65 (5.75)

4.3.8 MS1H2-15C30CB-A33*R

Motor specifications			Torque-Speed characteristics
Frame 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 (A)	8.6		Heatsink-based derating curve 
Maximum current (A)	32		
Rated speed (rpm)	3000		
Maximum Speed (rpm)	6000		
Torque coefficient (N·m/A)	0.62		
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35±10%	
	Motor with brake	3.17±10%	

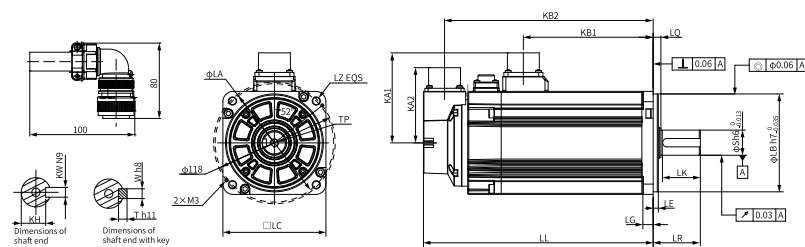
Electrical specifications of the brake

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

Allowable load

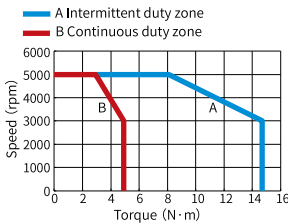
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

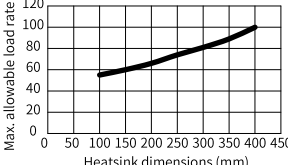
Dimensions (mm)

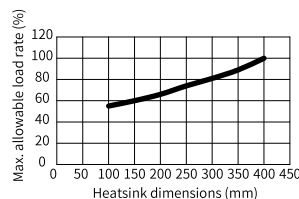
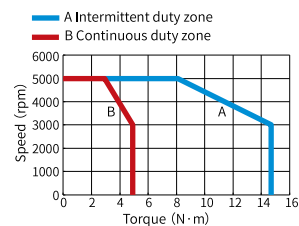


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45 ± 1	115	4 × φ7	88	92	73	140.5 (168.5)	10	5 ± 0.3
LQ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
7.5 ± 0.75	φ95h7 ⁰ -0.035	24	M8 x 16	36	20 ⁰ -0.2	8	8	7	4.65 (5.75)	

4.3.9 MS1H2-15C30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia and 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 (A)	8.6			
Maximum current (A)	32		Heatsink-based derating curve	
Rated speed (rpm)	3000			
Maximum speed (rpm)	5000			
Torque coefficient (N·m/A)	0.62			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	2.35 ± 10%		
	Motor with brake	3.17 ± 10%		

Max. allowable load rate (%)		Heatsink dimensions (mm)	
			



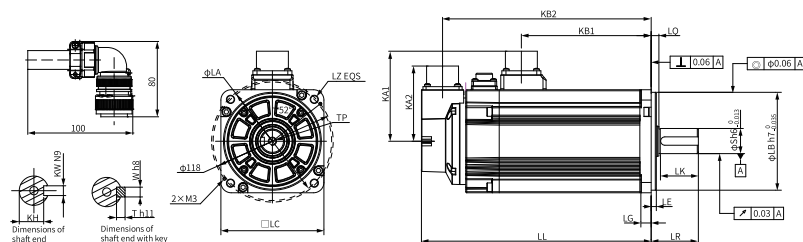
Electrical specifications of the brake

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

Allowable load

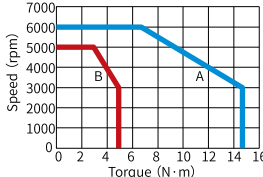
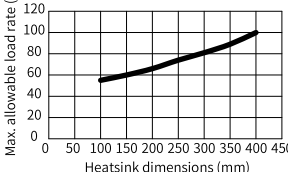
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45 ± 1	115	4 x φ7	88	92	74	140.5 (168.5)	10	5 ± 0.3
LQ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5 ± 0.75	φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	4.65 (5.75)

4.3.10 MS1H2-15C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	4.2		Heatsink-based derating curve	
Maximum current (A)	14			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.28			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35±10%		
	Motor with brake	3.17±10%		

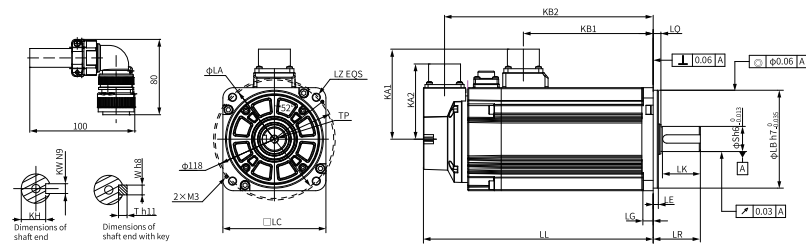
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ7	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	φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	4.65 (5.75)

4.3.11 MS1H2-15C30CD-A33*R

Motor specifications			Torque-Speed characteristics																					
Frame size (mm)	100		— A Intermittent duty zone — B Continuous duty zone <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>5000</td></tr><tr><td>4</td><td>6000</td><td>3000</td></tr><tr><td>6</td><td>6000</td><td>3000</td></tr><tr><td>14</td><td>3000</td><td>3000</td></tr><tr><td>15</td><td>2500</td><td>3000</td></tr><tr><td>16</td><td>2000</td><td>3000</td></tr></tbody></table>	Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	4	6000	3000	6	6000	3000	14	3000	3000	15	2500	3000	16	2000	3000
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																						
0	6000	5000																						
4	6000	3000																						
6	6000	3000																						
14	3000	3000																						
15	2500	3000																						
16	2000	3000																						
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 (A)	4.2																							
Maximum current (A)	14																							
Rated speed (rpm)	3000																							
Maximum Speed (rpm)	6000																							
Torque coefficient (N·m/A)	1.28																							
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35 ± 10%																						
	Motor with brake	3.17 ± 10%																						

Heatsink-based derating curve																	
Max. allowable load rate (%) <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>55</td></tr><tr><td>150</td><td>60</td></tr><tr><td>200</td><td>65</td></tr><tr><td>250</td><td>75</td></tr><tr><td>300</td><td>85</td></tr><tr><td>350</td><td>95</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	100	55	150	60	200	65	250	75	300	85	350	95	400	100
Heatsink dimensions (mm)	Max. allowable load rate (%)																
100	55																
150	60																
200	65																
250	75																
300	85																
350	95																
400	100																

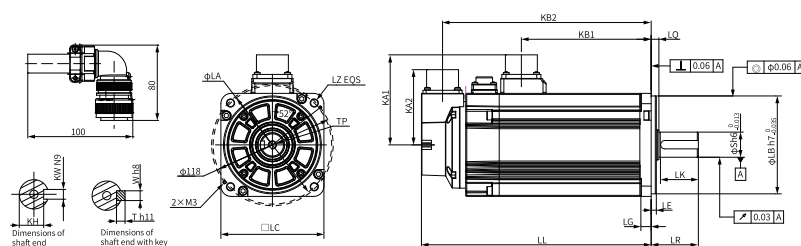
Electrical specifications of the brake

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

Allowable load

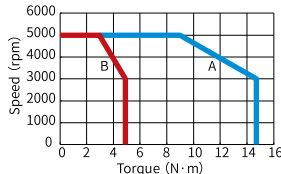
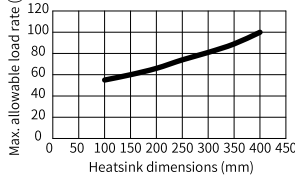
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45 ± 1	115	4 x Φ7	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	Φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	4.65 (5.75)

4.3.12 MS1H2-15C30CD-T33*R

Motor specifications			Torque-Speed characteristics
Frame size (mm)	100		
Inertia and 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 (A)	4.2		
Maximum current (A)	14		
Rated speed (rpm)	3000		
Maximum speed (rpm)	5000		
Torque coefficient (N·m/A)	1.28		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	2.35±10%	
	Motor with brake	3.17±10%	

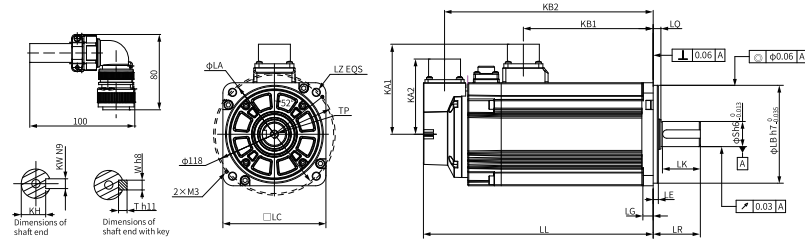
Electrical specifications of the brake

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

Allowable load

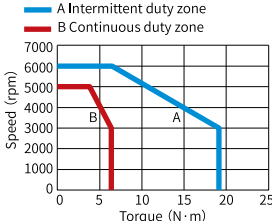
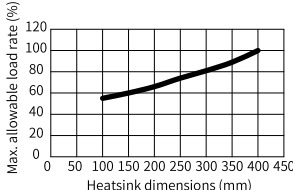
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	161 (189)	45 ± 1	115	4 x Φ7	88	92	74	140.5 (168.5)	10	5 ± 0.3
LQ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5 ± 0.75	Φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	4.65 (5.75)

4.3.13 MS1H2-20C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	11.3		Heatsink-based derating curve	
Maximum current (A)	42			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.60			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92±10%		
	Motor with brake	3.74±10%		

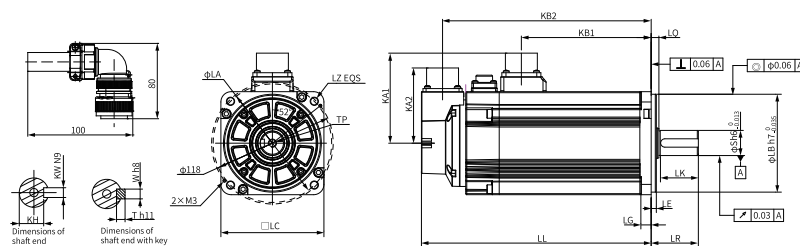
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ7	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	φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	5.5 (6.55)

4.3.14 MS1H2-20C30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100		— A Intermittent duty zone of S012 drive - - A Intermittent duty zone of S018 drive — B Continuous duty zone	
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 (A)	11.3		Heatsink-based derating curve	
Maximum current (A)	42		Max. allowable load rate (%) Heatsink dimensions (mm)	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.60			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92±10%		
	Motor with brake	3.74±10%		

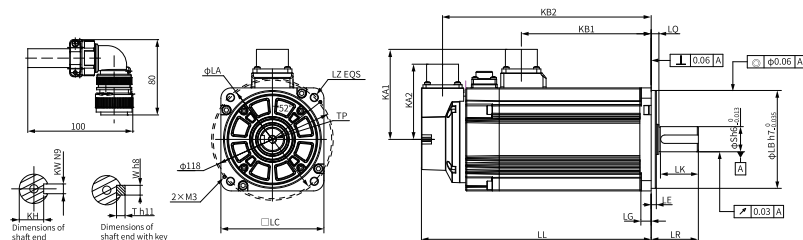
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil Resistance (Ω) ± 7%	Excitation 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 x Φ7	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	Φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	5.5 (6.55)

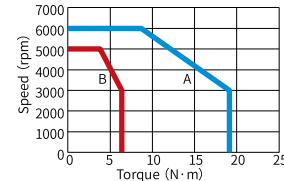
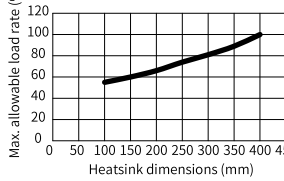
Motor specifications		Torque-Speed characteristics	
Frame size (mm)	100		— A Intermittent duty zone — B Continuous duty zone
Inertia and capacity	Low inertia, medium capacity		
Rated power (kW)	2.0		
Voltage (V)	220		
Rated torque (N·m)	6.36		
Maximum torque (N·m)	15.5		
Rated current (A)	11.3		
Maximum current (A)	32		
Rated speed (rpm)	3000		
Maximum speed (rpm)	5000		
Torque coefficient (N·m/A)	0.60		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	2.92 ± 10%	
	Motor with brake	3.74 ± 10%	

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

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

LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45±1	115	4 x ϕ7	88	108	74	156.5 (184.5)	10	5±0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5±0.75	ϕ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	5.5 (6.55)

4.3.16 MS1H2-20C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	5.6			
Maximum current (A)	20			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.19			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92±10%		
	Motor with brake	3.74±10%		

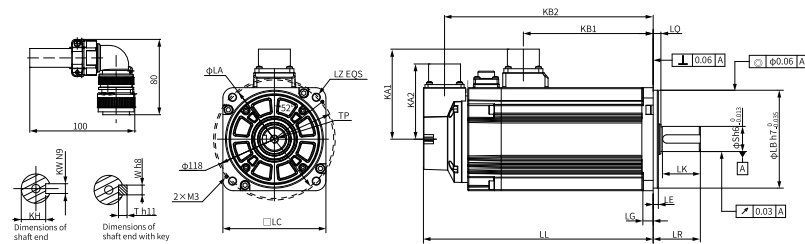
Electrical specifications of the brake

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

Allowable load

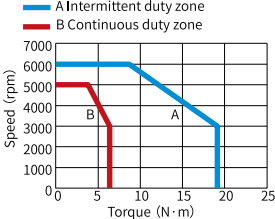
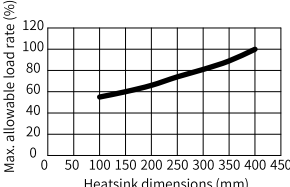
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45±1	115	4 x Φ7	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	Φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	5.5 (6.55)

4.3.17 MS1H2-20C30CD-A33*R

Motor specifications			Torque-Speed characteristics
Frame 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 (A)	5.6		
Maximum current (A)	20		
Rated speed (rpm)	3000		
Maximum Speed (rpm)	6000		
Torque coefficient (N·m/A)	1.19		
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92±10%	
	Motor with brake	3.74±10%	

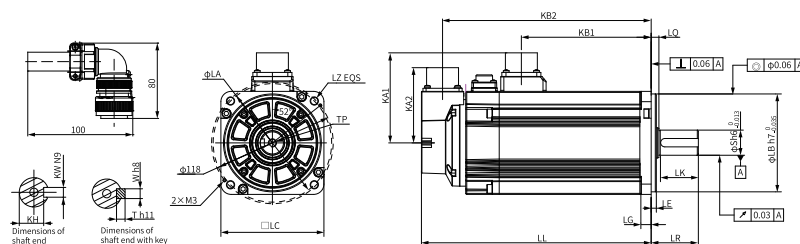
Electrical specifications of the brake

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

Allowable load

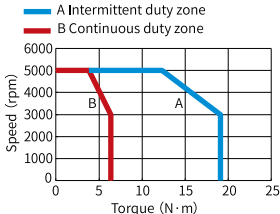
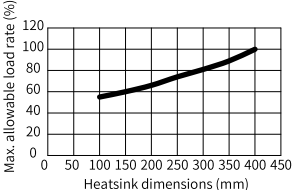
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45 ± 1	115	4 x φ7	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	φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	5.5 (6.55)

4.3.18 MS1H2-20C30CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia and 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 (A)	5.6			
Maximum current (A)	20			
Rated speed (rpm)	3000			
Maximum speed (rpm)	5000			
Torque coefficient (N·m/A)	1.19			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	2.92±10%		
	Motor with brake	3.74±10%		

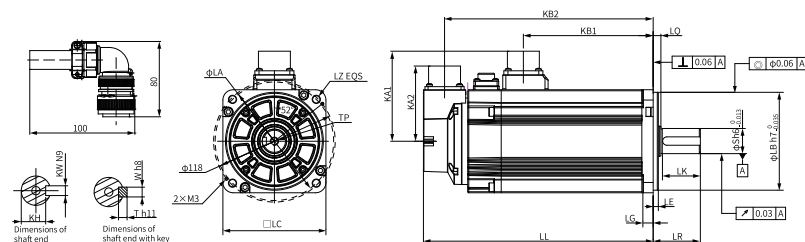
Electrical specifications of the brake

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

Allowable load

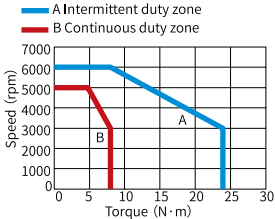
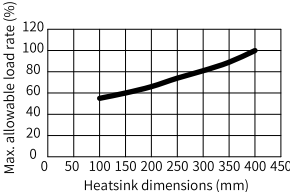
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45 ± 1	115	4 x φ7	88	108	74	156.5 (184.5)	10	5 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5 ± 0.75	φ95h7 ⁰ -0.035		24	M8 x 16	36	20 ⁰ -0.2	8	8	7	5.5 (6.55)

4.3.19 MS1H2-25C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	14.7			
Maximum current (A)	53			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.60			
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49±10%		
	Motor with brake	4.3±10%		

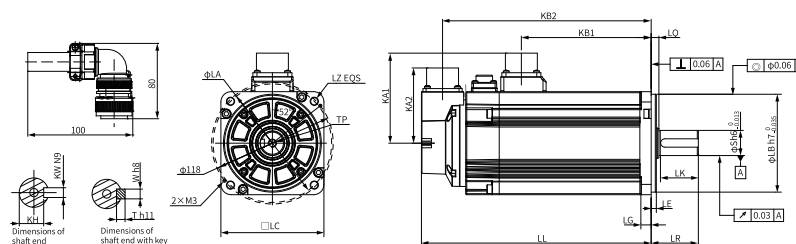
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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

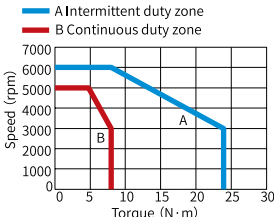
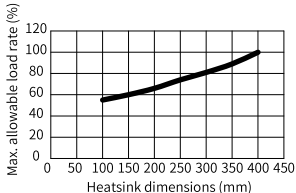
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45±1	115	4 x Φ7	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	Φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	6.3 (7.35)

4.3.20 MS1H2-25C30CB-A33*R

Motor specifications		Torque-Speed characteristics	
Frame 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 (A)	14.7		
Maximum current (A)	53		
Rated speed (rpm)	3000		
Maximum Speed (rpm)	6000		
Torque coefficient (N·m/A)	0.60		
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49±10%	
	Motor with brake	4.3±10%	

Heatsink-based derating curve	
	
	

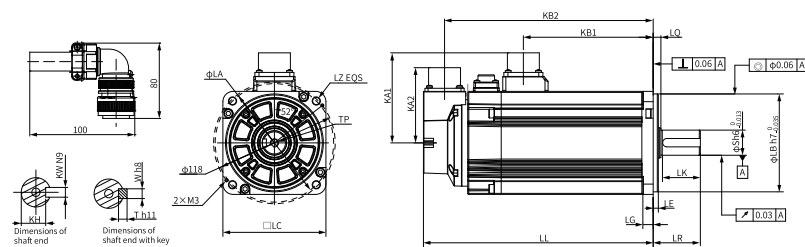
Electrical specifications of the brake

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

Allowable load

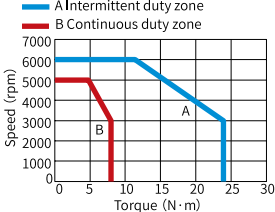
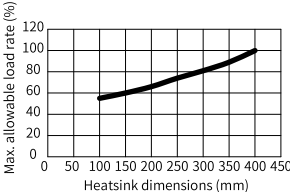
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45 ± 1	115	4 x φ7	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	φ95h7 ⁰ -0.035	24	M8 x 16	36	20 ⁰ -0.2	8	8	7	6.3 (7.35)	

4.3.21 MS1H2-25C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	7.2		Heatsink-based derating curve 	
Maximum current (A)	26			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.18			
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49±10%		
	Motor with brake	4.3±10%		

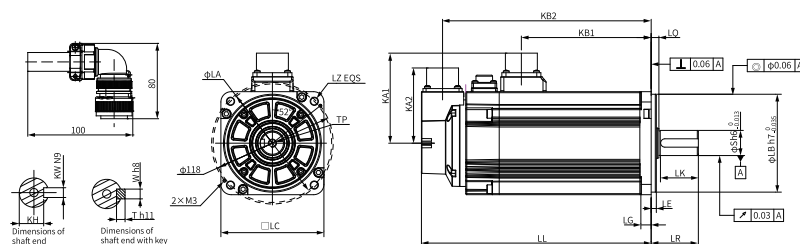
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x Φ7	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	Φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	6.3 (7.35)

4.3.22 MS1H2-25C30CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	7.2		Heatsink-based derating curve	
Maximum current (A)	26			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.18			
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49±10%		
	Motor with brake	4.3±10%		

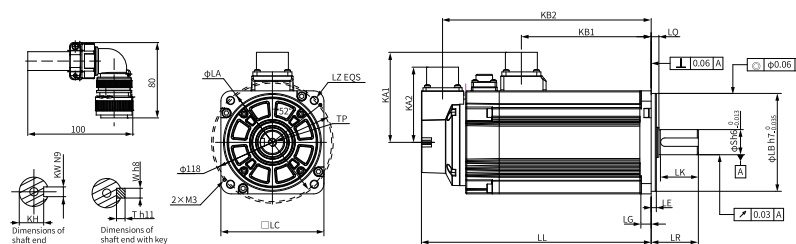
Electrical specifications of the brake

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

Allowable load

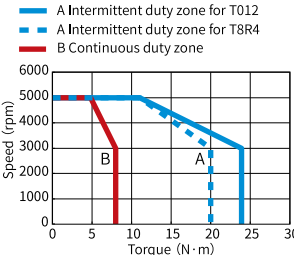
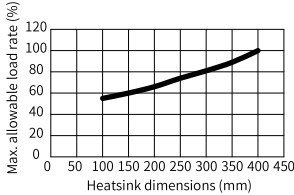
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45±1	115	4 x φ7	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	φ95h7 ⁰ _{-0.035}	24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	6.3 (7.35)	

4.3.23 MS1H2-25C30CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	100			
Inertia and 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 (A)	7.2		Heatsink-based derating curve	
Maximum current (A)	26			
Rated speed (rpm)	3000			
Maximum speed (rpm)	5000			
Torque coefficient (N·m/A)	1.18			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	3.49±10%		
	Motor with brake	4.3±10%		

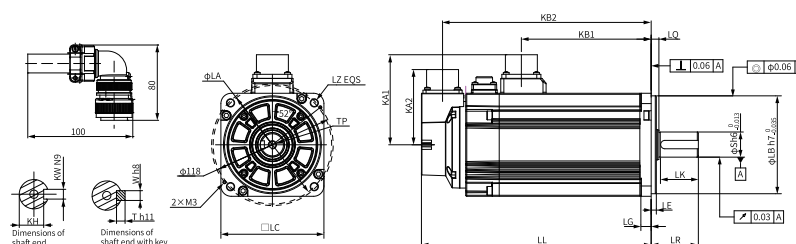
Electrical specifications of the brake

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

Allowable load

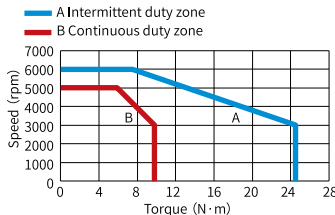
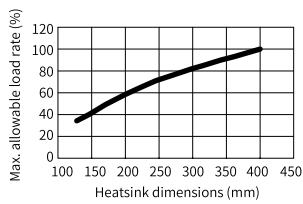
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45±1	115	4 x φ7	88	126	74	174.5 (202.5)	10	5±0.3
LQ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
7.5±0.75	φ95h7 ⁰ _{-0.035}		24	M8 x 16	36	20 ⁰ _{-0.2}	8	8	7	6.3 (7.35)

4.3.24 MS1H2-30C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	16.6		Heatsink-based derating curve 	
Maximum current (A)	55			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.67			
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4±10%		
	Motor with brake	9.38±10%		

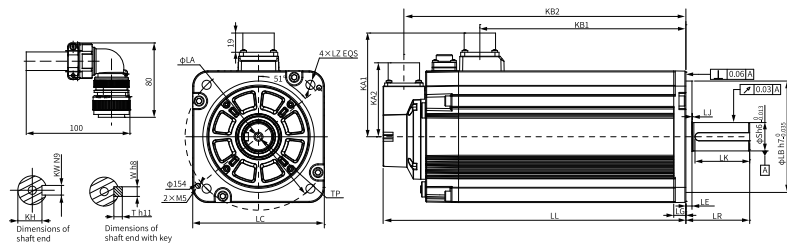
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	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	φ110h7 ⁰ _{-0.035}	28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)	

4.3.25 MS1H2-30C30CB-A33*R

Motor specifications			Torque-Speed characteristics																		
Frame size (mm)	130		Speed (rpm) Torque (N·m) A Intermittent duty zone B Continuous duty zone <table border="1"><caption>Data for Torque-Speed characteristics</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>5000</td></tr><tr><td>8</td><td>6000</td><td>3000</td></tr><tr><td>10</td><td>5500</td><td>3000</td></tr><tr><td>24</td><td>3000</td><td>3000</td></tr><tr><td>25</td><td>0</td><td>3000</td></tr></tbody></table>	Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	8	6000	3000	10	5500	3000	24	3000	3000	25	0	3000
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																			
0	6000	5000																			
8	6000	3000																			
10	5500	3000																			
24	3000	3000																			
25	0	3000																			
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 (A)	16.6		Heatsink-based derating curve																		
Maximum current (A)	55		Max. allowable load rate (%) Heatsink dimensions (mm) <table border="1"><caption>Data for Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>35</td></tr><tr><td>150</td><td>45</td></tr><tr><td>200</td><td>60</td></tr><tr><td>250</td><td>75</td></tr><tr><td>300</td><td>85</td></tr><tr><td>350</td><td>95</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>	Heatsink dimensions (mm)	Max. allowable load rate (%)	100	35	150	45	200	60	250	75	300	85	350	95	400	100		
Heatsink dimensions (mm)	Max. allowable load rate (%)																				
100	35																				
150	45																				
200	60																				
250	75																				
300	85																				
350	95																				
400	100																				
Rated speed (rpm)	3000																				
Maximum Speed (rpm)	6000																				
Torque coefficient (N·m/A)	0.67																				
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4±10%																			
	Motor with brake	9.38±10%																			

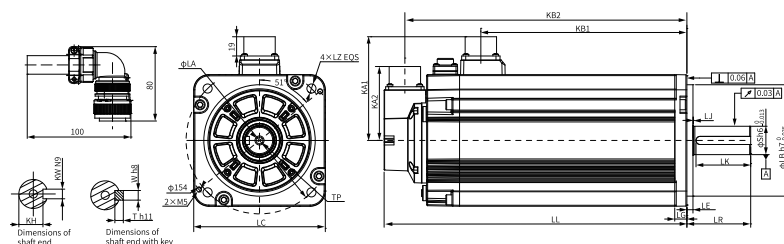
Electrical specifications of the brake

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

Allowable load

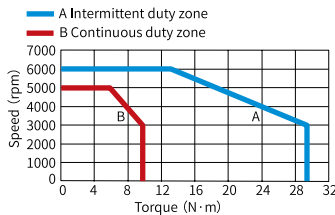
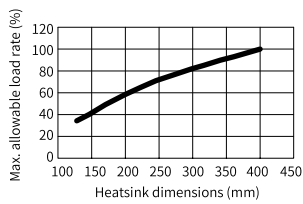
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63±1	145	4 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)

4.3.26 MS1H2-30C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
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 (A)	8.9		Heatsink-based derating curve	
Maximum current (A)	29			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.25			
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4±10%		
	Motor with brake	9.38±10%		

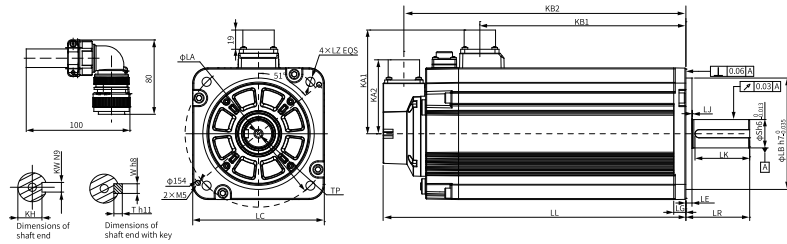
Electrical specifications of the brake

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

Allowable load

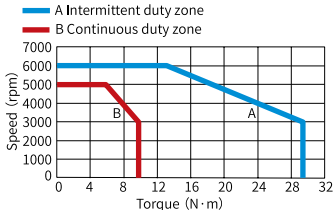
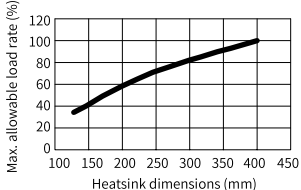
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63±1	145	4 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)

4.3.27 MS1H2-30C30CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
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 (A)	8.9			
Maximum current (A)	29			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.25			
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4±10%		
	Motor with brake	9.38±10%		

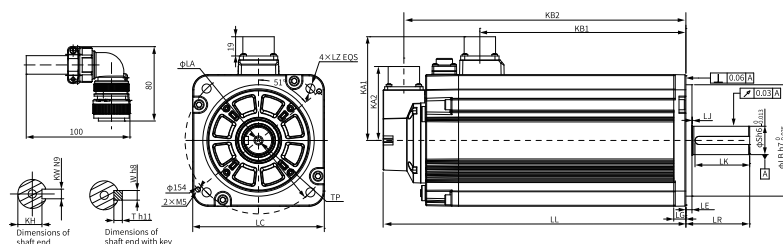
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)

4.3.28 MS1H2-30C30CD-T33*R

Motor specifications		Torque-Speed characteristics	
Frame size (mm)	130		
Inertia and 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 (A)	8.9		
Maximum current (A)	29		
Rated speed (rpm)	3000		
Maximum speed (rpm)	5000		
Torque coefficient (N·m/A)	1.25		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	6.4±10%	
	Motor with brake	9.38±10%	

Torque-Speed characteristics

Legend: A Intermittent duty zone, B Continuous duty zone

Speed (rpm) vs Torque (N·m)

Heatsink-based derating curve

Max. allowable load rate (%) vs Heatsink dimensions (mm)

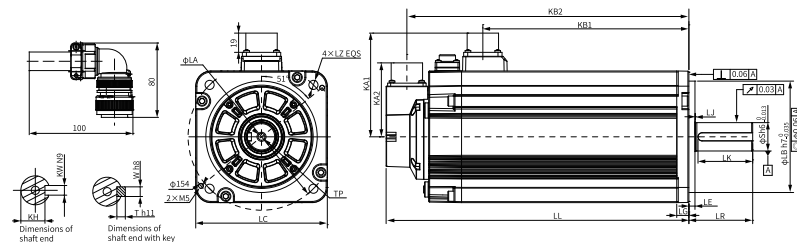
Electrical specifications of the brake

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

Allowable load

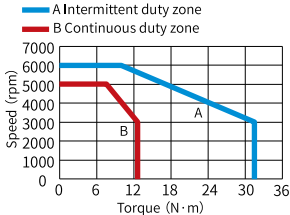
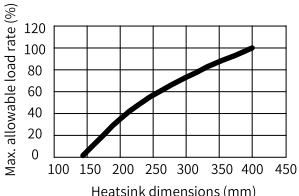
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63±1	145	4 x ϕ9	102.4	127.5	74	177.5 (202.5)	12	6±0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	ϕ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	10.0 (11.9)

4.3.29 MS1H2-40C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	22		Heatsink-based derating curve	
Maximum current (A)	67.5			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	0.65			
Rotor moment of inertia (kg·cm ²)	Motor without brake	9±10%		
	Motor with brake	11.98±10%		

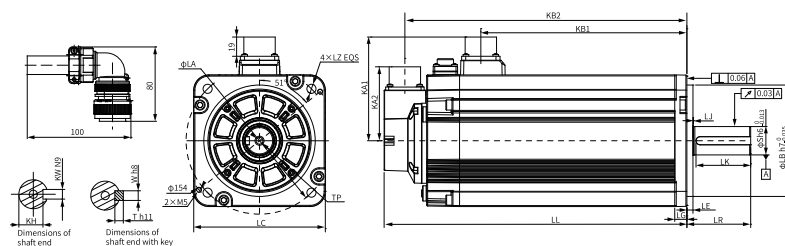
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	13.2 (15.1)

4.3.30 MS1H2-40C30CB-A33*R

Motor specifications			Torque-Speed characteristics
Frame size (mm)	130		Speed (rpm) Torque (N·m) A Intermittent duty zone B Continuous duty zone
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 (A)	22		
Maximum current (A)	67.5		Heatsink-based derating curve
Rated speed (rpm)	3000		Max. allowable load rate (%) Heatsink dimensions (mm)
Maximum Speed (rpm)	6000		
Torque coefficient (N·m/A)	0.65		
Rotor moment of inertia (kg·cm ²)	Motor without brake	9±10%	
	Motor with brake	11.98±10%	

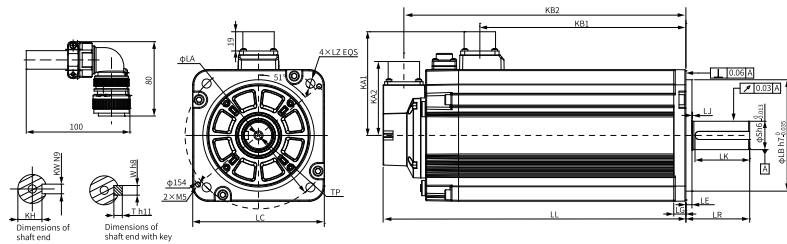
Electrical specifications of the brake

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

Allowable load

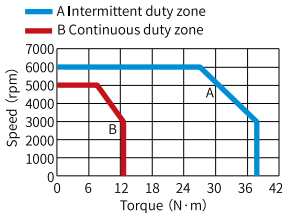
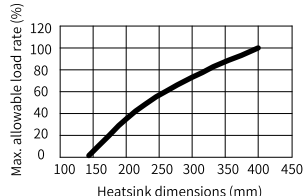
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63±1	145	4 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	13.2 (15.1)

4.3.31 MS1H2-40C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	13.5			
Maximum current (A)	42.5			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.06			
Rotor moment of inertia (kg·cm ²)	Motor without brake	9±10%		
	Motor with brake	11.98±10%		

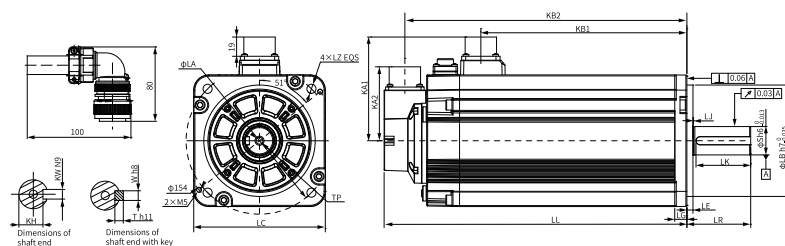
Electrical specifications of the brake

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

Allowable load

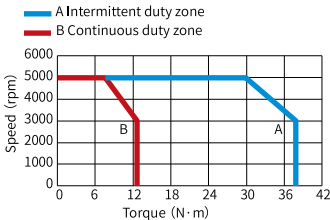
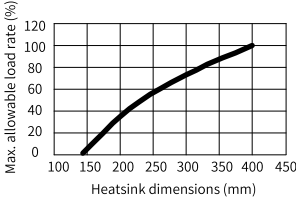
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63±1	145	4 x φ9	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	φ110h7 ⁰ _{-0.035}	28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	13.2 (15.1)	

4.3.33 MS1H2-40C30CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
Inertia and 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 (A)	13.5			
Maximum current (A)	42.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	5000			
Torque coefficient (N·m/A)	1.06			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	9±10%		
	Motor with brake	11.98±10%		

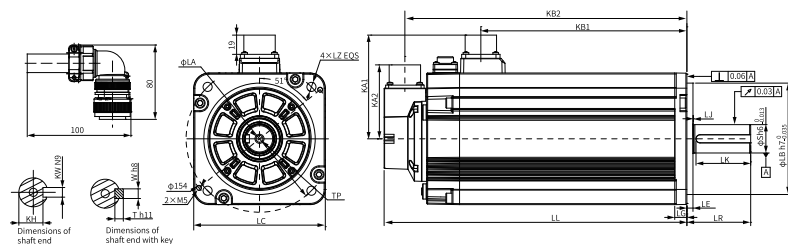
Electrical specifications of the brake

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

Allowable load

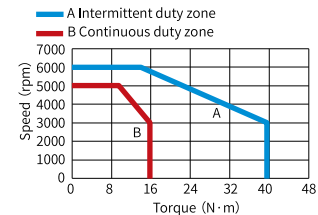
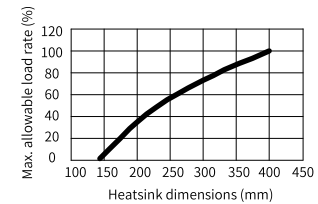
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63±1	145	4 x φ9	102.4	165.5	74	215.5 (240.5)	12	6±0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	13.2 (15.1)

4.3.34 MS1H2-50C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	22			
Maximum current (A)	67.5		Heatsink-based derating curve 	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N · m/A)	0.81			
Rotor moment of inertia (kg · cm ²)	Motor without brake	11.6±10%		
	Motor with brake	14.58±10%		

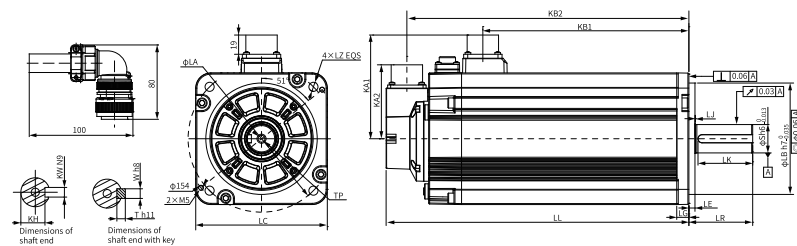
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)

Motor specifications		Torque-Speed characteristics	
Frame 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 (A)	22		
Maximum current (A)	67.5		
Rated speed (rpm)	3000		
Maximum Speed (rpm)	6000		
Torque coefficient (N·m/A)	0.81		
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6±10%	
	Motor with brake	14.58±10%	

The graph shows the torque-speed characteristics of the motor. The y-axis represents Speed in rpm, ranging from 0 to 7000. The x-axis represents Torque in N·m, ranging from 0 to 48. Two operating zones are defined: Zone A (Intermittent duty) shown in blue and Zone B (Continuous duty) shown in red. Zone A starts at approximately 6000 rpm for 0 N·m torque and decreases linearly to 3000 rpm at 40 N·m. Zone B starts at 5000 rpm for 0 N·m torque, remains constant until about 12 N·m, and then drops vertically to 0 rpm at 16 N·m.

Heatsink-based derating curve

The derating curve shows the maximum allowable load rate as a percentage of the rated power based on the heatsink dimensions. The y-axis is 'Max. allowable load rate (%)' from 0 to 120. The x-axis is 'Heatsink dimensions (mm)' from 100 to 450. The curve starts at approximately 10% load rate for 150 mm dimensions and increases non-linearly, reaching 100% load rate at 400 mm dimensions.

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

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

Technical drawings of the motor showing front, side, and shaft end views with dimensions:

- Front View:** Shows the motor's footprint with a width of 100 and a height of 82. The mounting flange has a diameter of $\phi 64$. The base has a diameter of $\phi 156$ and a thickness of $2 \times M5$. The mounting holes are $4 \times \varnothing 5.08$. The base has a diameter of $\phi 156$ and a thickness of $2 \times M5$. The mounting holes are $4 \times \varnothing 5.08$.
- Side View:** Shows the motor's profile with a total length of 100. The mounting flange has a diameter of $\phi 64$. The base has a diameter of $\phi 156$ and a thickness of $2 \times M5$. The mounting holes are $4 \times \varnothing 5.08$. The base has a diameter of $\phi 156$ and a thickness of $2 \times M5$. The mounting holes are $4 \times \varnothing 5.08$.
- Shaft End View:** Shows the shaft with a diameter of $\phi 15.875$ and a length of 100. The mounting flange has a diameter of $\phi 64$. The base has a diameter of $\phi 156$ and a thickness of $2 \times M5$. The mounting holes are $4 \times \varnothing 5.08$. The base has a diameter of $\phi 156$ and a thickness of $2 \times M5$. The mounting holes are $4 \times \varnothing 5.08$.

LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63±1	145	4 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)

4.3.36 MS1H2-50C30CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	17		Heatsink-based derating curve	
Maximum current (A)	52.5			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	6000			
Torque coefficient (N·m/A)	1.04			
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6±10%		
	Motor with brake	14.58±10%		

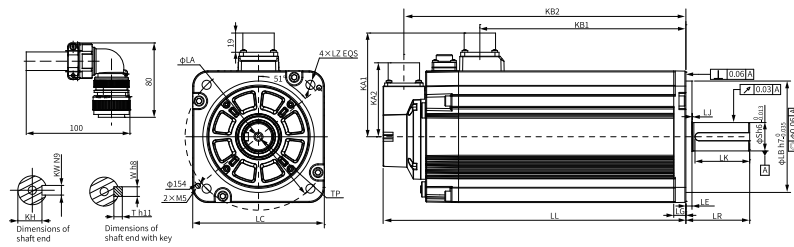
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)

4.3.37 MS1H2-50C30CD-A33*R

Motor specifications			Torque-Speed characteristics																													
Frame size (mm)	130		— A Intermittent duty zone of T021 drive - - A Intermittent duty zone of T017 drive — B Continuous duty zone <table border="1"><caption>Approximate data points from Torque-Speed graph</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone B</th><th>Speed (rpm) - Zone A (T021)</th><th>Speed (rpm) - Zone A (T017)</th></tr></thead><tbody><tr><td>0</td><td>5000</td><td>6000</td><td>6000</td></tr><tr><td>16</td><td>5000</td><td>6000</td><td>6000</td></tr><tr><td>24</td><td>3000</td><td>6000</td><td>6000</td></tr><tr><td>32</td><td>0</td><td>5000</td><td>5000</td></tr><tr><td>40</td><td>0</td><td>3000</td><td>3000</td></tr><tr><td>48</td><td>0</td><td>0</td><td>3000</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone B	Speed (rpm) - Zone A (T021)	Speed (rpm) - Zone A (T017)	0	5000	6000	6000	16	5000	6000	6000	24	3000	6000	6000	32	0	5000	5000	40	0	3000	3000	48	0	0	3000
Torque (N·m)	Speed (rpm) - Zone B	Speed (rpm) - Zone A (T021)			Speed (rpm) - Zone A (T017)																											
0	5000	6000			6000																											
16	5000	6000			6000																											
24	3000	6000			6000																											
32	0	5000			5000																											
40	0	3000			3000																											
48	0	0			3000																											
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 (A)	17																															
Maximum current (A)	52.5																															
Rated speed (rpm)	3000																															
Maximum Speed (rpm)	6000																															
Torque coefficient (N·m/A)	1.04																															
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6±10%																														
	Motor with brake	14.58±10%																														

Heatsink-based derating curve															
Max. allowable load rate (%) Heatsink dimensions (mm) <table border="1"><caption>Approximate data points from Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>150</td><td>0</td></tr><tr><td>200</td><td>30</td></tr><tr><td>250</td><td>55</td></tr><tr><td>300</td><td>75</td></tr><tr><td>350</td><td>90</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	150	0	200	30	250	55	300	75	350	90	400	100
Heatsink dimensions (mm)	Max. allowable load rate (%)														
150	0														
200	30														
250	55														
300	75														
350	90														
400	100														

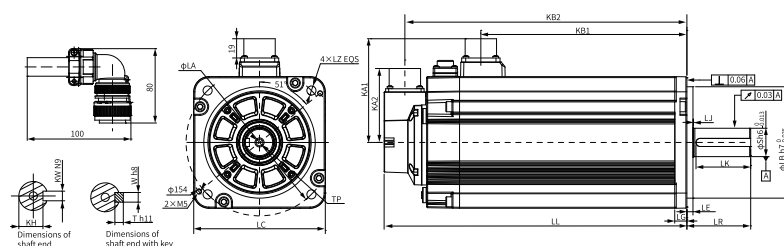
Electrical specifications of the brake

Holding torque (N·m)	Power 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

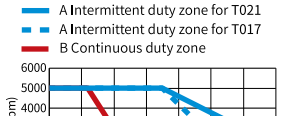
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63±1	145	4 x φ9	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	φ110h7 ⁰ _{-0.035}		28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)

4.3.38 MS1H2-50C30CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
Inertia and 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 (A)	17			
Maximum current (A)	52.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	5000			
Torque coefficient (N·m/A)	1.04			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	11.6±10%		
	Motor with brake	14.58±10%		

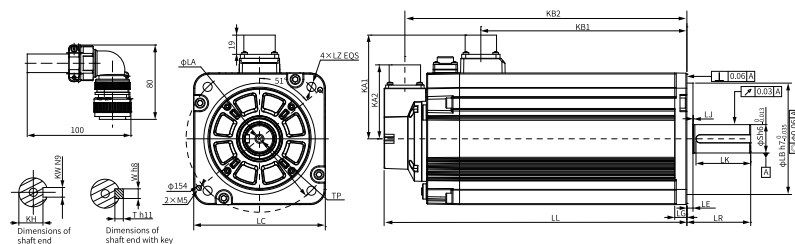
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation 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

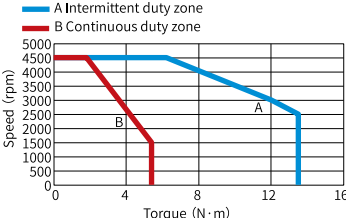
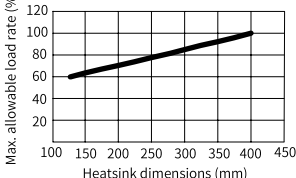
Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63±1	145	4 x φ9	102.4	203.5	74	253.5 (278.5)	12	6±0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5±0.75	φ110h7 ⁰ _{-0.035}	28	M8 x 20	54	24 ⁰ _{-0.2}	8	8	7	16.35 (18.25)	

4.4 MS1H3 Series Motor with Medium Inertia and Medium Capacity

4.4.1 MS1H3-85B15CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	6.6			
Maximum current (A)	17.2			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	0.93			
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56±10%		
	Motor with brake	15.8±10%		

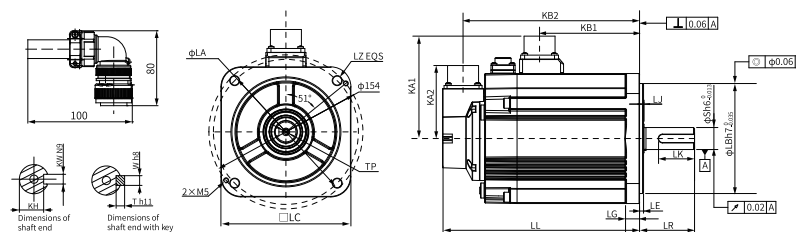
Electrical specifications of the brake

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

Allowable load

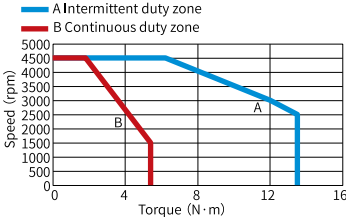
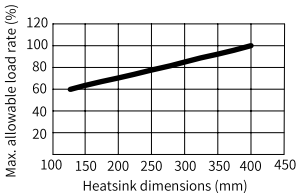
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4 x φ9	103	70	73	121.5 (146.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)

4.4.2 MS1H3-85B15CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	6.6			
Maximum current (A)	17.2			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	0.93			
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56±10%		
	Motor with brake	15.8±10%		

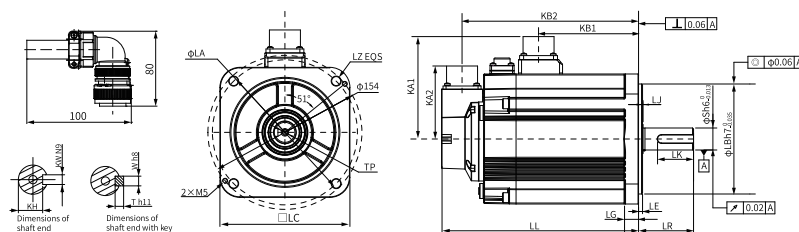
Electrical specifications of the brake

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

Allowable load

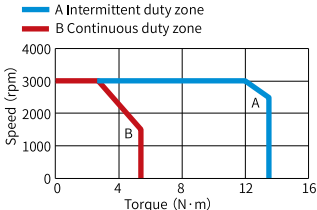
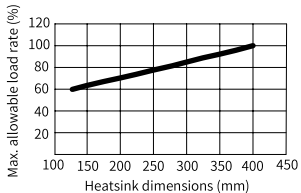
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4 x φ9	103	70	73	121.5 (146.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)

4.4.3 MS1H3-85B15CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
Inertia and 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 (A)	6.6			
Maximum current (A)	17.2			
Rated speed (rpm)	1500			
Maximum speed (rpm)	3000			
Torque coefficient (N·m/A)	0.93			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	13.56±10%		
	Motor with brake	15.8±10%		

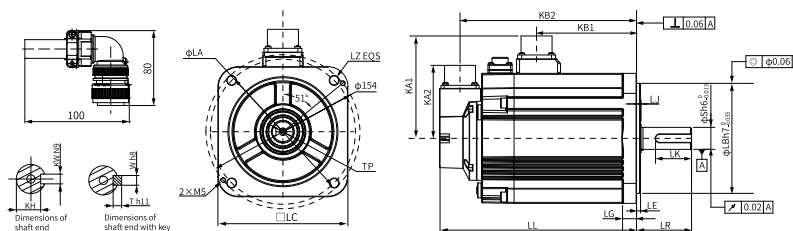
Electrical specifications of the brake

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

Allowable load

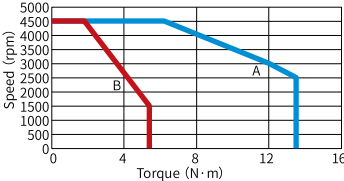
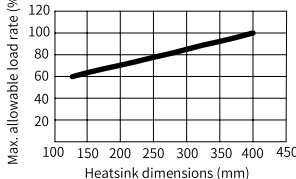
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4 x φ9	103	70	74	121.5 (146.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)

4.4.4 MS1H3-85B15CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
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 (A)	3.5		Heatsink-based derating curve	
Maximum current (A)	8.5			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.84			
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56±10%		
	Motor with brake	15.8±10%		

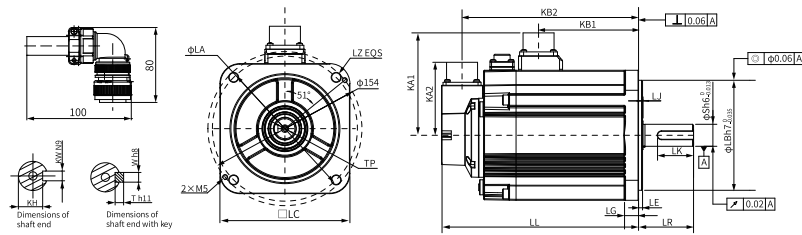
Electrical specifications of the brake

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

Allowable load

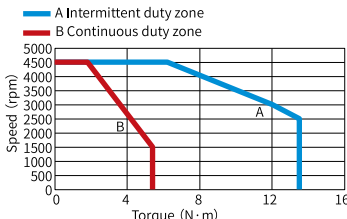
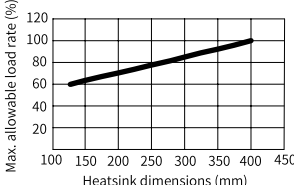
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4 x ϕ9	103	70	73	121.5 (146.5)	14	4
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5±0.75	ϕ110h7 ⁰ _{-0.035}	22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)	

4.4.5 MS1H3-85B15CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
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 (A)	3.5			
Maximum current (A)	8.5			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.84			
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56±10%		
	Motor with brake	15.8±10%		

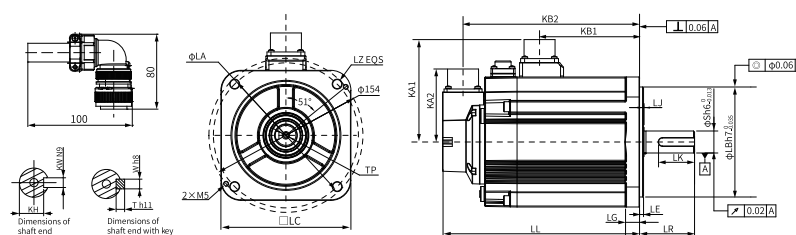
Electrical specifications of the brake

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

Allowable load

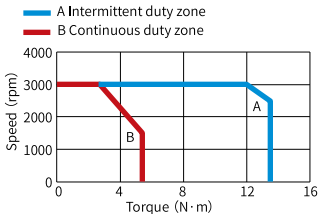
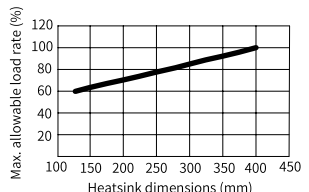
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4 x φ9	103	70	73	121.5 (146.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)

4.4.6 MS1H3-85B15CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	130			
Inertia and 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 (A)	3.5			
Maximum current (A)	8.5			
Rated speed (rpm)	1500			
Maximum speed (rpm)	3000			
Torque coefficient (N·m/A)	1.84			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	13.56±10%		
	Motor with brake	15.8±10%		

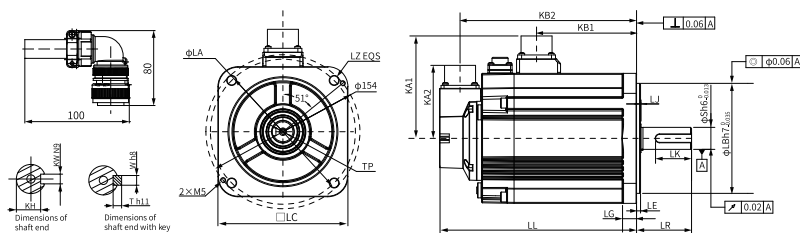
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation 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

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55±1	145	4 x φ9	103	70	74	121.5 (146.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	5.8 (7.7)

4.4.7 MS1H3-13C15CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	10.5			
Maximum current (A)	27.3			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	0.89			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25±10%		
	Motor with brake	21.5±10%		

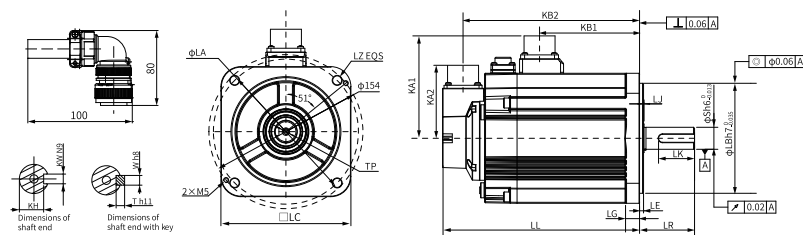
Electrical specifications of the brake

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

Allowable load

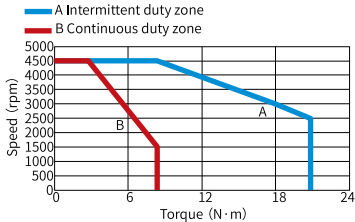
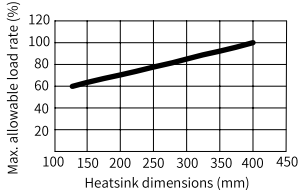
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55±1	145	4 x ϕ9	103	85	73	136.5 (161.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	ϕ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)

4.4.8 MS1H3-13C15CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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		Heatsink-based derating curve 	
Rated current (A)	10.5			
Maximum current (A)	27.3			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	0.89			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25±10%		
	Motor with brake	21.5±10%		

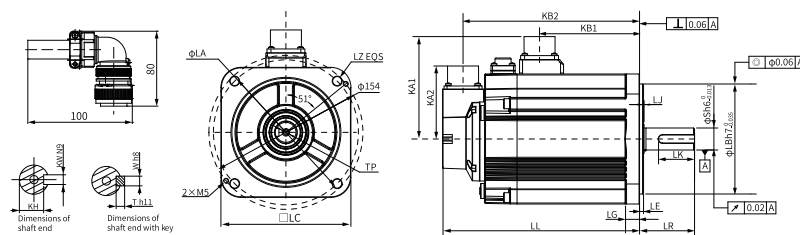
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	103	85	73	136.5 (161.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)

4.4.9 MS1H3-13C15CB-T33*R

Motor specifications		Torque-Speed characteristics	
Frame size (mm)	130		
Inertia and 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 (A)	10.5		
Maximum current (A)	27.3		
Rated speed (rpm)	1500		
Maximum speed (rpm)	3000		
Torque coefficient (N·m/A)	0.89		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	19.25±10%	
	Motor with brake	21.5±10%	

Legend:
— A Intermittent duty zone
— B Continuous duty zone

Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B
0	3000	3000
10	3000	1500
20	1500	-
24	0	-

Heatsink-based derating curve																			
Max. allowable load rate (%)	Legend: — Max. allowable load rate (%) <table border="1"><caption>Data points for Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>60</td></tr><tr><td>150</td><td>65</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>75</td></tr><tr><td>300</td><td>80</td></tr><tr><td>350</td><td>85</td></tr><tr><td>400</td><td>90</td></tr><tr><td>450</td><td>100</td></tr></tbody></table>	Heatsink dimensions (mm)	Max. allowable load rate (%)	100	60	150	65	200	70	250	75	300	80	350	85	400	90	450	100
		Heatsink dimensions (mm)	Max. allowable load rate (%)																
100	60																		
150	65																		
200	70																		
250	75																		
300	80																		
350	85																		
400	90																		
450	100																		

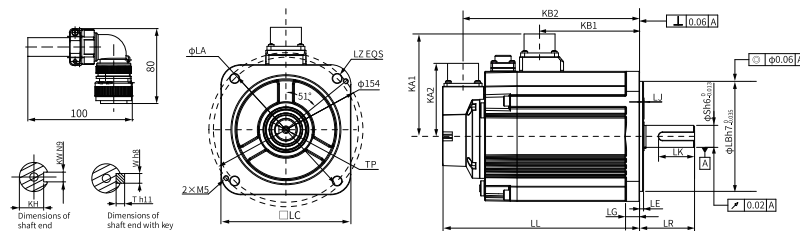
Electrical specifications of the brake

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

Allowable load

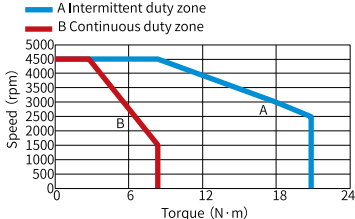
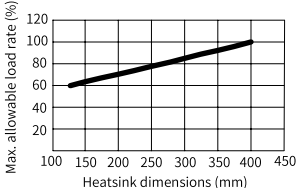
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55±1	145	4 x φ9	103	85	74	136.5 (161.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)

4.4.10 MS1H3-13C15CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	5.1			
Maximum current (A)	12.6			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.85			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25±10%		
	Motor with brake	21.5±10%		

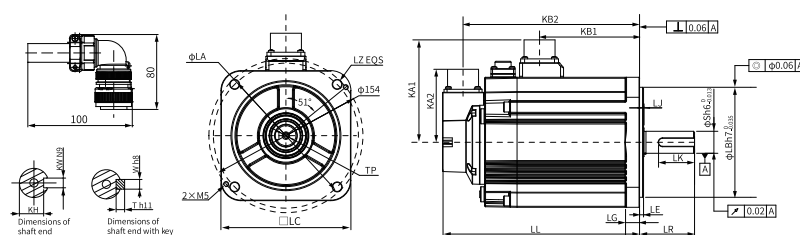
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ9	103	85	73	136.5 (161.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)

4.4.11 MS1H3-13C15CD-A33*R

Motor specifications			Torque-Speed characteristics															
Frame size (mm)	130		— A Intermittent duty zone — B Continuous duty zone <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>4500</td><td>4500</td></tr><tr><td>8.34</td><td>4500</td><td>1500</td></tr><tr><td>20.85</td><td>2500</td><td>1500</td></tr><tr><td>20.85</td><td>0</td><td>1500</td></tr></tbody></table>	Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	4500	4500	8.34	4500	1500	20.85	2500	1500	20.85	0	1500
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																
0	4500	4500																
8.34	4500	1500																
20.85	2500	1500																
20.85	0	1500																
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 (A)	5.1																	
Maximum current (A)	12.6																	
Rated speed (rpm)	1500																	
Maximum Speed (rpm)	4500																	
Torque coefficient (N·m/A)	1.85																	
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25±10%																
	Motor with brake	21.5±10%																

Heatsink-based derating curve							
Max. allowable load rate (%) Heatsink dimensions (mm) <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>60</td></tr><tr><td>450</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	100	60	450	100
Heatsink dimensions (mm)	Max. allowable load rate (%)						
100	60						
450	100						

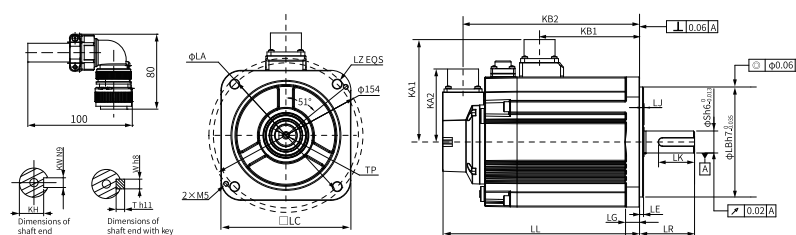
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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

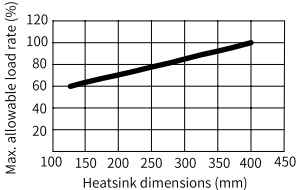
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55±1	145	4 x φ9	103	85	73	136.5 (161.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)

4.4.12 MS1H3-13C15CD-T33*R

Motor specifications		Torque-Speed characteristics	
Frame size (mm)	130		
Inertia and 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 (A)	5.1		
Maximum current (A)	12.6		
Rated speed (rpm)	1500		
Maximum speed (rpm)	3000		
Torque coefficient (N·m/A)	1.85		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	19.25±10%	
	Motor with brake	21.5±10%	

Heatsink-based derating curve	
Max. allowable load rate (%)	

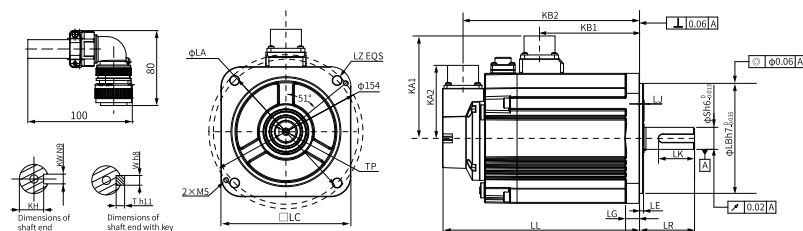
Electrical specifications of the brake

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

Allowable load

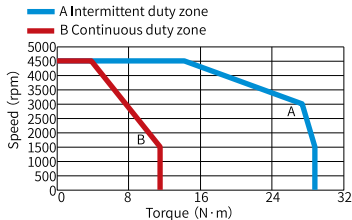
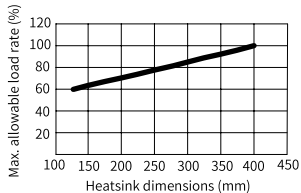
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55±1	145	4 x φ9	103	85	74	136.5 (161.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	7.1 (8.9)

4.4.14 MS1H3-18C15CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	11.9			
Maximum current (A)	32.2			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.09		Heatsink-based derating curve 	
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9±10%		
	Motor with brake	27.2±10%		

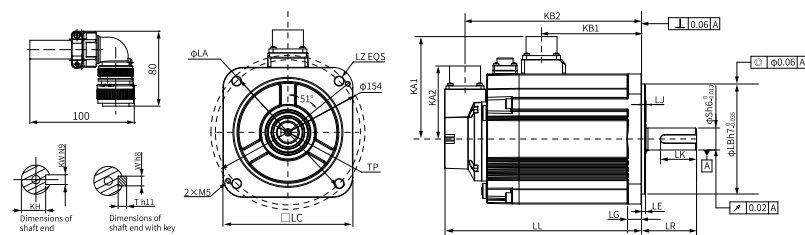
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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

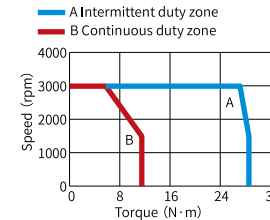
Dimensions (mm)

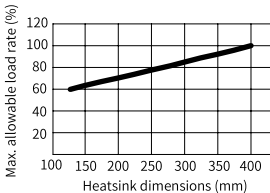


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4 x φ9	103	100	73	151.5 (176.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)

4.4.15 MS1H3-18C15CB-T33*R

Motor specifications		Torque-Speed characteristics	
Frame size (mm)	130		
Inertia and 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 (A)	11.9		
Maximum current (A)	32.2		
Rated speed (rpm)	1500		
Maximum speed (rpm)	3000		
Torque coefficient (N·m/A)	1.09		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	24.9±10%	
	Motor with brake	27.2±10%	

Torque-Speed characteristics	
	

Heatsink-based derating curve	
	

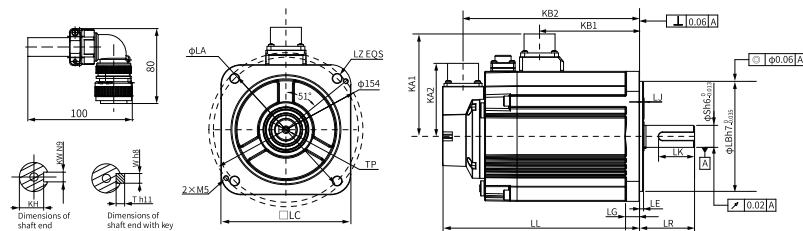
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation 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

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4 x φ9	103	100	74	151.5 (176.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)

4.4.16 MS1H3-18C15CD-A6/S63*R

Motor specifications		Torque-Speed characteristics	
Frame 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 (A)	6.75		
Maximum current (A)	17.7		
Rated speed (rpm)	1500		
Maximum Speed (rpm)	4500		
Torque coefficient (N·m/A)	1.87		
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9±10%	
	Motor with brake	27.2±10%	

Torque-Speed characteristics

Legend: A Intermittent duty zone, B Continuous duty zone

Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B
0	4500	4500
5	4500	4500
12	4500	0
15	4500	0
30	0	0

Heatsink-based derating curve

Heatsink dimensions (mm)	Max. allowable load rate (%)
100	60
200	70
300	80
400	100

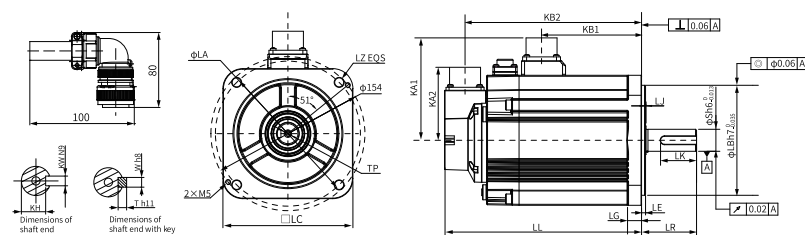
Electrical specifications of the brake

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

Allowable load

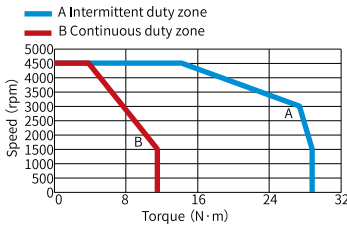
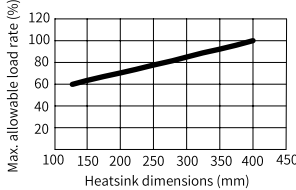
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4 x ϕ9	103	100	73	151.5 (176.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	ϕ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)

4.4.17 MS1H3-18C15CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	6.75			
Maximum current (A)	17.7			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.87		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9±10%		
	Motor with brake	27.2±10%		

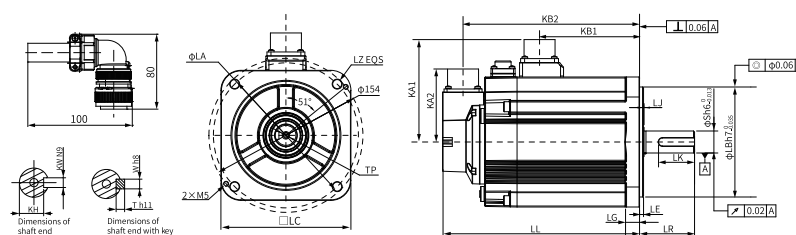
Electrical specifications of the brake

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

Allowable load

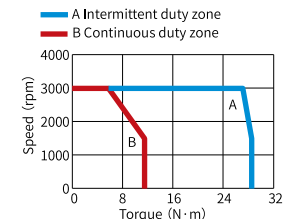
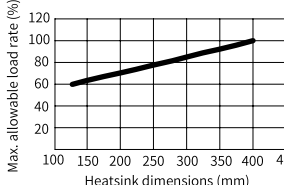
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4 x φ9	103	100	73	151.5 (176.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)

4.4.18 MS1H3-18C15CD-T33*R

Motor specifications			Torque-Speed characteristics
Frame size (mm)	130		
Inertia and 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 (A)	6.75		
Maximum current (A)	17.7		
Rated speed (rpm)	1500		
Maximum speed (rpm)	3000		
Torque coefficient (N·m/A)	1.87		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	24.9±10%	
	Motor with brake	27.2±10%	

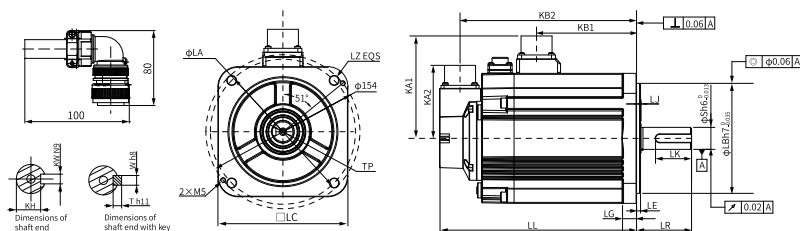
Electrical specifications of the brake

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

Allowable load

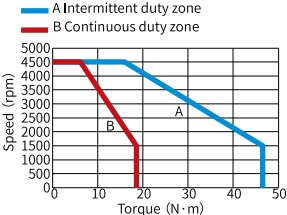
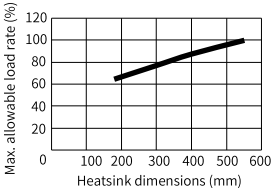
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55±1	145	4 x φ9	103	100	74	151.5 (176.5)	14	4
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	φ110h7 ⁰ _{-0.035}		22	M6 x 20	36	18 ⁰ _{-0.2}	8	8	7	8.5 (10.3)

4.4.19 MS1H3-29C15CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	180			
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 (A)	18		Heatsink-based derating curve	
Maximum current (A)	52.5			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.16			
Rotor moment of inertia (kg·cm ²)	Motor without brake	44.7±10%		
	Motor with brake	52.35±10%		

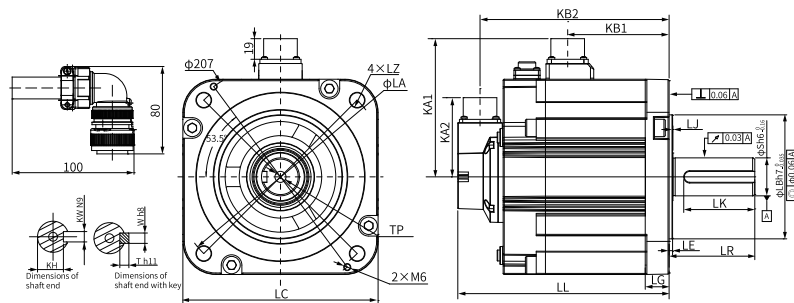
Electrical specifications of the brake

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

Allowable load

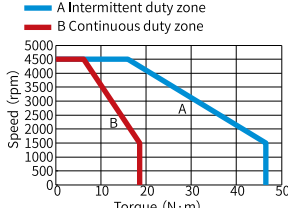
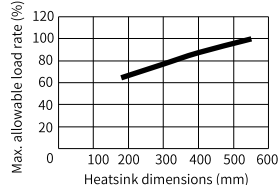
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79±1	200	4 x φ13.5	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	φ114.3h7 ⁰ _{-0.035}		35	M12 x 25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)

4.4.20 MS1H3-29C15CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	180			
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 (A)	18			
Maximum current (A)	52.5		Heatsink-based derating curve 	
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.16			
Rotor moment of inertia (kg·cm ²)	Motor without brake	44.7±10%		
	Motor with brake	52.35±10%		

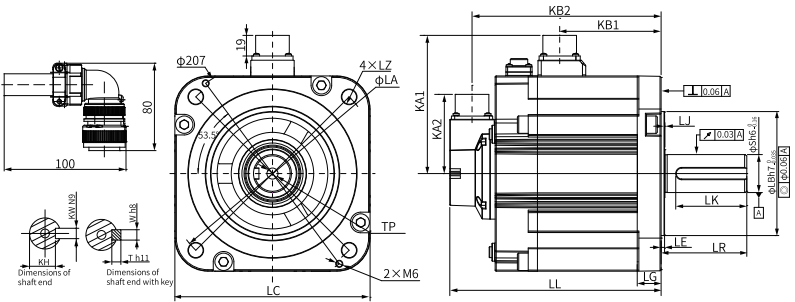
Electrical specifications of the brake

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

Allowable load

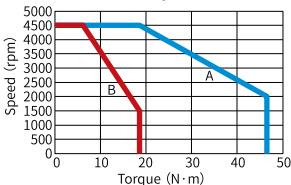
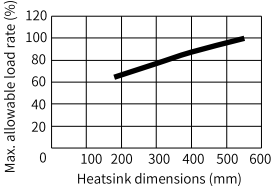
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79 ± 1	200	4 × φ13.5	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	φ114.3h7 ⁰ _{-0.035}	35	M12 × 25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)	

4.4.21 MS1H3-29C15CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	180			
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 (A)	10.5		Heatsink-based derating curve	
Maximum current (A)	29.75			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.94			
Rotor moment of inertia (kg·cm ²)	Motor without brake	44.7±10%		
	Motor with brake	52.35±10%		

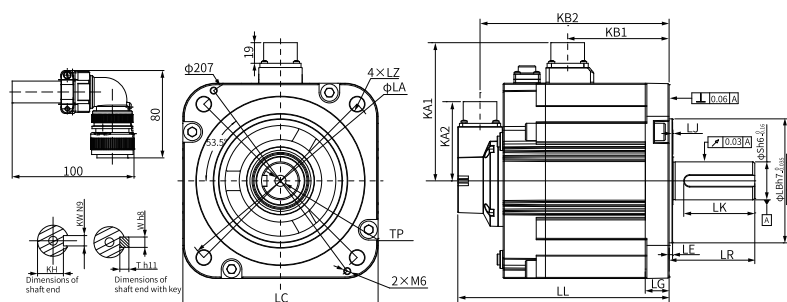
Electrical specifications of the brake

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

Allowable load

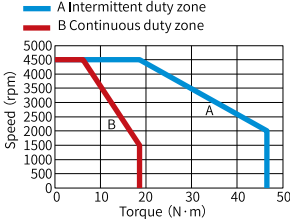
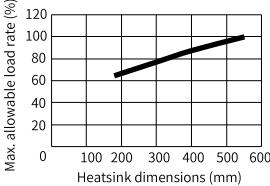
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79±1	200	4 x φ13.5	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	φ114.3h7 ⁰ _{-0.035}		35	M12 x 25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)

4.4.22 MS1H3-29C15CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	180			
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		Heatsink-based derating curve 	
Rated current (A)	10.5			
Maximum current (A)	29.75			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.94			
Rotor moment of inertia (kg·cm ²)	Motor without brake	44.7±10%		
	Motor with brake	52.35±10%		

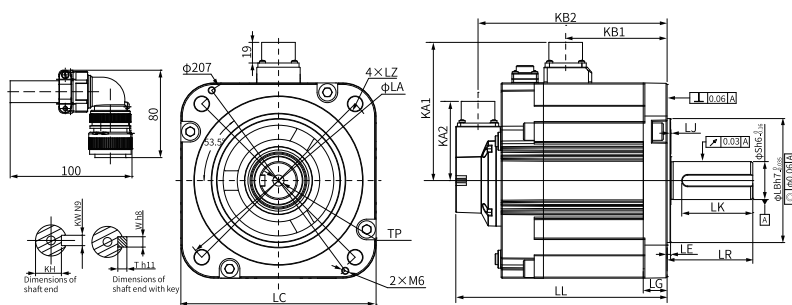
Electrical specifications of the brake

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

Allowable load

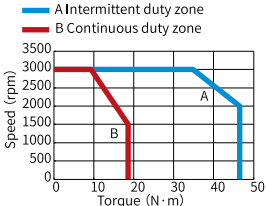
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

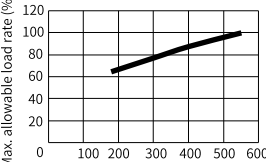
Dimensions (mm)

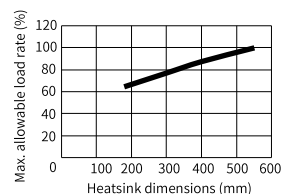


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79 ± 1	200	4 × φ13.5	127.4	93.5	73	140.5 (174.3)	22	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5 ± 0.75	φ114.3h7 ⁰ _{-0.035}		35	M12 × 25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)

4.4.23 MS1H3-29C15CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	180			
Inertia and 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 (A)	10.5			
Maximum current (A)	29.75		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	3000			
Torque coefficient (N·m/A)	1.94			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	44.7±10%		
	Motor with brake	52.35±10%		

Max. allowable load rate (%)		Heatsink dimensions (mm)	
			



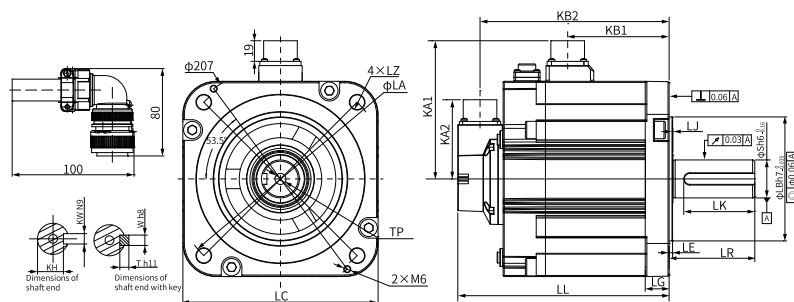
Electrical specifications of the brake

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

Allowable load

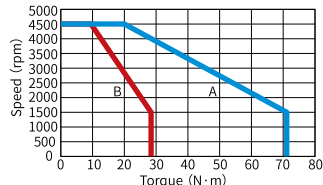
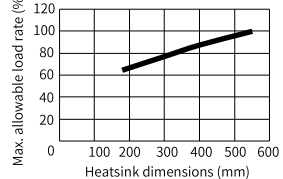
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	161 (194.8)	79 ± 1	200	4 × φ13.5	127.4	93.5	74	140.5 (174.3)	22	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5 ± 0.75	φ114.3h7 ⁰ _{-0.035}		35	M12 × 25	65	30 ⁰ _{-0.2}	10	10	8	13.8 (17.9)

4.4.24 MS1H3-44C15CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	25.5		Heatsink-based derating curve	
Maximum current (A)	67			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.25			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9±10%		
	Motor with brake	72.55±10%		

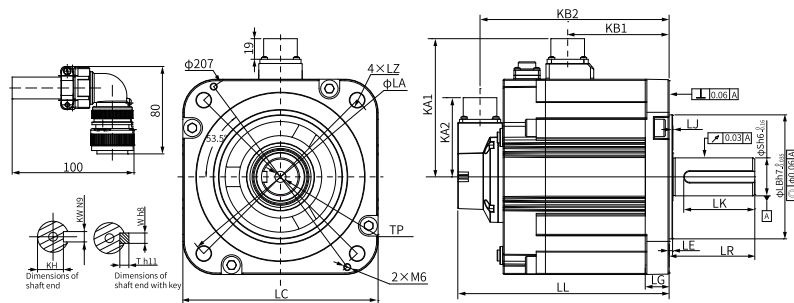
Electrical specifications of the brake

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

Allowable load

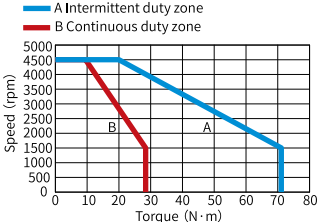
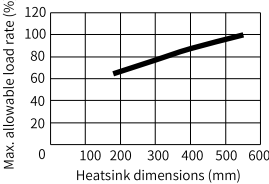
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79±1	200	4 x φ13.5	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	φ114.3h7 ⁰ _{-0.035}		35	M12 x 25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.9)

4.4.25 MS1H3-44C15CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	25.5			
Maximum current (A)	67			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.25			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9±10%		
	Motor with brake	72.55±10%		

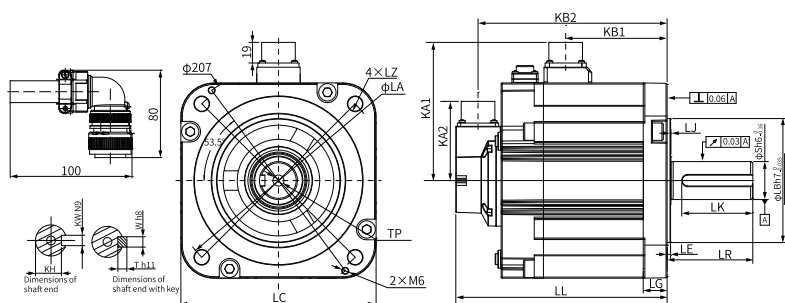
Electrical specifications of the brake

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

Allowable load

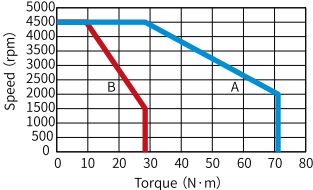
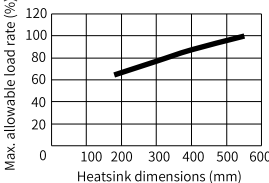
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79 ± 1	200	4 × φ13.5	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	φ114.3h7 ⁰ _{-0.035}		35	M12 × 25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.9)

4.4.26 MS1H3-44C15CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	16			
Maximum current (A)	42			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.96			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9±10%		
	Motor with brake	72.55±10%		

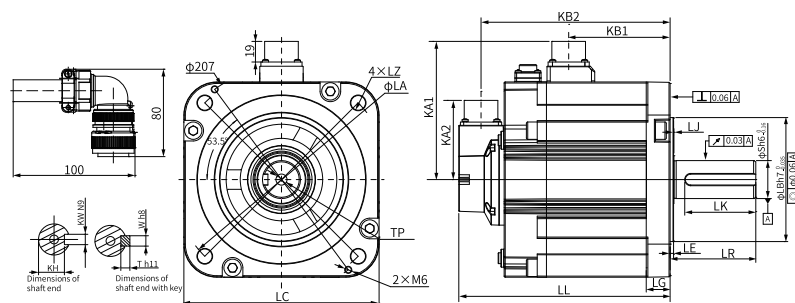
Electrical specifications of the brake

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

Allowable load

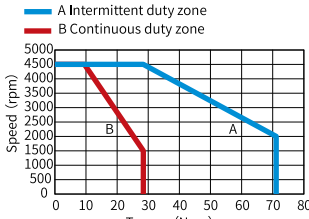
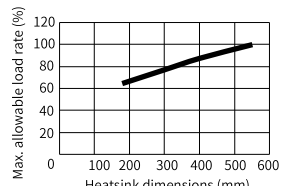
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79±1	200	4 x Φ13.5	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	Φ114.3h7 ⁰ _{-0.035}	35	M12 x 25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.6)	

4.4.27 MS1H3-44C15CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	16		Heatsink-based derating curve	
Maximum current (A)	42			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.96			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9±10%		
	Motor with brake	72.55±10%		

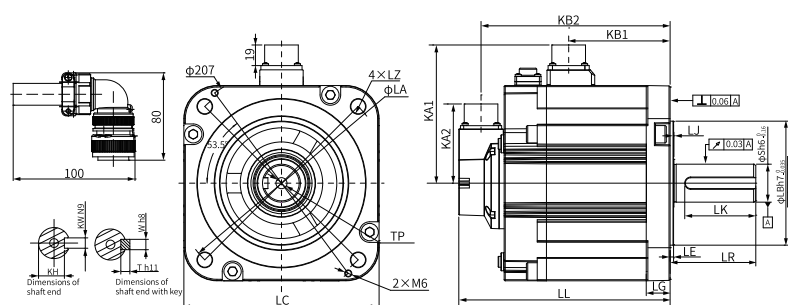
Electrical specifications of the brake

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

Allowable load

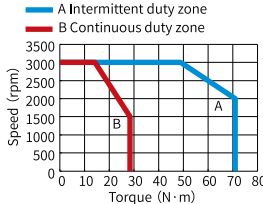
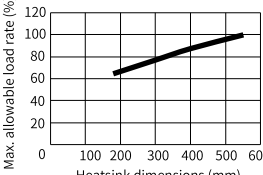
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79±1	200	4 x Φ13.5	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	Φ114.3h7 ⁰ _{-0.035}		35	M12 x 25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.6)

4.4.28 MS1H3-44C15CD-T33*R

Motor specifications			Torque-Speed characteristics
Frame size (mm)	180		
Inertia and 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 (A)	16		Heatsink-based derating curve
Maximum current (A)	42		
Rated speed (rpm)	1500		
Maximum speed (rpm)	3000		
Torque coefficient (N·m/A)	1.96		
Rotor moment of inertia (kg·cm ²)	Brake-less motor	64.9±10%	
	Motor with brake	72.55±10%	

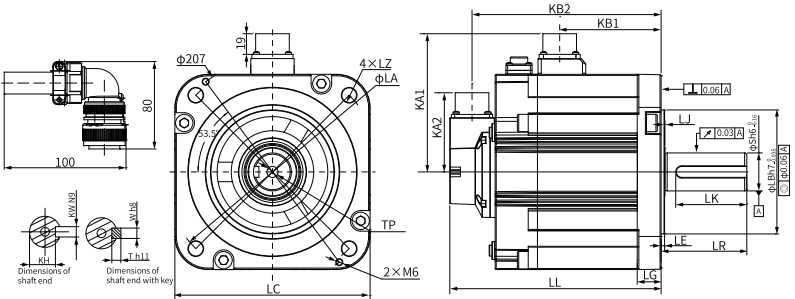
Electrical specifications of the brake

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

Allowable load

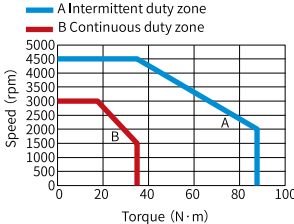
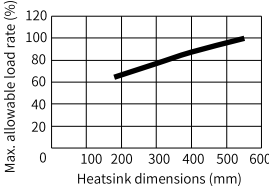
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	184.5 (218.3)	79±1	200	4 x φ13.5	127.4	117	74	164 (197.8)	22	3.2±0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5±0.75	φ114.3h7 ⁰ _{-0.035}	35	M12 x 25	65	30 ⁰ _{-0.2}	10	10	8	17.4 (21.6)	

4.4.29 MS1H3-55C15CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	20.7		Heatsink-based derating curve	
Maximum current (A)	52			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	1.92			
Rotor moment of inertia (kg·cm ²)	Motor without brake	86.9±10%		
	Motor with brake	94.55±10%		

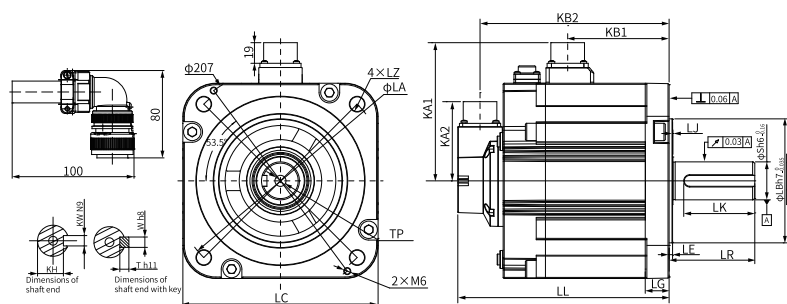
Electrical specifications of the brake

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

Allowable load

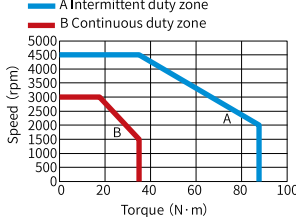
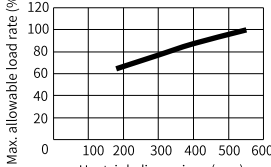
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	≤ 1764	≤ 588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	208 (241.8)	113±1	200	4 x φ13.5	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	φ114.3h7 ⁰ _{-0.035}		42	M16 x 32	97	37 ⁰ _{-0.2}	12	12	8	21.7 (25.9)

4.4.30 MS1H3-55C15CD-A33*R

Motor specifications			Torque-Speed characteristics
Frame 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 (A)	20.7		Heatsink-based derating curve 
Maximum current (A)	52		
Rated speed (rpm)	1500		
Maximum Speed (rpm)	4500		
Torque coefficient (N·m/A)	1.92		
Rotor moment of inertia (kg·cm ²)	Motor without brake	86.9±10%	
	Motor with brake	94.55±10%	

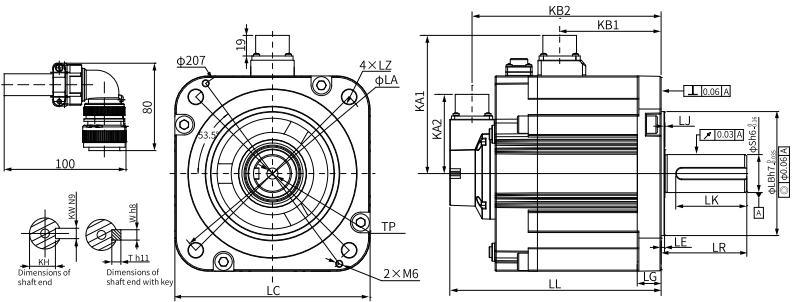
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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 x φ13.5	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	φ114.3h7 ⁰ _{-0.035}	42	M16 x 32	97	37 ⁰ _{-0.2}	12	12	8	21.7 (25.9)	

4.4.31 MS1H3-55C15CD-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	180		— A Intermittent duty zone — B Continuous duty zone	
Inertia and 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 (A)	20.7		Heatsink-based derating curve Max. allowable load rate (%) Heatsink dimensions (mm)	
Maximum current (A)	52			
Rated speed (rpm)	1500			
Maximum speed (rpm)	3000			
Torque coefficient (N·m/A)	1.92			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	86.9±10%		
	Motor with brake	94.55±10%		

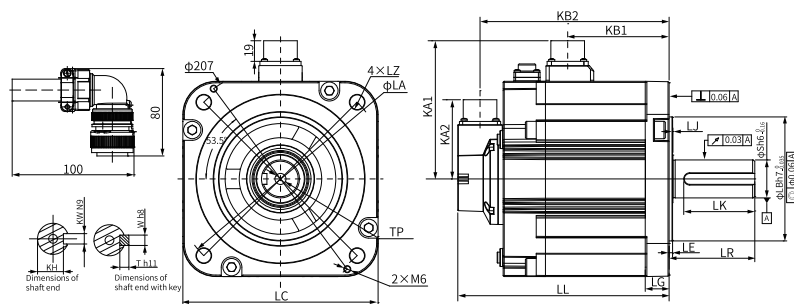
Electrical specifications of the brake

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

Allowable load

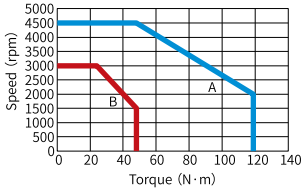
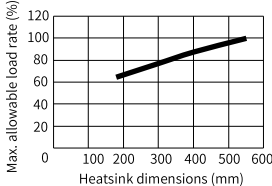
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	≤ 1764	≤ 588

Product dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	208 (241.8)	113±1	200	4 × ϕ13.5	127.4	140.5	74	187.5 (221.3)	22	3.2±0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.5±0.75	ϕ114.3h7 ⁰ _{-0.035}		42	M16 × 32	97	37 ⁰ _{-0.2}	12	12	8	21.7 (25.9)

4.4.32 MS1H3-75C15CD-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	25		Heatsink-based derating curve	
Maximum current (A)	65			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	2.13			
Rotor moment of inertia (kg·cm ²)	Motor without brake	127.5±10%		
	Motor with brake	135.15±10%		

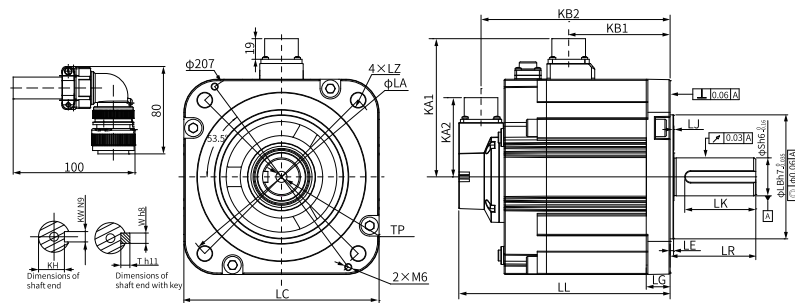
Electrical specifications of the brake

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

Allowable load

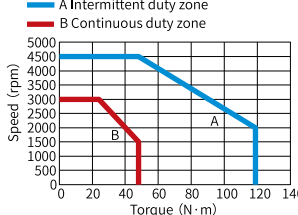
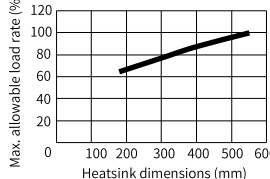
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	≤ 1764	≤ 588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	255 (288.8)	113±1	200	4 x Φ13.5	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	Φ114.3h7 ⁰ _{-0.035}		42	M16 x 32	97	37 ⁰ _{-0.2}	12	12	8	29 (33.2)

4.4.33 MS1H3-75C15CD-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	25			
Maximum current (A)	65			
Rated speed (rpm)	1500			
Maximum Speed (rpm)	4500			
Torque coefficient (N·m/A)	2.13			
Rotor moment of inertia (kg·cm ²)	Motor without brake	127.5±10%		
	Motor with brake	135.15±10%		

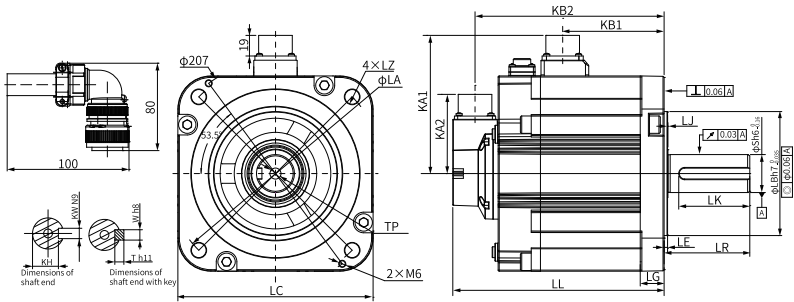
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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

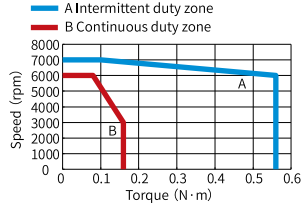
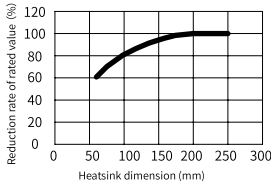
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	255 (288.8)	113±1	200	4 x ϕ13.5	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	ϕ114.3h7 ⁰ _{-0.035}		42	M16 x 32	97	37 ⁰ _{-0.2}	12	12	8	29 (33.2)

4.5 MS1H4 Series Motor with Medium Inertia and Small Capacity

4.5.1 MS1H4-05B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.05			
Voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56		Heatsink-based derating curve 	
Rated current (A)	1.27			
Maximum current (A)	4.78			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.038±10%		
	Motor with brake	0.04±10%		

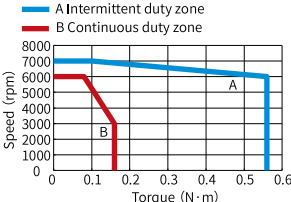
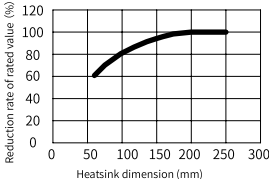
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

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

4.5.2 MS1H4-05B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.05			
Voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated current (A)	1.27			
Maximum current (A)	4.78		Heatsink-based derating curve	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm²)	Motor without brake	0.038±10%		
	Motor with brake	0.04±10%		

Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

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

Dimensions (mm)

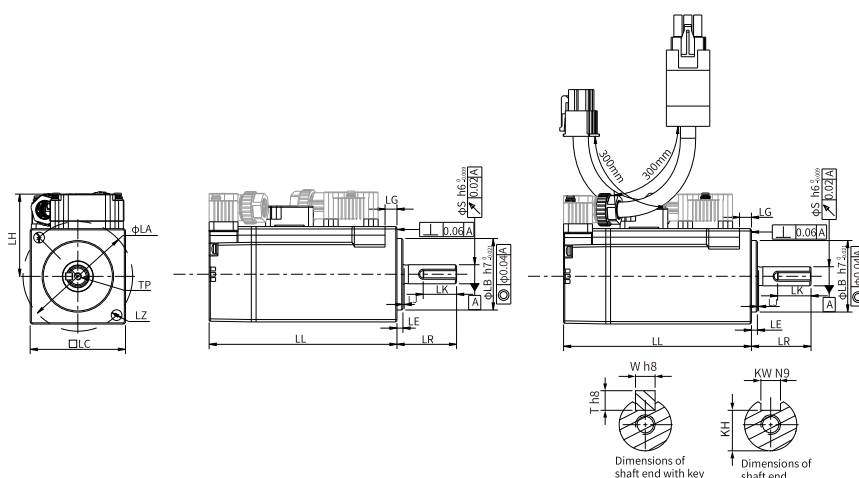


Figure 4-3 MS1H4-05B30CB-A330R and MS1H4-05B30CB-A332R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
51 (78.3)	40	25±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.24 (0.40)

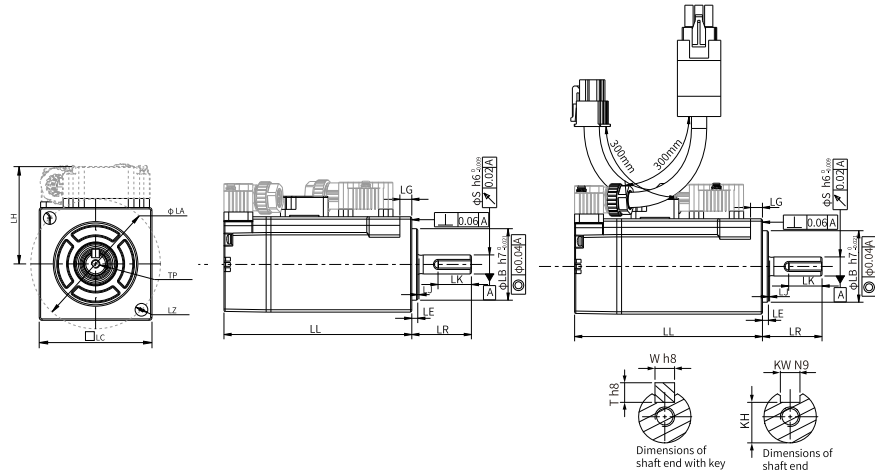


Figure 4-4 MS1H4-05B30CB-A331R and MS1H4-05B30CB-A334R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
53.7 (81)	40	25±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.26 (0.42)

4.5.3 MS1H4-05B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia and capacity	Medium inertia, low capacity			
Rated output (kW)	0.05			
Voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated current (A)	1.27		Heatsink-based derating curve	
Maximum current (A)	4.78			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	0.038		
	Motor with brake	0.04		

Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

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

Product dimensions (mm)

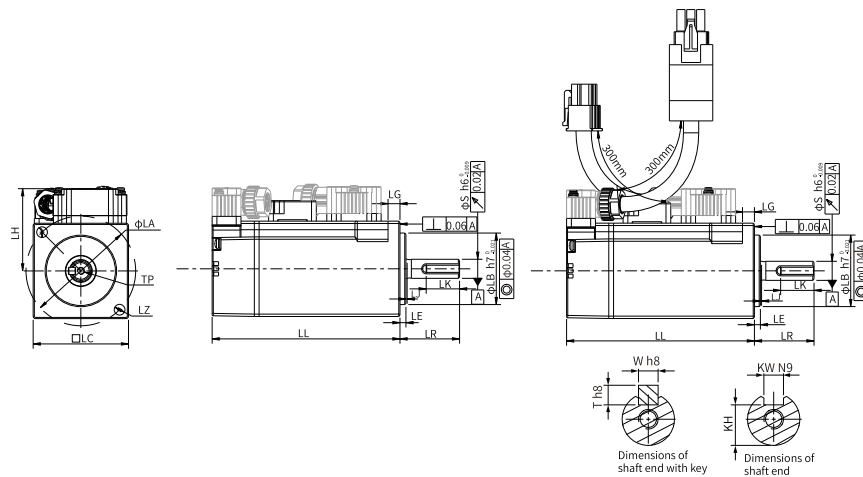


Figure 4-5 MS1H4-05B30CB-T330R and MS1H4-05B30CB-T332R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
51 (78.3)	40	25±0.5	46	2 × φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.24 (0.40)

Figure 4-6 MS1H4-05B30CB-T331R and MS1H4-05B30CB-T334R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
53.7 (81)	40	25±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.26 (0.42)

4.5.4 MS1H4-10B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40		Speed (rpm) Torque (N·m) — A Intermittent duty zone — B Continuous duty zone	
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.1			
Voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (A)	1.27			
Maximum current (A)	4.78			
Rated speed (rpm)	3000		Reduction rate of rated value (%) Heatsink dimension (mm)	
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.29			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.072±10%		
	Motor with brake	0.074±10%		

Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

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

Dimensions (mm)

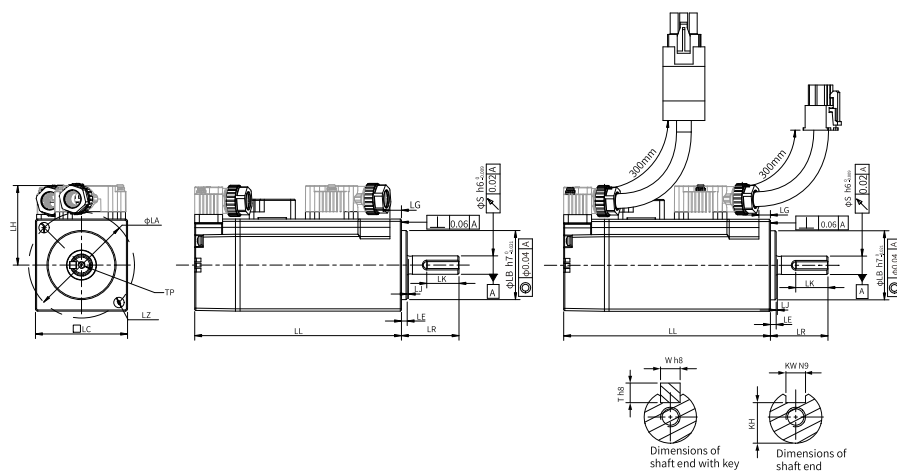


Figure 4-7 MS1H4-10B30CB-A6/S630R and MS1H4-10B30CB-A6/S632R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
62 (89.3)	40	35±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.32 (0.48)

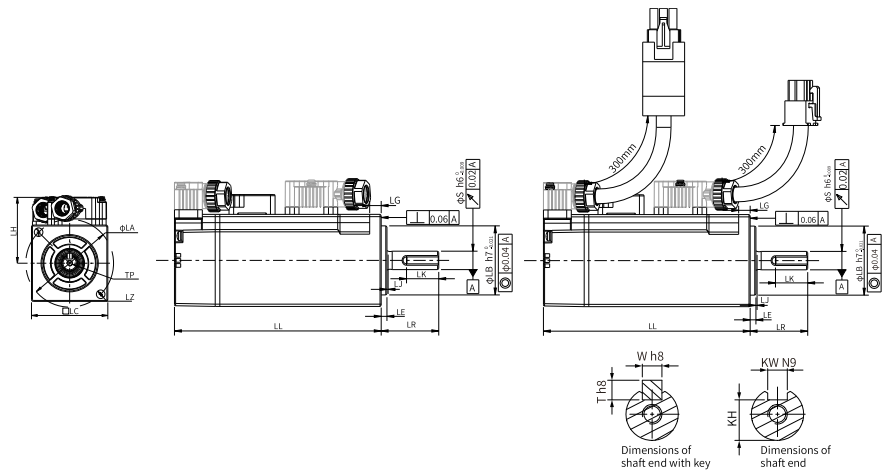
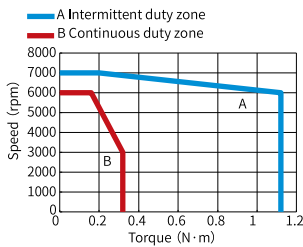
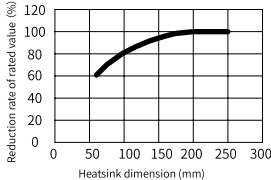


Figure 4-8 MS1H4-10B30CB-A6/S631R and MS1H4-10B30CB-A6/S634R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
64.7 (92)	40	35±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.34 (0.50)

4.5.5 MS1H4-10B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.1			
Voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (A)	1.27		Heatsink-based derating curve	
Maximum current (A)	4.78			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.29			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.072±10%		
	Motor with brake	0.074±10%		

Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

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

Dimensions (mm)

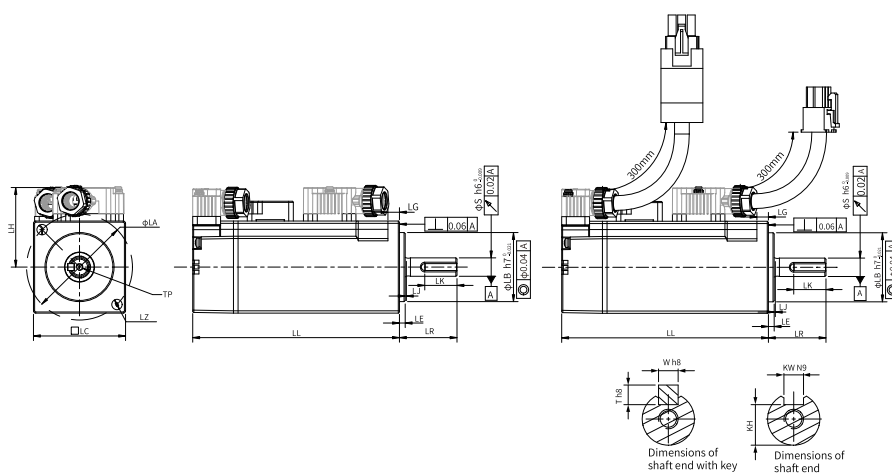


Figure 4-9 MS1H4-10B30CB-A330R and MS1H4-10B30CB-A332R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
62 (89.3)	40	35±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ -0.021	M3 x 6	14	6.2 ⁰ -0.1	3	3	3	0.32 (0.48)

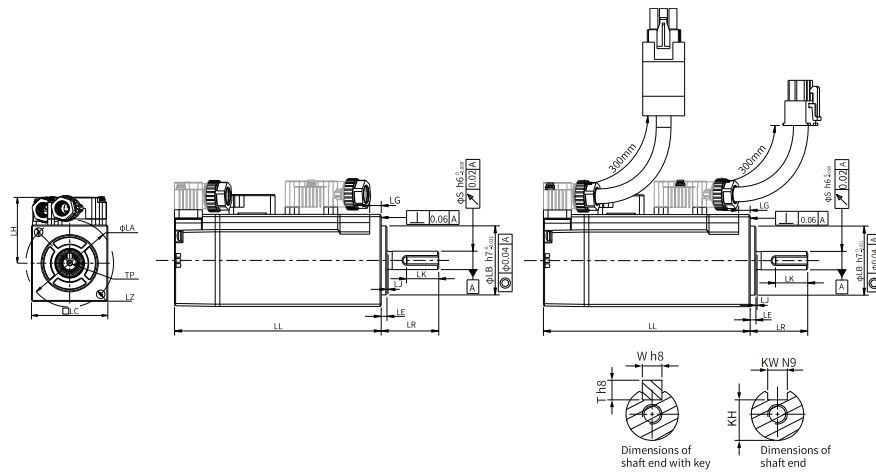


Figure 4-10 MS1H4-10B30CB-A331R and MS1H4-10B30CB-A334R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
64.7 (92)	40	35±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.34 (0.50)

4.5.6 MS1H4-10B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	40			
Inertia and capacity	Medium inertia, low capacity			
Rated output (kW)	0.1			
Voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated current (A)	1.27		Heatsink-based derating curve	
Maximum current (A)	4.78			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.29			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	0.072±10%		
	Motor with brake	0.074±10%		

Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
0.32	24	6.9	83.5	0.29	≤ 40	≤ 20	≤ 1.5

Allowable load

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

Product dimensions (mm)

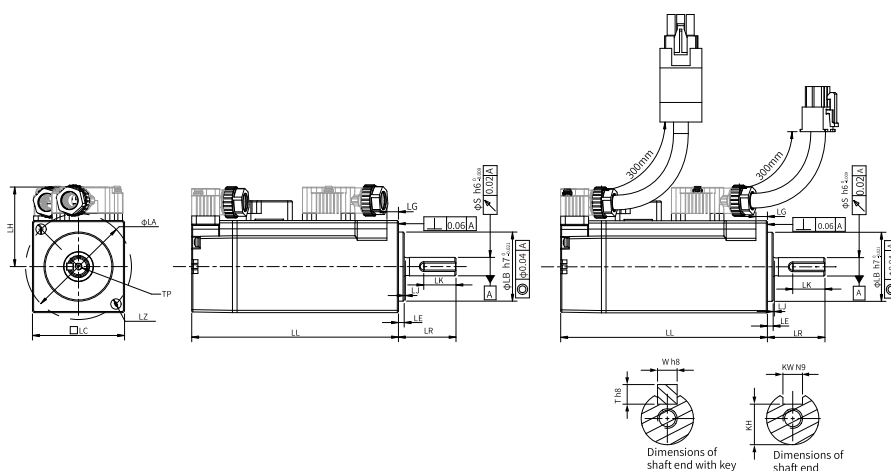


Figure 4-11 MS1H4-10B30CB-T330R and MS1H4-10B30CB-T332R

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
62 (89.3)	40	25±0.5	46	2 x φ4.5	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	φ30h7 ⁰ _{-0.021}	M3 x 6	14	6.2 ⁰ _{-0.1}	3	3	3	0.32 (0.48)

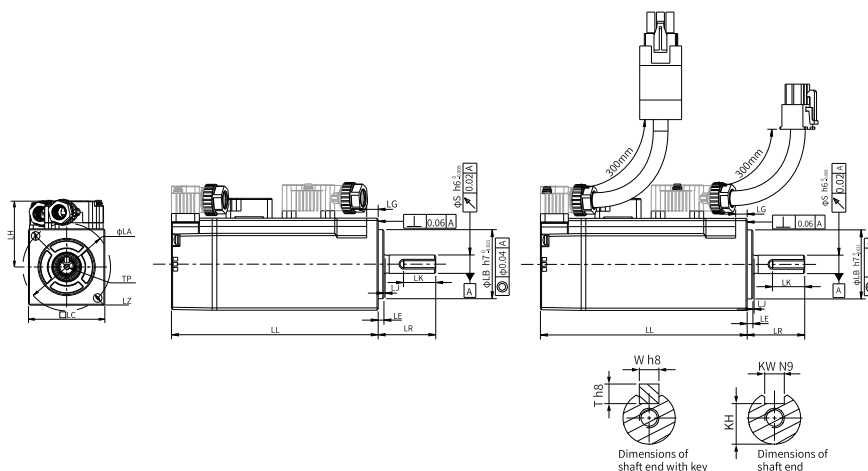
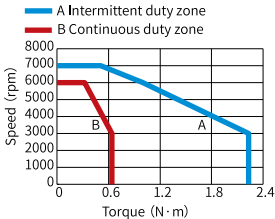
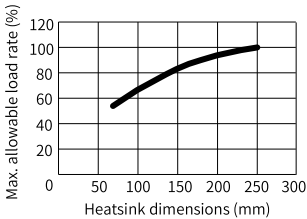


Figure 4-12 MS1H4-10B30CB-T331R and MS1H4-10B30CB-T334R

Motor Selection

LL	LC	LR	LA	LZ	LH	LG	LE	LJ
64.7 (92)	40	25±0.5	46	2 x $\phi 4.5$	34.5	5	2.5±0.5	0.5±0.35
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	$\phi 30h7^0_{-0.021}$	M3 x 6	14	$6.2^0_{-0.1}$	3	3	3	0.34 (0.50)

4.5.7 MS1H4-20B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	1.3			
Maximum current (A)	5.3			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.55			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.22±10%		
	Motor with brake	0.23±10%		

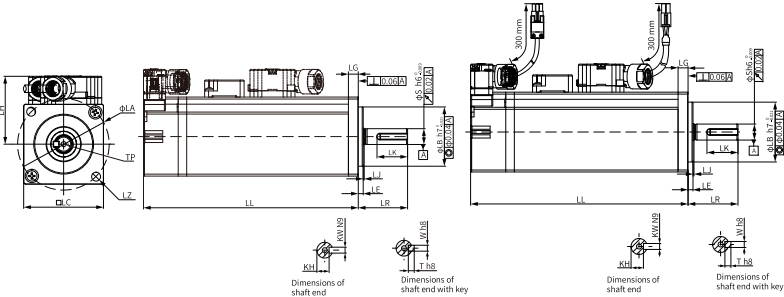
Electrical specifications of the brake

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

Allowable load

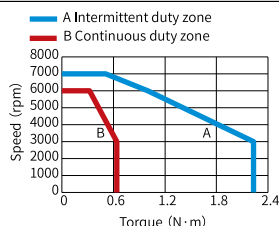
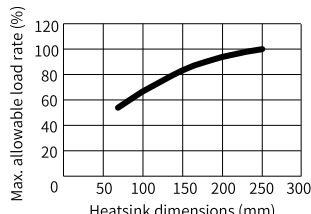
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	73.5 (101.1)	30±0.5	70	4 x $\phi 5.5$	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 50h7^0_{-0.025}$	14	M5 x 8	16.5	11 ⁰ -0.1	5	5	5	0.78 (1.16)

4.5.8 MS1H4-20B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	1.3			
Maximum current (A)	5.3			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.55			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.22±10%		
	Motor with brake	0.23±10%		

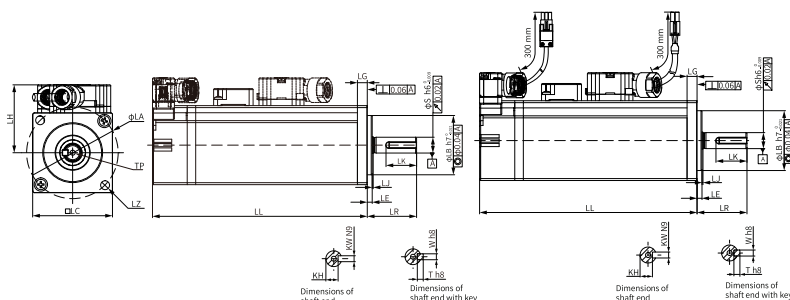
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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

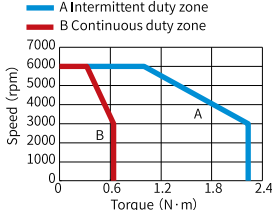
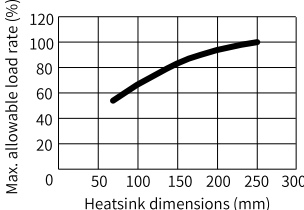
Dimensions (mm)



Motor Selection

LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	73.5 (101.1)	30±0.5	70	4 x ϕ5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
ϕ50h7 ⁰ _{-0.025}	14	M5 x 8	16.5	11 ⁰ _{-0.1}	5	5	5	0.78 (1.16)

4.5.9 MS1H4-20B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	60			
Inertia and 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 (A)	1.3		Heatsink-based derating curve	
Maximum current (A)	5.3			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.55			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	0.22±10%		
	Motor with brake	0.23±10%		

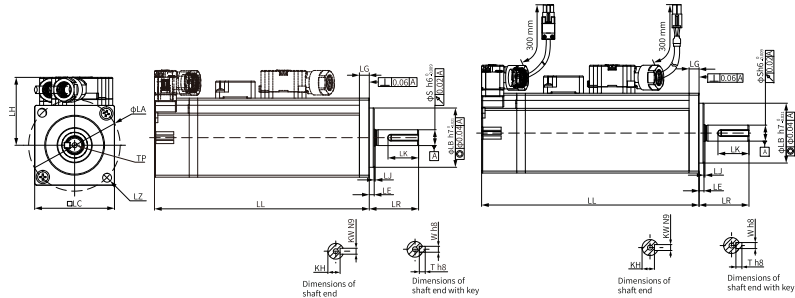
Electrical specifications of the brake

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

Allowable load

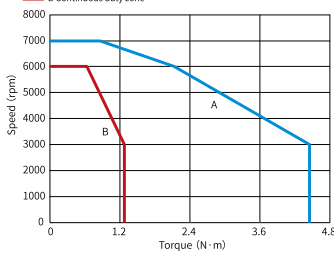
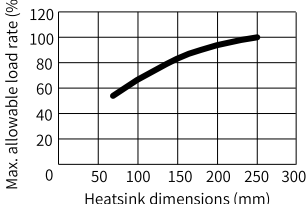
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	73.5 (101.1)	30±0.5	70	4 x $\phi 5.5$	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 50h7^0_{-0.025}$	14	M5 x 8	16.5	11 ⁰ _{-0.1}	5	5	5	0.78 (1.16)

4.5.10 MS1H4-40B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	2.4		Heatsink-based derating curve	
Maximum current (A)	9.2			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.43±10%		
	Motor with brake	0.44±10%		

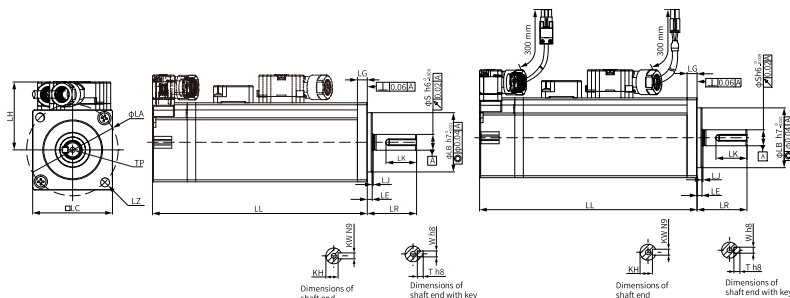
Electrical specifications of the brake

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

Allowable load

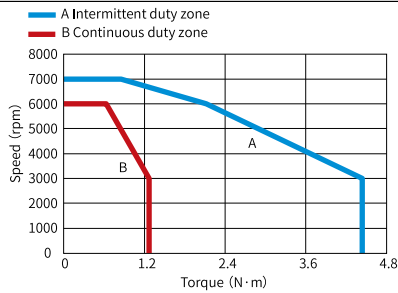
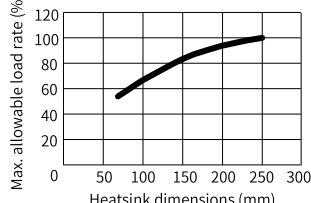
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	92 (119.8)	30±0.5	70	4 x φ5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ50h7 ⁰ _{-0.025}	14	M5 x 8	16.5	11 ⁰ _{-0.1}	5	5	5	1.11 (1.48)

4.5.11 MS1H4-40B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	2.4		Heatsink-based derating curve	
Maximum current (A)	9.2			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.43±10%		
	Motor with brake	0.44±10%		

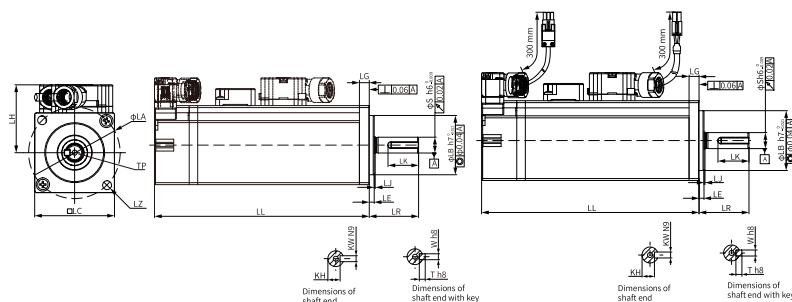
Electrical specifications of the brake

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

Allowable load

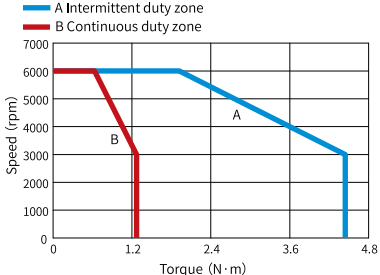
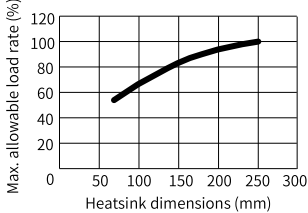
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	92 (119.8)	30±0.5	70	4 x φ5.5	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ50h7 ⁰ -0.025	14	M5 x 8	16.5	11 ⁰ -0.1	5	5	5	1.11 (1.48)

4.5.12 MS1H4-40B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	60			
Inertia and 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 (A)	2.4		Heatsink-based derating curve	
Maximum current (A)	9.2			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	0.43±10%		
	Motor with brake	0.44±10%		

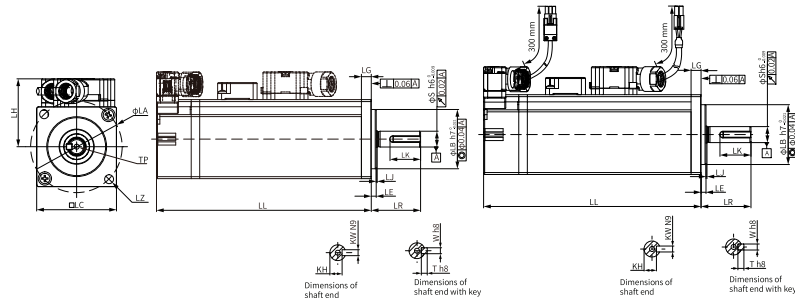
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation 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

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
60	92 (119.8)	30±0.5	70	4 x $\phi 5.5$	44	8.0	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 50h7^0_{-0.025}$	14	M5 x 8	16.5	11 ⁰ _{-0.1}	5	5	5	1.11 (1.48)

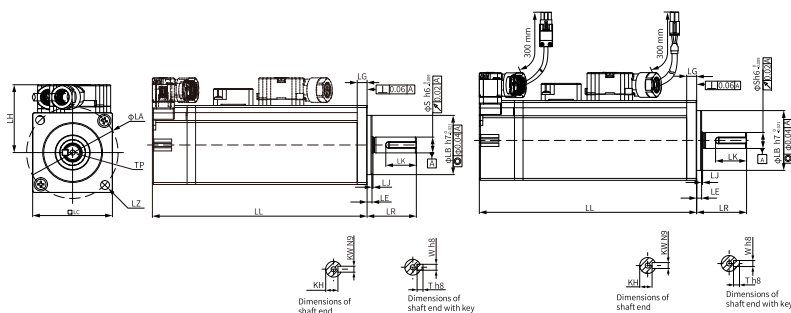
4.5.13 MS1H4-55B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	80		— A Intermittent duty zone — B Continuous duty zone	
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 (A)	3.3		Heatsink-based derating curve	
Maximum current (A)	13.2		Max. allowable load rate (%) Heatsink dimensions (mm)	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.12 ± 10%		
	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	35±0.5	90	4 x $\phi 7$	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 70h7^0_{-0.03}$	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	1.85

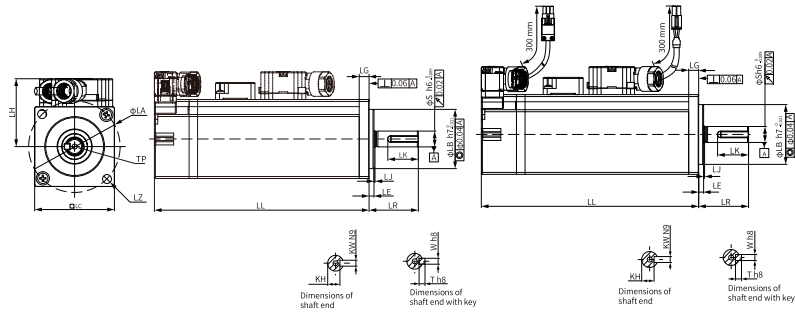
4.5.14 MS1H4-55B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	80		Speed (rpm) Torque (N·m) A Intermittent duty zone B Continuous duty zone	
Inertia and 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 (A)	3.3			
Maximum current (A)	13.2		Max. allowable load rate (%) Heatsink dimensions (mm)	
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	1.12±10%		
	Motor with brake	-		

Allowable load

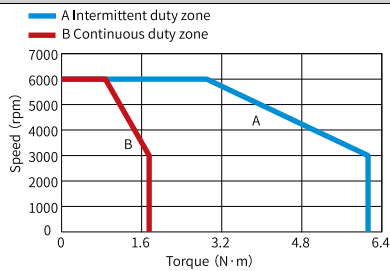
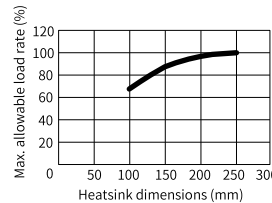
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ -0.03	19	M6 x 20	26	15.5 ⁰ -0.1	6	6	6	1.85

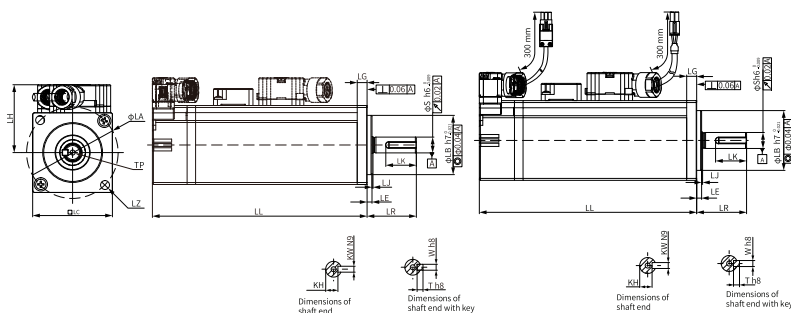
4.5.15 MS1H4-55B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	80			
Inertia and 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 (A)	3.3			
Maximum current (A)	13.2		Heatsink-based derating curve	
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	1.12 ± 10%		
	Motor with brake	-		

Allowable load

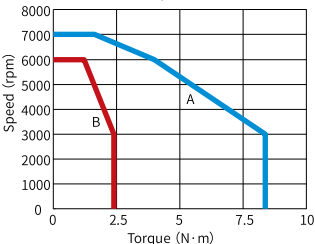
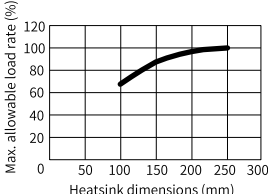
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35±0.5	90	4 x $\phi 7$	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 70h7^0_{-0.03}$	19	M6 x 20	26	15.5 $^0_{-0.1}$	6	6	6	1.85

4.5.16 MS1H4-75B30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	4.4		Heatsink-based derating curve	
Maximum current (A)	16.9			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N · m/A)	0.63			
Rotor moment of inertia (kg · cm ²)	Motor without brake	1.46 ± 10%		
	Motor with brake	1.51 ± 10%		

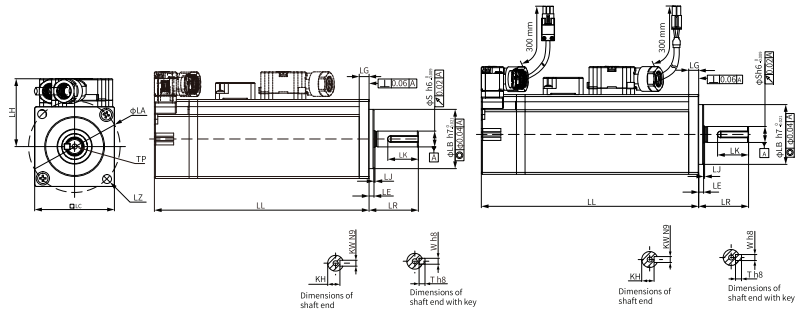
Electrical specifications of the brake

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

Allowable load

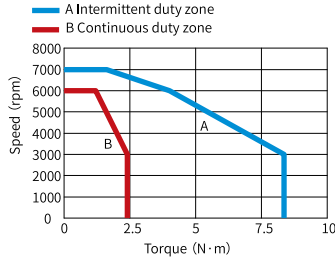
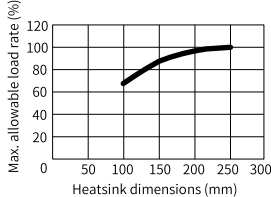
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ _{-0.03}	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.18 (2.82)

4.5.17 MS1H4-75B30CB-A33*R

Motor specifications			Torque-Speed characteristics	
Frame 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 (A)	4.4		Heatsink-based derating curve	
Maximum current (A)	16.9			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.63			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.46±10%		
	Motor with brake	1.51±10%		

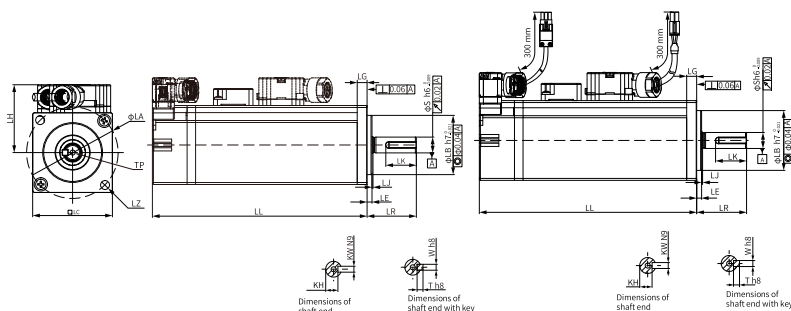
Electrical specifications of the brake

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

Allowable load

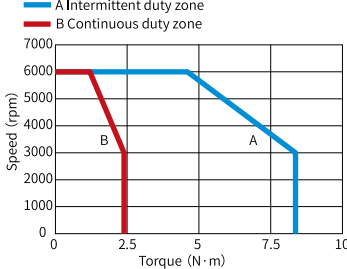
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

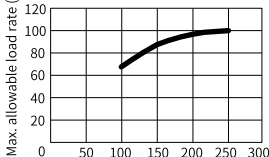
Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35±0.5	90	4 x $\phi 7$	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 70h7^0_{-0.03}$	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.18 (2.82)

4.5.18 MS1H4-75B30CB-T33*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	80			
Inertia and 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 (A)	4.4		Heatsink-based derating curve	
Maximum current (A)	16.9			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.63			
Rotor moment of inertia (kg·cm ²)	Brake-less motor	1.46±10%		
	Motor with brake	1.51±10%		

Max. allowable load rate (%)		Heatsink dimensions (mm)	
			

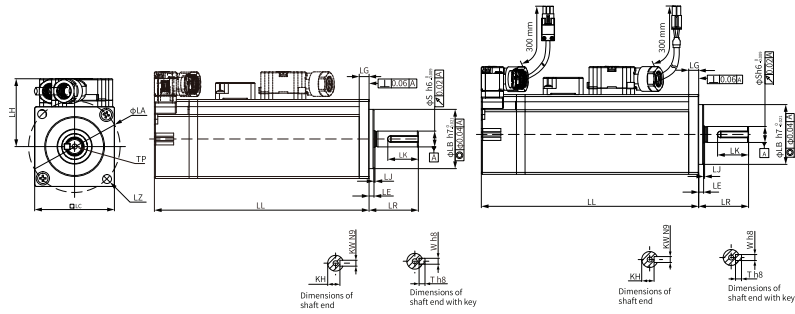
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation 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

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (140.5)	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ _{-0.03}	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.18 (2.82)

4.5.19 MS1H4-10C30CB-A6/S63*R

Motor specifications			Torque-Speed characteristics	
Frame size (mm)	80		Speed (rpm) Torque (N·m) A Intermittent duty zone B Continuous duty zone	
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 (A)	6.5		Heatsink-based derating curve	
Maximum current (A)	24		Max. allowable load rate (%) Heatsink dimensions (mm)	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.53			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.87±10%		
	Motor with brake	1.97±10%		

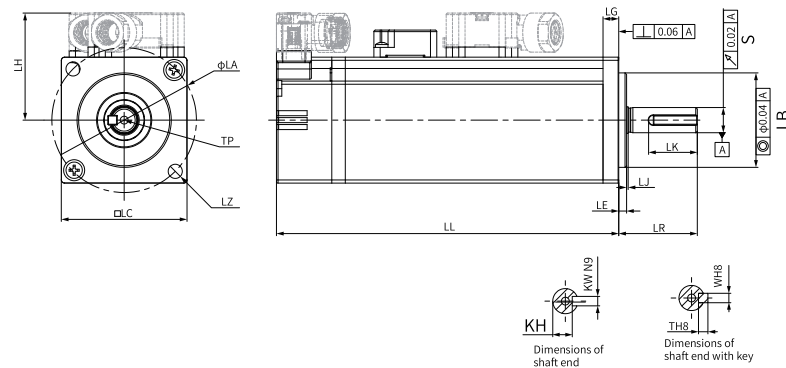
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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

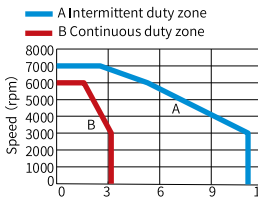
Dimensions (mm)

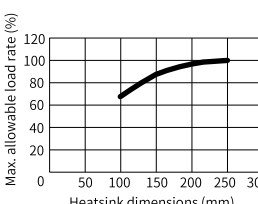


LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	118.7 (153.2)	35±0.5	90	4 x $\phi 7$	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 70h7^0_{-0.03}$	19	M6 x 20	26	15.5 ⁰ _{-0.1}	6	6	6	2.55 (2.9)

4.5.20 MS1H4-10C30CB-A33*R

Motor specifications		Torque-Speed characteristics	
Frame 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 (A)	6.5		
Maximum current (A)	24		
Rated speed (rpm)	3000		
Maximum Speed (rpm)	7000		
Torque coefficient (N·m/A)	0.53		
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.87±10%	
	Motor with brake	1.97±10%	

Torque-Speed characteristics																						
	The graph plots Speed (rpm) on the y-axis (0 to 8000) against Torque (N·m) on the x-axis (0 to 12). Two regions are defined: Zone A (Intermittent duty zone) in blue and Zone B (Continuous duty zone) in red. Zone B is a constant speed region from 0 to 3.18 N·m at 6000 rpm. Zone A starts at 3.18 N·m and 6000 rpm, following a downward curve that passes through approximately (6, 5000) and (11.13, 3000), ending at 12 N·m and 2500 rpm. <table border="1"><caption>Approximate data points for Torque-Speed characteristics</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>-</td><td>6000</td></tr><tr><td>3.18</td><td>6000</td><td>6000</td></tr><tr><td>6</td><td>5000</td><td>-</td></tr><tr><td>9</td><td>4000</td><td>-</td></tr><tr><td>11.13</td><td>3000</td><td>-</td></tr><tr><td>12</td><td>2500</td><td>-</td></tr></tbody></table>	Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	-	6000	3.18	6000	6000	6	5000	-	9	4000	-	11.13	3000	-	12	2500	-
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																				
0	-	6000																				
3.18	6000	6000																				
6	5000	-																				
9	4000	-																				
11.13	3000	-																				
12	2500	-																				

Heatsink-based derating curve													
	The graph plots Max. allowable load rate (%) on the y-axis (0 to 120) against Heatsink dimensions (mm) on the x-axis (0 to 300). The curve starts at approximately (100, 70) and rises to reach 100% at 250 mm, remaining at 100% up to 300 mm. <table border="1"><caption>Approximate data points for Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>70</td></tr><tr><td>150</td><td>90</td></tr><tr><td>200</td><td>100</td></tr><tr><td>250</td><td>100</td></tr><tr><td>300</td><td>100</td></tr></tbody></table>	Heatsink dimensions (mm)	Max. allowable load rate (%)	100	70	150	90	200	100	250	100	300	100
Heatsink dimensions (mm)	Max. allowable load rate (%)												
100	70												
150	90												
200	100												
250	100												
300	100												

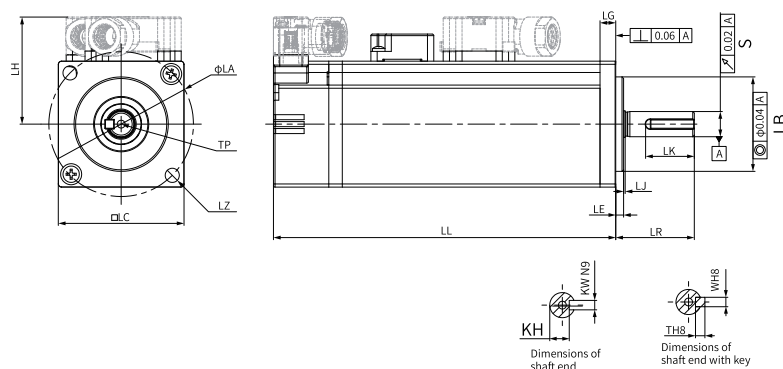
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC)±10%	Rated power (W)	Coil Resistance (Ω)±7%	Excitation 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)	35±0.5	90	4 x φ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
φ70h7 ⁰ -0.03	19	M6 x 20	26	15.5 ⁰ -0.1	6	6	6	2.55 (2.9)

4.5.21 MS1H4-10C30CB-T33*R

Motor specifications			Torque-Speed characteristics																						
Frame size (mm)	80		— A Intermittent duty zone — B Continuous duty zone <table border="1"><caption>Data points for Torque-Speed characteristics</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>6000</td></tr><tr><td>2</td><td>6000</td><td>6000</td></tr><tr><td>3.18</td><td>6000</td><td>3000</td></tr><tr><td>4</td><td>6000</td><td>0</td></tr><tr><td>10</td><td>3000</td><td>0</td></tr><tr><td>10</td><td>0</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	6000	2	6000	6000	3.18	6000	3000	4	6000	0	10	3000	0	10	0	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																							
0	6000	6000																							
2	6000	6000																							
3.18	6000	3000																							
4	6000	0																							
10	3000	0																							
10	0	0																							
Inertia and capacity	Medium inertia, low capacity																								
Rated power (kW)	1.0																								
Voltage (V)	220																								
Rated torque (N·m)	3.18																								
Maximum torque (N·m)	9.54																								
Rated current (A)	6.5																								
Maximum current (A)	24																								
Rated speed (rpm)	3000																								
Maximum speed (rpm)	6000																								
Torque coefficient (N·m/A)	0.53																								
Rotor moment of inertia (kg·cm ²)	Brake-less motor	1.87±10%																							
	Motor with brake	1.97±10%																							

Heatsink-based derating curve											
Max. allowable load rate (%) Heatsink dimensions (mm) <table border="1"><caption>Data points for Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>70</td></tr><tr><td>150</td><td>90</td></tr><tr><td>200</td><td>100</td></tr><tr><td>250</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	100	70	150	90	200	100	250	100
Heatsink dimensions (mm)	Max. allowable load rate (%)										
100	70										
150	90										
200	100										
250	100										

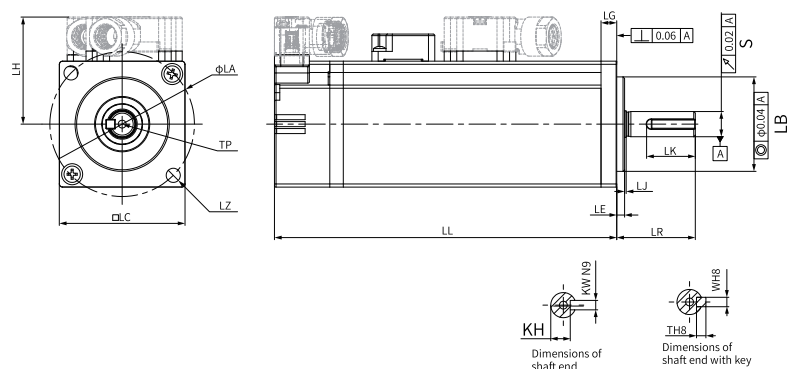
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±7%	Excitation 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

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	118.7 (153.2)	35±0.5	90	4 x $\phi 7$	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
$\phi 70h7^0_{-0.03}$	19	M6 x 20	26	$15.5^0_{-0.1}$	6	6	6	2.55 (2.9)

5 Cable Selection

5.1 Model Description

Description of power cables

S6-L-M 0 0 1 - 3.0 - T
 ① ②③④ ⑤ ⑥

① Cable type S6-L-B/M: Motion control power cable B: With brake M: Without brake	③ Frame size (mm) 0: Frame sizes 25/40/60/80 1: Frame sizes 100/130/180 2: Frame size 180 (motors of 4.4 kW and above)	⑤ Cable length (m) 3.0: 3 5.0: 5 10.0: 10
② Connector type at drive side 0: U-type terminal 1: Pin-type terminal	④ Connector type at motor side 0: 6-core plastic connector 1: 9-core aviation connector 2: 6-core aviation connector 7: SDC-06T series aviation connector (front outlet) 8: SDC-06T series aviation connector (rear outlet)	⑥ Special requirements _: Fixed cable T: Flexible cable ≥ 10 million reciprocating cycles S: Shielded TS: Shielded flexible cable ≥ 10 million reciprocating cycles OR: Oil-resistant cables

Description of encoder cable model

S6-L-P 1 1 1 - 3.0 - T
 ① ②③④ ⑤ ⑥

① Cable type S6-L-P: Motion control encoder cable	③ Encoder 1: Communication-type incremental encoder 2: Communication-type multi-turn absolute encoder	⑤ Cable length (m) 3.0: 3 5.0: 5 10.0: 10
② Connector type at drive side 0: DB9 1: USB	④ Connector type at motor side 0: 9-core plastic connector 1: 9-core aviation connector 4: SDC-06T series aviation connector (front outlet) 5: SDC-06T series aviation connector (rear outlet)	⑥ Special requirements _: Fixed cable T: Flexible cable ≥ 10 million reciprocating cycles

Note

Encoder cables are shielded by default.

Model of communication cables

S6-L-T 00 - 3.0
① ② ③

① Cable type	② Communication cable connection type	③ Cable length (m)
S6-L-T: Motion control communication cable	00: Drive to PC communication cable	3.0: 3
	01: Multi-drive communication cable (CAN&485)	5.0: 5
	02: Drive to PLC communication cable	10.0: 10
	03: Drive communication termination resistor cable (CAN&485)	
	04: Drive network communication cable (EtherCAT)	

Note

For selection of cables, see related section for details.

5.2 Cable Type

Fixed cable

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.

Recommended bending radius $\geq 5D$ (D: Cable diameter)

Flexible cable

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

Recommended bending radius $\geq 10D$ (D: Cable diameter)

Note

- Do not wind or twist the cables in the drag chain.
- Ensure the cable can move within the bending radius. Do not move the cables by force. Ensure a relative movement between cables or between the cable and the guiding device is available.
- do not fix or bundle the cables inside the cable protection chain. You can bundle them at both ends of the cable protection chain;

Oil-resistant cable

Oil-resistant cables apply to machine tools, cutting fluids, and cutting compounds.

More information

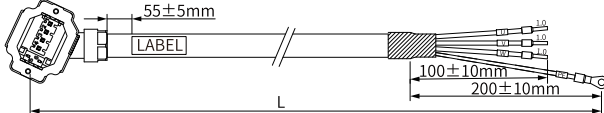
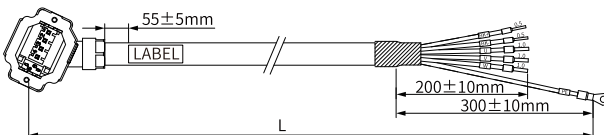
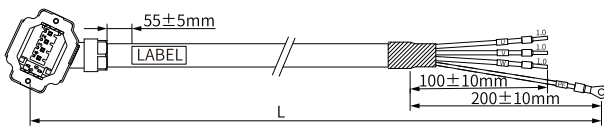
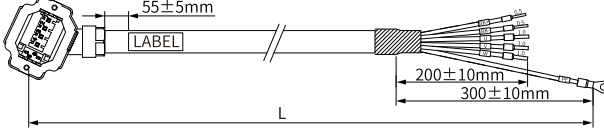
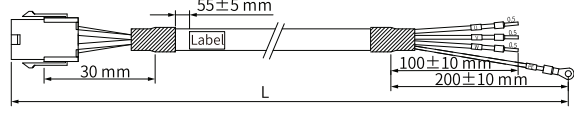
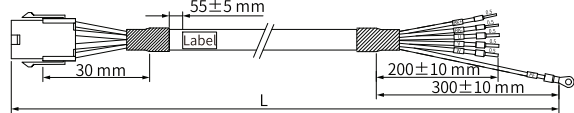
The terminal type motor power cables and encoder cables require dedicated equipment and tooling for assembly. Order finished cables from channels authorized by Inovance.

For more information, see related sections.

5.3 Cable Selection List

5.3.1 SV680 Series

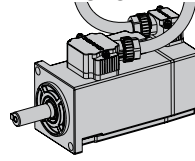
Power cables

Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	Without brake	S6-L-M107-3.0	3100	
			S6-L-M107-5.0	5100	
			S6-L-M107-10.0	10100	
		With bake	S6-L-B107-3.0	3100	
			S6-L-B107-5.0	5100	
			S6-L-B107-10.0	10100	
	Rear outlet	Without brake	S6-L-M108-3.0	3100	
			S6-L-M108-5.0	5100	
			S6-L-M108-10.0	10100	
		With bake	S6-L-B108-3.0	3100	
			S6-L-B108-5.0	5100	
			S6-L-B108-10.0	10100	
MS1H1/ MS1H4 flying leads type (-S) motor	Without brake	S6-L-M100-3.0	3100		
		S6-L-M100-5.0	5100		
		S6-L-M100-10.0	10100		
	With bake	S6-L-B100-3.0	3100		
		S6-L-B100-5.0	5100		
		S6-L-B100-10.0	10100		

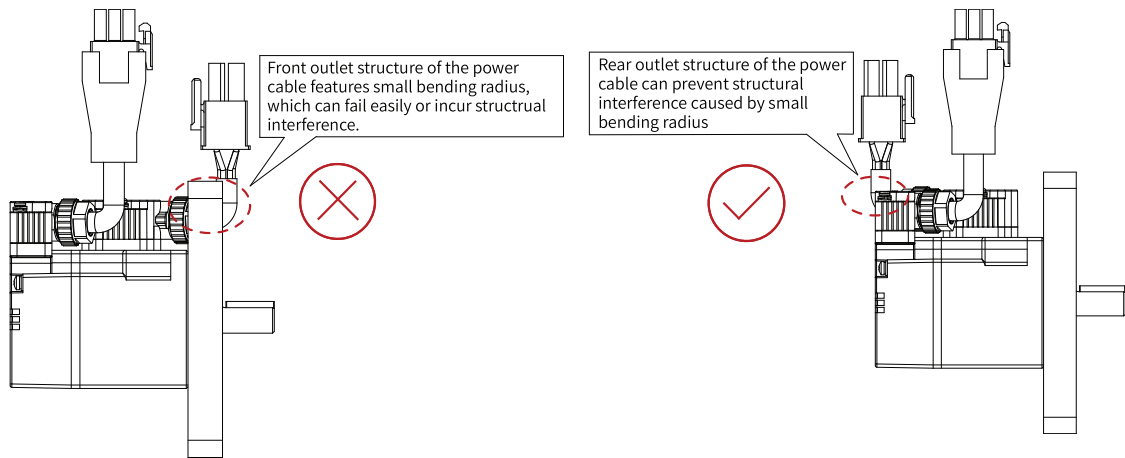
Motor model	Name	Cable model	Cable length (mm)	Drawing
MS1H2 motors rated 3 kW and below/ MS1H3 motors rated 1.8 kW and below	Without brake	S6-L-M111-3.0	3100	
		S6-L-M111-5.0	5100	
		S6-L-M111-10.0	10100	
	With brake	S6-L-B111-3.0	3100	
		S6-L-B111-5.0	5100	
		S6-L-B111-10.0	10100	
MS1H2 motors rated 4 kW/5 kW	Without brake	S6-L-M011-3.0	3000	
		S6-L-M011-5.0	5000	
		S6-L-M011-10.0	10000	
	With brake	S6-L-B011-3.0	3000	
		S6-L-B011-5.0	5000	
		S6-L-B011-10.0	10000	
MS1H3 motors rated 2.9 kW	Without brake	S6-L-M112-3.0	3100	
		S6-L-M112-5.0	5100	
		S6-L-M112-10.0	10100	
	With brake	S6-L-B112-3.0	3100	
		S6-L-B112-5.0	5100	
		S6-L-B112-10.0	10100	
MS1H3 motors rated 4.4 kW and above	Without brake	S6-L-M022-3.0	3000	
		S6-L-M022-5.0	5000	
		S6-L-M022-10.0	10000	
	With brake	S6-L-B022-3.0	3000	
		S6-L-B022-5.0	5000	
		S6-L-B022-10.0	10000	

Note

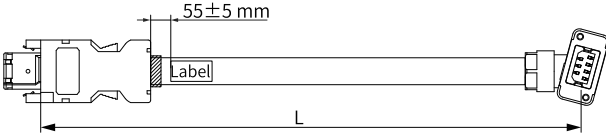
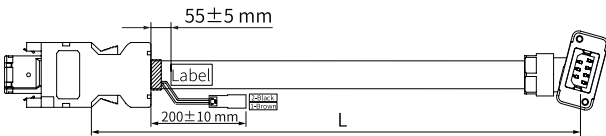
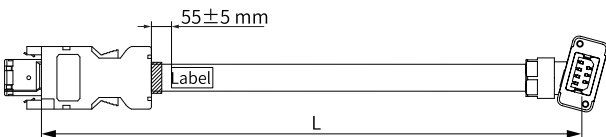
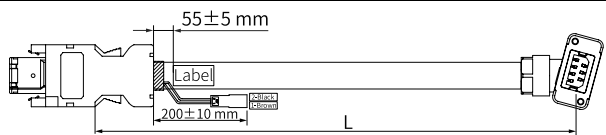
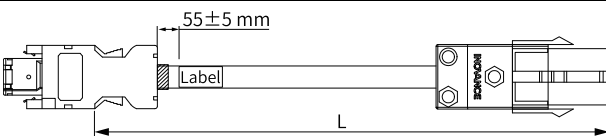
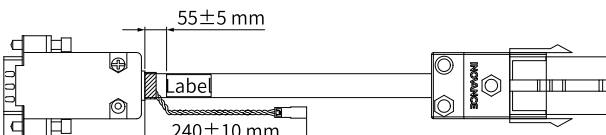
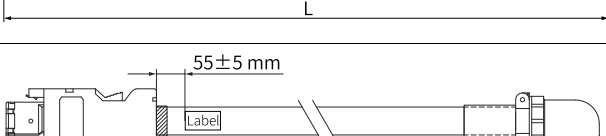
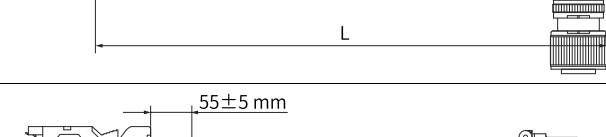
- To prevent the mounting flange from being disturbed by power cables, route the power cables of 50 W motors through the rear outlet mode as shown in the following figure.



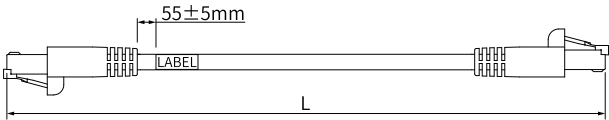
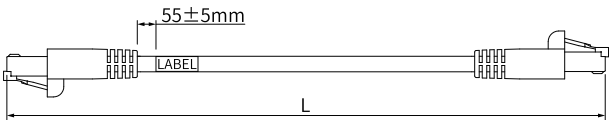
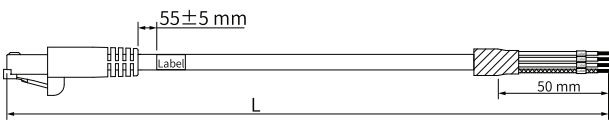
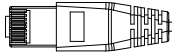
- For more information about cables, see the servo drive hardware guide.
- Power cables are equipped with a shield as standard. Select a shield bracket and lock the clamp on the cable to the shield bracket.
- -T: Flexible cable is optional.



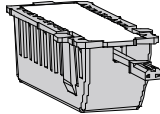
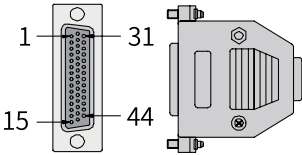
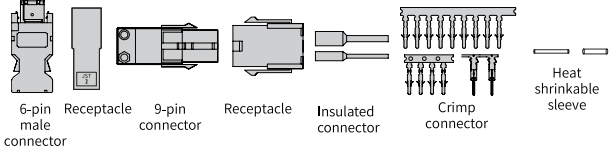
Encoder cables

Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	Single-turn absolute encoder cable	S6-L-P114-3.0	3000	
			S6-L-P114-5.0	5000	
			S6-L-P114-10.0	10000	
		Multi-turn absolute encoder cable	S6-L-P124-3.0	3000	
			S6-L-P124-5.0	5000	
			S6-L-P124-10.0	10000	
	Rear outlet	Single-turn absolute encoder cable	S6-L-P115-3.0	3000	
			S6-L-P115-5.0	5000	
			S6-L-P115-10.0	10000	
		Multi-turn absolute encoder cable	S6-L-P125-3.0	3000	
			S6-L-P125-5.0	5000	
			S6-L-P125-10.0	10000	
MS1H1/MS1H4 flying leads type (-S) motor	Single-turn absolute encoder cable	S6-L-P110-3.0	3000		
		S6-L-P110-5.0	5000		
		S6-L-P110-10.0	10000		
	Multi-turn absolute encoder cable	S6-L-P120-3.0	3000		
		S6-L-P120-5.0	5000		
		S6-L-P120-10.0	10000		
MS1H2 motor	Single-turn absolute encoder cable	S6-L-P111-3.0	3000		
		S6-L-P111-5.0	5000		
		S6-L-P111-10.0	10000		
	Multi-turn absolute encoder cable	S6-L-P121-3.0	3000		
		S6-L-P121-5.0	5000		
		S6-L-P121-10.0	10000		

Communication cables

Name	Cable model	Cable length (mm)	Drawing
Servo drive communication cable (for SV680N models)	S6-L-T04-0.3	300	
Multi-drive communication cable (for SV680P models)	S6-L-T01-0.3	300	
Servo drive to host controller communication cable	S6-L-T02-2.0	2000	
Servo drive termination resistor connector	S6-L-T03-0.0	-	

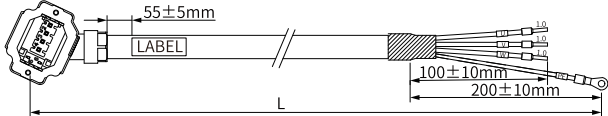
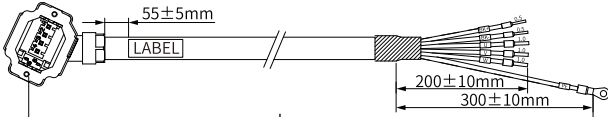
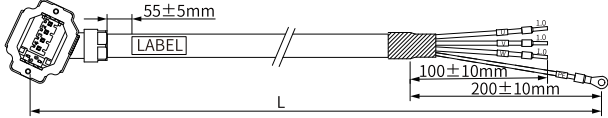
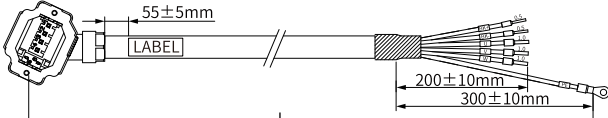
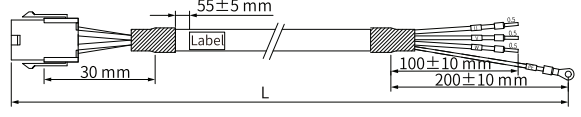
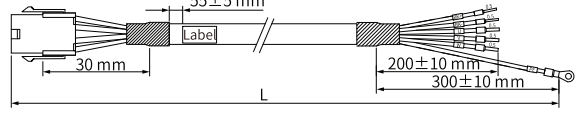
Connector kit

Name	Cable model	Cable length (mm)	Drawing
Battery kit	S6-C4A	-	
CN1 terminal (DB44) (for SV680P models)	S6-C8	-	 Soldering side Side face of the enclosure
Connector for MS1H1 flying leads type (-S) motors	S6-C26	-	 6-pin male connector Receptacle 9-pin connector Receptacle Insulated connector Crimp connector Heat shrinkable sleeve

Name	Cable model	Cable length (mm)	Drawing
Connector for motors below 2.9 kW	S6-C29	-	6-pin male connector Receptacle Crimp connector circular connector circular connector Heat shrinkable sleeve Insulation material 1.0 1.5 Insulated connector
Connector for motors of 2.9 kW and above	S6-C39	-	1394 male Base Crimping terminal Aviation connector Aviation connector Heat-shrink tube Insulation material

5.3.2 SV670 Series

Power cables

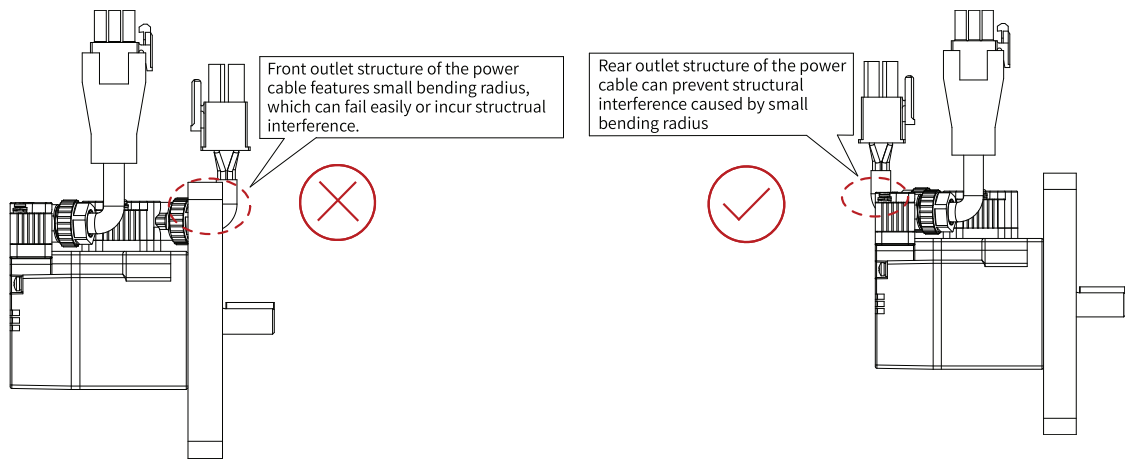
Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	Without brake	S6-L-M107-3.0	3100	
			S6-L-M107-5.0	5100	
			S6-L-M107-10.0	10100	
		With bake	S6-L-B107-3.0	3100	
			S6-L-B107-5.0	5100	
			S6-L-B107-10.0	10100	
	Rear outlet	Without brake	S6-L-M108-3.0	3100	
			S6-L-M108-5.0	5100	
			S6-L-M108-10.0	10100	
		With bake	S6-L-B108-3.0	3100	
			S6-L-B108-5.0	5100	
			S6-L-B108-10.0	10100	
MS1H1/ MS1H4 flying leads type (-S) motor	Without brake	S6-L-M100-3.0	3100		
		S6-L-M100-5.0	5100		
		S6-L-M100-10.0	10100		
	With bake	S6-L-B100-3.0	3100		
		S6-L-B100-5.0	5100		
		S6-L-B100-10.0	10100		

Cable Selection

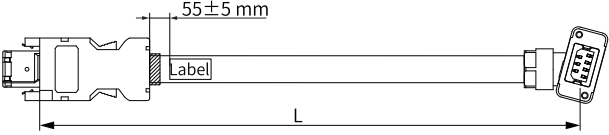
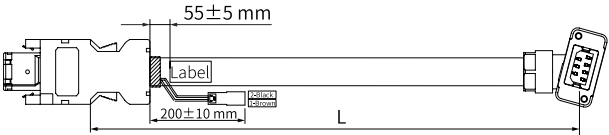
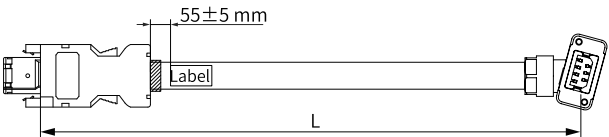
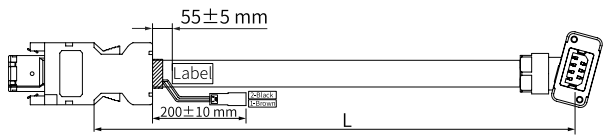
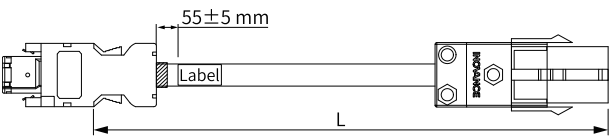
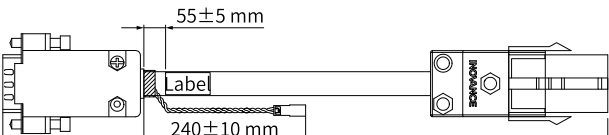
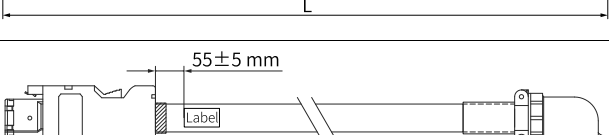
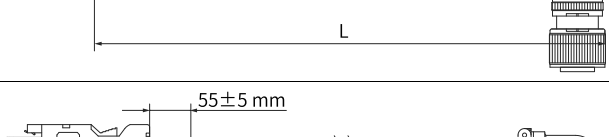
Motor model	Name	Cable model	Cable length (mm)	Drawing
MS1H2 motors rated 3 kW and below/ MS1H3 motors rated 1.8 kW and below	Without brake	S6-L-M111-3.0	3100	
		S6-L-M111-5.0	5100	
		S6-L-M111-10.0	10100	
	With brake	S6-L-B111-3.0	3100	
		S6-L-B111-5.0	5100	
		S6-L-B111-10.0	10100	
MS1H2 motors rated 4 kW/5 kW	Without brake	S6-L-M011-3.0	3000	
		S6-L-M011-5.0	5000	
		S6-L-M011-10.0	10000	
	With brake	S6-L-B011-3.0	3000	
		S6-L-B011-5.0	5000	
		S6-L-B011-10.0	10000	
MS1H3 motors rated 2.9 kW	Without brake	S6-L-M112-3.0	3100	
		S6-L-M112-5.0	5100	
		S6-L-M112-10.0	10100	
	With brake	S6-L-B112-3.0	3100	
		S6-L-B112-5.0	5100	
		S6-L-B112-10.0	10100	
MS1H3 motors rated 4.4 kW and above	Without brake	S6-L-M022-3.0	3000	
		S6-L-M022-5.0	5000	
		S6-L-M022-10.0	10000	
	With brake	S6-L-B022-3.0	3000	
		S6-L-B022-5.0	5000	
		S6-L-B022-10.0	10000	

Note

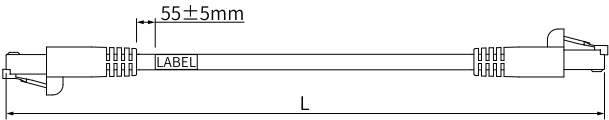
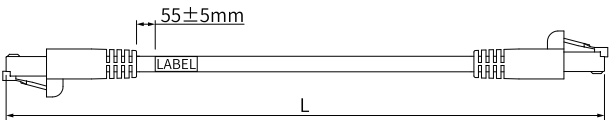
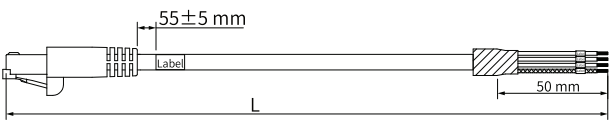
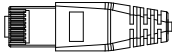
- For 50 W terminal type models, use rear outlet for power cables.
- For 100 W models, if the mounting flange face is internally stepped type, only terminal-type models can be used, which are equipped with power cables with rear outlet.



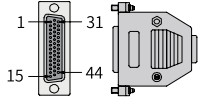
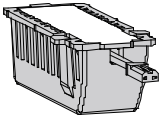
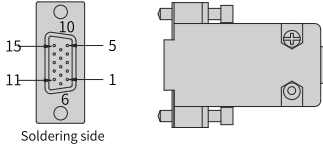
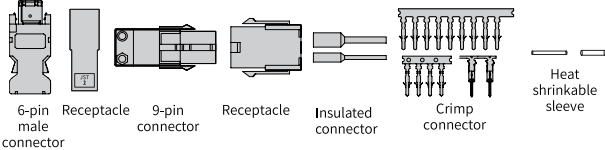
Encoder cables

Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	Single-turn absolute encoder cable	S6-L-P114-3.0	3000	
			S6-L-P114-5.0	5000	
			S6-L-P114-10.0	10000	
		Multi-turn absolute encoder cable	S6-L-P124-3.0	3000	
			S6-L-P124-5.0	5000	
			S6-L-P124-10.0	10000	
	Rear outlet	Single-turn absolute encoder cable	S6-L-P115-3.0	3000	
			S6-L-P115-5.0	5000	
			S6-L-P115-10.0	10000	
		Multi-turn absolute encoder cable	S6-L-P125-3.0	3000	
			S6-L-P125-5.0	5000	
			S6-L-P125-10.0	10000	
MS1H1/MS1H4 flying leads type (-S) motor	Single-turn absolute encoder cable	Single-turn absolute encoder cable	S6-L-P110-3.0	3000	
			S6-L-P110-5.0	5000	
			S6-L-P110-10.0	10000	
	Multi-turn absolute encoder cable	Multi-turn absolute encoder cable	S6-L-P120-3.0	3000	
			S6-L-P120-5.0	5000	
			S6-L-P120-10.0	10000	
MS1H2/MS1H3 motor	Single-turn absolute encoder cable	Single-turn absolute encoder cable	S6-L-P111-3.0	3000	
			S6-L-P111-5.0	5000	
			S6-L-P111-10.0	10000	
	Multi-turn absolute encoder cable	Multi-turn absolute encoder cable	S6-L-P121-3.0	3000	
			S6-L-P121-5.0	5000	
			S6-L-P121-10.0	10000	

Communication cables

Name	Cable model	Cable length (mm)	Drawing
Multi-drive communication cable (for SV670P models)	S6-L-T01-0.3	300	
Servo drive communication cable (for SV670N models)	S6-L-T04-0.3	300	
Servo drive to host controller communication cable	S6-L-T02-2.0	2000	
Servo drive termination resistor connector	S6-L-T03-0.0	-	

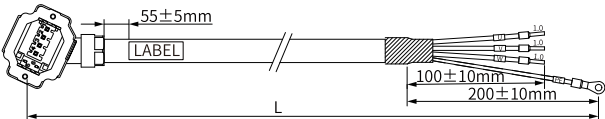
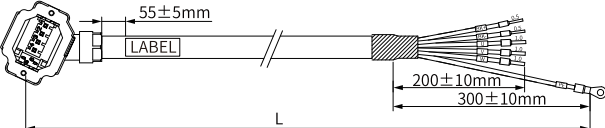
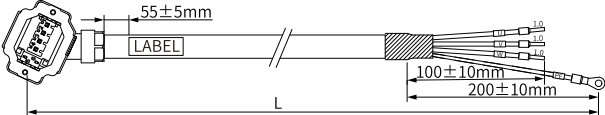
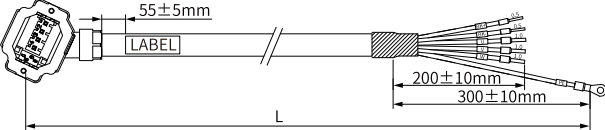
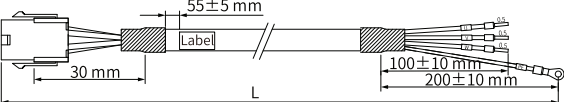
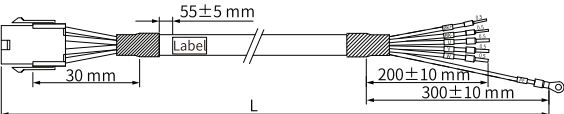
Connector kit

Name	Model	Outline Drawing
CN1 terminal (DB44) (for SV670P models)	S6-C8	 Soldering side Side of the enclosure
Battery kit	S6-C4A	
CN7 terminal (DB15)	S6-C6	 Soldering side
Connector for MS1H1 flying leads type (-S) motors	S6-C26	 6-pin male connector Receptacle 9-pin connector Receptacle Insulated connector Crimp connector Heat shrinkable sleeve

Name	Model	Outline Drawing
Connector for motors below 2.9 kW	S6-C29	6-pin male connector, Receptacle, Crimp connector, circular connector, circular connector, Heat shrinkable sleeve, Insulation material, Insulated connector
Connector for motors of 2.9 kW and above	S6-C39	1394 male connector, Receptacle, Crimp connector, circular connector, circular connector, Heat shrinkable sleeve, Insulation material

5.3.3 SV660 and SV630 Series

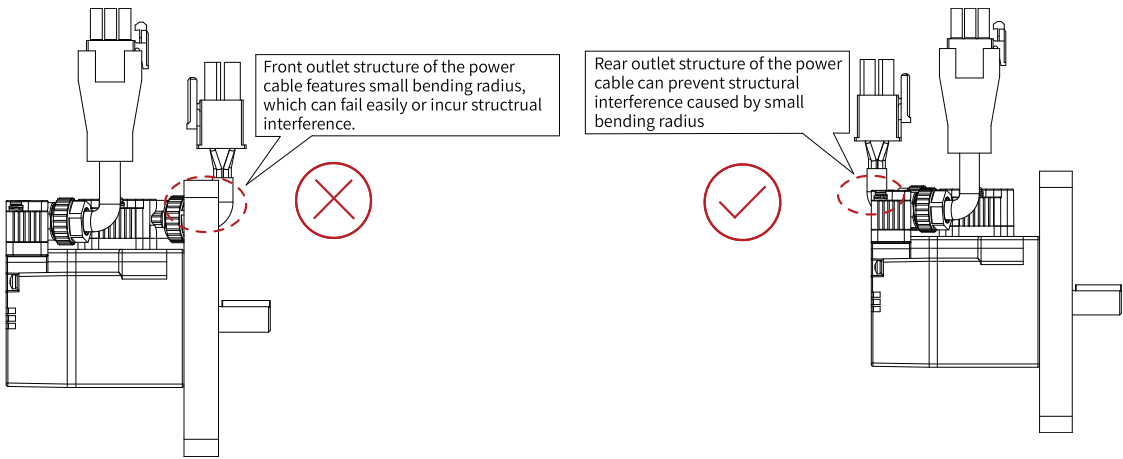
Power cables

Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	Without brake	S6-L-M107-3.0	3100	
			S6-L-M107-5.0	5100	
			S6-L-M107-10.0	10100	
		With bake	S6-L-B107-3.0	3100	
			S6-L-B107-5.0	5100	
			S6-L-B107-10.0	10100	
	Rear outlet	Without brake	S6-L-M108-3.0	3100	
			S6-L-M108-5.0	5100	
			S6-L-M108-10.0	10100	
		With bake	S6-L-B108-3.0	3100	
			S6-L-B108-5.0	5100	
			S6-L-B108-10.0	10100	
MS1H1/ MS1H4 flying leads type (-S) motor	Without brake	S6-L-M100-3.0	3100		
		S6-L-M100-5.0	5100		
		S6-L-M100-10.0	10100		
	With bake	S6-L-B100-3.0	3100		
		S6-L-B100-5.0	5100		
		S6-L-B100-10.0	10100		

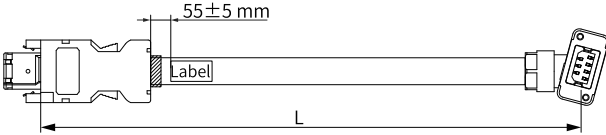
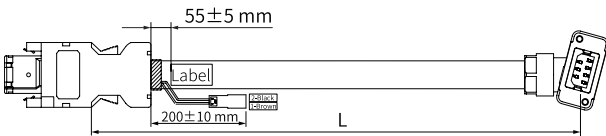
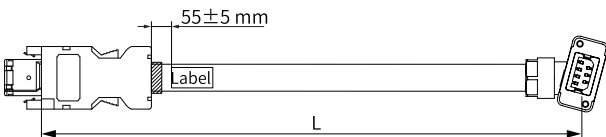
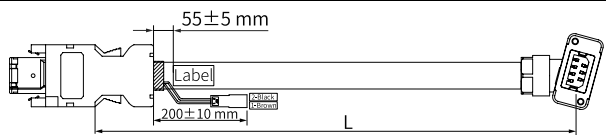
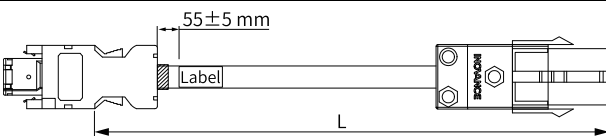
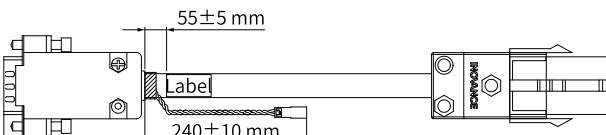
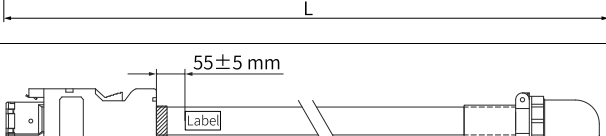
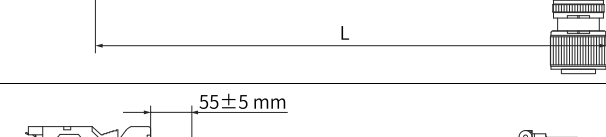
Motor model	Name	Cable model	Cable length (mm)	Drawing
MS1H2 motors rated 3 kW and below/ MS1H3 motors rated 1.8 kW and below	Without brake	S6-L-M111-3.0	3100	
		S6-L-M111-5.0	5100	
		S6-L-M111-10.0	10100	
	With brake	S6-L-B111-3.0	3100	
		S6-L-B111-5.0	5100	
		S6-L-B111-10.0	10100	
MS1H2 motor rated 4 kW/5 kW	Without brake	S6-L-M011-3.0	3000	
		S6-L-M011-5.0	5000	
		S6-L-M011-10.0	10000	
	With brake	S6-L-B011-3.0	3000	
		S6-L-B011-5.0	5000	
		S6-L-B011-10.0	10000	
MS1H3 motors rated 2.9 kW	Without brake	S6-L-M112-3.0	3100	
		S6-L-M112-5.0	5100	
		S6-L-M112-10.0	10100	
	With brake	S6-L-B112-3.0	3100	
		S6-L-B112-5.0	5100	
		S6-L-B112-10.0	10100	
MS1H3 motors rated 4.4 kW and above	Without brake	S6-L-M022-3.0	3000	
		S6-L-M022-5.0	5000	
		S6-L-M022-10.0	10000	
	With brake	S6-L-B022-3.0	3000	
		S6-L-B022-5.0	5000	
		S6-L-B022-10.0	10000	

Note

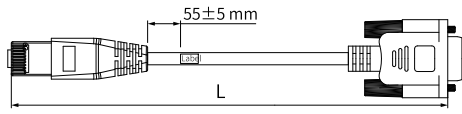
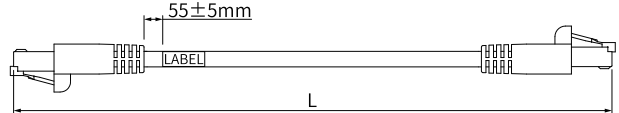
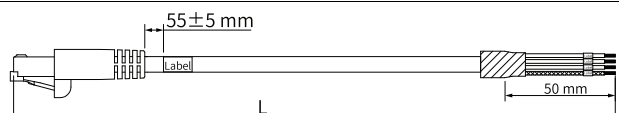
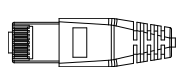
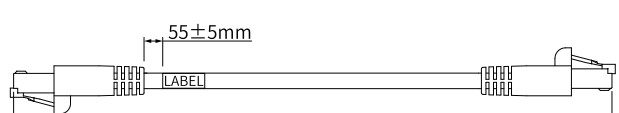
- For 50 W terminal type models, use rear outlet for power cables.
- For 100 W models, if the mounting flange face is internally stepped type, only terminal-type models can be used, which are equipped with power cables with rear outlet.



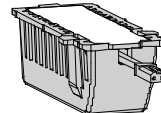
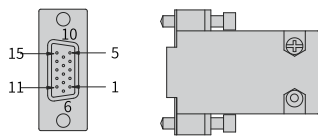
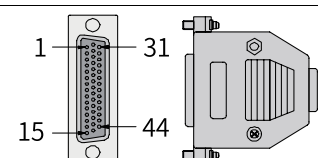
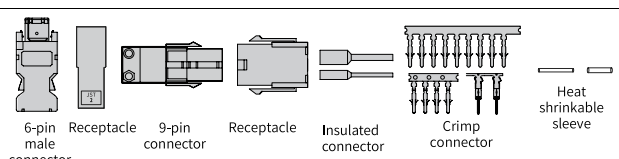
Encoder cable

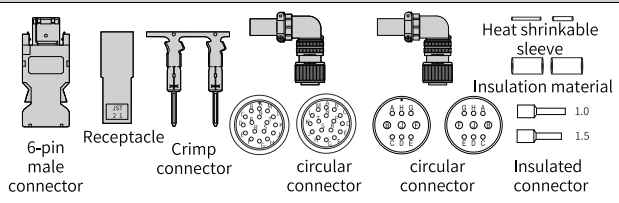
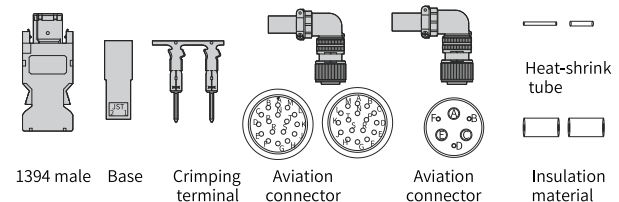
Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	Single-turn absolute encoder cable	S6-L-P114-3.0	3000	
			S6-L-P114-5.0	5000	
			S6-L-P114-10.0	10000	
		Multi-turn absolute encoder cable	S6-L-P124-3.0	3000	
			S6-L-P124-5.0	5000	
			S6-L-P124-10.0	10000	
	Rear outlet	Single-turn absolute encoder cable	S6-L-P115-3.0	3000	
			S6-L-P115-5.0	5000	
			S6-L-P115-10.0	10000	
		Multi-turn absolute encoder cable	S6-L-P125-3.0	3000	
			S6-L-P125-5.0	5000	
			S6-L-P125-10.0	10000	
MS1H1/MS1H4 flying leads type (-S) motor	Single-turn absolute encoder cable	S6-L-P110-3.0	3000		
		S6-L-P110-5.0	5000		
		S6-L-P110-10.0	10000		
	Multi-turn absolute encoder cable	S6-L-P120-3.0	3000		
		S6-L-P120-5.0	5000		
		S6-L-P120-10.0	10000		
MS1H2/H3 motor	Single-turn absolute encoder cable	S6-L-P111-3.0	3000		
		S6-L-P111-5.0	5000		
		S6-L-P111-10.0	10000		
	Multi-turn absolute encoder cable	S6-L-P121-3.0	3000		
		S6-L-P121-5.0	5000		
		S6-L-P121-10.0	10000		

Communication cables

Name	Cable model	Cable length (mm)	Drawing
Drive to PC communication cable	S6-L-T00-3.0	3000	
Multi-drive communication cable (for SV660P models)	S6-L-T01-0.3	300	
Servo drive to host controller communication cable (for SV660P models)	S6-L-T02-2.0	2000	
Termination resistor connector (for SV660P models)	S6-L-T03-0.0	-	
Servo drive network communication cable	S6-L-T04-0.3	300	
Servo drive to host controller communication cable	S6-L-T04-3.0	3000	

Connector kit

Name	Cable model	Cable length (mm)	Drawing
Battery kit	S6-C4A	-	
CN1 terminal (DB15)	S6-C6	-	
CN1 terminal (DB44) (for SV660P models)	S6-C8	-	
Connector for MS1H1 flying leads type (-S) motors	S6-C26	-	

Name	Cable model	Cable length (mm)	Drawing
Connector for motors below 2.9 kW	S6-C29	-	
Connector for motors of 2.9 kW and above	S6-C39	-	

5.4 Cable Terminals

5.4.1 Power Cable Terminals



- Do not connect the output terminals U, V, and W of the drive to a three-phase power supply. Failure to comply may result in physical injury or a fire.
- Do not connect the motor terminals U, V, and W to a mains power supply. Failure to comply may result in physical injury or a fire.
- The main circuit cable must be away from the motor so that its insulation will not be damaged by high temperature of the motor surface.
- Connect the servo drive to the motor directly. Do not use an electromagnetic contactor during wiring. Failure to comply may result in equipment fault.

- The following figure shows the wiring diagram for a terminal type motor.

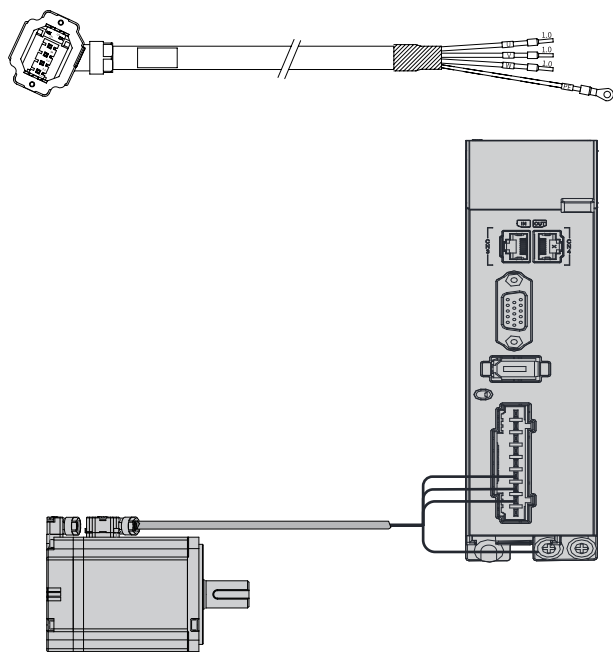
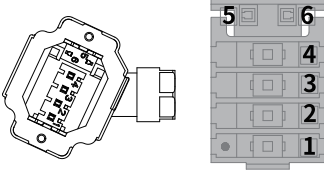


Figure 5-1 Wiring between the drive and terminal type motor

Table 5-1 Description of power cable connector (motor side)

Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Signal name	Color
Terminal type: 40 60 80	 Black 6-pin connector	1	PE	Yellow/Green
		2	W	Red
		3	V	Black
		4	U	White
		5	Brake (polarity insensitive)	Brown
		6		Blue

Note

- [1] The frame size refers to the width of the mounting flange (in mm).
 - Power cable colors are subject to the actual product. All cable colors mentioned in this guide refer to Inovance cable colors.
 - Ground the motor to the PE position of the drive screw if possible. For details, see System Wiring Diagram.
-
- The connection diagram for a flying leads type motor is shown in the following figure.

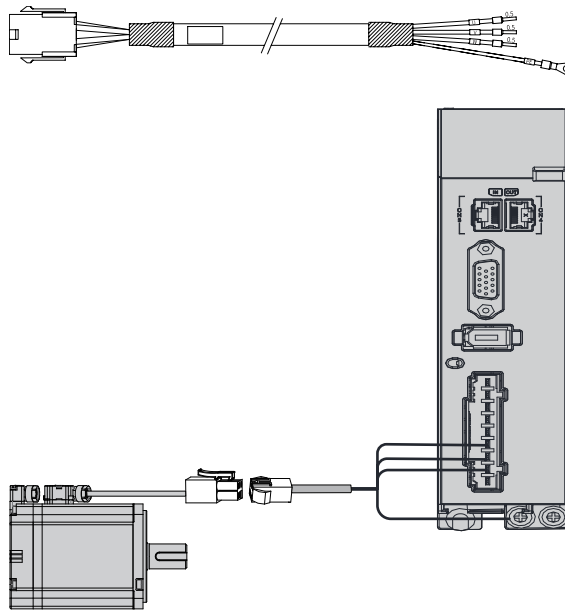
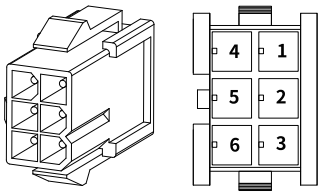


Figure 5-2 Wiring between the drive and terminal type motor

Table 5-2 Description of power cable connector (motor side)

Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Signal name	Color
Flying leads type: 40 60 80	 Black 6-pin connector Recommendation: Plastic enclosure: MOLEX-50361736 Terminal: MOLEX-39000061	1	U	White
		2	V	Black
		4	W	Red
		5	PE	Yellow/Green
		3	Brake (polarity insensitive)	Brown
		6		Blue

Note

- [1] The frame 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.
- Ground the motor to the PE position of the drive screw if possible. For details, see System Wiring Diagram.

- The following table describes the connector for high-power motor power cables.

Table 5–3 Description of power cable connector (motor side)

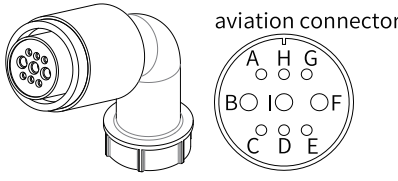
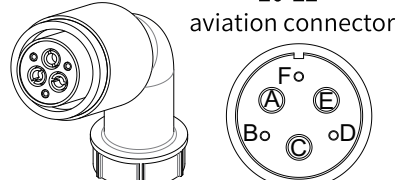
Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Signal name	Color
100 130		B	U	Blue
		I	V	Black
		F	W	Red
		G	PE	Yellow/Green
		C	Brake (polarity insensitive)	Red
		E		Black

Table 5–4 Description of power cable connector (motor side)

Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Signal name	Color
180		A	U	Blue
		C	V	Black
		E	W	Red
		F	PE	Yellow/Green
		B	Brake (polarity insensitive)	Red
		D		Black

Note

- [1] The frame 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.
- Ground the motor to the PE position of the drive screw if possible. For details, see System Wiring Diagram.

Cable shield requirements

Take proper shielding measures in the following locations to prevent equipment damage:

- Locations with interference caused by static electricity
- Locations with strong electric field or magnetic field
- Locations with radioactive rays

The motor power cable shield needs to be connected to the power cable grounding cable to ensure reliable grounding, as shown in the following figure.

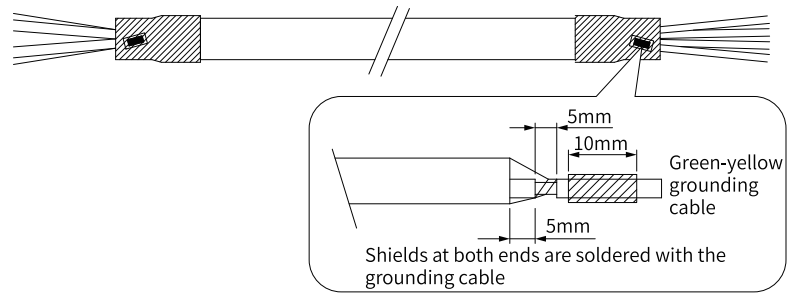


Figure 5-3 Wiring of the shield

5.4.2 Encoder Cable Terminals

Cable specifications

- Ground the shielded layers on both the servo drive side and the motor side. Otherwise, the servo drive will report a false alarm.
- Do not connect cables to the "reserved" terminals.
- Given the voltage drop caused by cable resistance and signal attenuation caused by distributed capacitance, it is recommended to use twisted-pair cables of 26AWG or above (as per UL20276 standard) with length no longer than 10 m as the encoder cable.

Note

It is recommended to use 22AWG to 26AWG cables for 10B, 20B, 40B, and 75B series motors. If a longer cable is required, increase the cable cross sectional area properly. See [“Table 5-5 Recommended cables” on page 167](#) for details.

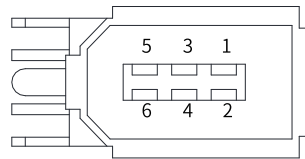
Table 5-5 Recommended cables

Cable size (AWG)	Cable resistance per unit length (Ω/km)	Allowable cable length (m)
3P x 26	143	0 to 10
1P x 22+2P x 26	54.3	10 to 26.4
1P x 20+2P x 24	33.9	26.4 to 42.2
1P x 18+2P x 22	21.4	42.2 to 66.8
1P x 16+2P x 18	13.5	66.8 to 105.0

Note

- The above length can be increased by 2 m to 3 m.
- If the cables of above 16AWG are required, contact the sales personnel of Inovance.

Terminal layout



Encoder signal terminal CN2

Figure 5-4 Layout of encoder terminal pins

Table 5-6 Description of encoder terminal pins

Pin No.	Assignment	Description
1	+5V	5 V power supply
2	GND	
3	Reserved	-
4	Reserved	-
5	PS+	Gantry synchronization signal
6	PS-	
Enclosure	PE	Shield

Terminal description

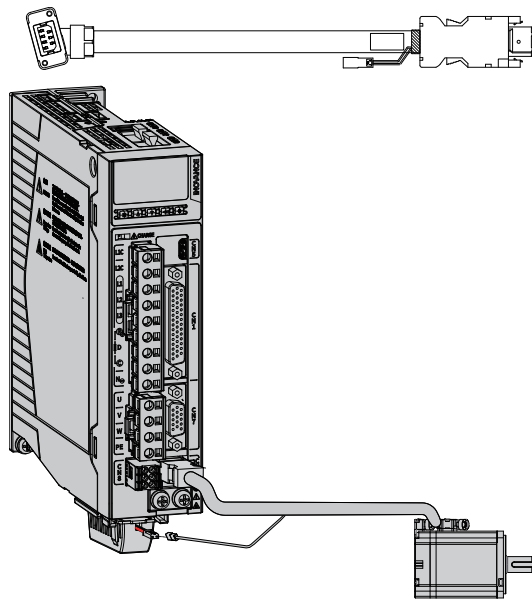


Figure 5-5 Wiring example of absolute encoder signals^[1]

Note

- [1] The preceding figure shows the wiring of a 26-bit multi-turn absolute encoder.
- The encoder cable color is subject to the color of the actual product. Cable colors mentioned in this guide all refer to Inovance cables.

The following figure describes the lead wire color of the battery box.

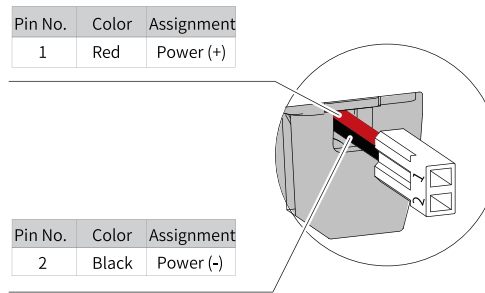


Figure 5-6 Lead wire color of the battery box

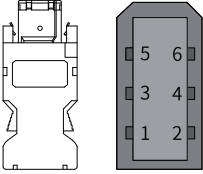
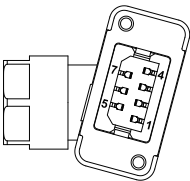
Note

- Keep the battery in environments within the required ambient temperature range and ensure the battery is in reliable contact and carries sufficient power capacity. Otherwise, encoder data loss may occur.
- Model of the battery box (battery included): S6-C4A

Note

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

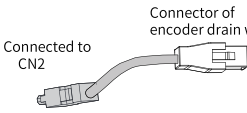
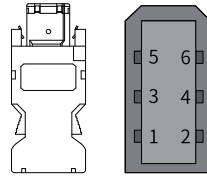
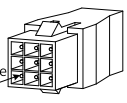
Table 5-7 terminal type motor encoder cable connector

Applicable motor frame size ^[1]	Drawing of the connector		Pin layout			
			Pin No.	Signal name	Color	Type
Terminal type: 40 60 80	Drive side	 6-pin male (right side as the joint side)	1	+5V	Red	Twisted pair
			2	GND	Orange	
			5	PS+	Blue	Twisted pair
			6	PS-	Purple	
			Enclosure	PE	-	-
	Motor side	 7-pin connector	1	PS+	Blue	Twisted pair
			2	PS-	Purple	
			3	DC+	Brown	Twisted pair
			4	DC-	Black	
			5	+5V	Red	Twisted pair
			6	GND	Orange	
			7	PE	-	-

Note

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

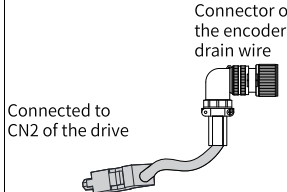
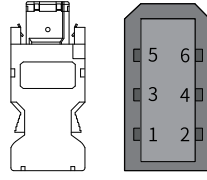
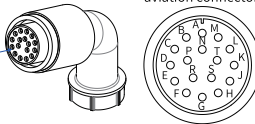
Table 5-8 Flying leads type motor encoder cable connector

Applicable motor frame size ^[1]	Drawing of the connector			Pin layout			
				Pin No.	Signal name	Color	Type
Flying leads type: 40 60 80		Drive side	 6-pin male (right side as the joint side)	1	+5V	Red	Twisted pair
				2	GND	Orange	
				5	PS+	Blue	Twisted pair
				6	PS-	Purple	
		Motor side	 9-pin connector Recommended: Plastic enclosure: AMP 172161-1; terminal: AMP 770835-1	Enclosure	PE	-	-
				1	Battery (+)	Brown	Twisted pair
				4	Battery (-)	Black	
				3	PS+	Blue	
				6	PS-	Purple	-
				9	+5V	Red	
				8	GND	Orange	
				7	Shield	-	

Note

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

Table 5-9 High power motor encoder cable connector

Applicable motor frame size ^[1]	Drawing of the connector			Pin layout			
				Pin No.	Signal name	Color	Type
100 130 180		Drive side	 6-pin male (right side as the joint side)	1	+5V	Red	Twisted pair
				2	GND	Orange	
				5	PS+	Blue	Twisted pair
				6	PS-	Purple	
		Motor side	 20-29 aviation connector	Enclosure	PE	-	-
				A	PS+	Blue	Twisted pair
				B	PS-	Purple	
				E	Battery (+)	Brown	-
				F	Battery (-)	Black	
				G	+5V	Red	-
				H	GND	Orange	
				J	Shield	-	

Note

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

5.5 Connectors

Power cable connector

Note

Check that the connector cushion is in place before connection.

Align pins 5 and 6 to corresponding holes (as shown in the following figure) and insert them into the holes. Do not insert pins 5 and 6 forcibly. After insertion, screw down with a tightening torque of 1.5 ± 0.5 kgf.cm.

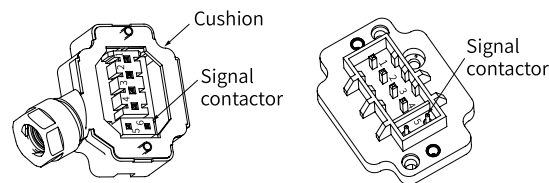


Figure 5-7 Power connector

Encoder connector

Note

Screw-down is allowed only when the rubber gasket of the plug is in place with both long edges locked into the enclosure slot flatly.

Connectors and sockets are designed with fool-proof chamfers (as shown below). Align the fool-proof chamfer before insertion. After insertion, screw down the two screws on the connector with a tightening torque of 1.5 ± 0.5 kgf.cm · m.

Screw-down is allowed only when the rubber gasket of the plug is in place with both long edges locked into the enclosure slot flatly.

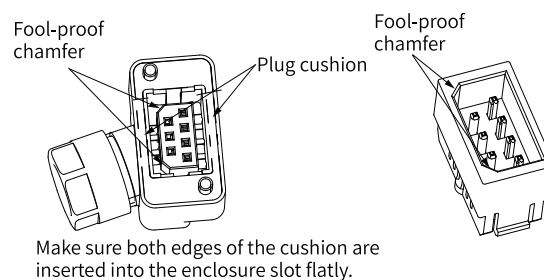


Figure 5-8 Encoder connector

Note

- The assembly direction of the plug insulator is subject to the actual direction.
- Do not energize an electrical connector connected loosely. Plug-in/out is not allowed when the power is on.
- The mating life of the electrical connector is 50 cycles. Keep the connector and socket clean without greasy dirt during use. Handle the connector and socket with care to prevent damage.
- Before connecting the male and female connectors, ensure they are free from condensation and pollutants. Take protective measures for idled connectors to prevent intrusion of dust and liquid.

Power cable and encoder cable adapter scheme

For the adapter between the power cable and encoder cable, it is recommended to use models Molex-39039062 and Molex-469990295 as power cable connectors and model TE-1-172169-9 as encoder connector, as shown below.

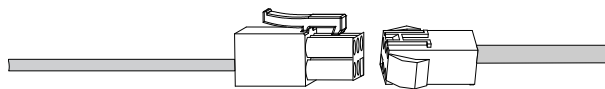


Figure 5-9 Power cable adapter scheme

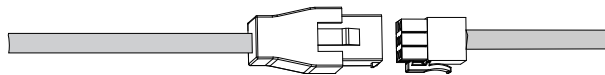


Figure 5-10 Encoder cable adapter scheme

5.6 Absolute Encoder Batteries**Selection**

Select an appropriate battery according to the following table.

Table 5-10 Description of the absolute encoder battery

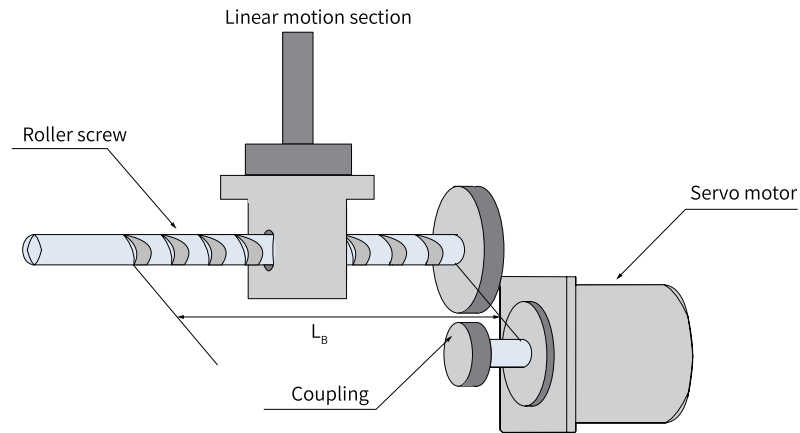
Specification	Item	Rating			Condition
		Min.	Typical Value	Max.	
Output: 3.6 V, 2700 mAh	External battery voltage (V)	3.2	3.6	3.8	In the standby mode ^[1]
	Circuit fault voltage (V)	-	2.6	-	In standby mode
	Battery alarm voltage (V)	2.85	3	3.15	-
	Circuit draw current (μA)	-	2	-	In the normal operation mode ^[2]
		-	10	-	In the standby mode, the axis is static.
		-	300	-	In standby mode, axis rotating
	Ambient temperature (°C)	0	-	40	Same as the motor
	Storage temperature (°C)	0	-	30	

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.
 - The values in the table are obtained under an ambient temperature of 20°C.
 - Store the battery box in a cool, clean and dry environment, with recommended temperature $\leq 30^{\circ}\text{C}$ and relative humidity $\leq 60\%$. Avoid contact with corrosive materials and keep it away from fire and heat sources.
-

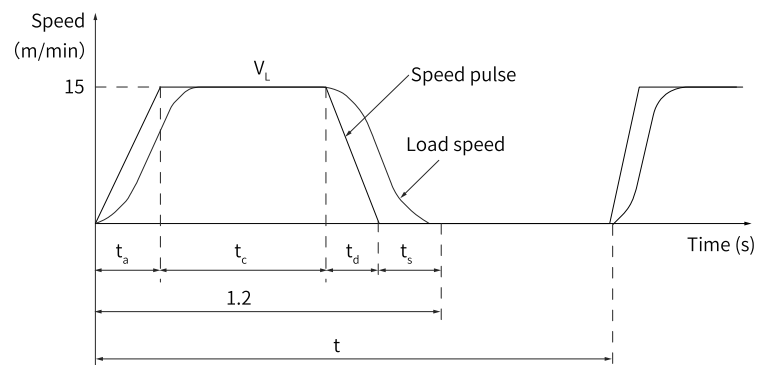
6 Servo Motor Capacity Selection

6.1 Capacity Selection Example for Position Control



Load speed (V_L) = 15 m/min
 Mass of the rectilinear motion part (m): 80 kg
 Roller screw length (L_B): 0.8 m
 Roller screw diameter (d_B): 0.016 m
 Roller screw lead (P_B): 0.005 m
 Coupling mass (m_c): 0.3 kg
 Coupling outer diameter (d_c): 0.03 m
 Times of feeding (n): 40/min
 Length of feeding (L): 0.25 m
 Feeding time (t_m) < 1.2s
 Electrical stopping precision (δ) = ± 0.01 mm
 Friction coefficient (μ): 0.2
 Mechanical efficiency (η) = 0.9 (90%)

1. Speed diagram



$$t = \frac{60}{n} = \frac{60}{40} = 1.5(s)$$

$$T_a = t_d, t_s = 0.1(s)$$

$$T_a = t_m - t_s - \frac{60L}{V_L} = 1.2 - 0.1 - \frac{60 \times 0.25}{15} = 0.1(s)$$

$$t_c = 1.2 - 0.1 - 0.1 \times 2 = 0.9(s)$$

2. Speed

- Rotational speed of the load shaft

$$n_L = \frac{V_L}{P_B} = \frac{15}{0.005} = 3000 \text{ (rpm)}$$

- Rotational speed of the motor shaft

As the coupling is directly connected, the gear ratio (1/R) is 1:1.

$$n_M = n_L \times R = 3000 \times 1 = 3000 \text{ (rpm)}$$

3. Load torque

$$T_L = \frac{9.8 \mu \times m \times P_B}{2\pi R \times \eta} = \frac{9.8 \times 0.2 \times 80 \times 0.005}{2\pi \times 1 \times 0.9} = 0.139 \text{ (N} \cdot \text{m)}$$

4. Load Moment of Inertia

- Rectilinear motion part

$$J_U = m \times \left(\frac{P_B}{2\pi R} \right)^2 = 80 \times \left(\frac{0.005}{2\pi \times 1} \right)^2 = 0.507 \times 10^{-4} \text{ (kg} \cdot \text{m}^2)$$

- Roller screw

$$J_B = \frac{\pi}{32} P \times L_B \times d_B^4 = \frac{\pi}{32} \times 7.87 \times 10^3 \times 0.8 \times (0.016)^4 = 0.405 \times 10^{-4} \text{ (kg} \cdot \text{m}^2)$$

- Coupling

$$J_C = \frac{1}{8} m_c \times d_c^4 = \frac{1}{8} \times 0.3 \times (0.03)^2 = 0.338 \times 10^{-4} \text{ (kg} \cdot \text{m}^2)$$

5. Load moving power

$$P_o = \frac{2\pi \times n_M \times T_L}{60} = \frac{2\pi \times 3000 \times 0.139}{60} = 43.7 \text{ (W)}$$

6. Load acceleration power

$$\begin{aligned} P_a &= \left(\frac{2\pi}{60} \times n_m \right)^2 \frac{J_L}{t_a} = \left(\frac{2\pi}{60} \times n_m \right)^2 \times \frac{J_U + J_B + J_C}{t_a} \\ &= \left(\frac{2\pi}{60} \times 3000 \right)^2 \times \frac{1.25 \times 10^{-4}}{0.1} = 123.4 \text{ (W)} \end{aligned}$$

7. Temporary settings of the servo motor

- Selection condition

$T_L \leq \text{Rated torque of the motor}$

$P_a + P_o = (1 \text{ to } 2) \times \text{Rated output of the motor}$

$n_M \leq \text{Rated speed of the motor}$

$J_L \leq \text{Allowable load moment of inertia of the servo unit}$

Perform the following provisional selections according to preceding conditions:

Servo motor: MS1H1-20B30CB-A630R

Servo drive: SV670PS1R6I

- Specifications of the servo motor and servo drive

Rated output: 200 (W)

Rated speed: 3000 (RPM)

Rated torque: 0.64 (N·m)

Maximum instantaneous torque: 1.95 (N·m)

Rotor moment of inertia: 0.082×10^{-4} (kg·m²)

Allowable load moment of inertia: 1.64×10^{-4} (kg·m²)

Number of encoder pulses: 67108864 (P/R)

8. Confirmation of the servo motor selected temporarily

Confirm the startup torque required

$$T_p = \frac{2\pi \times n_M \times (J_M + J_L)}{60 \times t_a} + T_L = \frac{2\pi \times 3000 \times (0.082 + 1.25) \times 10^{-4}}{60 \times 0.1} + 0.139$$

$$= 0.557 \text{ (N·m)} < \text{Max. instantaneous torque...Satisfactory}$$

Confirm the brake torque required

$$T_s = \frac{2\pi \times n_M \times (J_M + J_L)}{60 \times t_a} - T_L = \frac{2\pi \times 3000 \times (0.082 + 1.25) \times 10^{-4}}{60 \times 0.1} - 0.139$$

$$= 0.279 \text{ (N·m)} < \text{Max. instantaneous torque...Satisfactory}$$

Confirm the effective torque value

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

$$= \sqrt{\frac{(0.557)^2 \times 0.1 + (0.139)^2 \times 0.9 + (0.279)^2 \times 0.1}{1.5}}$$

$$= 0.19 \text{ (N·m)} < \text{Rated torque...Satisfactory}$$

The capacities of the servo motor and servo drive selected temporarily based on preceding steps are available for use. The position control analysis is as follows.

9. Electronic gear ratio (B/A)

The electrical stopping precision (δ) is ± 0.01 mm, so the position detection unit (ΔL) is 0.01 mm/pulse.

$$\frac{P}{\Delta L} \times \frac{B}{A} = \frac{5}{0.01} \times \frac{B}{A} = 67108864$$

$$\frac{B}{A} = \frac{67108864 \times 0.01}{5} = \frac{67108864}{500}$$

10. Reference pulse frequency

$$v_s = \frac{1000 \times V_L}{60 \times \Delta L} = \frac{1000 \times 15}{60 \times 0.01} = 25000 \text{ (pps)}$$

11. Offset counter droop pulse

- Set the position loop gain (K_p) to 30 (l/s).

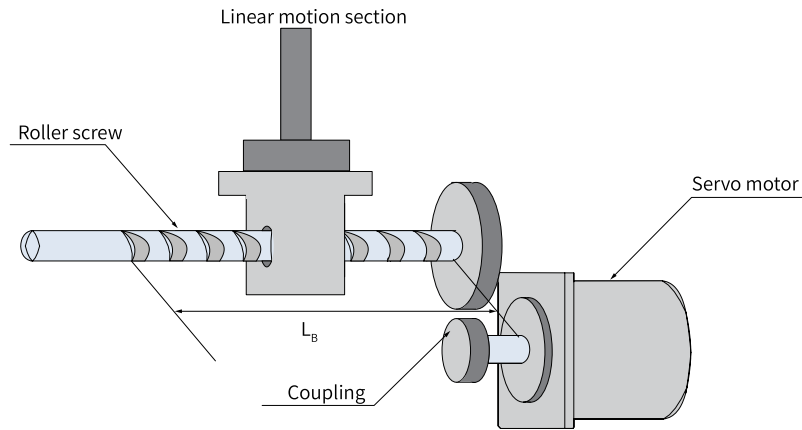
$$\varepsilon = \frac{v_s}{K_p} = \frac{25000}{30} = 833 \text{ (pulse)}$$

- Electrical stop precision

$$\begin{aligned}\pm \Delta \varepsilon &= \pm \frac{\varepsilon}{(\text{Servo drive control range}) \times \frac{n_M}{n_R}} = \pm \frac{833}{5000 \times \frac{3000}{3000}} \\ &= \pm 0.17 < \pm 1 \text{ (pulse)} \pm 0.01 \text{ (mm/pulse)}\end{aligned}$$

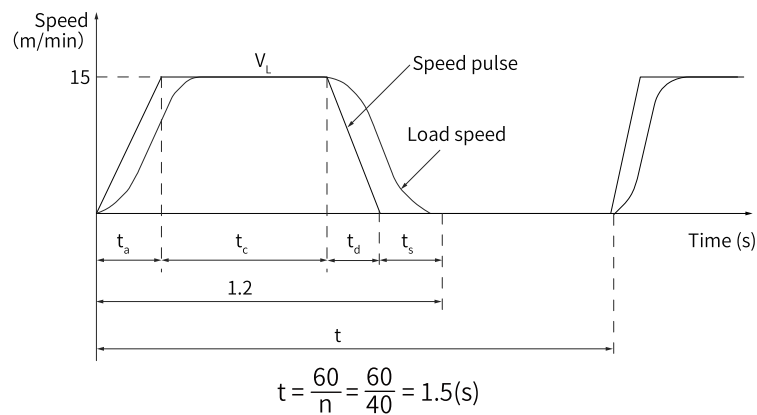
By observing preceding steps, the servo motor and servo drive selected temporarily for position control are available for use.

6.2 Capacity Selection Example for Speed Control



Load speed (V_L) = 15 m/min
 Mass of the rectilinear motion part (m): 80 kg
 Roller screw length (L_B): 0.8 m
 Roller screw diameter (d_B): 0.04 m
 Roller screw lead (P_B): 0.01 m
 Coupling mass (m_c): 1 kg
 Coupling outer diameter (d_c): 0.06 m
 Times of feeding (n): 40/min
 Length of feeding (L): 0.25 m
 Feeding time (t_m) < 1.2s
 Friction coefficient (μ): 0.2
 Mechanical efficiency (η) = 0.9 (90%)

1. Speed diagram



Set t_a to the same value as t_d .

$$t_a = t_m - t_s - \frac{60 \times L}{V_L} = 1.2 - 0.1 - \frac{60 \times 0.25}{15} = 0.1(\text{s})$$

$$t_c = 1.2 - 0.1 - 0.1 \times 2 = 0.9(\text{s})$$

2. Speed

- Rotational speed of the load shaft

$$n_L = \frac{V_L}{P_B} = \frac{15}{0.01} = 1500 \text{ (rpm)}$$

- Rotational speed of the motor shaft

As the coupling is directly connected, the gear ratio (1/R) is 1:1.

$$n_M = n_L \times R = 1500 \times 1 = 1500 \text{ (rpm)}$$

3. Load torque

$$T_L = \frac{9.8 \mu \times m \times P_B}{2\pi \times R \times \eta} = \frac{9.8 \times 0.2 \times 80 \times 0.01}{2\pi \times 1 \times 0.9} = 0.277 \text{ (N} \cdot \text{m)}$$

4. Load moment of inertia

- Rectilinear motion part

$$J_u = m \times \left(\frac{P_B}{2\pi R} \right)^2 = 80 \times \left(\frac{0.01}{2\pi \times 1} \right)^2 = 2.02 \times 10^{-4} \text{ (kg} \cdot \text{m}^2)$$

- Roller screw

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

- Coupling

$$J_c = \frac{1}{8} m_c \times d_c^4 = \frac{1}{8} \times 1 \times (0.06)^2 = 4.5 \times 10^{-4} \text{ (kg} \cdot \text{m}^2)$$

5. Load moving power

$$P_o = \frac{2\pi \times n_M \times T_L}{60} = \frac{2\pi \times 1500 \times 0.277}{60} = 43.6 \text{ (W)}$$

6. Load acceleration power

$$\begin{aligned} P_a &= \left(\frac{2\pi}{60} \times n_m \right)^2 \times \frac{J_L}{t_a} = \left(\frac{2\pi}{60} \times n_m \right)^2 \times \frac{J_c + J_B + J_u}{t_a} \\ &= \left(\frac{2\pi}{60} \times 1500 \right)^2 \times \frac{34.22 \times 10^{-4}}{0.1} = 844 \text{ (W)} \end{aligned}$$

7. Temporary settings of the servo motor

- Selection condition

$T_L \leq \text{Rated torque of the motor}$

$P_a + P_o = (1 \text{ to } 2) \times \text{Rated output of the motor}$

$n_M \leq \text{Rated speed of the motor}$

$J_L \leq \text{Allowable load moment of inertia of the servo unit}$

Perform the following provisional selections according to preceding conditions:

Servo motor: MS1H4-75B30CB-A630R

Servo drive: SV670PS5R5I

- Specifications of the servo motor and servo drive

Rated output: 750 (W)

Rated speed: 3000 (RPM)

Rated torque: 2.39 (N·m)

Maximum instantaneous torque: 8.365 (N·m)

Rotor moment of inertia: 1.38×10^{-4} (kg·m²)

Allowable load moment of inertia: 69.58×10^{-4} (kg·m²)

8. Confirmation of the servo motor selected temporarily

Confirm the startup torque required

$$T_p = \frac{2\pi \times \eta_M \times (J_M + J_L)}{60 \times t_a} + T_L = \frac{2\pi \times 1500 \times (1.38 + 34.22) \times 10^{-4}}{60 \times 0.1} + 0.277$$

$$= 5.87 \text{ (N·m)} < \text{Max. instantaneous torque...Satisfactory}$$

Confirm the brake torque required

$$T_s = \frac{2\pi \times \eta_M \times (J_M + J_L)}{60 \times t_a} - T_L = \frac{2\pi \times 1500 \times (1.38 + 34.22) \times 10^{-4}}{60 \times 0.1} - 0.277$$

$$= 5.32 \text{ (N·m)} < \text{Max. instantaneous torque...Satisfactory}$$

Confirm the effective torque value

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

$$= \sqrt{\frac{(5.87)^2 \times 0.1 + (0.277)^2 \times 0.9 + (5.32)^2 \times 0.1}{1.5}}$$

$$= 2.06 \text{ (N·m)} < \text{Rated torque...Satisfactory}$$

9. Selection result

The servo motor and servo drive selected temporarily according to preceding steps are available for use. The torque diagram is as follows.

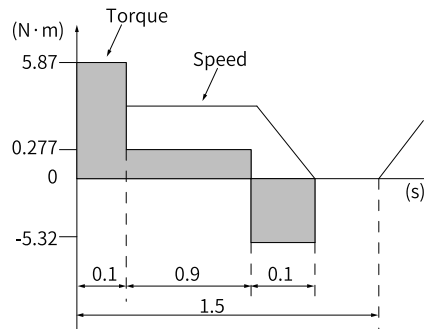


Figure 6-1 Torque diagram

7 Standards Compliance

CE Certification

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

UL/cUL certification

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

Note

- The product complies with the latest version of directives and standards for CE and UL/cUL certifications.
 - The product complies with UKCA certification.
-

China Energy Label

Name	Remarks
 ① The China Energy Label is attached to the motor. You can scan the QR code on the label to get the filing information. ② The motor model only represents one specific model in MS1 series motors. ③ Motor efficiency values ④ Name of the standard: GB30253-2013 (Minimum allowable value of energy efficiency and energy efficiency grades for permanent magnet synchronous motors)	
 ⑤ Scan the QR code to access China Energy Label website, which shows the main model in the list of filing models. ⑥ Click View More to view the list of other filing models. ⑦ Displays the list of filing models and related efficiency values.	



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