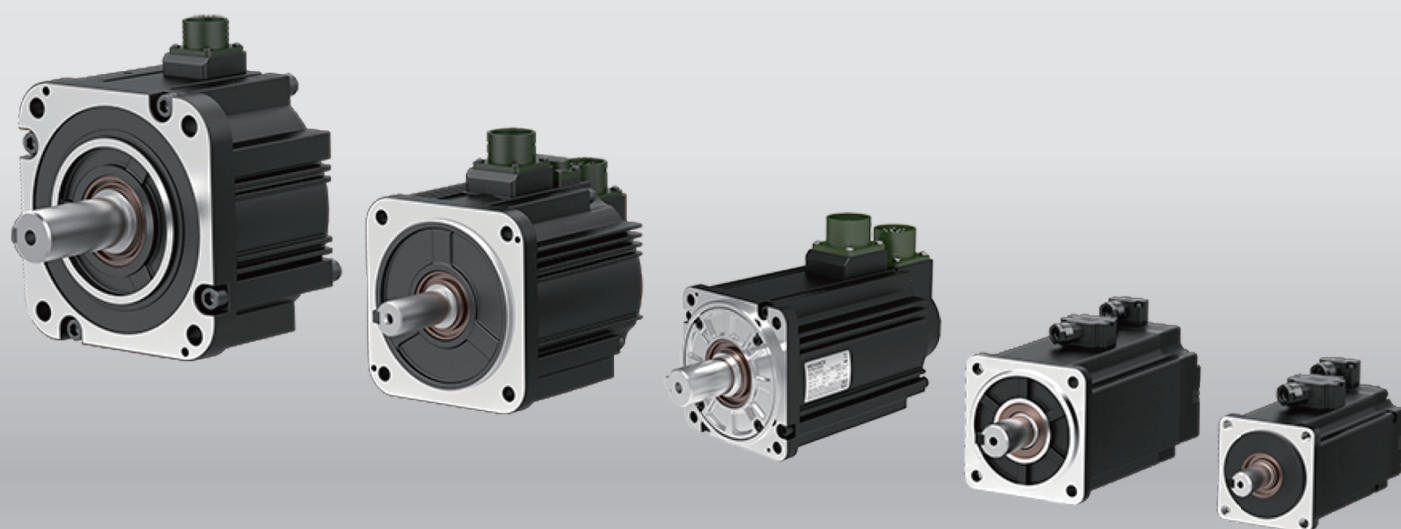




MS1-R-INT Series Servo Motor with Battery-less Encoder Selection Guide



Industrial
Automation



New Energy
Vehicle



Intelligent
Elevator



Intelligent
Robot



Digital
Energy



Rail
Transit



Data code PS00021688A01

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Proper Use of the Product

Proper transportation, storage, assembly, installation, commissioning, operation, and maintenance are required to ensure the safe operation of the product without any problems. The required ambient conditions must be met. All operations must follow the guidelines provided in this documentation.

Preface

Introduction

Thank you for purchasing the MS1-R-INT series servo motor with battery-less encoder.

This motor supports a power range of 0.2 kW to 7.5 kW and frame sizes 60 to 180. Multiple types of inertia configuration and speed segment configuration are available. The encoder supports multi-turn counting with a battery.

This motor applies to accurate position control, speed control, and torque control in industries including semiconductors, lithium-ion 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.

Revision history

Date	Version	Revision
March 2026	A01	• Updated “Model Selection Overview” on page 7. • Updated “3.1 Mechanical characteristics” on page 19. • Updated “3.3 Derating Characteristics” on page 24. • Updated motor specifications for all models in the "Motor Selection" section (add rated frequency). • Updated the appearance diagram of the DB15 connector kit (model: S6-C6) in the "Cable Selection List" section.
October 2025	A00	Initial release.

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- Damage caused by fire, flood, or abnormal voltage
- Damage caused by using the product for unintended functions
- Damage caused by using the product outside the specified scope
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When applicable, relevant maintenance fee will be charged according to the latest Price List of Inovance. If otherwise agreed upon, the agreed terms and conditions shall prevail.

For details, see the Warranty Card.

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1 Model Selection Overview

1.1 Applicable SV680-INT Series Servo Drives for Motors with 26-bit Battery-less Encoder

Servo motor				Servo drive SV680-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommended model	No.
Ratings of MS1H1 ($n_N = 3000$ rpm, $n_{max} = 7000$ rpm) series motors							
MS1H1-20B30CB-V631R-INT	MS1H1-20B30CB-V634R-INT	60	0.2	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H1-40B30CB-V631R-INT	MS1H1-40B30CB-V634R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H1-55B30CB-V631R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H1-75B30CB-V631R-INT	MS1H1-75B30CB-V634R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H1-10C30CB-V631R-INT	MS1H1-10C30CB-V634R-INT	80	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
Ratings of MS1H2 ($n_N = 3000$ rpm, $n_{max} = 6000$ rpm) series motors							
MS1H2-10C30CB-V631R-INT	MS1H2-10C30CB-V634R-INT	100	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H2-10C30CD-V631R-INT	MS1H2-10C30CD-V634R-INT	100	1.0	Three-phase 400 V		T3R5	10001
MS1H2-15C30CB-V631R-INT	MS1H2-15C30CB-V634R-INT	100	1.5	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-15C30CD-V631R-INT	MS1H2-15C30CD-V634R-INT	100	1.5	Three-phase 400 V	C	T5R4	10002
MS1H2-20C30CB-V631R-INT	MS1H2-20C30CB-V634R-INT	100	2.0	Three-phase 200 V	E	S018	00008
MS1H2-20C30CD-V631R-INT	MS1H2-20C30CD-V634R-INT	100	2.0	Three-phase 400 V	D	T8R4	10003
MS1H2-25C30CB-V631R-INT	MS1H2-25C30CB-V634R-INT	100	2.5	Three-phase 200 V	E	S022	00009
MS1H2-25C30CD-V631R-INT	MS1H2-25C30CD-V634R-INT	100	2.5	Three-phase 400 V	D	T012	10004

Servo motor				Servo drive			
				SV680-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommended model	No.
MS1H2-30C30CB-V631R-INT	MS1H2-30C30CB-V634R-INT	130	3.0	Three-phase 200 V	E	S022	00009
MS1H2-30C30CD-V631R-INT	MS1H2-30C30CD-V634R-INT	130	3.0	Three-phase 400 V	D	T012	10004
MS1H2-40C30CB-V631R-INT	MS1H2-40C30CB-V634R-INT	130	4.0	Three-phase 200 V	E	S027	00010
MS1H2-40C30CD-V631R-INT	MS1H2-40C30CD-V634R-INT	130	4.0	Three-phase 400 V		T017	10005
MS1H2-50C30CB-V631R-INT	MS1H2-50C30CB-V634R-INT	130	5.0	Three-phase 200 V		S027	00010
MS1H2-50C30CD-V631R-INT	MS1H2-50C30CD-V634R-INT	130	5.0	Three-phase 400 V		T021	10006
Ratings of MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series motors							
MS1H3-85B15CB-V631R-INT	MS1H3-85B15CB-V634R-INT	130	0.85	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H3-85B15CD-V631R-INT	MS1H3-85B15CD-V634R-INT	130	0.85	Three-phase 400 V		T3R5	10001
MS1H3-13C15CB-V631R-INT	MS1H3-13C15CB-V634R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-V631R-INT	MS1H3-13C15CD-V634R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-V631R-INT	MS1H3-18C15CB-V634R-INT	130	1.8	Three-phase 200 V	E	S018	00008
MS1H3-18C15CD-V631R-INT	MS1H3-18C15CD-V634R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CB-V631R-INT	MS1H3-29C15CB-V634R-INT	180	2.9	Three-phase 200 V	E	S022	00009
MS1H3-29C15CD-V631R-INT	MS1H3-29C15CD-V634R-INT	180	2.9	Three-phase 400 V	D	T012	10004
MS1H3-44C15CB-V631R-INT	MS1H3-44C15CB-V634R-INT	180	4.4	Three-phase 200 V	E	S027	00010
MS1H3-44C15CD-V631R-INT	MS1H3-44C15CD-V634R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-V631R-INT	MS1H3-55C15CD-V634R-INT	180	5.5	Three-phase 400 V		T021	10006
MS1H3-75C15CD-V631R-INT	MS1H3-75C15CD-V634R-INT	180	7.5	Three-phase 400 V		T026	10007
Ratings of MS1H4 (n _N = 3000 rpm, n _{max} =7000 rpm) series motors							

Servo motor				Servo drive SV680-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommended model	No.
MS1H4-20B30CB-V631R-INT	MS1H4-20B30CB-V634R-INT	60	0.2	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-40B30CB-V631R-INT	MS1H4-40B30CB-V634R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H4-55B30CB-V631R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H4-75B30CB-V631R-INT	MS1H4-75B30CB-V634R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H4-10C30CB-V631R-INT	MS1H4-10C30CB-V634R-INT	80	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006

Note

- Models of drives:
 - S: 200 V voltage class
 - T: 400 V voltage class
 - 1R6: Rated output current: 1.6 A; 2R8: Rated output current: 2.8 A ... 026: Rated output current: 26 A, 027: Rated output current: 27 A.
- 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 (V3) or 26-bit (V6) encoders have the same dimensions.
- The MS1-R series motors equipped with the V6/V3/A6/A3 encoders have the same dimensions.

1.2 Applicable SV670-INT Series Servo Drives for Motors with 23-bit Battery-less Encoder

Servo motor				Servo drive SV670-INT Series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommend ed model	No.
Ratings of MS1H1 ($n_N = 3000$ rpm, $n_{max} = 7000$ rpm) series motors							
MS1H1-20B30CB-V331R-INT	MS1H1-20B30CB-V334R-INT	60	0.2	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H1-40B30CB-V331R-INT	MS1H1-40B30CB-V334R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003

Servo motor				Servo drive			
				SV670-INT Series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommend ed model	No.
MS1H1-55B30CB-V331R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H1-75B30CB-V331R-INT	MS1H1-75B30CB-V334R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H1-10C30CB-V331R-INT	MS1H1-10C30CB-V334R-INT	80	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
Ratings of MS1H2 (n _N = 3000 rpm, n _{max} = 6000 rpm) series motors							
MS1H2-10C30CB-V331R-INT	MS1H2-10C30CB-V334R-INT	100	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H2-10C30CD-V331R-INT	MS1H2-10C30CD-V334R-INT	100	1.0	Three-phase 400 V		T3R5	10001
MS1H2-15C30CB-V331R-INT	MS1H2-15C30CB-V334R-INT	100	1.5	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-15C30CD-V331R-INT	MS1H2-15C30CD-V334R-INT	100	1.5	Three-phase 400 V	C	T5R4	10002
MS1H2-20C30CB-V331R-INT	MS1H2-20C30CB-V334R-INT	100	2.0	Three-phase 200 V	E	S018 ^[1]	00008
MS1H2-20C30CD-V331R-INT	MS1H2-20C30CD-V334R-INT	100	2.0	Three-phase 400 V	D	T8R4	10003
MS1H2-25C30CB-V331R-INT	MS1H2-25C30CB-V334R-INT	100	2.5	Three-phase 200 V	E	S022	00009
MS1H2-25C30CD-V331R-INT	MS1H2-25C30CD-V334R-INT	100	2.5	Three-phase 400 V	D	T012 ^[2]	10004
MS1H2-30C30CB-V331R-INT	MS1H2-30C30CB-V334R-INT	130	3.0	Three-phase 200 V	E	S022	00009
MS1H2-30C30CD-V331R-INT	MS1H2-30C30CD-V334R-INT	130	3.0	Three-phase 400 V	D	T012	10004
MS1H2-40C30CB-V331R-INT	MS1H2-40C30CB-V334R-INT	130	4.0	Three-phase 200 V	E	S027	00010
MS1H2-40C30CD-V331R-INT	MS1H2-40C30CD-V334R-INT	130	4.0	Three-phase 400 V	E	T017	10005
MS1H2-50C30CB-V331R-INT	MS1H2-50C30CB-V334R-INT	130	5.0	Three-phase 200 V		S027	00010
MS1H2-50C30CD-V331R-INT	MS1H2-50C30CD-V334R-INT	130	5.0	Three-phase 400 V		T021 ^[3]	10006
Ratings of MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series motors							

Model Selection Overview

Servo motor				Servo drive			
				SV670-INT Series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommend ed model	No.
MS1H3-85B15CB-V331R-INT	MS1H3-85B15CB-V334R-INT	130	0.85	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H3-85B15CD-V331R-INT	MS1H3-85B15CD-V334R-INT	130	0.85	Three-phase 400 V		T3R5	10001
MS1H3-13C15CB-V331R-INT	MS1H3-13C15CB-V334R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-V331R-INT	MS1H3-13C15CD-V334R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-V331R-INT	MS1H3-18C15CB-V334R-INT	130	1.8	Three-phase 200 V	D	S012	00007
MS1H3-18C15CD-V331R-INT	MS1H3-18C15CD-V334R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CB-V331R-INT	MS1H3-29C15CB-V334R-INT	180	2.9	Three-phase 200 V	E	S022	00009
MS1H3-29C15CD-V331R-INT	MS1H3-29C15CD-V334R-INT	180	2.9	Three-phase 400 V	D	T012	10004
MS1H3-44C15CB-V331R-INT	MS1H3-44C15CB-V334R-INT	180	4.4	Three-phase 200 V	E	S027	00010
MS1H3-44C15CD-V331R-INT	MS1H3-44C15CD-V334R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-V331R-INT	MS1H3-55C15CD-V334R-INT	180	5.5	Three-phase 400 V		T021	10006
MS1H3-75C15CD-V331R-INT	MS1H3-75C15CD-V334R-INT	180	7.5	Three-phase 400 V		T026	10007
Ratings of MS1H4 (n _n = 3000 rpm, n _{max} =7000 rpm) series motors							
MS1H4-20B30CB-V331R-INT	MS1H4-20B30CB-V334R-INT	60	0.2	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-40B30CB-V331R-INT	MS1H4-40B30CB-V334R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H4-55B30CB-V331R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H4-75B30CB-V331R-INT	MS1H4-75B30CB-V334R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H4-10C30CB-V331R-INT	MS1H4-10C30CB-V334R-INT	80	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006

Note

- [1] See the torque-speed characteristics curves of this model for drives with S012. The drive parameters does not change.
- [2] See the torque-speed characteristics curves of this model for drives with T8R4. The drive parameters does not change.
- [3] See the torque-speed characteristics curves of this model for drives with T017. The drive parameters does not change.
- [4] See the torque-speed characteristics curves of this model for drives with S018. The drive parameters does not change.
- Models of drives:
 - S - 200 V voltage class
 - T - 400 V voltage class
 - 1R6 - Rated output current = 1.6 A; 2R8 - Rated output current = 2.8 A...; 026 - Rated output current = 26 A; 027 - Rated output current = 27 A
- Different motors match different series of servo drives. The maximum speed and maximum torque output of the motor vary slightly. See the selection guide of the servo drive for details.
- Servo motors designed to work with 23-bit (V3) or 26-bit (V6) encoders have the same dimensions.
- The MS1-R series motors equipped with the V6/V3/A6/A3 encoders have the same dimensions.

1.3 Applicable SV660-INT Series Servo Drives for Motors with 23-bit Battery-less Encoder

Servo motor				Servo drive SV660-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommended model	No.
Ratings of MS1H1 ($n_N = 3000$ rpm, $n_{max} = 7000$ rpm) series motors							
MS1H1-20B30CB-V331R-INT	MS1H1-20B30CB-V334R-INT	60	0.2	Single-phase 200 V	A	S1R6	00002
MS1H1-40B30CB-V331R-INT	MS1H1-40B30CB-V334R-INT	60	0.4	Single-phase 200 V		S2R8	00003
MS1H1-55B30CB-V331R-INT	-	80	0.55	Single-phase 200 V	B	S5R5	00005
MS1H1-75B30CB-V331R-INT	MS1H1-75B30CB-V334R-INT	80	0.75	Single-phase 200 V		S5R5	00005
MS1H1-10C30CB-V331R-INT	MS1H1-10C30CB-V334R-INT	80	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
Ratings of MS1H2 ($n_N = 3000$ rpm, $n_{max} = 6000$ rpm) series motors							
MS1H2-10C30CB-V331R-INT	MS1H2-10C30CB-V334R-INT	100	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H2-10C30CD-V331R-INT	MS1H2-10C30CD-V334R-INT	100	1.0	Three-phase 400 V		T3R5	10001

Model Selection Overview

Servo motor				Servo drive			
				SV660-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommended model	No.
MS1H2-15C30CB-V331R-INT	MS1H2-15C30CB-V334R-INT	100	1.5	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-15C30CD-V331R-INT	MS1H2-15C30CD-V334R-INT	100	1.5	Three-phase 400 V	C	T5R4	10002
MS1H2-20C30CB-V331R-INT	MS1H2-20C30CB-V334R-INT	100	2.0	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-20C30CD-V331R-INT	MS1H2-20C30CD-V334R-INT	100	2.0	Three-phase 400 V	D	T8R4	10003
MS1H2-25C30CD-V331R-INT	MS1H2-25C30CD-V334R-INT	100	2.5	Three-phase 400 V	D	T012 ^[1]	10004
MS1H2-30C30CD-V331R-INT	MS1H2-30C30CD-V334R-INT	130	3.0	Three-phase 400 V	D	T012	10004
MS1H2-40C30CD-V331R-INT	MS1H2-40C30CD-V334R-INT	130	4.0	Three-phase 400 V	E	T017	10005
MS1H2-50C30CD-V331R-INT	MS1H2-50C30CD-V334R-INT	130	5.0	Three-phase 400 V		T021 ^[2]	10006
Ratings of MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series motors							
MS1H3-85B15CB-V33*R	MS1H3-85B15CB-V334R-INT	130	0.85	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H3-85B15CD-V331R-INT	MS1H3-85B15CD-V334R-INT	130	0.85	Three-phase 400 V		T3R5	10001
MS1H3-13C15CB-V331R-INT	MS1H3-13C15CB-V334R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-V331R-INT	MS1H3-13C15CD-V334R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-V331R-INT	MS1H3-18C15CB-V334R-INT	130	1.8	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-18C15CD-V331R-INT	MS1H3-18C15CD-V334R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CD-V331R-INT	MS1H3-29C15CD-V334R-INT	180	2.9	Three-phase 400 V	D	T012	10004
MS1H3-44C15CD-V331R-INT	MS1H3-44C15CD-V334R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-V331R-INT	MS1H3-55C15CD-V334R-INT	180	5.5	Three-phase 400 V		T021	10006
MS1H3-75C15CD-V331R-INT	MS1H3-75C15CD-V334R-INT	180	7.5	Three-phase 400 V		T026	10007

Servo motor				Servo drive			
				SV660-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommended model	No.
Ratings of MS1H4 ($n_n = 3000$ rpm, $n_{max} = 7000$ rpm) series motors							
MS1H4-20B30CB-V331R-INT	MS1H4-20B30CB-V334R-INT	60	0.2	Single-phase 200 V	A	S1R6	00002
MS1H4-40B30CB-V331R-INT	MS1H4-40B30CB-V334R-INT	60	0.4	Single-phase 200 V		S2R8	00003
MS1H4-55B30CB-V331R-INT	-	80	0.55	Single-phase 200 V	B	S5R5	00005
MS1H4-75B30CB-V331R-INT	MS1H4-75B30CB-V334R-INT	80	0.75	Single-phase 200 V		S5R5	00005
MS1H4-10C30CB-V331R-INT	MS1H4-10C30CB-V334R-INT	80	1.0	Single-phase/ Three-phase 200 V		S7R6	00006

Note

- [1] See the torque-speed characteristics curves of this model for drives with T8R4. The drive parameters does not change.
- [2] See the torque-speed characteristics curves of this model for drives with T017. The drive parameters does not change.
- Models of drives:
 - S - 200 V voltage class
 - T - 400 V voltage class
 - 1R6 - Rated output current = 1.6 A; 2R8 - Rated output current = 2.8 A...; 026 - Rated output current = 26 A; 027 - Rated output current = 27 A
- Different motors match different series of servo drives. The maximum speed and maximum torque output of the motor vary slightly. See the selection guide of the servo drive for details.
- Servo motors designed to work with 23-bit (V3) or 26-bit (V6) encoders have the same dimensions.
- The MS1-R series motors equipped with the V6/V3/A6/A3 encoders have the same dimensions.

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 (MS1-Z series)
- **High speed**
 - Maximum speed of MS1H1 and MS1H4 (frame sizes 60/80) motors improved from 6000 rpm to 7000 rpm
 - Maximum speed of MS1H2 motors improved from 5000 rpm to 6000 rpm
 - Maximum speed of MS1H3 (frame sizes 130/180) motors improved from 3000 rpm to 4500 rpm
- **Low temperature rise rate**
 - Optimized electromagnetic circuits to reduce the temperature rise rate
 - Frame sizes 60/80: Temperature rise reduced by 20K compared with previous generation of motors
- **High reliability**

Metal code disc used for the optical encoder to prevent the risk of fracture
- **Compliant with Energy Efficiency Class 1 in China**

Inovance motors of 550 W to 7.5 kW meeting the energy efficiency requirements of GB30253-Class 1 in China
- **Equipped with battery-less absolute encoder**
 - Battery-less models developed based on the technical platform for MS1-R-INT series motors
 - High-speed and high-precision positioning control available through 23-bit and 26-bit high-resolution encoders
 - No need for external batteries to save multi-turn count, preventing device fault caused by exhaustion of batteries and removing the need for maintenance

2.2 Model and Nameplate

Model description

MS1										H1	- 75B	30C	B - V3	3	1	R - INT													
①										②																			
① MS1 series servo motor										② Inertia and capacity										③ Rated power (W)									
										H1: Low inertia and low capacity										One letter and two digits									
										H2: Low inertia and medium capacity										B: x 10									
										H3: Medium inertia and medium capacity										C: x 100									
										H4: Medium inertia and low capacity										Example: 75B: 750 W									
④ Rated speed (rpm)										⑤ Voltage class										⑥ Encoder type									
One letter and two digits										B: 200 V										One letter and one digit									
B: x 10										D: 400 V										V6: Battery-less 26-bit multi-turn absolute encoder									
C: x 100																				V3: Battery-less 23-bit multi-turn absolute encoder									
Example: 30C: 3,000 rpm																													
⑦ Shaft connection mode										⑧ Brake, reducer, oil seal										⑨ Sub-series number									
3: Solid shaft, with key and threaded hole										1: With oil seal but no brake										R: R version									
										4: With oil seal and brake										⑩ Non-standard functions									
																				INT: Global version									

2.3 Components

Motor with frame sizes 60/80

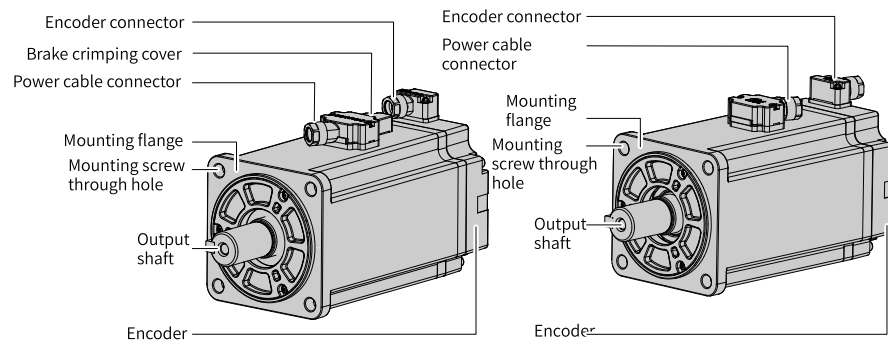


Figure 2-2 Components of the motor (frame sizes 60/80) (Left: Front outlet; Right: Rear outlet)

Motor with frame sizes 100/130/180

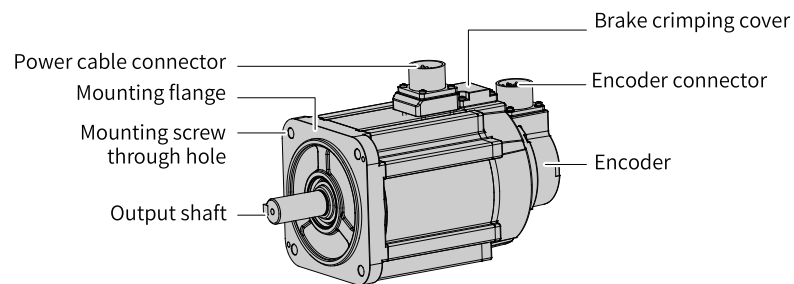


Figure 2-3 Components of the motor (frame sizes 100/130/180)

2.4 Motor Model

Motor type		Rated output capacity (kW)	Encoder
Low inertia, small capacity	 MS1H1	0.2, 0.4, 0.55, 0.75, 1.0	V6: Battery-less 26-bit multi-turn absolute encoder V3: Battery-less 23-bit multi-turn absolute encoder
Low inertia, medium capacity	 MS1H2	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0	V6: Battery-less 26-bit multi-turn absolute encoder V3: Battery-less 23-bit multi-turn absolute encoder

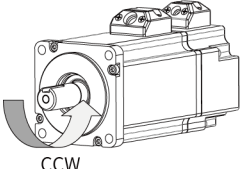
Motor type		Rated output capacity (kW)	Encoder
Medium inertia, medium capacity	 MS1H3	0.85, 1.3, 1.8, 2.9, 4.4, 5.5, 7.5	V6: Battery-less 26-bit multi-turn absolute encoder V3: Battery-less 23-bit multi-turn absolute encoder
Medium inertia, small capacity	 MS1H4	0.2, 0.4, 0.55, 0.75, 1.0	V6: Battery-less 26-bit multi-turn absolute encoder V3: Battery-less 23-bit multi-turn absolute encoder

Note

- V6 - 26-bit absolute encoder (resolution: About 67.1 million pulse/rev, internal 1024 S/R) + 16-bit multi-turn (operating range: 65536 revolutions)
- V3 - 23-bit absolute encoder (resolution: About 8.38 million pulse/rev, internal 1024 S/R) + 16-bit multi-turn (operating range: 65536 revolutions)

3 Product Specifications

3.1 Mechanical characteristics

Item	Description
Duty type	S1 (Continuous duty)
Vibration class ^[1]	V15
Insulation resistance	500 VDC, above 10 MΩ
Excitation mode	Permanent magnetic
Installation method	Flange
Heat-resistance level	F
Insulation voltage	1500 VAC for 1 min (220 V level) 1800 VAC, 1 minute (380 V level)
IP rating of the enclosure	IP67 (except the shaft opening)
Direction of rotation	Rotates counterclockwise (CCW) when viewed from the shaft extension side with a forward run command.  CCW

Item		Description
Environmental conditions	Ambient temperature	0°C to 40°C (non-freezing)
	Ambient humidity	20% to 80% RH (without condensation)
	Rated operating altitude	1000 m
	Altitude-based Derating	• 1000 m and below: Derating is not needed. • For use above 1000 m, derate according to “3.3 Derating Characteristics” on page 24. For altitudes above 2000 m, install an isolation transformer at the power input end.
	Installation location	• Free from corrosive or explosive gases • Well ventilated with minimum amount of dust, waste, and moisture • Convenient for inspection and cleaning • Away from sources that may generate strong magnetic field • Away from heating sources such as a heating stove • Use a motor with oil seal in places with grinding fluid, oil mist, iron powders or cuttings. • Oil seal protection capability: The oil seal is only dust-proof. It cannot withstand the intrusion of oil for a long term. For direct-connected reducer applications requiring long-term oil resistance on the motor oil seal, contact Inovance technical support. • Not applicable to vacuum environment • Not applicable to inching (not full-turn)^[2] and may be stuck • The brake motor may generate a pattering sound, which is normal. • 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. Install the coupler based on the permissible mechanical accuracy. • Do not keep the system operating continuously at natural frequency. Exceeding the allowable vibration value may damage the system.
	Storage environment	Observe the following requirements for storing a de-energized motor. • Temperature: -20°C to +60°C (non-freezing) • Storage humidity: 20% to 80% RH (without condensation)
Shock resistance ^{[3][5]}	Shock acceleration (flange face as standard)	490 m/s ²
	Number of shocks	2
Vibration resistance ^{[4][5]}	Vibration acceleration (flange face as standard)	Radial 49 m/s² Axial 24.5 m/s²

Note

- [1] Vibration class V15 indicates that the amplitude of vibration is lower than 15 μm when an individual motor rotates at rated values.
- [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 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.

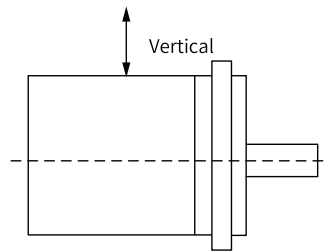


Figure 3-1 Shock applied to the servo motor

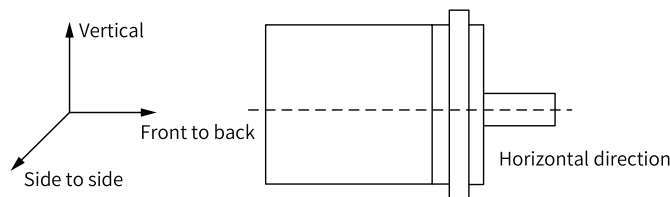


Figure 3-2 Vibration applied to the servo motor

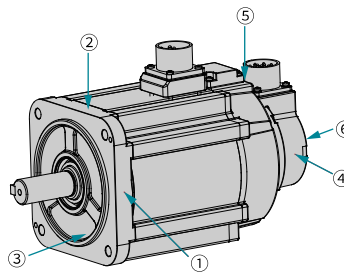


Figure 3-3 Max. allowable vibration limit of the motor

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, contact Inovance.

3.2 Overload Characteristics

The drive 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 in cases of 100% output or above. During use, keep the effective torque of the load within the continuous duty zone.

To protect motors with different load capacities, set the motor overload protection gain based on the overload threshold 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 an environment with a 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 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

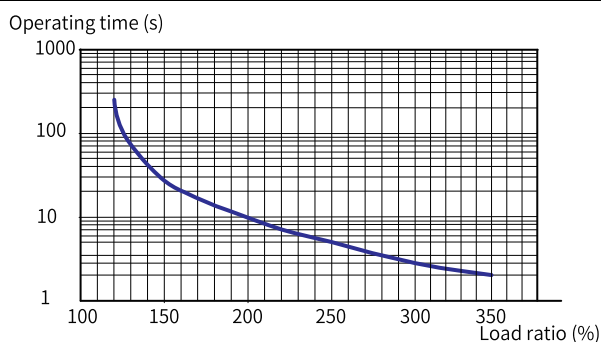


Figure 3-4 MS1H1/H4 (frame sizes 40/60/80) series motor overload curve

Note

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

- MS1H2/MS1H3

Load ratio (%)	Operating time (s)
115	6,000
120	2,533
125	1,226
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
275	9
280	8
285	7
290	6
295	5
300	5

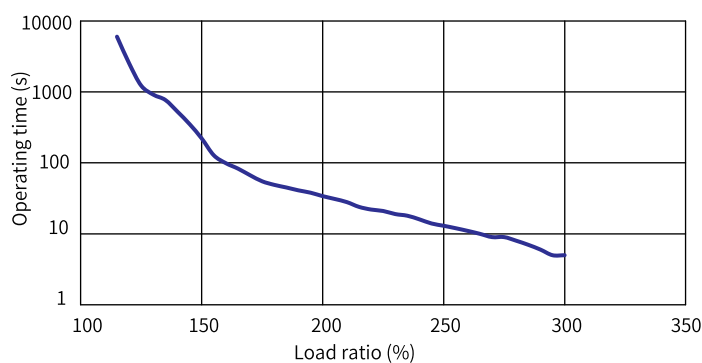


Figure 3-5 Overload curve of MS1H2 and MS1H3 series motors

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

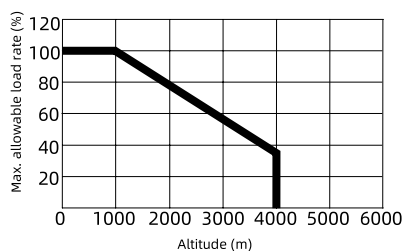
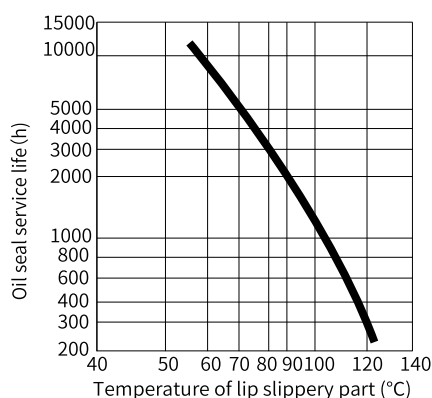


Figure 3-6 Altitude-based derating curve

3.4 Temperature Curve of the Oil Seal



3.5 Load Moment of Inertia

The load moment of inertia represents the ratio of the 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 allowable 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 reported. In cases 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 by using the above measures.

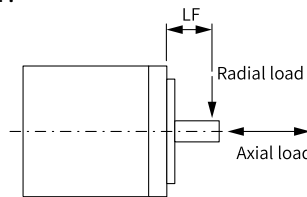


- For the built-in braking resistor of the drive, see Components.
 - Even you use a built-in resistor, the energy generated in some regenerative conditions may exceed the allowable capacity loss (W) of the resistor. In this case, an external braking resistor is required.
-

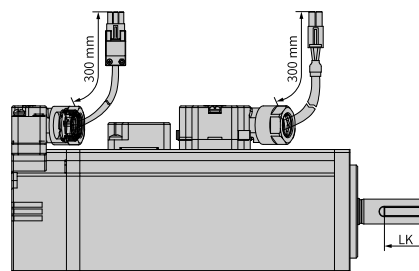
4 Motor Selection

4.1 Model Description

- 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 within a short period of 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):
 - MS1H1 to MS1H4: 250 × 250 × 6 (mm) (aluminum)
 - MS1H2-10C to 25C: 400 × 400 × 20 (mm) (steel)
 - MS1H2-30C to 50C: 400 × 400 × 20 (mm) (steel)
 - MS1H3-85B to 18C: 400 × 400 × 20 (mm) (steel)
 - MS1H3-29C to 55C: 550 × 550 × 30 (mm) (aluminum)
 - MS1H3-75C: 700 × 700 × 30 (mm) (aluminum)
- Radial and axial loads of the motor:



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



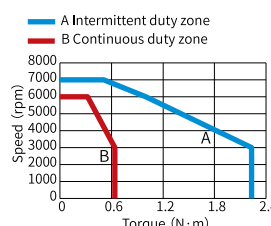
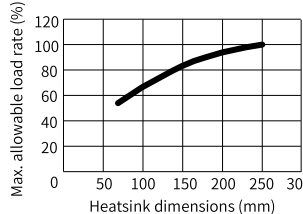
- As shown in the preceding figure, the product is marked with an LK value in the dimension diagram in the section of each model. LK indicates the length of the shaft key.
- The MS1H3 (130-flange and 180-flange) model comes with a keyway. When the operating speed is above 3,000 RPM, the motor must run with the keyway. If you need to run the motor without the keyway at a speed higher than 3,000 RPM, contact Inovance.

Note

- Values inside the parentheses in the sections corresponding to the models are parameters of the servo motor carrying a brake.
- The motor with oil seal must be derated by 10% during use.
- Use your own DC power supply as 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.
- Do not share a power supply with multiple brakes. Otherwise, the coil is short-circuited after one brake is dry-worn, causing failures to start the brakes that are connected to the power supply in parallel.
- 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 Motors with Low Inertia and Small Capacity

4.2.1 MS1H1-20B30CB-V63*R-INT

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 frequency (Hz)	250			
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%		

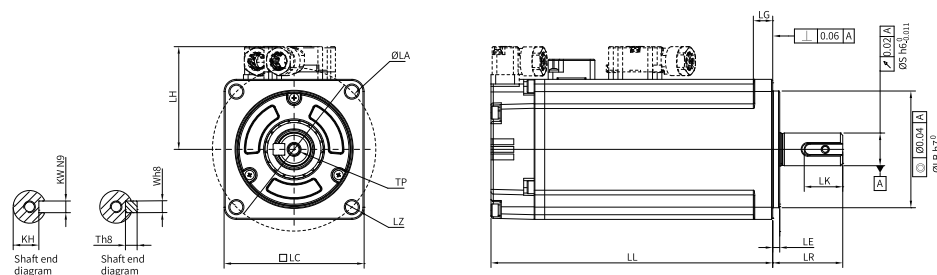
Electrical specifications of the brake

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

Allowable load

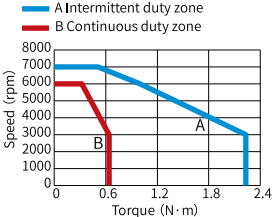
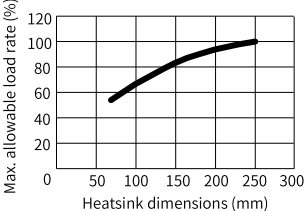
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	
60	75.5 (103)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 12	16 ⁰ -0.53	11 ⁰ -0.1	5	5	5	0.80 (1.17)

4.2.2 MS1H1-20B30CB-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	1.5			
Maximum current (A)	5.3		Heatsink-based derating curve	
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%		

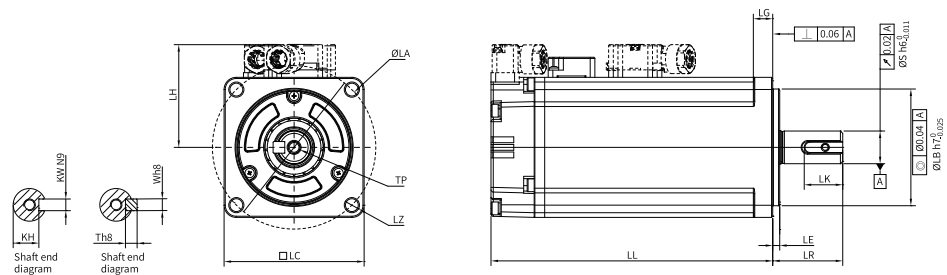
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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	
60	75.5 (103)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 12	160 ^{-0.53}	110 ^{-0.1}	5	5	5	0.80 (1.17)

4.2.3 MS1H1-40B30CB-V63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60		The graph plots Speed (rpm) on the y-axis (0 to 8000) against Torque (N·m) on the x-axis (0 to 4.8). Two curves are shown: Curve A (Intermittent duty zone) is a blue line starting at 7000 rpm for 0 torque, dropping to 3000 rpm at 4.45 N·m, and then dropping vertically to 0 rpm at 4.8 N·m. Curve B (Continuous duty zone) is a red line starting at 6000 rpm for 0 torque, dropping to 3000 rpm at 1.27 N·m, and then dropping vertically to 0 rpm at 1.27 N·m. The area under curve A is labeled 'A' and the area under curve B is labeled 'B'.	
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 frequency (Hz)	250			
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		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.145 ± 10%	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). A single black curve shows the relationship, starting at approximately 55% load rate for 50 mm dimensions and rising to 100% load rate for 250 mm dimensions.	
	Motor with brake	0.157 ± 10%		

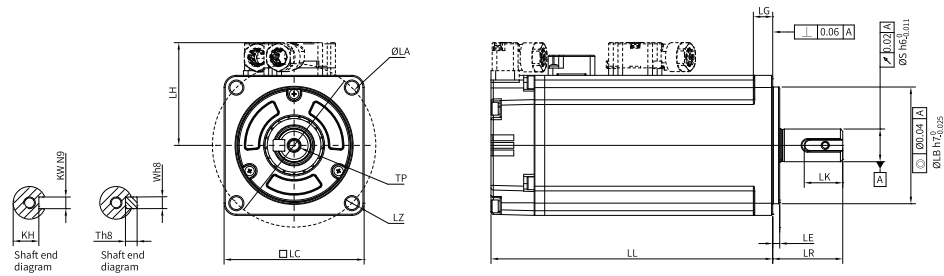
Electrical specifications of the brake

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

Allowable load

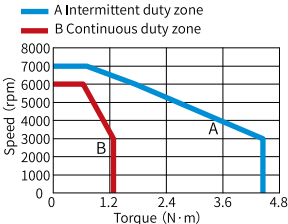
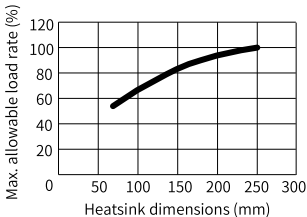
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	
60	93 (121)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 12	16 ⁰ -0.53	11 ⁰ -0.1	5	5	5	1.11 (1.48)

4.2.4 MS1H1-40B30CB-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	2.5			
Maximum current (A)	9.8		Heatsink-based derating curve	
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%		

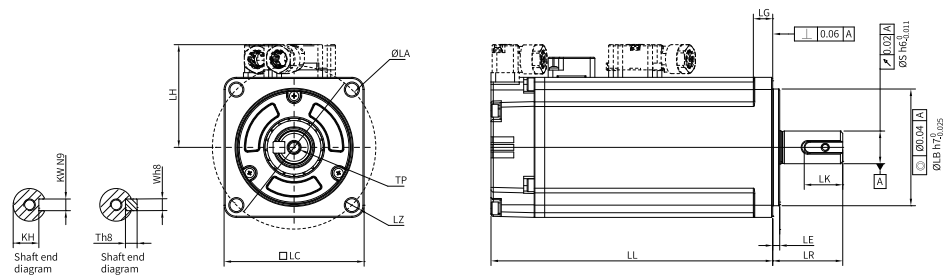
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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	
60	93 (121)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 12	160 ^{-0.53}	110 ^{-0.1}	5	5	5	1.11 (1.48)

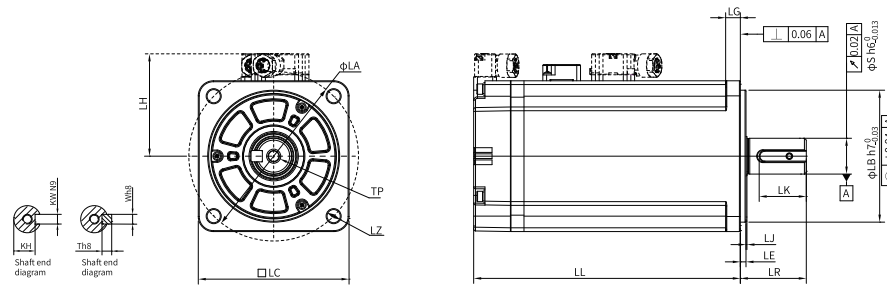
4.2.5 MS1H1-55B30CB-V631R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80		Speed (rpm) Torque (N·m) A Intermittent duty zone B Continuous duty zone	
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 frequency (Hz)	250			
Rated current (A)	3.9			
Maximum current (A)	15			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.51		Heatsink-based derating curve Max. allowable load rate (%) Heatsink dimensions (mm)	
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.55 ± 10%		
	Motor with brake	-		

Allowable load

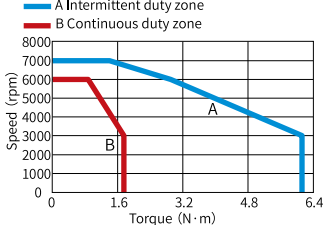
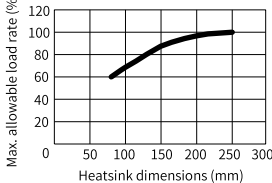
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35 ± 0.5	90	4 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	1.88

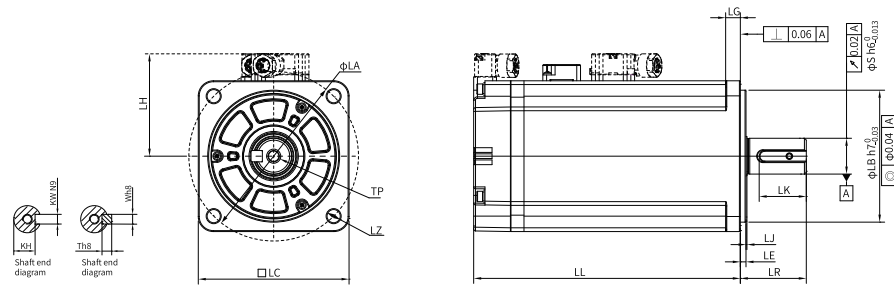
4.2.6 MS1H1-55B30CB-V331R-INT

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 frequency (Hz)	250		
Rated current (A)	3.9		
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%	Heatsink-based derating curve 
	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 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	250 - ^{0.62}	15.50 - ^{0.1}	6	6	6	1.88

4.2.7 MS1H1-75B30CB-V63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80		The graph shows speed (rpm) on the y-axis (0 to 8000) and torque (N·m) on the x-axis (0 to 10). Curve A (intermittent duty) starts at 7000 rpm for 0 torque and decreases to 3000 rpm at 10 N·m. Curve B (continuous duty) starts at 6000 rpm for 0 torque and drops sharply to 0 rpm at 2.5 N·m.	
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 frequency (Hz)	250			
Rated current (A)	4.4		The graph shows max allowable load rate (%) on the y-axis (0 to 120) and heatsink dimensions (mm) on the x-axis (0 to 300). The curve starts at approximately 60% for 50 mm and rises to 100% for 300 mm.	
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%		

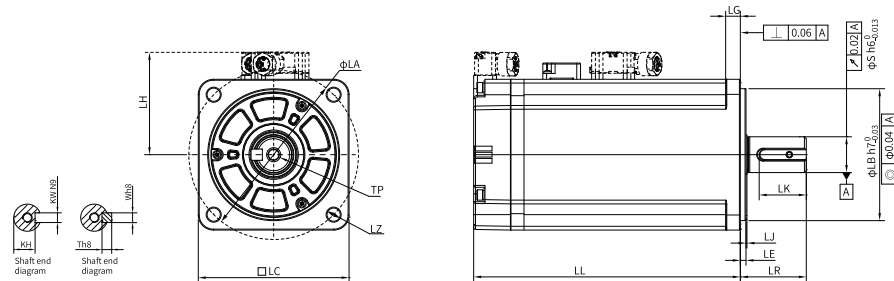
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	2.22 (2.88)

4.2.8 MS1H1-75B30CB-V33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80		The graph plots Speed (rpm) on the y-axis (0 to 8000) against Torque (N·m) on the x-axis (0 to 10). A blue line represents the intermittent duty zone (A), starting at approximately 7000 rpm for 0 torque and decreasing to 3000 rpm at 8.5 N·m. A red line represents the continuous duty zone (B), starting at 6000 rpm for 0 torque, dropping to 3000 rpm at 2.5 N·m, and then dropping vertically to 0 rpm at 2.5 N·m.	
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 frequency (Hz)	250			
Rated current (A)	4.4			
Maximum current (A)	16.9		Heatsink-based derating curve	
Rated speed (rpm)	3000		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 60% load rate for 50 mm dimensions and rises to 100% load rate at 250 mm dimensions, remaining at 100% up to 300 mm.	
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%		

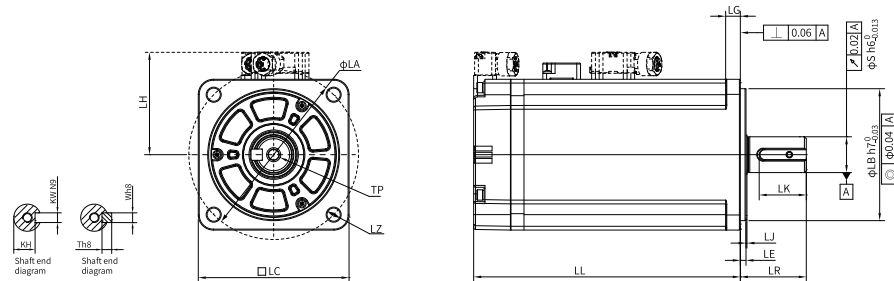
Electrical specifications of the brake

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

Allowable load

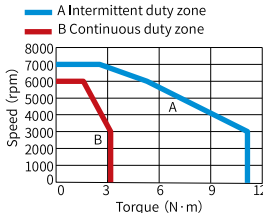
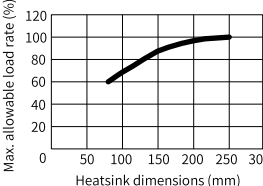
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (141.5)	35 ± 0.5	90	4 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	250 ^{-0.62}	15.50 ^{-0.1}	6	6	6	2.22 (2.88)

4.2.9 MS1H1-10C30CB-V63*R-INT

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			
Rated frequency (Hz)	250			
Rated current (A)	6.2		Heatsink-based derating curve	
Maximum current (A)	24			
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%		

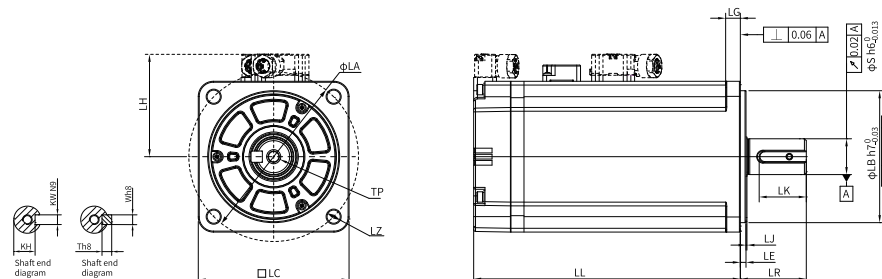
Electrical specifications of the brake

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

Allowable load

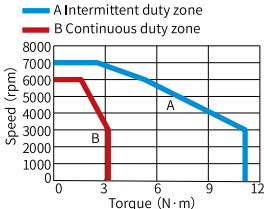
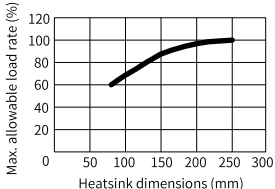
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

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)
70	19	M6 × 20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	2.61 (3.27)

4.2.10 MS1H1-10C30CB-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	6.2			
Maximum current (A)	24			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.59			
Rotor moment of inertia (kg·cm²)	Motor without brake	0.82 ± 10%		
	Motor with brake	0.87 ± 10%		

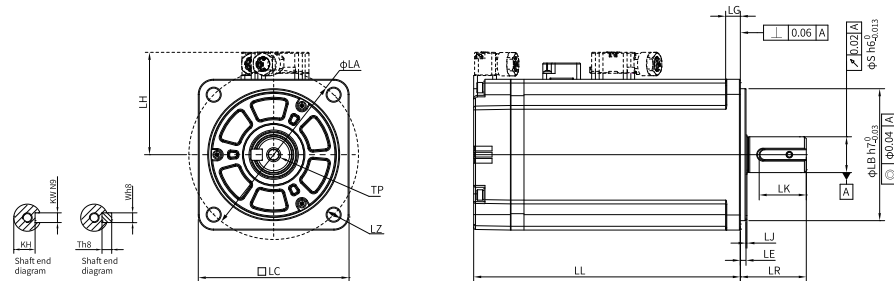
Electrical specifications of the brake

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

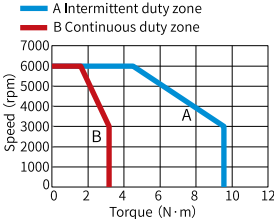
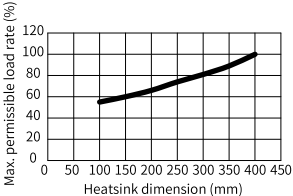
Dimensions (mm)



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)
70	19	M6 × 20	250 ^{-0.62}	15.50 ^{-0.1}	6	6	6	2.61 (3.27)

4.3 MS1H2 Series Motors with Low Inertia and Medium Capacity

4.3.1 MS1H2-10C30CB-V63*R-INT

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			
Rated frequency (Hz)	250			
Rated current (A)	6.4			
Maximum current (A)	23			
Rated speed (rpm)	3000		Heatsink-based derating curve	
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%		

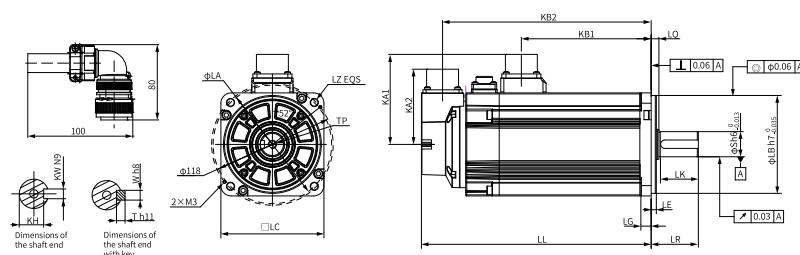
Electrical specifications of the brake

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

Allowable load

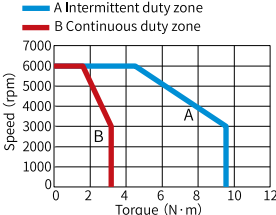
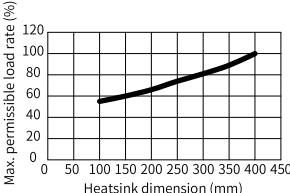
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	3.85 (4.9)	

4.3.2 MS1H2-10C30CB-V33*R-INT

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			
Rated current (A)	6.4		Heatsink-based derating curve	
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%		

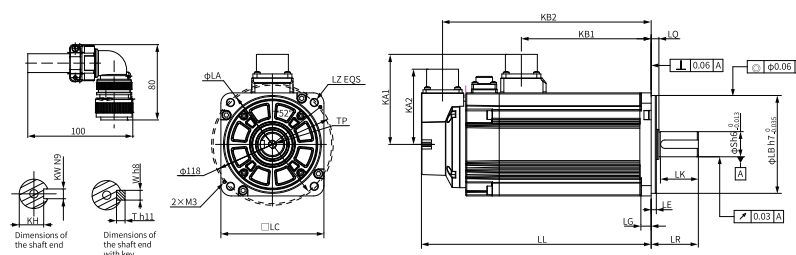
Electrical specifications of the brake

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

Allowable load

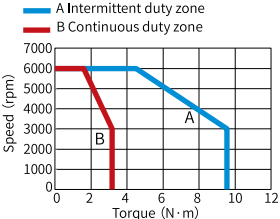
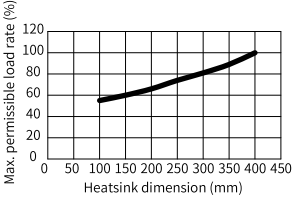
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	3.85 (4.9)	

4.3.4 MS1H2-10C30CD-V33*R-INT

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 frequency (Hz)	250			
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·cm²)	Motor without brake	1.78 ± 10%		
	Motor with brake	2.6 ± 10%		

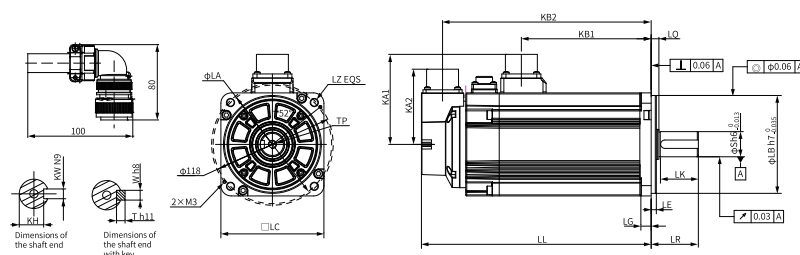
Electrical specifications of the brake

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

Allowable load

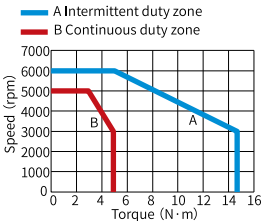
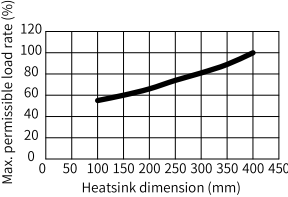
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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	95	24	M8 × 16	350 - 0.62	200 - 0.2	8	8	7	3.85 (4.9)	

4.3.5 MS1H2-15C30CB-V63*R-INT

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 frequency (Hz)	250			
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%		

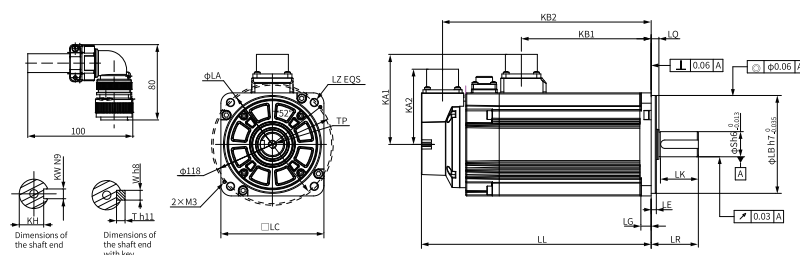
Electrical specifications of the brake

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

Allowable load

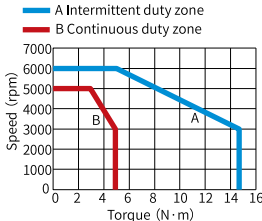
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

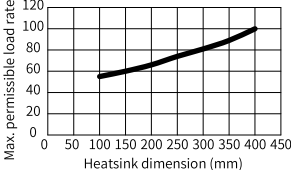
Dimensions (mm)



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	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	4.65 (5.75)	

4.3.6 MS1H2-15C30CB-V33*R-INT

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 frequency (Hz)	250			
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·cm²)	Motor without brake	2.35 ± 10%		
	Motor with brake	3.17 ± 10%		

Max. permissible load rate (%)		Heatsink dimension (mm)	
			

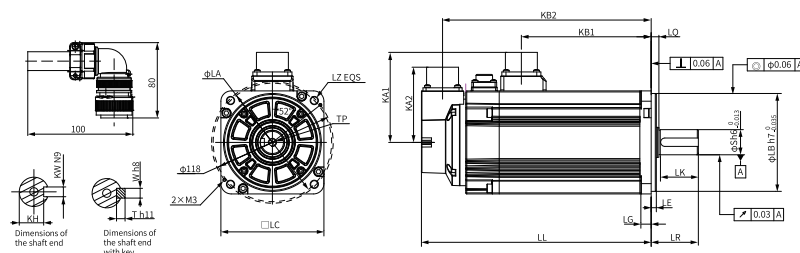
Electrical specifications of the brake

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

Allowable load

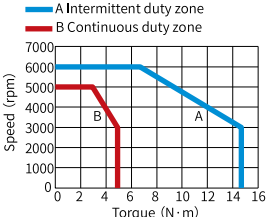
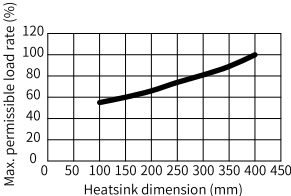
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	4.65 (5.75)	

4.3.8 MS1H2-15C30CD-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	4.2			
Maximum current (A)	14			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.28		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35 ± 10%		
	Motor with brake	3.17 ± 10%		
				

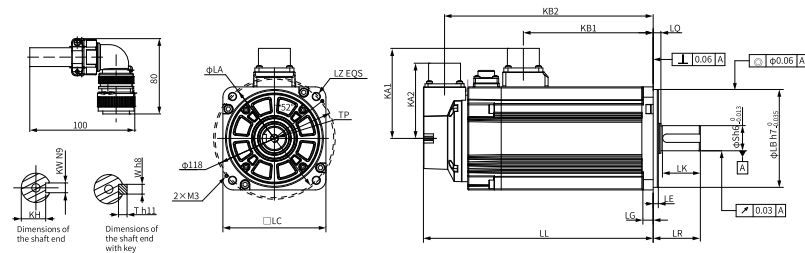
Electrical specifications of the brake

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

Allowable load

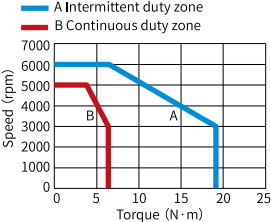
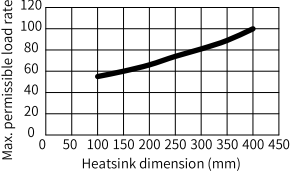
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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	95	24	M8 × 16	350 - ^{0.62}	200 - ^{0.2}	8	8	7	4.65 (5.75)	

4.3.9 MS1H2-20C30CB-V63*R-INT

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 frequency (Hz)	250			
Rated current (A)	11.3			
Maximum current (A)	42			
			Heatsink-based derating curve	
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%		

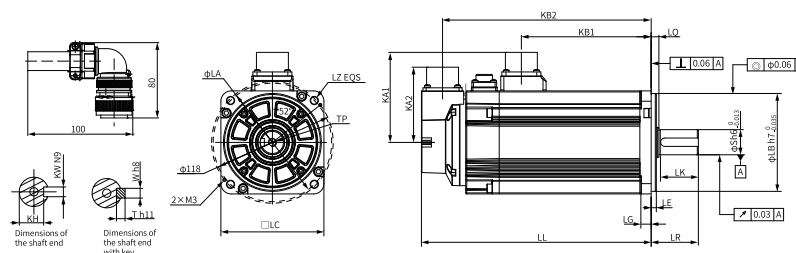
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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 × Φ7	88	108	73	156.5 (184.5)	10	5 ± 0.3
LQ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
7.5 ± 0.75	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	5.5 (6.55)	

4.3.10 MS1H2-20C30CB-V33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	100		— A Intermittent duty zone of S012 drives - - - A Continuous duty zone of S018 drives — 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 frequency (Hz)	250			
Rated current (A)	11.3			
Maximum current (A)	42			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.60		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92 ± 10%		
	Motor with brake	3.74 ± 10%		

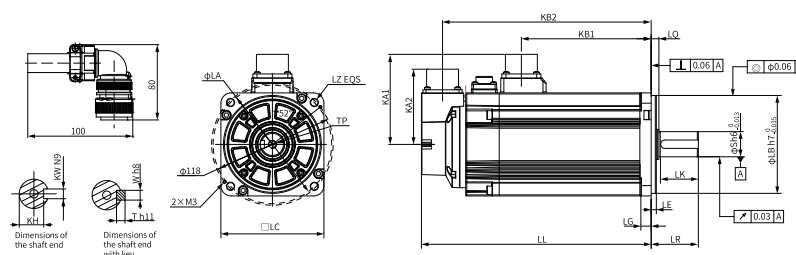
Electrical specifications of the brake

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

Allowable load

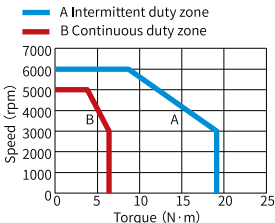
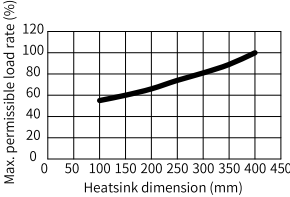
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45 ± 1	115	4 × φ7	88	108	73	156.5 (184.5)	10	5 ± 0.3
LQ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
7.5 ± 0.75	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	5.5 (6.55)	

4.3.12 MS1H2-20C30CD-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	5.6			
Maximum current (A)	20			
Rated speed (rpm)	3000		Heatsink-based derating curve 	
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%		

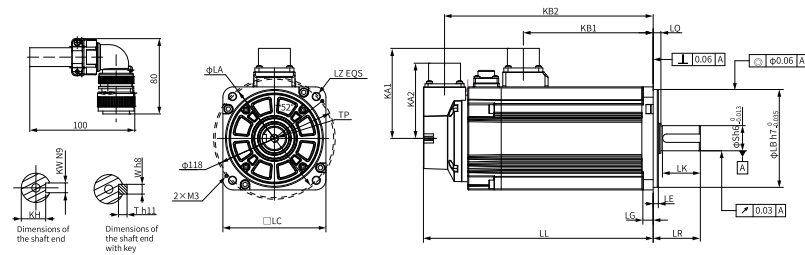
Electrical specifications of the brake

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

Allowable load

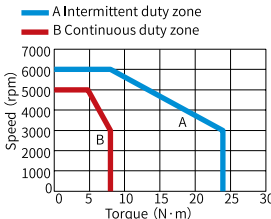
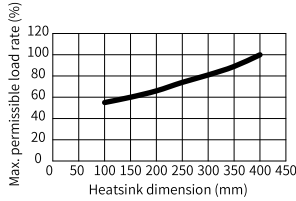
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	177 (205)	45 ± 1	115	4 × φ7	88	108	73	156.5 (184.5)	10	5 ± 0.3
LQ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
7.5 ± 0.75	95	24	M8 × 16	350 - ^{0.62}	200 - ^{0.2}	8	8	7	5.5 (6.55)	

4.3.13 MS1H2-25C30CB-V63*R-INT

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 frequency (Hz)	250			
Rated current (A)	14.7			
Maximum current (A)	53			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.60		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49 ± 10%		
	Motor with brake	4.3 ± 10%		

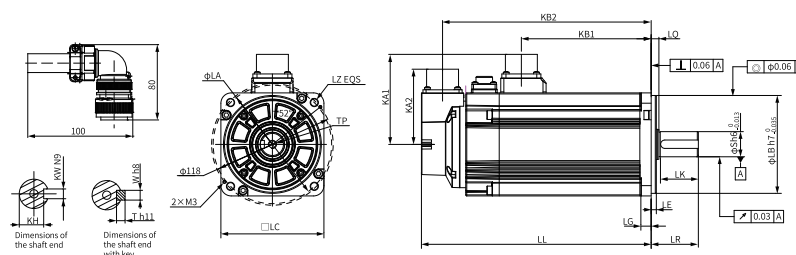
Electrical specifications of the brake

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

Allowable load

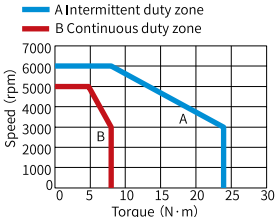
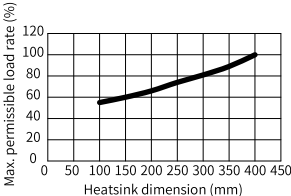
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45 ± 1	115	4 × 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	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	6.3 (7.35)	

4.3.14 MS1H2-25C30CB-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	14.7		Heatsink-based derating curve	
Maximum current (A)	53			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.60			
Rotor moment of inertia (kg·cm²)	Motor without brake	3.49 ± 10%		
	Motor with brake	4.3 ± 10%		

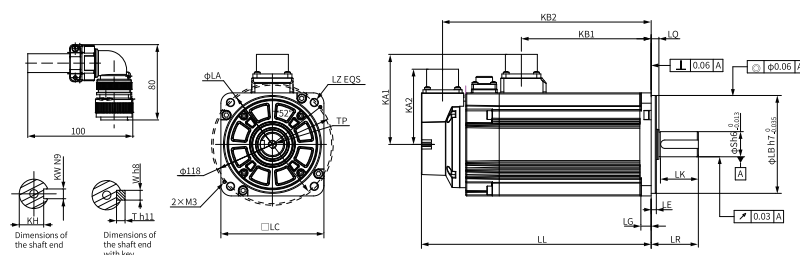
Electrical specifications of the brake

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

Allowable load

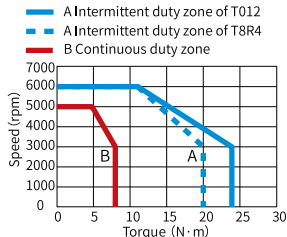
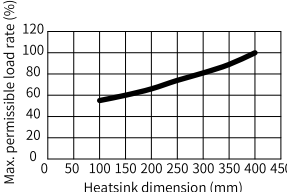
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45 ± 1	115	4 × 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	95	24	M8 × 16	35 ⁰ -0.62	20 ⁰ -0.2	8	8	7	6.3 (7.35)	

4.3.16 MS1H2-25C30CD-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	7.2			
Maximum current (A)	26			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.18		Heatsink-based derating curve 	
Rotor moment of inertia (kg·cm²)	Motor without brake	3.49 ± 10%		
	Motor with brake	4.3 ± 10%		

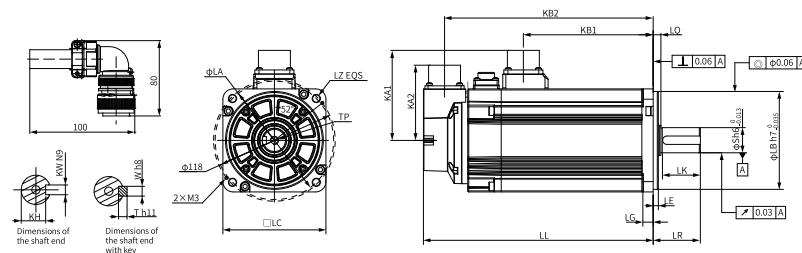
Electrical specifications of the brake

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

Allowable load

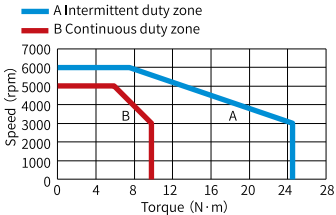
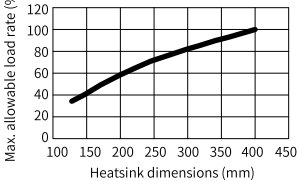
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	195 (223)	45 ± 1	115	4 × 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	95	24	M8 × 16	350 - 0.62	200 - 0.2	8	8	7	6.3 (7.35)	

4.3.17 MS1H2-30C30CB-V63*R-INT

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 frequency (Hz)	150				
Rated current (A)	16.6				
Maximum current (A)	55				
Rated speed (rpm)	3000				
Maximum speed (rpm)	6000				
Torque coefficient (N·m/A)	0.67			Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4 ± 10%			
	Motor with brake	9.38 ± 10%			

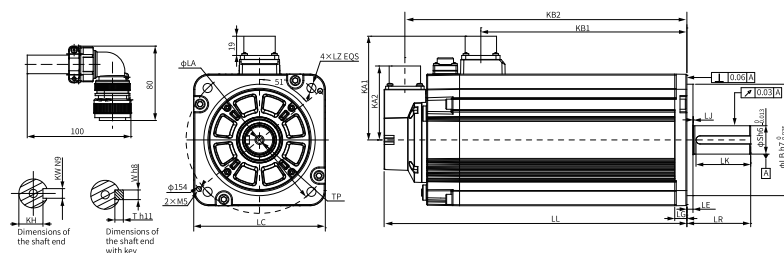
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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 × φ9	102.4	127.5	73	177.5 (202.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	53 ⁰ -0.62	24 ⁰ -0.2	8	8	7	10.0 (11.9)	

4.3.18 MS1H2-30C30CB-V33*R-INT

Motor specifications			Torque-speed characteristics																									
Frame size (mm)	130		— A Intermittent duty zone — B Continuous duty zone <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>6000</td><td>5000</td></tr><tr><td>8</td><td>6000</td><td>5000</td></tr><tr><td>10</td><td>5500</td><td>5000</td></tr><tr><td>11</td><td>5000</td><td>3000</td></tr><tr><td>12</td><td>4500</td><td>3000</td></tr><tr><td>24</td><td>3000</td><td>3000</td></tr><tr><td>25</td><td>3000</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	8	6000	5000	10	5500	5000	11	5000	3000	12	4500	3000	24	3000	3000	25	3000	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																										
0	6000	5000																										
8	6000	5000																										
10	5500	5000																										
11	5000	3000																										
12	4500	3000																										
24	3000	3000																										
25	3000	0																										
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 frequency (Hz)	150																											
Rated current (A)	16.6																											
Maximum current (A)	55																											
Rated speed (rpm)	3000																											
Maximum speed (rpm)	6000																											
Torque coefficient (N·m/A)	0.67		Heatsink-based derating curve																									
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4 ± 10%	Max. allowable load rate (%) <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>35</td></tr><tr><td>150</td><td>50</td></tr><tr><td>200</td><td>65</td></tr><tr><td>250</td><td>78</td></tr><tr><td>300</td><td>88</td></tr><tr><td>350</td><td>95</td></tr><tr><td>400</td><td>102</td></tr><tr><td>450</td><td>105</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	100	35	150	50	200	65	250	78	300	88	350	95	400	102	450	105						
	Heatsink dimensions (mm)	Max. allowable load rate (%)																										
100	35																											
150	50																											
200	65																											
250	78																											
300	88																											
350	95																											
400	102																											
450	105																											
	Motor with brake	9.38 ± 10%																										

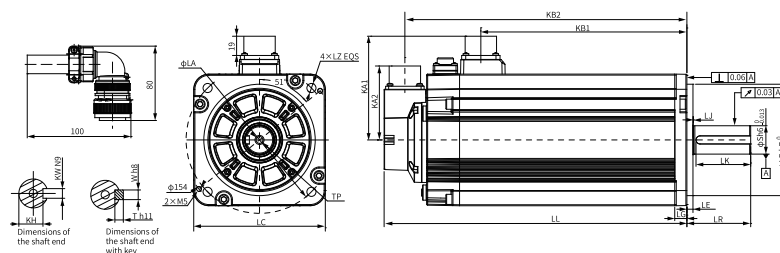
Electrical specifications of the brake

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

Allowable load

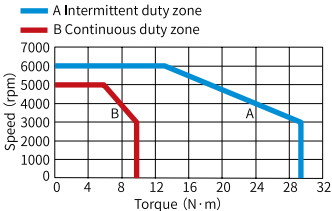
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

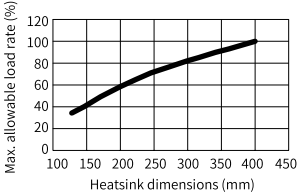
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63 ± 1	145	4 × φ9	102.4	127.5	73	177.5 (202.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	53 ⁰ -0.62	24 ⁰ -0.2	8	8	7	10.0 (11.9)	

4.3.20 MS1H2-30C30CD-V33*R-INT

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 frequency (Hz)	150			
Rated current (A)	8.9			
Maximum current (A)	29			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.25		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	6.4 ± 10%		
	Motor with brake	9.38 ± 10%		

Heatsink-based derating curve	
	

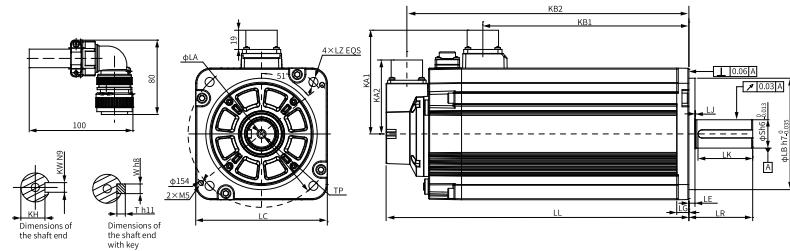
Electrical specifications of the brake

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

Allowable load

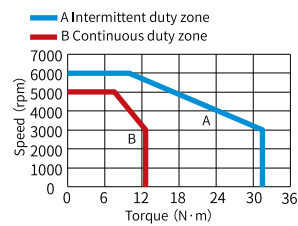
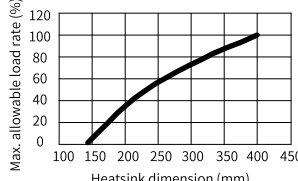
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	198 (223)	63 ± 1	145	4 × φ9	102.4	127.5	73	177.5 (202.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	530 _{-0.62}	240 _{-0.2}	8	8	7	10.0 (11.9)	

4.3.21 MS1H2-40C30CB-V63*R-INT

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 frequency (Hz)	150			
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%		

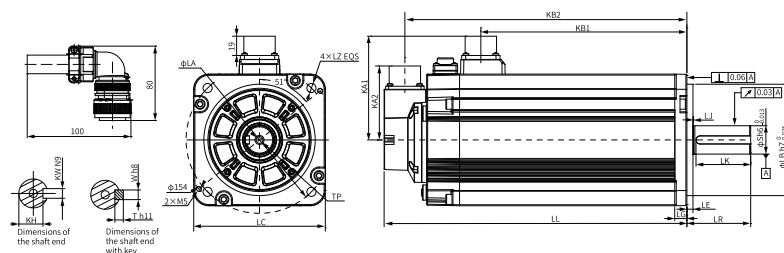
Electrical specifications of the brake

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

Allowable load

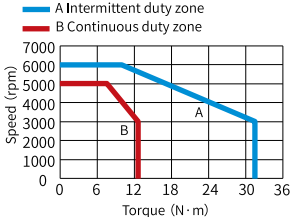
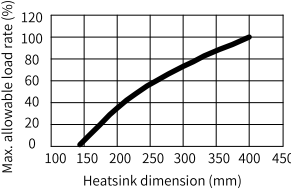
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63 ± 1	145	4 × φ9	102.4	165.5	73	215.5 (240.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	53 ⁰ -0.62	24 ⁰ -0.2	8	8	7	13.2 (15.1)	

4.3.22 MS1H2-40C30CB-V33*R-INT

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 frequency (Hz)	150			
Rated current (A)	22			
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%		

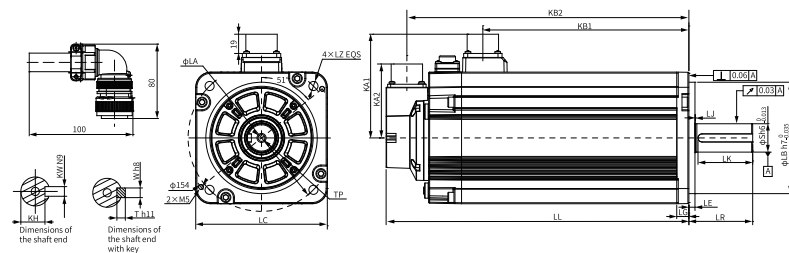
Electrical specifications of the brake

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

Allowable load

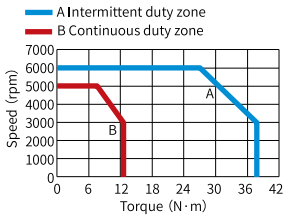
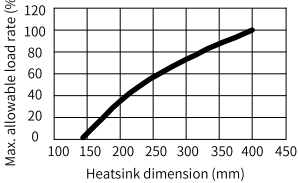
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63 ± 1	145	4 × φ9	102.4	165.5	73	215.5 (240.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	530 _{-0.62}	240 _{-0.2}	8	8	7	13.2 (15.1)	

4.3.23 MS1H2-40C30CD-V63*R-INT

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 frequency (Hz)	150			
Rated current (A)	13.5		Heatsink-based derating curve	
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·cm²)	Motor without brake	9 ± 10%		
	Motor with brake	11.98 ± 10%		

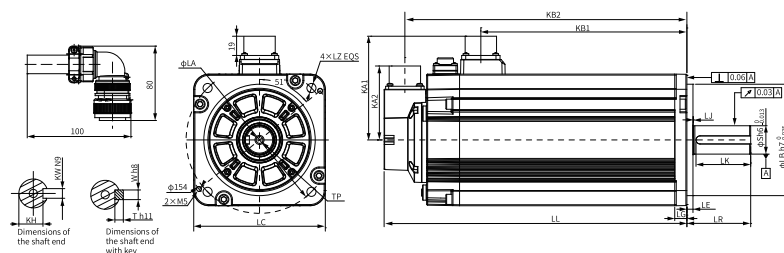
Electrical specifications of the brake

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

Allowable load

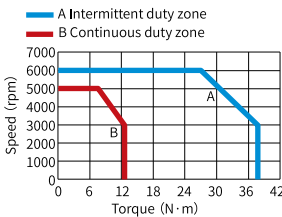
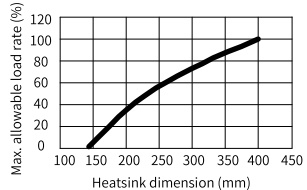
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63 ± 1	145	4 × φ9	102.4	165.5	73	215.5 (240.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	53 ⁰ -0.62	24 ⁰ -0.2	8	8	7	13.2 (15.1)	

4.3.24 MS1H2-40C30CD-V33*R-INT

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 frequency (Hz)	150			
Rated current (A)	13.5			
Maximum current (A)	42.5		Heatsink-based derating curve 	
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%		

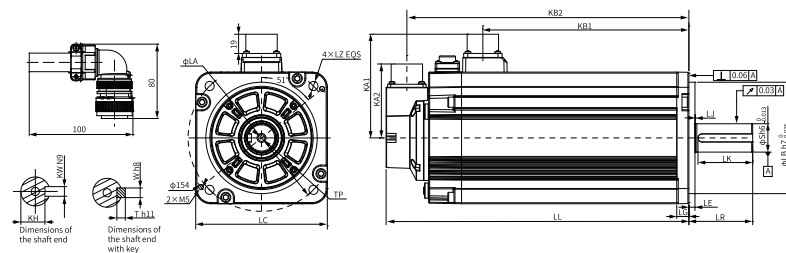
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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 × φ9	102.4	165.5	73	215.5 (240.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	530 ± 0.62	240 ± 0.2	8	8	7	13.2 (15.1)	

4.3.25 MS1H2-50C30CB-V63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130		The graph shows speed (rpm) on the y-axis (0 to 7000) and torque (N·m) on the x-axis (0 to 48). Zone A (Intermittent duty) is a blue line starting at 6000 rpm for 0 torque and decreasing to 3000 rpm at 40 N·m. Zone B (Continuous duty) is a red line starting at 5000 rpm for 0 torque and decreasing to 3000 rpm at 16 N·m.	
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 frequency (Hz)	150			
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%		

Heatsink-based derating curve	
The graph shows max. allowable load rate (%) on the y-axis (0 to 120) and heatsink dimension (mm) on the x-axis (100 to 450). The curve starts at 0% for 100 mm and increases to 100% at 450 mm.	

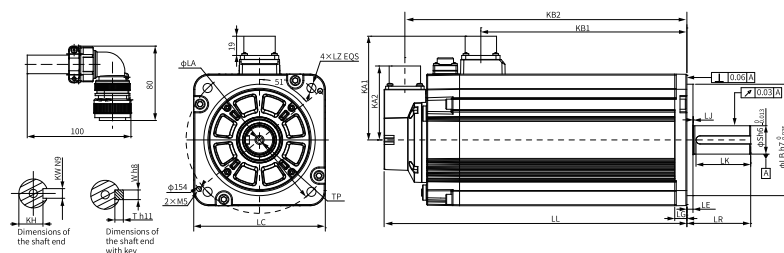
Electrical specifications of the brake

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

Allowable load

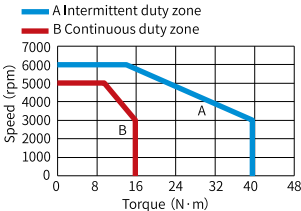
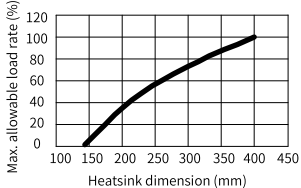
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63 ± 1	145	4 × φ9	102.4	203.5	73	253.5 (278.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	53 ⁰ -0.62	24 ⁰ -0.2	8	8	7	16.35 (18.25)	

4.3.26 MS1H2-50C30CB-V33*R-INT

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 frequency (Hz)	150			
Rated current (A)	22			
Maximum current (A)	67.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.81		Heatsink-based derating curve 	
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6 ± 10%		
	Motor with brake	14.58 ± 10%		

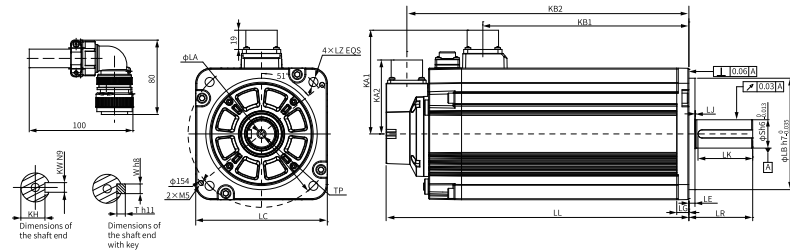
Electrical specifications of the brake

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

Allowable load

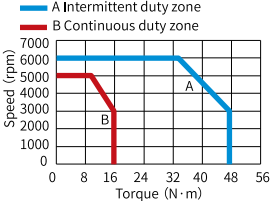
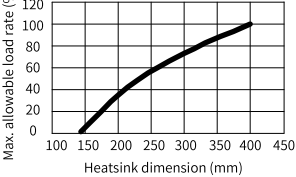
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63 ± 1	145	4 × φ9	102.4	203.5	73	253.5 (278.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	530 _{-0.62}	240 _{-0.2}	8	8	7	16.35 (18.25)	

4.3.27 MS1H2-50C30CD-V63*R-INT

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 frequency (Hz)	150			
Rated current (A)	17			
Maximum current (A)	52.5		Heatsink-based derating curve	
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%		

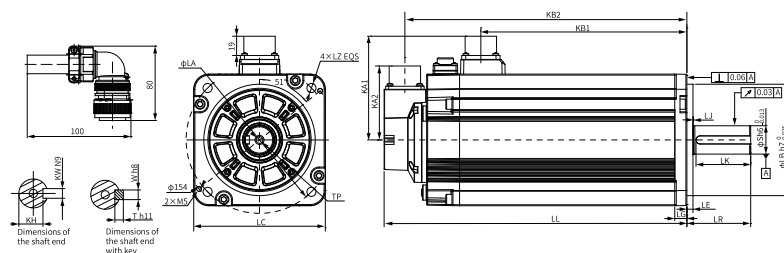
Electrical specifications of the brake

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

Allowable load

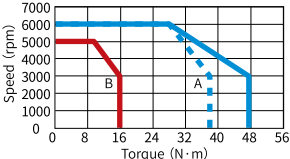
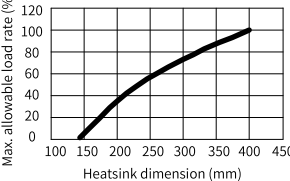
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

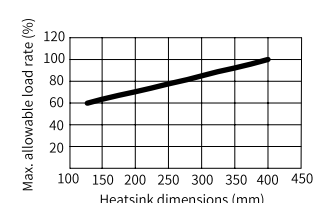
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	274 (299)	63 ± 1	145	4 × φ9	102.4	203.5	73	253.5 (278.5)	10.5	6 ± 0.3
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	28	M8 × 20	53 ⁰ -0.62	24 ⁰ -0.2	8	8	7	16.35 (18.25)	

4.3.28 MS1H2-50C30CD-V33*R-INT

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 	
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 frequency (Hz)	150			
Rated current (A)	17			
Maximum current (A)	52.5			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.04		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	11.6 ± 10%		
	Motor with brake	14.58 ± 10%		

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	13.56 ± 10%	
	Motor with brake	15.8 ± 10%	

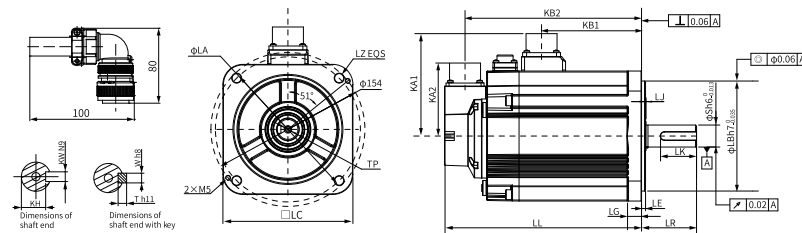
Electrical specifications of the brake

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

Allowable load

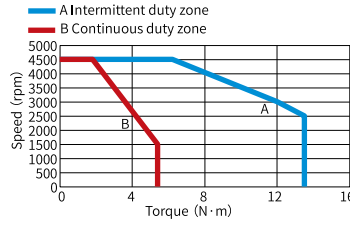
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55 ± 1	145	4 × 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	110	22	M6 × 20	35 ⁰ -0.62	18 ⁰ -0.2	8	8	7	5.8 (7.7)	

4.4.2 MS1H3-85B15CB-V33*R-INT

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 frequency (Hz)	125 m	
Rated current (A)	6.6	
		Heatsink-based derating curve

Motor Selection

Motor specifications			Torque-speed characteristics	
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·cm²)	Motor without brake	13.56 ± 10%		
	Motor with brake	15.8 ± 10%		

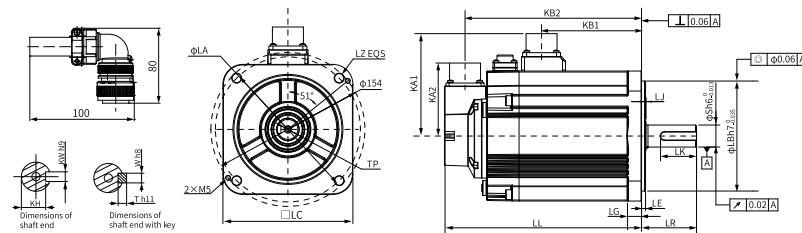
Electrical specifications of the brake

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

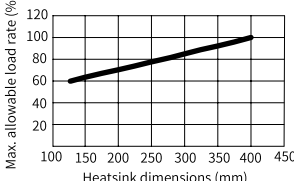
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55 ± 1	145	4 × 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	110	22	M6 × 20	350 _{-0.62}	180 _{-0.2}	8	8	7	5.8 (7.7)	

4.4.3 MS1H3-85B15CD-V63*R-INT

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 frequency (Hz)	125	
Rated current (A)	3.5	
		Heatsink-based derating curve

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	13.56 ± 10%	
	Motor with brake	15.8 ± 10%	

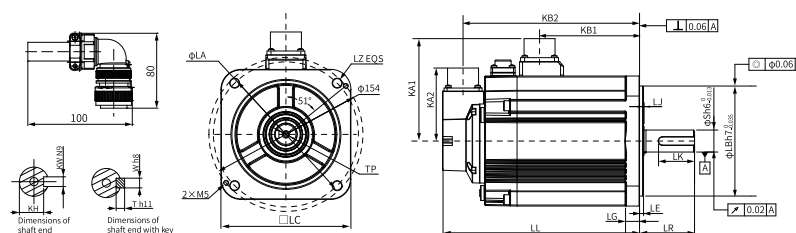
Electrical specifications of the brake

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

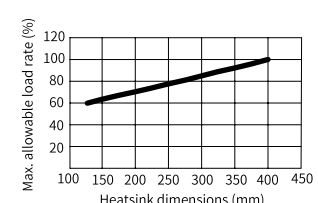


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55 ± 1	145	4 × φ9	103	70	73	121.5 (146.5)	14	4
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	22	M6 × 20	35 ⁰ -0.62	18 ⁰ -0.2	8	8	7	5.8 (7.7)	

4.4.4 MS1H3-85B15CD-V33*R-INT

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 frequency (Hz)	125 m	
Rated current (A)	3.5	
		Heatsink-based derating curve

Motor Selection

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	13.56 ± 10%	
	Motor with brake	15.8 ± 10%	

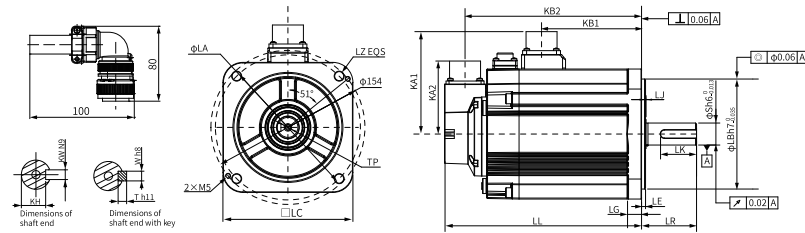
Electrical specifications of the brake

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

Allowable load

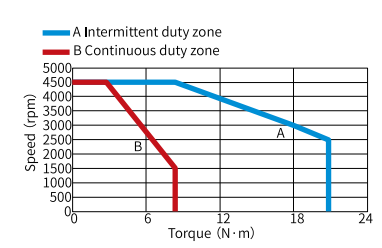
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)

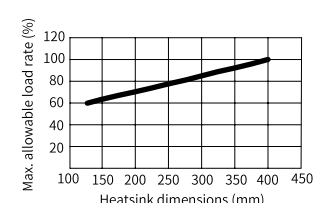


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	142 (167)	55 ± 1	145	4 × φ9	103	70	73	121.5 (146.5)	14	4
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	22	M6 × 20	350 _{-0.62}	180 _{-0.2}	8	8	7	5.8 (7.7)	

4.4.5 MS1H3-13C15CB-V63*R-INT

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 frequency (Hz)	125	
Rated current (A)	10.5	Heatsink-based derating curve

Motor Selection

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	19.25 ± 10%	
	Motor with brake	21.5 ± 10%	

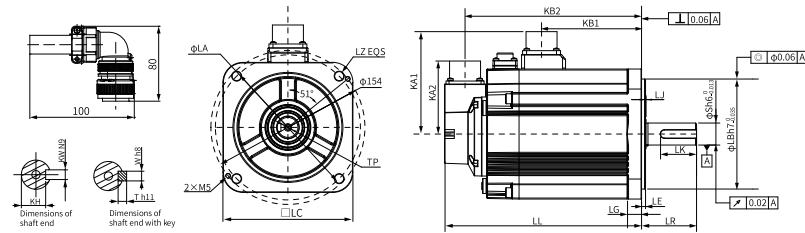
Electrical specifications of the brake

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

Allowable load

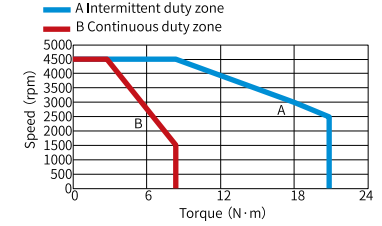
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

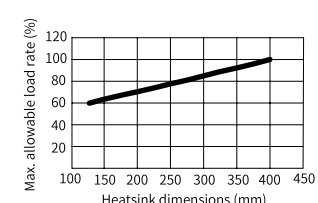
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55 ± 1	145	4 × 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	110		22	M6 × 20	350 _{-0.62}	180 _{-0.2}	8	8	7	7.1 (8.9)

4.4.7 MS1H3-13C15CD-V63*R-INT

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 frequency (Hz)	125	
Rated current (A)	5.1	
		Heatsink-based derating curve

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	19.25 ± 10%	
	Motor with brake	21.5 ± 10%	

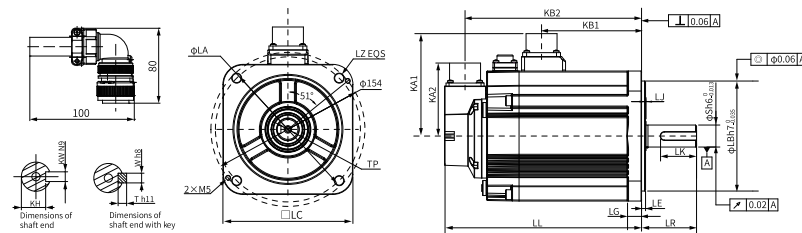
Electrical specifications of the brake

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

Allowable load

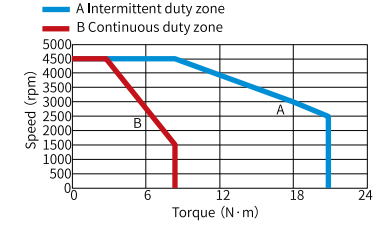
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)

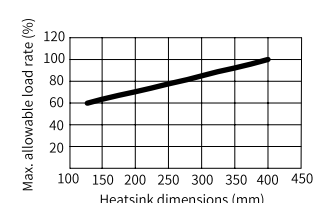


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55 ± 1	145	4 × φ9	103	85	73	136.5 (161.5)	14	4
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	22	M6 × 20	35 ⁰ -0.62	18 ⁰ -0.2	8	8	7	7.1 (8.9)	

4.4.8 MS1H3-13C15CD-V33*R-INT

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 frequency (Hz)	125 m	
Rated current (A)	5.1	Heatsink-based derating curve

Motor Selection

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	19.25 ± 10%	
	Motor with brake	21.5 ± 10%	

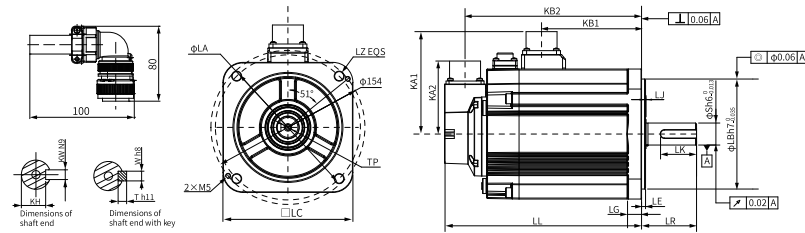
Electrical specifications of the brake

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

Allowable load

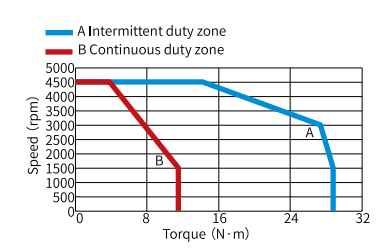
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

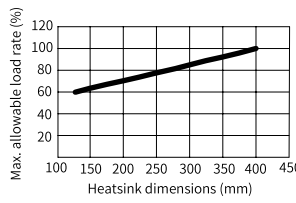
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	157 (182)	55 ± 1	145	4 × 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	110	22	M6 × 20	350 _{-0.62}	180 _{-0.2}	8	8	7	7.1 (8.9)	

4.4.9 MS1H3-18C15CB-V63*R-INT

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 frequency (Hz)	125	
Rated current (A)	11.9	
		Heatsink-based derating curve

Motor specifications			Torque-speed characteristics
Maximum current (A)	32.2		
Rated speed (rpm)	1500		
Maximum speed (rpm)	4500		
Torque coefficient (N·m/A)	1.09		
Rotor moment of inertia (kg·cm²)	Motor without brake	24.9 ± 10%	
	Motor with brake	27.2 ± 10%	

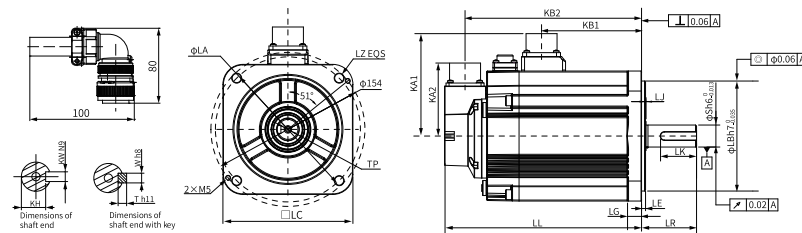
Electrical specifications of the brake

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

Allowable load

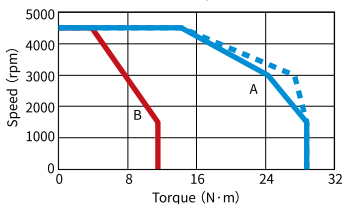
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)

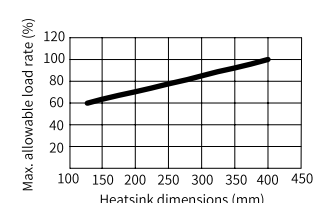


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55 ± 1	145	4 × φ9	103	100	73	151.5 (176.5)	14	4
LJ	LB	S	TP	LK	KH	kW	W	T	Weight (kg)	
0.5 ± 0.75	110	22	M6 × 20	35 ⁰ -0.62	18 ⁰ -0.2	8	8	7	8.5 (10.3)	

4.4.10 MS1H3-18C15CB-V33*R-INT

Motor specifications		Torque-speed characteristics
Frame size (mm)	130	 — A Intermittent duty zone of S012 drives — A Intermittent duty zone of S018 drives — B Continuous duty zone
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 frequency (Hz)	125 m	
Rated current (A)	11.9	
		Heatsink-based derating curve

Motor Selection

Motor specifications			Torque-speed characteristics
Maximum current (A)	32.2		
Rated speed (rpm)	1500		
Maximum speed (rpm)	4500		
Torque coefficient (N·m/A)	1.09		
Rotor moment of inertia (kg·cm²)	Motor without brake	24.9 ± 10%	
	Motor with brake	27.2 ± 10%	

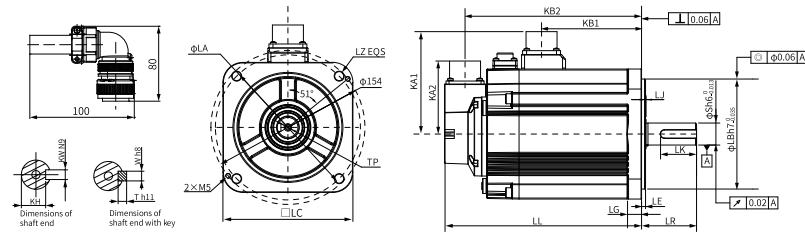
Electrical specifications of the brake

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

Allowable load

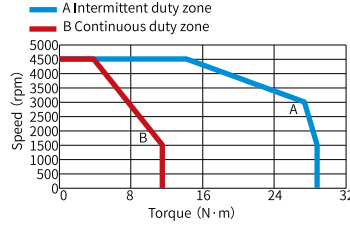
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

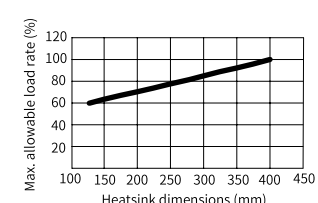
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55 ± 1	145	4 × 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	110	22	M6 × 20	350 ^{-0.62}	180 ^{-0.2}	8	8	7	8.5 (10.3)	

4.4.11 MS1H3-18C15CD-V63*R-INT

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 frequency (Hz)	125	
Rated current (A)	6.75	
		Heatsink-based derating curve

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	24.9 ± 10%	
	Motor with brake	27.2 ± 10%	

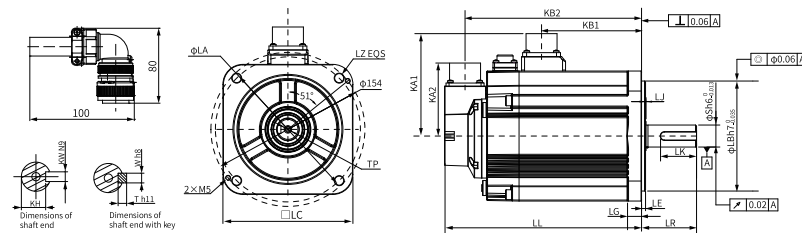
Electrical specifications of the brake

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

Allowable load

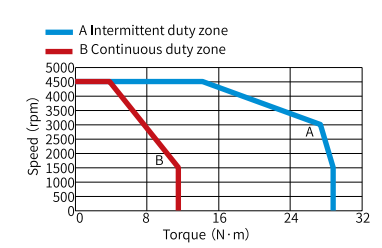
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55 ± 1	145	4 × 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	110	22	M6 × 20	35 ⁰ -0.62	18 ⁰ -0.2	8	8	7	8.5 (10.3)	

4.4.12 MS1H3-18C15CD-V33*R-INT

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 frequency (Hz)	125 m	
Rated current (A)	6.75	
		Heatsink-based derating curve

Motor Selection

Motor specifications			Torque-speed characteristics															
Maximum current (A)	17.7		<table><caption>Data points for Torque-Speed Characteristics</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>150</td><td>60</td></tr><tr><td>200</td><td>65</td></tr><tr><td>250</td><td>70</td></tr><tr><td>300</td><td>75</td></tr><tr><td>350</td><td>80</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	150	60	200	65	250	70	300	75	350	80	400	100
Heatsink dimensions (mm)	Max. allowable load rate (%)																	
150	60																	
200	65																	
250	70																	
300	75																	
350	80																	
400	100																	
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%																

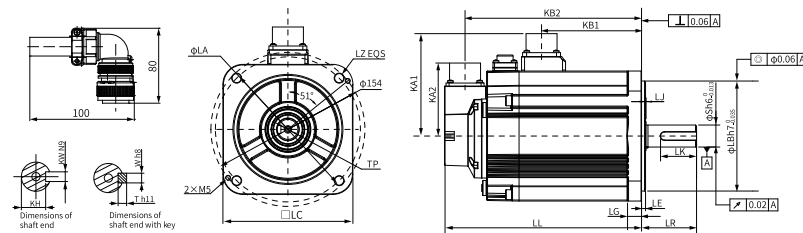
Electrical specifications of the brake

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

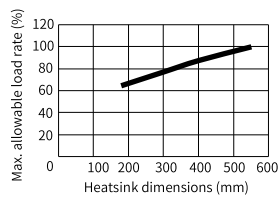
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55 ± 1	145	4 × 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	110		22	M6 × 20	350 _{-0.62}	180 _{-0.2}	8	8	7	8.5 (10.3)

4.4.13 MS1H3-29C15CB-V63*R-INT

Motor specifications		Torque-speed characteristics	
Frame size (mm)	180	— A Intermittent duty zone — B Continuous duty zone	
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 frequency (Hz)	125		
Rated current (A)	18		
		Heatsink-based derating curve	

Motor specifications			Torque-speed characteristics
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·cm²)	Motor without brake	44.7 ± 10%	
	Motor with brake	52.35 ± 10%	

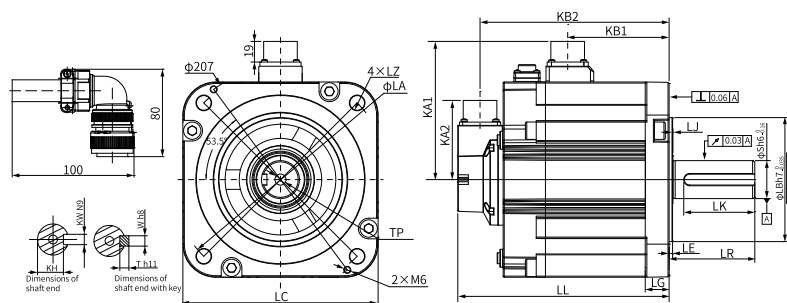
Electrical specifications of the brake

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

Allowable load

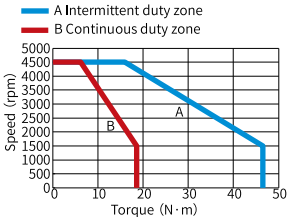
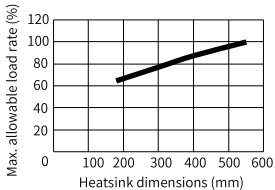
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

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)	20.5	3.2 ± 0.3
IJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	64 ⁰ -0.74	30 ⁰ -0.2	10	10	8	13.8 (17.9)

4.4.14 MS1H3-29C15CB-V33*R-INT

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 frequency (Hz)	125 m			
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%		

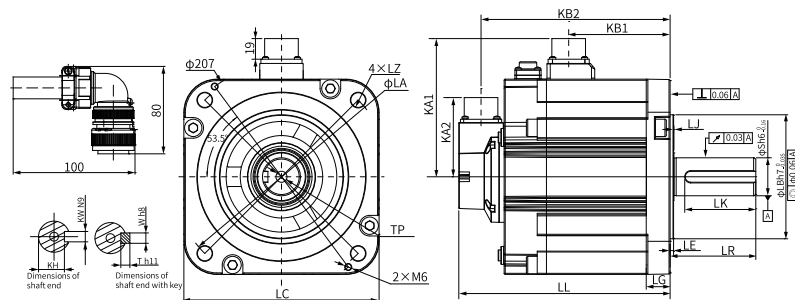
Electrical specifications of the brake

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

Allowable load

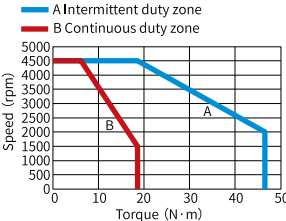
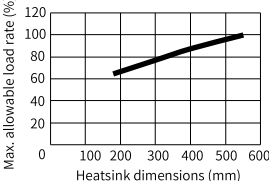
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

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)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	640 ^{-0.74}	300 ^{-0.2}	10	10	8	13.8 (17.9)

4.4.15 MS1H3-29C15CD-V63*R-INT

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 frequency (Hz)	125			
Rated current (A)	10.5			
Maximum current (A)	29.75		Heatsink-based derating curve	
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%		

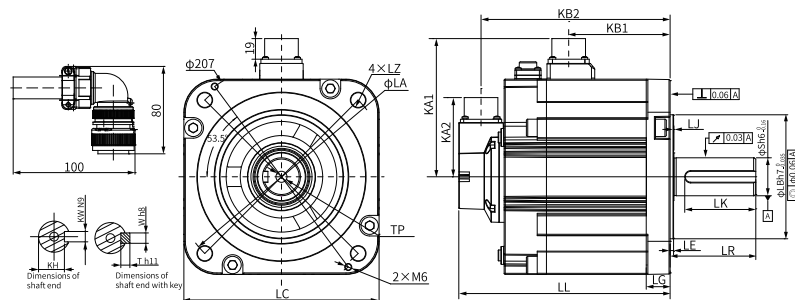
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	64 ⁰ -0.74	30 ⁰ -0.2	10	10	8	13.8 (17.9)

4.4.16 MS1H3-29C15CD-V33*R-INT

Motor specifications		
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 frequency (Hz)	125 m	
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%

Torque-speed characteristics

The graph shows the torque-speed characteristics of the motor. The y-axis represents Speed (rpm) from 0 to 5000, and the x-axis represents Torque (N·m) from 0 to 50. Two duty zones are indicated: A (Intermittent duty zone, blue line) and B (Continuous duty zone, red line). Zone B starts at 4500 rpm and 0 torque, drops to 1500 rpm at 18.6 N·m, and then drops vertically to 0 torque. Zone A starts at 4500 rpm and 0 torque, drops to 1500 rpm at 18.6 N·m, and then continues as a straight line to 0 rpm at 46.5 N·m.

Heatsink-based derating curve

The graph shows the derating curve for the motor based on heatsink dimensions. The y-axis represents Max. allowable load rate (%) from 0 to 120, and the x-axis represents Heatsink dimensions (mm) from 0 to 600. A single black line shows the relationship, starting at approximately 65% load rate for 180 mm dimensions and increasing linearly to 100% load rate for 550 mm dimensions.

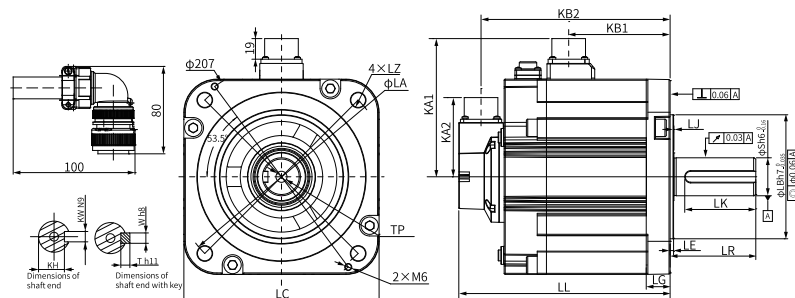
Electrical specifications of the brake

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

Allowable load

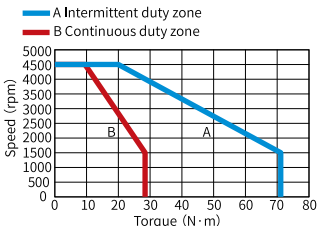
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

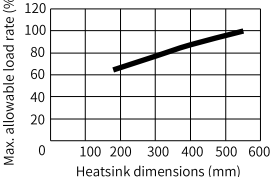
Dimensions (mm)



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)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	640 _{-0.74}	300 _{-0.2}	10	10	8	13.8 (17.9)

4.4.17 MS1H3-44C15CB-V63*R-INT

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 frequency (Hz)	125			
Rated current (A)	25.5			
Maximum current (A)	67			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.25		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9 ± 10%		
	Motor with brake	72.55 ± 10%		

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

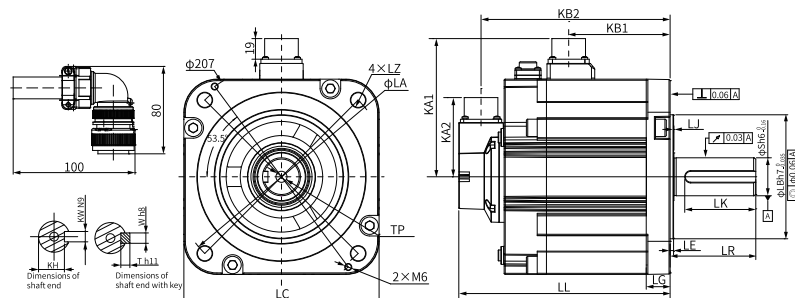
Electrical specifications of the brake

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

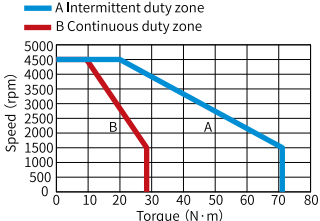
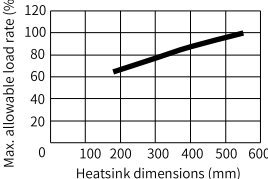
Allowable load

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

Dimensions (mm)



4.4.18 MS1H3-44C15CB-V33*R-INT

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 frequency (Hz)	125 m			
Rated current (A)	25.5			
Maximum current (A)	67			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.25		Heatsink-based derating curve 	
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9 ± 10%		
	Motor with brake	72.55 ± 10%		

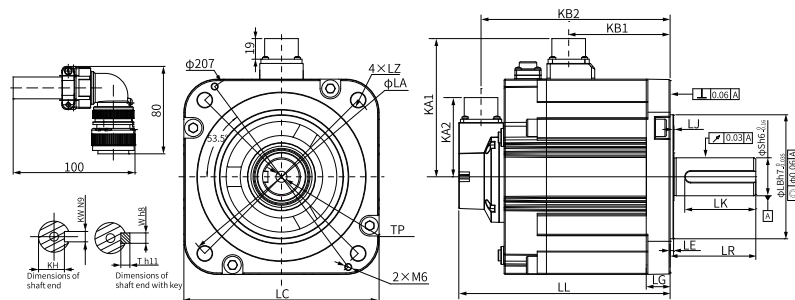
Electrical specifications of the brake

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

Allowable load

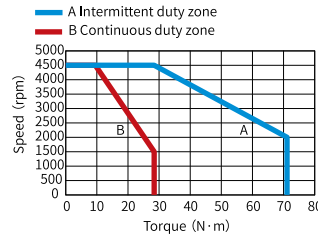
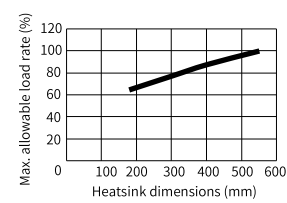
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

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)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	640 ^{-0.74}	300 ^{-0.2}	10	10	8	17.4 (21.9)

4.4.19 MS1H3-44C15CD-V63*R-INT

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 frequency (Hz)	125			
Rated current (A)	16			
Maximum current (A)	42			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.96		Heatsink-based derating curve 	
Rotor moment of inertia (kg·cm²)	Motor without brake	64.9 ± 10%		
	Motor with brake	72.55 ± 10%		

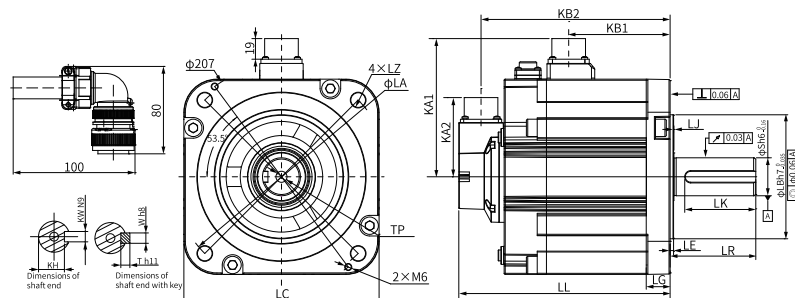
Electrical specifications of the brake

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

Allowable load

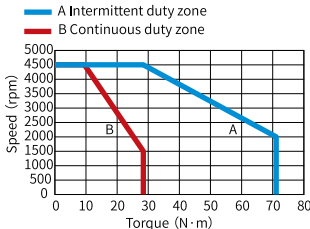
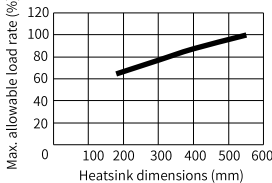
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

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)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	64 ⁰ -0.74	30 ⁰ -0.2	10	10	8	17.4 (21.6)

4.4.20 MS1H3-44C15CD-V33*R-INT

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 frequency (Hz)	125 m			
Rated current (A)	16			
Maximum current (A)	42			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.96		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9 ± 10%		
	Motor with brake	72.55 ± 10%		

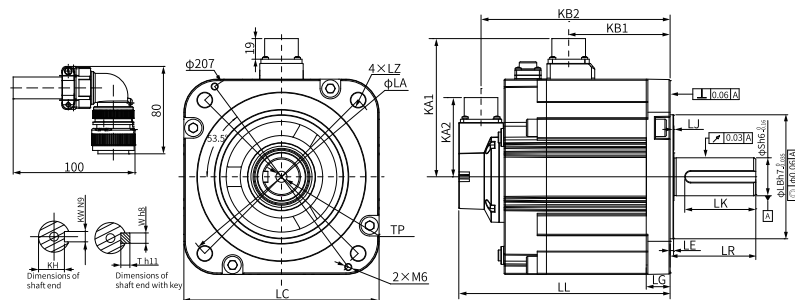
Electrical specifications of the brake

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

Allowable load

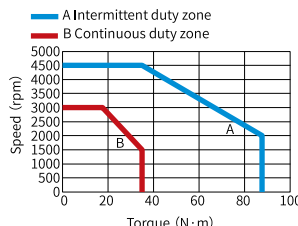
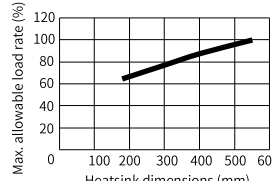
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

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)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		35	M12 × 25	640 ^{-0.74}	300 ^{-0.2}	10	10	8	17.4 (21.6)

4.4.21 MS1H3-55C15CD-V63*R-INT

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 frequency (Hz)	125			
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%		

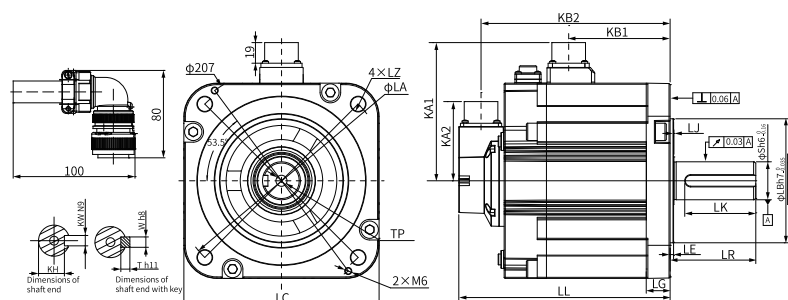
Electrical specifications of the brake

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

Allowable load

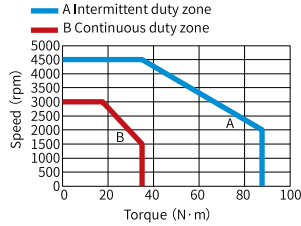
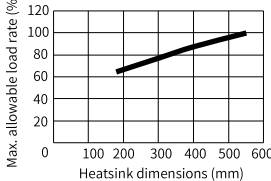
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	≤ 1764	≤ 588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	208 (241.8)	113 ± 1	200	4 × φ13.5	127.4	140.5	73	187.5 (221.3)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		42	M16 × 32	95 ⁰ -0.87	37 ⁰ -0.2	12	12	8	21.7 (25.9)

4.4.22 MS1H3-55C15CD-V33*R-INT

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 frequency (Hz)	125 m			
Rated current (A)	20.7			
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%		

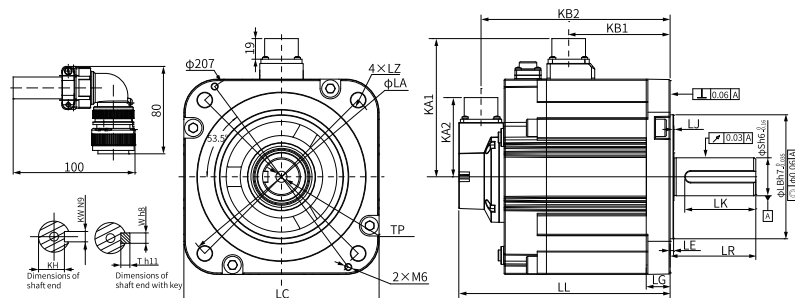
Electrical specifications of the brake

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

Allowable load

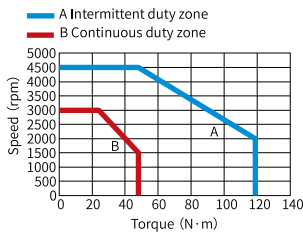
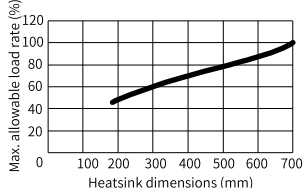
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	≤ 1764	≤ 588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	208 (241.8)	113 ± 1	200	4 × φ13.5	127.4	140.5	73	187.5 (221.3)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		42	M16 × 32	950 _{-0.87}	370 _{-0.2}	12	12	8	21.7 (25.9)

4.4.23 MS1H3-75C15CD-V63*R-INT

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 frequency (Hz)	125			
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·cm²)	Motor without brake	127.5 ± 10%		
	Motor with brake	135.15 ± 10%		

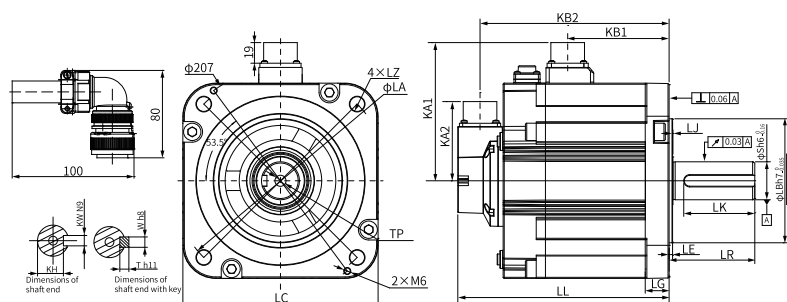
Electrical specifications of the brake

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

Allowable load

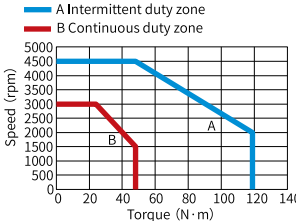
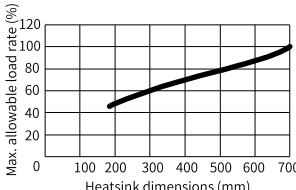
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
113	≤ 1764	≤ 588

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	255 (288.8)	113 ± 1	200	4 × φ13.5	127.4	187.5	73	234.5 (268.5)	20.5	3.2 ± 0.3
IJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		42	M16 × 32	95° -0.87	37° -0.2	12	12	8	29 (33.2)

4.4.24 MS1H3-75C15CD-V33*R-INT

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 frequency (Hz)	125 m			
Rated current (A)	25			
Maximum current (A)	65			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	2.13		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	127.5 ± 10%		
	Motor with brake	135.15 ± 10%		

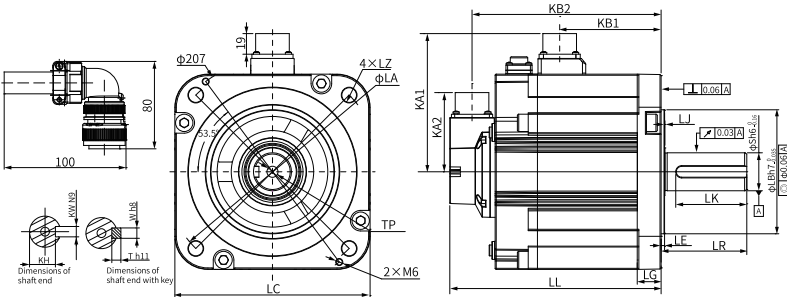
Electrical specifications of the brake

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

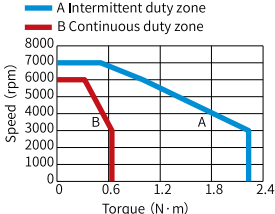
Dimensions (mm)

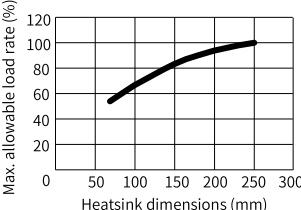


LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	255 (288.8)	113 ± 1	200	4 × φ13.5	127.4	187.5	73	234.5 (268.5)	20.5	3.2 ± 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 ± 0.75	114.3		42	M16 × 32	950 _{-0.87}	370 _{-0.2}	12	12	8	29 (33.2)

4.5 MS1H4 Series Motors with Medium Inertia and Small Capacity

4.5.1 MS1H4-20B30CB-V63*R-INT

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 frequency (Hz)	250		
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		Heatsink-based derating curve
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.22 ± 10%	
	Motor with brake	0.23 ± 10%	

Heatsink-based derating curve	
	

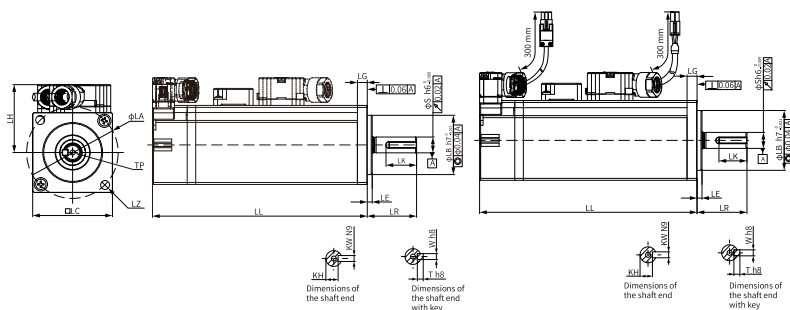
Electrical specifications of the brake

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

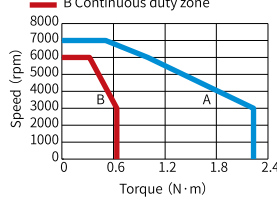
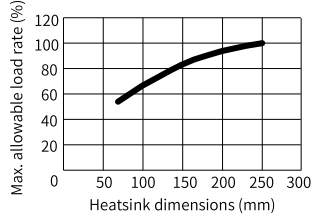
Dimensions (mm)



Motor Selection

LC	LL	LR	LA	LZ	LH	LG	LE	
60	73.5 (101.1)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 8	16.5 ⁰ _{-0.53}	11 ⁰ _{-0.1}	5	5	5	0.78 (1.16)

4.5.2 MS1H4-20B30CB-V33*R-INT

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 frequency (Hz)	250			
Rated current (A)	1.3			
Maximum current (A)	5.3		Heatsink-based derating curve	
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%		

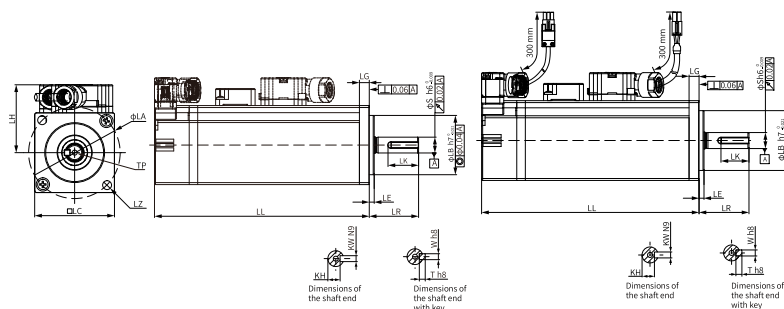
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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	
60	73.5 (101.1)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 8	16.50 -0.53	110 -0.1	5	5	5	0.78 (1.16)

4.5.3 MS1H4-40B30CB-V63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60		The graph plots Speed (rpm) on the y-axis (0 to 8000) against Torque (N·m) on the x-axis (0 to 4.8). Two curves are shown: Curve A (Intermittent duty zone) is a blue line starting at 7000 rpm for 0 torque, dropping to 3000 rpm at 4.45 N·m, and then dropping vertically to 0 at 4.8 N·m. Curve B (Continuous duty zone) is a red line starting at 6000 rpm for 0 torque, dropping to 3000 rpm at 1.27 N·m, and then dropping vertically to 0 at 1.27 N·m.	
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 frequency (Hz)	250			
Rated current (A)	2.4		Heatsink-based derating curve	
Maximum current (A)	9.2		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). A single black curve shows the relationship, starting at approximately 55% load rate for 50 mm dimensions and rising to 100% load rate for 250 mm dimensions.	
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%		

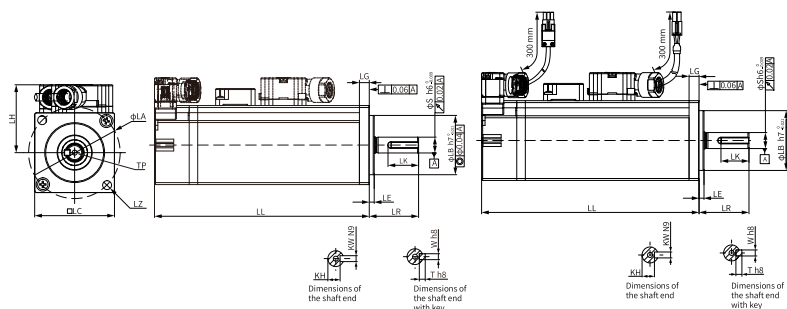
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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	
60	92 (119.8)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 8	16.5 ⁰ -0.53	11 ⁰ -0.1	5	5	5	1.11 (1.48)

4.5.4 MS1H4-40B30CB-V33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60		Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 8000 rpm, and the x-axis ranges from 0 to 4.8 N·m. Two curves are shown: A (Intermittent duty zone) and B (Continuous duty zone). Curve A starts at 7000 rpm at 0 torque and decreases to 3000 rpm at 4.8 N·m. Curve B starts at 6000 rpm at 0 torque and decreases to 3000 rpm at 1.2 N·m.	
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 frequency (Hz)	250			
Rated current (A)	2.4			
Maximum current (A)	9.2			
Rated speed (rpm)	3000		Graph showing Max. allowable load rate (%) vs Heatsink dimensions (mm). The y-axis ranges from 0 to 120%, and the x-axis ranges from 0 to 300 mm. The curve starts at approximately 55% at 50 mm and increases to 100% at 300 mm.	
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%		

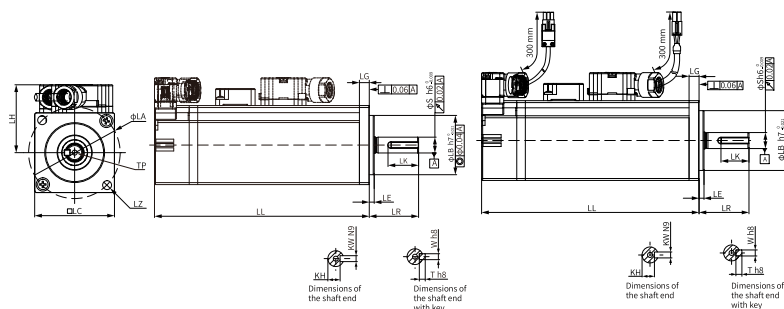
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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	
60	92 (119.8)	30 ± 0.5	70	4 × φ5.5	44	8.0	3 ± 0.5	
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
50	14	M5 × 8	16.50 -0.53	110 -0.1	5	5	5	1.11 (1.48)

4.5.5 MS1H4-55B30CB-V631R-INT

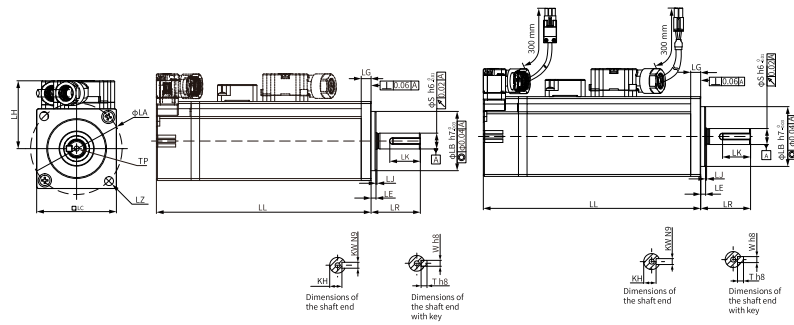
Motor specifications			Torque-speed characteristics	
Frame size (mm)	80		The graph plots Speed (rpm) on the y-axis (0 to 8000) against Torque (N·m) on the x-axis (0 to 6.4). Two curves are shown: A (Intermittent duty zone) and B (Continuous duty zone). Curve A starts at 7000 rpm at 0 torque and decreases linearly to 3000 rpm at 6.4 N·m. Curve B starts at 6000 rpm at 0 torque, remains constant until 1.6 N·m, and then drops vertically to 0 rpm.	
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 frequency (Hz)	250			
Rated current (A)	3.3			
Maximum current (A)	13.2			
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	1.12 ± 10%		
	Motor with brake	-		

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 shows that the max allowable load rate increases from approximately 60% at 50 mm to 100% at 300 mm.	

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 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	1.85

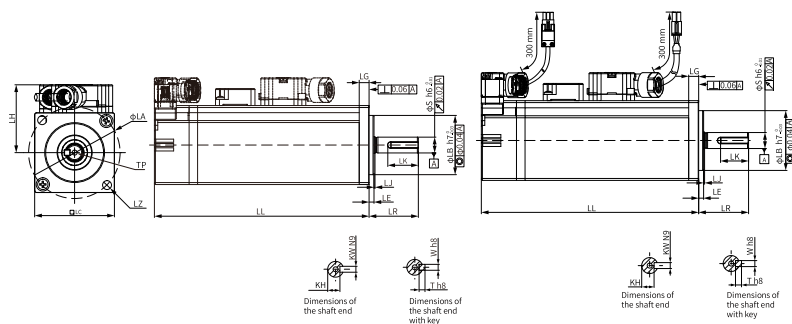
4.5.6 MS1H4-55B30CB-V331R-INT

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)	0.55			
Voltage (V)	220			
Rated torque (N·m)	1.75			
Maximum torque (N·m)	6.13			
Rated frequency (Hz)	250			
Rated current (A)	3.3			
Maximum current (A)	13.2			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58		Heatsink-based derating curve Max. allowable load rate (%) Heatsink dimensions (mm)	
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.12 ± 10%		
	Motor with brake	-		

Allowable load

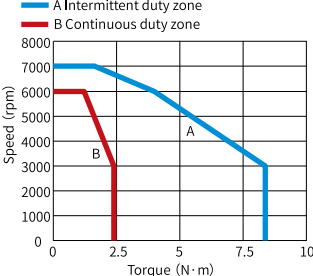
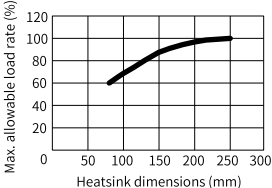
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35 ± 0.5	90	4 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	250 ^{0.62}	15.50 ^{-0.1}	6	6	6	1.85

4.5.7 MS1H4-75B30CB-V63*R-INT

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 frequency (Hz)	250			
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 to 10 %		

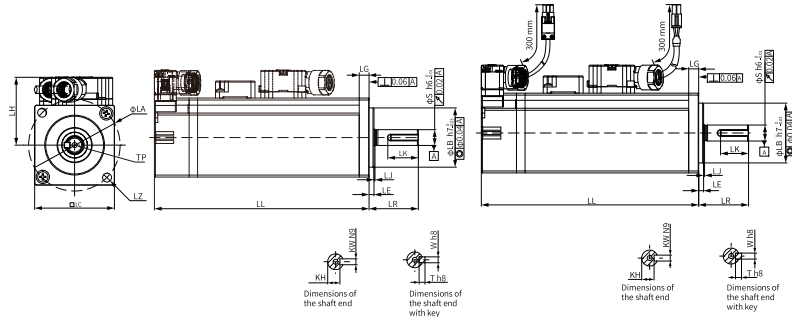
Electrical specifications of the brake

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

Allowable load

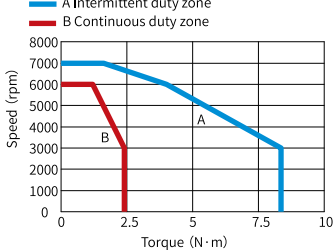
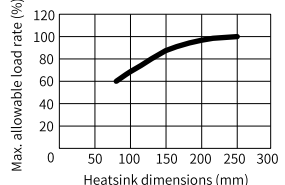
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (140.5)	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)
70	19	M6 × 20	250 - 0.62	15.50 - 0.1	6	6	6	2.18 (2.82)

4.5.8 MS1H4-75B30CB-V33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80			
Inertia, capacity	Medium inertia, small capacity			
Rated power (kW)	0.75			
Voltage (V)	220			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.37			
Rated frequency (Hz)	250			
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)	Brake-less motor	1.46±10%		
	Brake motor	1.51±10%		

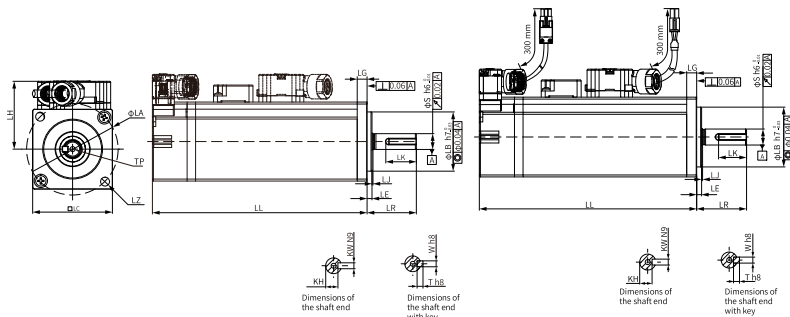
Electrical specifications of the brake

Holding torque (N·m)	Supply voltage (VDC)±10%	Rated power (W)	Coil resistance (Ω)±10%	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 $\phi 7$	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6x20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	2.18 (2.82)

4.5.9 MS1H4-10C30CB-V63*R-INT

Motor specifications			Torque-speed characteristics															
Frame size (mm)	80		— A Intermittent duty zone — B Continuous duty zone <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>7000</td><td>6000</td></tr><tr><td>3</td><td>7000</td><td>3000</td></tr><tr><td>12</td><td>3000</td><td>-</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	7000	6000	3	7000	3000	12	3000	-		
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																
0	7000	6000																
3	7000	3000																
12	3000	-																
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 frequency (Hz)	250																	
Rated current (A)	6.5		Heatsink-based derating curve															
Maximum current (A)	24		Max. allowable load rate (%) Heatsink dimensions (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>50</td><td>60</td></tr><tr><td>100</td><td>75</td></tr><tr><td>150</td><td>90</td></tr><tr><td>200</td><td>98</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 (%)	50	60	100	75	150	90	200	98	250	100	300	100
Heatsink dimensions (mm)	Max. allowable load rate (%)																	
50	60																	
100	75																	
150	90																	
200	98																	
250	100																	
300	100																	
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%																

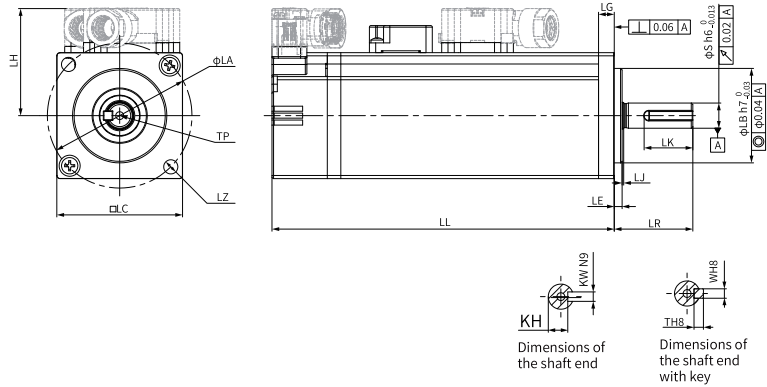
Electrical specifications of the brake

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

Allowable load

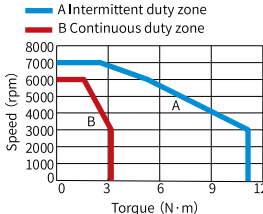
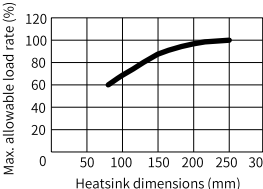
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	118.7 (153.2)	35 ± 0.5	90	4 × φ7	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	2.55 (2.9)

4.5.10 MS1H4-10C30CB-V33*R-INT

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)	1.0				
Voltage (V)	220				
Rated torque (N·m)	3.18				
Maximum torque (N·m)	11.13				
Rated frequency (Hz)	250				
Rated current (A)	6.5				
Maximum current (A)	24				
Rated speed (rpm)	3000				
Maximum speed (rpm)	7000				
Torque coefficient (N·m/A)	0.53		Heatsink-based derating curve		
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.87 ± 10%			 Max. allowable load rate (%) Heatsink dimensions (mm)
	Motor with brake	1.97 ± 10%			

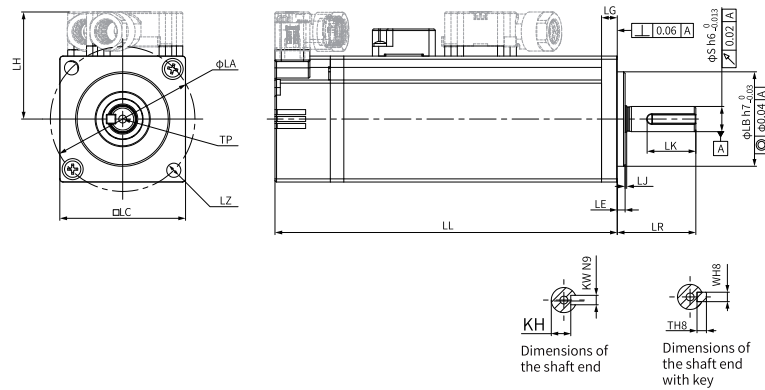
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	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 × $\phi 7$	54	7.5	3 ± 0.5	0.5 ± 0.35
LB	S	TP	LK	KH	kW	W	T	Weight (kg)
70	19	M6 × 20	250 - 0.62	15.50 - 0.1	6	6	6	2.55 (2.9)

5 Cable Selection

5.1 Model Description

Power cable model

S6-L- M 0 0 1 - 3.0 - T - INT
 ① ② ③ ④ ⑤ ⑥ ⑦

① Servo system power cable B: With brake M: Without brake	③ Applicable power of the motor 0: Frame sizes 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: Tubular terminal	④ Connector type at motor side 1: 9-core aviation connector 2: 6-core aviation connector 7: MS1 custom connector (front outlet) 8: MS1 custom connector (rear outlet)	⑥ Special requirements Null: Non-flexible T: Flexible cables ≥ 10 million bending cycles
		⑦ Version INT: Global version ^[1]

Note

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

Description of encoder cable model

S6-L- P 1 2 1 - 3.0 - T - INT
 ① ② ③ ④ ⑤ ⑥ ⑦

① Servo system encoder cable P: Encoder cable	③ Encoder 1: Communication-type incremental encoder 2: Multi-turn absolute encoder	⑤ Cable length (m) 3.0: 3 5.0: 5 10.0: 10
② Connector type at drive side 1: 1394 connector (5-pin)	④ Connector type at motor side 1: 17-core aviation connector 4: MS1 custom connector (front outlet) 5: MS1 custom connector (rear outlet)	⑥ Special requirements Null: Non-flexible T: Flexible cables ≥ 10 million bending cycles
		⑦ Version INT: Global version ^[1]

Note

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

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)
T: Communication cable	00: Drive-to-PC communication cable 01: Network communication cable (CAN&485) of the drive 02: Drive-to-PLC communication cable 03: Communication termination resistor cable (CAN&485) of the drive 04: Network communication cable (EtherCAT) of the drive	0.3: 0.3

Note

For selection of cables, see section "Cable Selection List".

5.2 Cable Type

Fixed cables

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

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

Flexible cables

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 cable carrier.
- Ensure the cable can move within the bending radius. Do not move the cables forcibly. Check that a relative movement between cables or between the cable and the guiding device is allowed.
- Do not fix or bundle the cables inside the cable carrier. The cables can be bundled and fixed only at two unmovable ends of the cable carrier.

Oil-resistant cables

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

More information

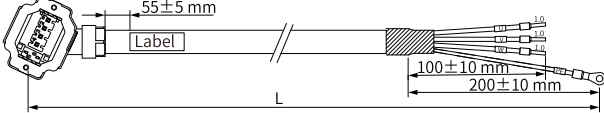
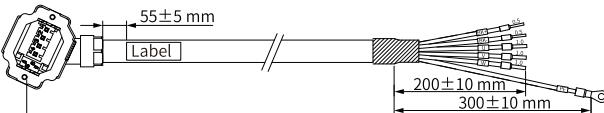
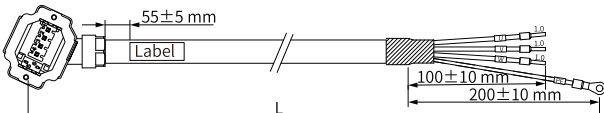
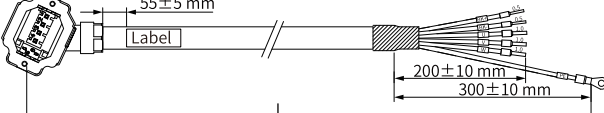
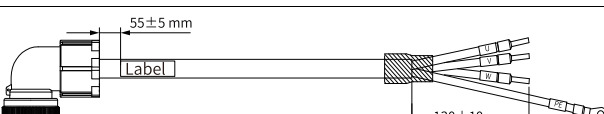
The terminal-type motor power cables and encoder cables require dedicated equipment and tooling for assembly. Order finished cables from channels authorized by Inovance.

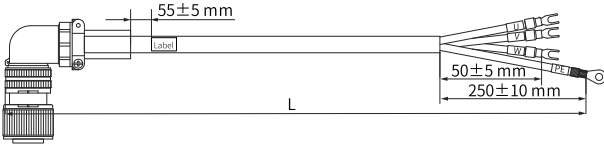
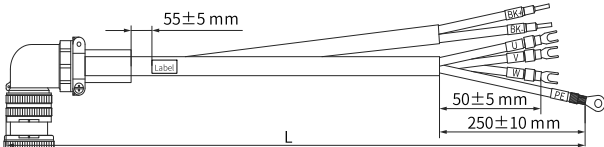
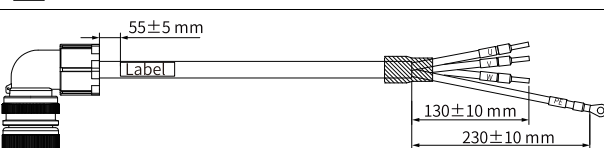
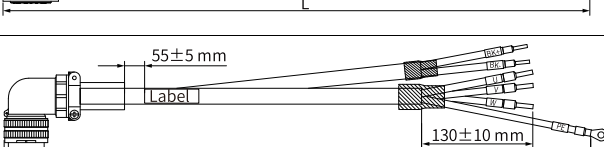
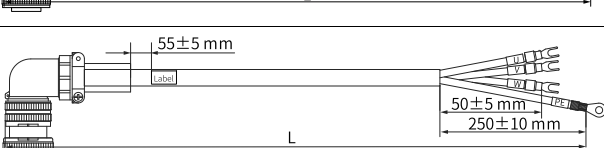
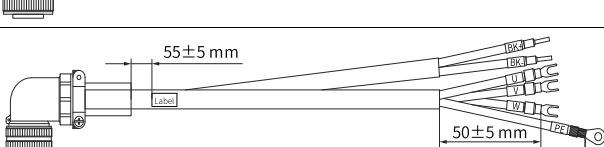
For motor information, see the user guide of the servo drive.

5.3 Cable Model Overview

5.3.1 SV680-INT Series

Power cable

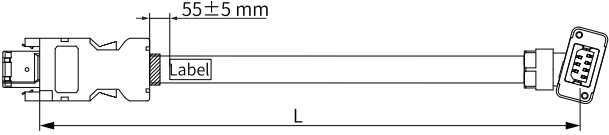
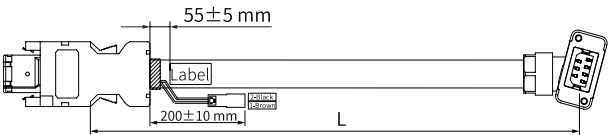
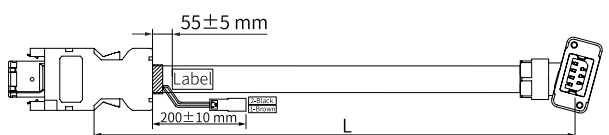
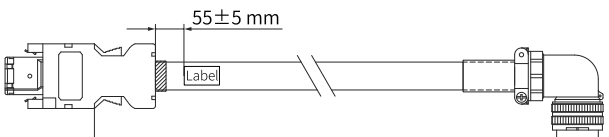
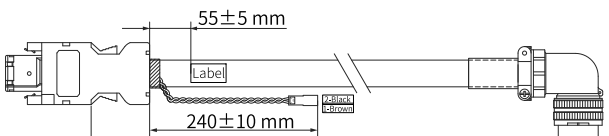
Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 motor	Front outlet	Without brake	S6-L-M107-3.0(-T)-INT	3000	
			S6-L-M107-5.0(-T)-INT	5000	
			S6-L-M107-10.0(-T)-INT	10000	
		With brake	S6-L-B107-3.0(-T)-INT	3000	
			S6-L-B107-5.0(-T)-INT	5000	
			S6-L-B107-10.0(-T)-INT	10000	
	Rear outlet	Without brake	S6-L-M108-3.0(-T)-INT	3000	
			S6-L-M108-5.0(-T)-INT	5000	
			S6-L-M108-10.0(-T)-INT	10000	
MS1H2 motors rated 3 kW and below/ MS1H3 motors rated 1.8 kW and below	Without brake		S6-L-M111-3.0(-T)-INT	3000	
			S6-L-M111-5.0(-T)-INT	5000	
			S6-L-M111-10.0(-T)-INT	10000	
	With brake		S6-L-B111-3.0(-T)-INT	3000	
			S6-L-B111-5.0(-T)-INT	5000	
			S6-L-B111-10.0(-T)-INT	10000	

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

Note

- 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: The optional flexible cable is available.

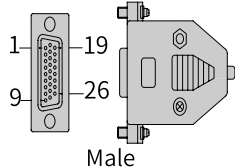
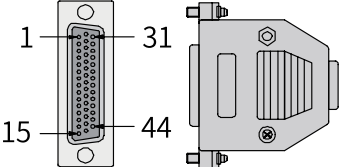
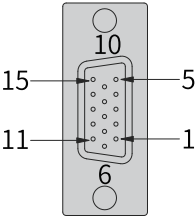
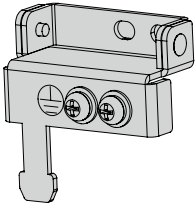
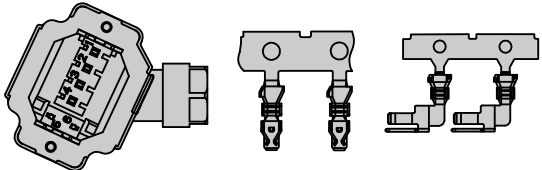
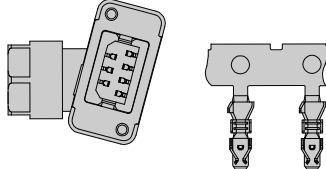
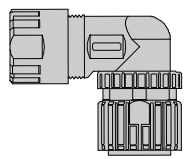
Encoder cable

Motor Model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 motor	Front outlet	4-conductor cable	S6-L-P114-3.0(-T)-INT	3000	
			S6-L-P114-5.0(-T)-INT	5000	
			S6-L-P114-10.0(-T)-INT	10000	
		6-conductor cable ^[1]	S6-L-P124-3.0(-T)-INT	3000	
			S6-L-P124-5.0(-T)-INT	5000	
			S6-L-P124-10.0(-T)-INT	10000	
	Rear outlet	4-conductor cable	S6-L-P115-3.0(-T)-INT	3000	
			S6-L-P115-5.0(-T)-INT	5000	
			S6-L-P115-10.0(-T)-INT	10000	
		6-conductor cable ^[1]	S6-L-P125-3.0(-T)-INT	3000	
			S6-L-P125-5.0(-T)-INT	5000	
			S6-L-P125-10.0(-T)-INT	10000	
MS1H2/MS1H3 motor	4-conductor cable		S6-L-P111-3.0(-T)-INT	3000	
			S6-L-P111-5.0(-T)-INT	5000	
			S6-L-P111-10.0(-T)-INT	10000	
	6-conductor cable ^[1]		S6-L-P121-3.0(-T)-INT	3000	
			S6-L-P121-5.0(-T)-INT	5000	
			S6-L-P121-10.0(-T)-INT	10000	

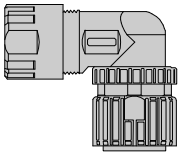
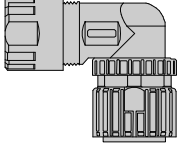
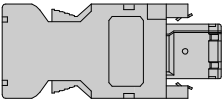
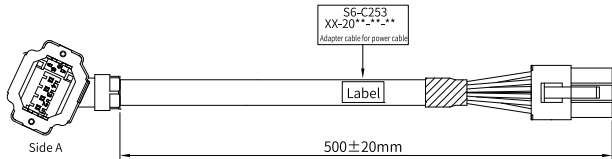
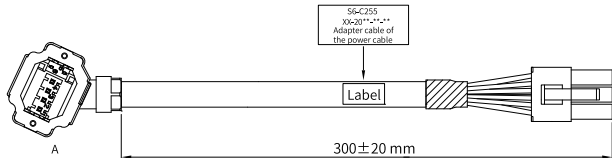
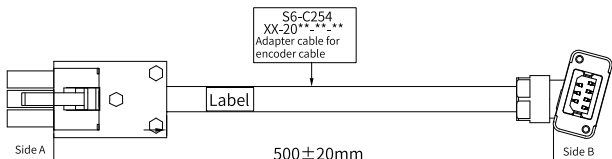
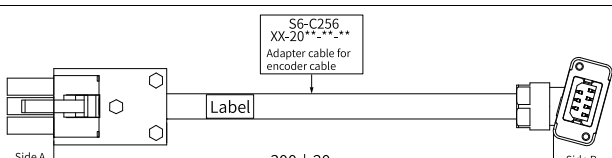
Note

^[1]The 6-conductor cable can be used normally. This type of cable is reserved for compatibility with the original battery model. It is not necessary to connect it to the battery box during use.

Connector kit

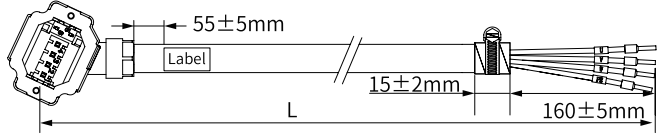
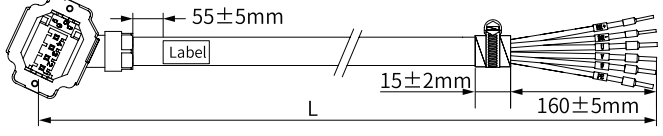
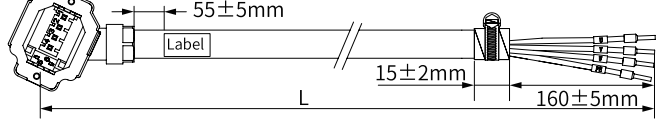
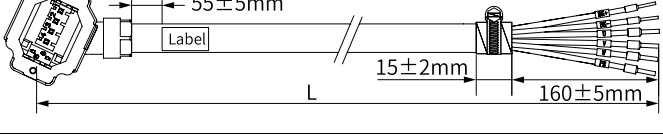
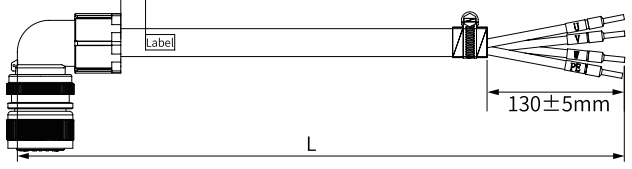
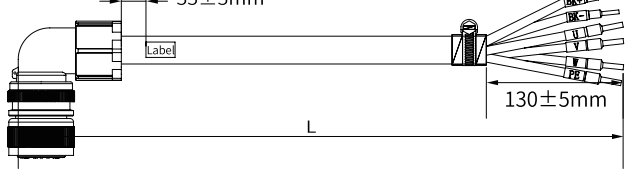
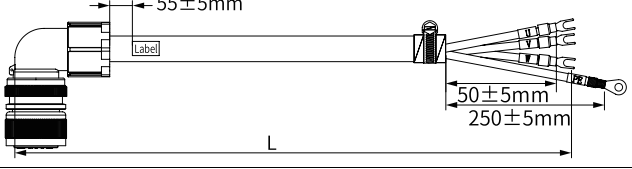
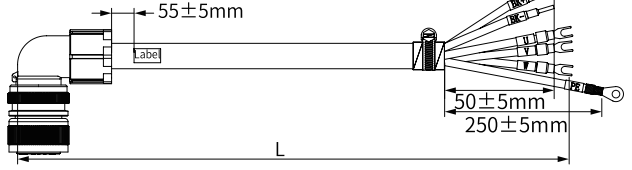
Name	Cable model	Drawing
CN1 terminal (DB26)	S6-C74	 Male
CN1 terminal (DB44)	S6-C8	 Soldering side Side face of the enclosure
CN7 terminal (DB15)	S6-C6	 Soldering face
Shield bracket	S6-C25 (optional for size A to size C)	
	S6-C27 (optional for size D to size E)	
Power connector at motor side with power below 750 W	S6-C246	
Encoder connector at motor side with power below 750 W	S6-C247	
Power connector for frame sizes 100 to 130 at motor side with power above 1000 W	S6-C248	

Cable Selection

Name	Cable model	Drawing
Power connector for frame size 180 at motor side with power above 1000 W	S6-C249	
Encoder connector at motor side with power above 1000 W	S6-C250	
CN2 (1394)	S6-C251	
Power flying leads at motor side with power below 750 W - 500 mm	S6-C253	
Power flying leads at motor side with power below 750 W - 300 mm	S6-C255	
Encoder flying leads at motor side with power below 750 W - 500 mm	S6-C254	
Encoder flying leads at motor side with power below 750 W - 300 mm	S6-C256	

5.3.2 SV670-INT Series

Power cable

Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 motor	Front outlet	Without brake	S6-L-M107-3.0 (-T) -INT	3000	
			S6-L-M107-5.0 (-T) -INT	5000	
			S6-L-M107-10.0 (-T) -INT	10000	
		With brake	S6-L-B107-3.0 (-T) -INT	3000	
			S6-L-B107-5.0 (-T) -INT	5000	
			S6-L-B107-10.0 (-T) -INT	10000	
	Rear outlet	Without brake	S6-L-M108-3.0 (-T) -INT	3000	
			S6-L-M108-5.0 (-T) -INT	5000	
			S6-L-M108-10.0 (-T) -INT	10000	
		With brake	S6-L-B108-3.0 (-T) -INT	3000	
			S6-L-B108-5.0 (-T) -INT	5000	
			S6-L-B108-10.0 (-T) -INT	10000	
MS1H2 motors rated 3 kW and below/ MS1H3 motors rated 1.8 kW and below	Without brake		S6-L-M111-3.0 (-T) -INT	3000	
			S6-L-M111-5.0 (-T) -INT	5000	
			S6-L-M111-10.0 (-T) -INT	10000	
	With brake		S6-L-B111-3.0 (-T) -INT	3000	
			S6-L-B111-5.0 (-T) -INT	5000	
			S6-L-B111-10.0 (-T) -INT	10000	
MS1H2 motors rated 4 kW/5 kW	Without brake		S6-L-M011-3.0 (-T) -INT	3000	
			S6-L-M011-5.0 (-T) -INT	5000	
			S6-L-M011-10.0 (-T) -INT	10000	
	With brake		S6-L-B011-3.0 (-T) -INT	3000	
			S6-L-B011-5.0 (-T) -INT	5000	
			S6-L-B011-10.0 (-T) -INT	10000	

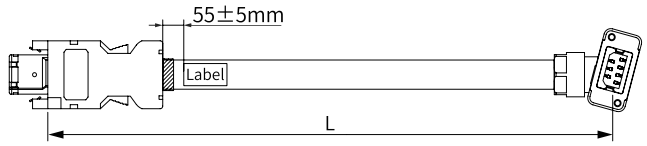
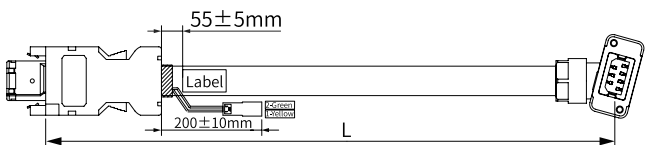
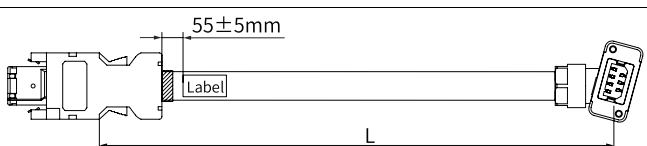
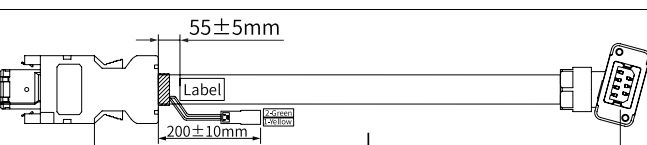
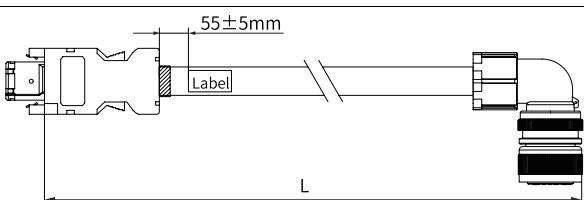
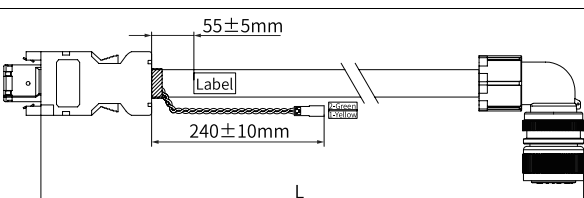
Cable Selection

Motor model	Name	Cable model	Cable length (mm)	Drawing
MS1H3 motors (2.9 kW)	Without brake	S6-L-M112-3.0 (-T) -INT	3000	
		S6-L-M112-5.0 (-T) -INT	5000	
		S6-L-M112-10.0 (-T) -INT	10000	
	With brake	S6-L-B112-3.0 (-T) -INT	3000	
		S6-L-B112-5.0 (-T) -INT	5000	
		S6-L-B112-10.0 (-T) -INT	10000	
MS1H3 (4.4 kW and above)	Without brake	S6-L-M022-3.0 (-T) -INT	3000	
		S6-L-M022-5.0 (-T) -INT	5000	
		S6-L-M022-10.0 (-T) -INT	10000	
	With brake	S6-L-B022-3.0 (-T) -INT	3000	
		S6-L-B022-5.0 (-T) -INT	5000	
		S6-L-B022-10.0 (-T) -INT	10000	

Note

- 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: The optional flexible cable is available.

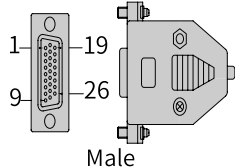
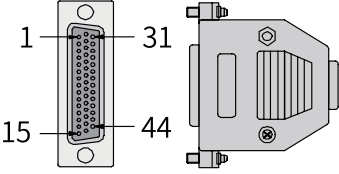
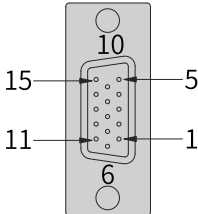
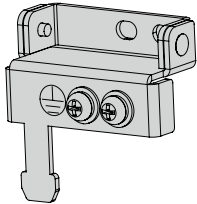
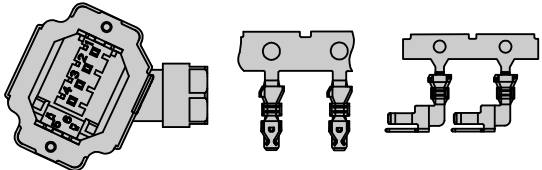
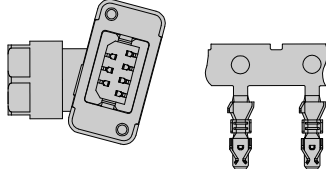
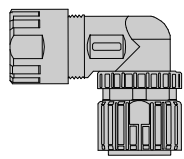
Encoder cable

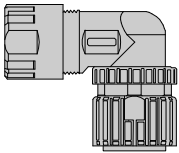
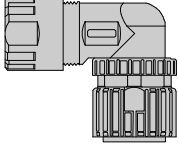
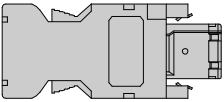
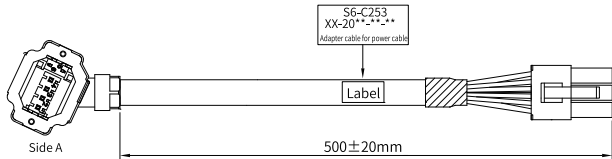
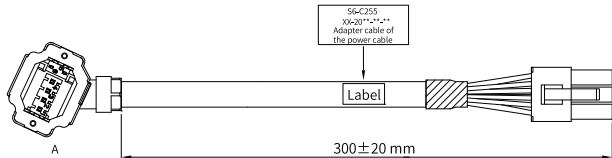
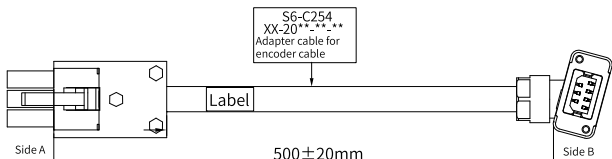
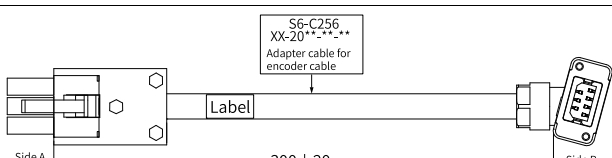
Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	4-conductor cable	S6-L-P114-3.0 (-T) -INT	3000	
			S6-L-P114-5.0 (-T) -INT	5000	
			S6-L-P114-10.0 (-T) -INT	10000	
		6-conductor cable ^[1]	S6-L-P124-3.0 (-T) -INT	3000	
			S6-L-P124-5.0 (-T) -INT	5000	
			S6-L-P124-10.0 (-T) -INT	10000	
	Rear outlet	4-conductor cable	S6-L-P115-3.0 (-T) -INT	3000	
			S6-L-P115-5.0 (-T) -INT	5000	
			S6-L-P115-10.0 (-T) -INT	10000	
		6-conductor cable ^[1]	S6-L-P125-3.0 (-T) -INT	3000	
			S6-L-P125-5.0 (-T) -INT	5000	
			S6-L-P125-10.0 (-T) -INT	10000	
MS1H2/MS1H3 motor	4-conductor cable		S6-L-P111-3.0 (-T) -INT	3000	
			S6-L-P111-5.0 (-T) -INT	5000	
			S6-L-P111-10.0 (-T) -INT	10000	
	6-conductor cable ^[1]		S6-L-P121-3.0 (-T) -INT	3000	
			S6-L-P121-5.0 (-T) -INT	5000	
			S6-L-P121-10.0 (-T) -INT	10000	

Note

^[1]The 6-conductor cable can be used normally. This type of cable is reserved for compatibility with the original battery model. It is not necessary to connect it to the battery box during use.

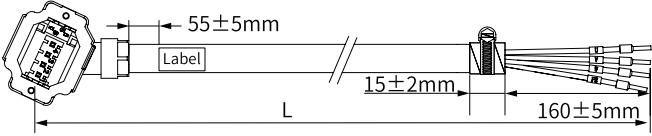
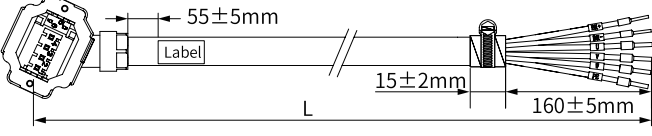
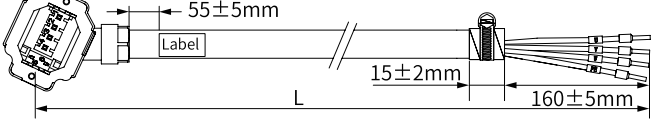
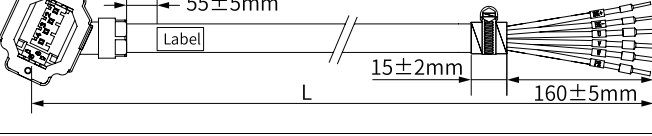
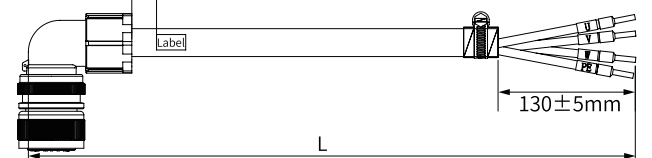
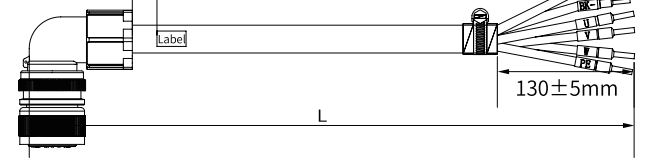
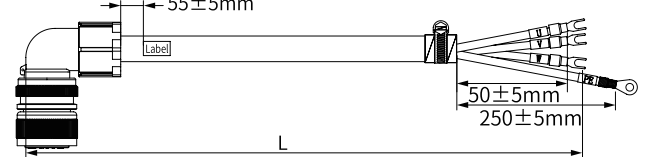
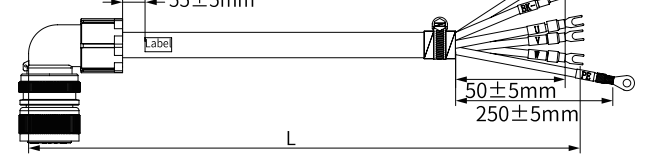
Connector kit

Name	Cable model	Drawing
CN1 terminal (DB26)	S6-C74	 Male
CN1 terminal (DB44)	S6-C8	 Soldering side Side face of the enclosure
CN7 terminal (DB15)	S6-C6	 Soldering face
Shield bracket	S6-C25 (optional for size A to size C)	
	S6-C27 (optional for size D to size E)	
Power connector at motor side with power below 750 W	S6-C246	
Encoder connector at motor side with power below 750 W	S6-C247	
Power connector for frame sizes 100 to 130 at motor side with power above 1000 W	S6-C248	

Name	Cable model	Drawing
Power connector for frame size 180 at motor side with power above 1000 W	S6-C249	
Encoder connector at motor side with power above 1000 W	S6-C250	
CN2 (1394)	S6-C251	
Power flying leads at motor side with power below 750 W - 500 mm	S6-C253	
Power flying leads at motor side with power below 750 W - 300 mm	S6-C255	
Encoder flying leads at motor side with power below 750 W - 500 mm	S6-C254	
Encoder flying leads at motor side with power below 750 W - 300 mm	S6-C256	

5.3.3 SV660-INT Series

Power cable

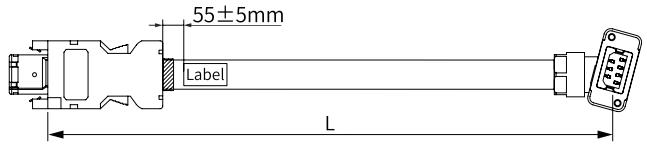
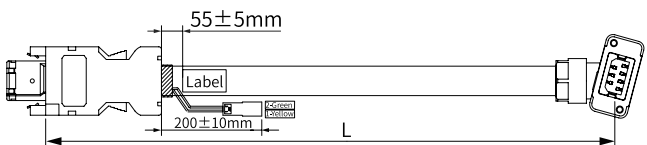
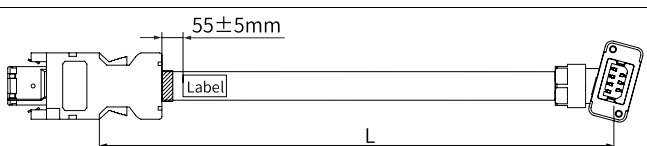
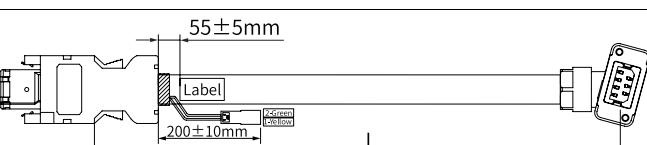
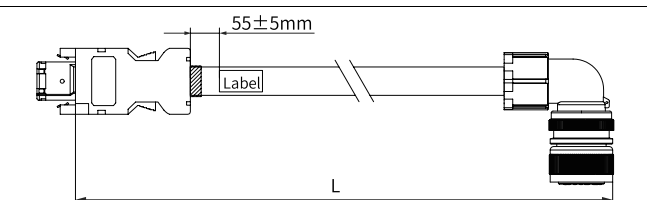
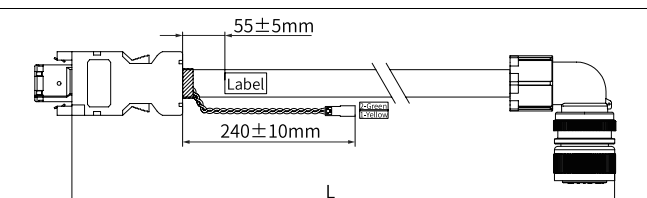
Motor model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 motor	Front outlet	Without brake	S6-L-M107-3.0 (-T) -INT	3000	
			S6-L-M107-5.0 (-T) -INT	5000	
			S6-L-M107-10.0 (-T) -INT	10000	
		With brake	S6-L-B107-3.0 (-T) -INT	3000	
			S6-L-B107-5.0 (-T) -INT	5000	
			S6-L-B107-10.0 (-T) -INT	10000	
	Rear outlet	Without brake	S6-L-M108-3.0 (-T) -INT	3000	
			S6-L-M108-5.0 (-T) -INT	5000	
			S6-L-M108-10.0 (-T) -INT	10000	
		With brake	S6-L-B108-3.0 (-T) -INT	3000	
			S6-L-B108-5.0 (-T) -INT	5000	
			S6-L-B108-10.0 (-T) -INT	10000	
MS1H2 motors rated 3 kW and below/ MS1H3 motors rated 1.8 kW and below	Without brake		S6-L-M111-3.0 (-T) -INT	3000	
			S6-L-M111-5.0 (-T) -INT	5000	
			S6-L-M111-10.0 (-T) -INT	10000	
	With brake		S6-L-B111-3.0 (-T) -INT	3000	
			S6-L-B111-5.0 (-T) -INT	5000	
			S6-L-B111-10.0 (-T) -INT	10000	
MS1H2 motors rated 4 kW/5 kW	Without brake		S6-L-M011-3.0 (-T) -INT	3000	
			S6-L-M011-5.0 (-T) -INT	5000	
			S6-L-M011-10.0 (-T) -INT	10000	
	With brake		S6-L-B011-3.0 (-T) -INT	3000	
			S6-L-B011-5.0 (-T) -INT	5000	
			S6-L-B011-10.0 (-T) -INT	10000	

Motor model	Name	Cable model	Cable length (mm)	Drawing
MS1H3 motors (2.9 kW)	Without brake	S6-L-M112-3.0 (-T) -INT	3000	
		S6-L-M112-5.0 (-T) -INT	5000	
		S6-L-M112-10.0 (-T) -INT	10000	
	With brake	S6-L-B112-3.0 (-T) -INT	3000	
		S6-L-B112-5.0 (-T) -INT	5000	
		S6-L-B112-10.0 (-T) -INT	10000	
MS1H3 (4.4 kW and above)	Without brake	S6-L-M022-3.0 (-T) -INT	3000	
		S6-L-M022-5.0 (-T) -INT	5000	
		S6-L-M022-10.0 (-T) -INT	10000	
	With brake	S6-L-B022-3.0 (-T) -INT	3000	
		S6-L-B022-5.0 (-T) -INT	5000	
		S6-L-B022-10.0 (-T) -INT	10000	

Note

- 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: The optional flexible cable is available.

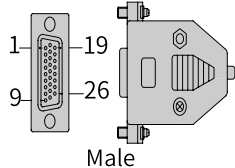
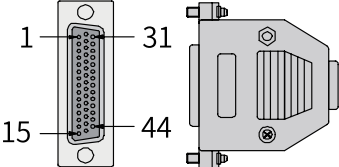
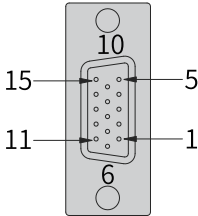
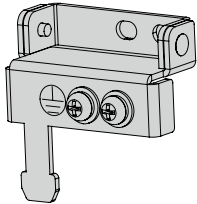
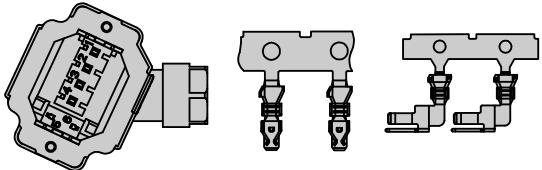
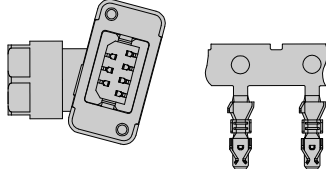
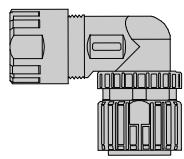
Encoder cable

Motor Model	Name		Cable model	Cable length (mm)	Drawing
MS1H1/ MS1H4 terminal type motors	Front outlet	4-conductor cable	S6-L-P114-3.0 (-T) -INT	3000	
			S6-L-P114-5.0 (-T) -INT	5000	
			S6-L-P114-10.0 (-T) -INT	10000	
		6-conductor cable ^[1]	S6-L-P124-3.0 (-T) -INT	3000	
			S6-L-P124-5.0 (-T) -INT	5000	
			S6-L-P124-10.0 (-T) -INT	10000	
	Rear outlet	4-conductor cable	S6-L-P115-3.0 (-T) -INT	3000	
			S6-L-P115-5.0 (-T) -INT	5000	
			S6-L-P115-10.0 (-T) -INT	10000	
		6-conductor cable ^[1]	S6-L-P125-3.0 (-T) -INT	3000	
			S6-L-P125-5.0 (-T) -INT	5000	
			S6-L-P125-10.0 (-T) -INT	10000	
MS1H2/MS1H3 motor	4-conductor cable		S6-L-P111-3.0 (-T) -INT	3000	
			S6-L-P111-5.0 (-T) -INT	5000	
			S6-L-P111-10.0 (-T) -INT	10000	
	6-conductor cable ^[1]		S6-L-P121-3.0 (-T) -INT	3000	
			S6-L-P121-5.0 (-T) -INT	5000	
			S6-L-P121-10.0 (-T) -INT	10000	

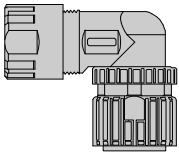
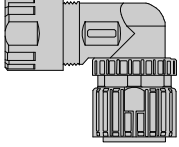
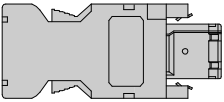
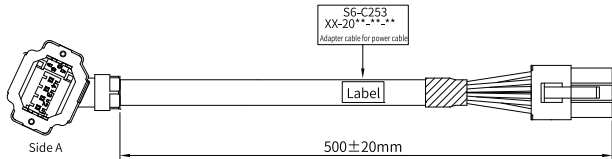
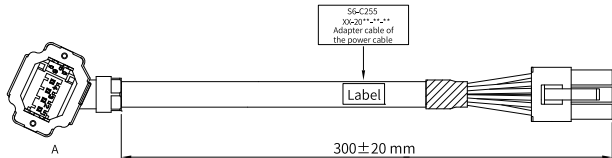
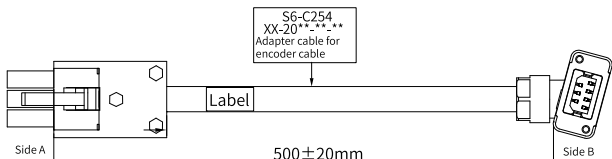
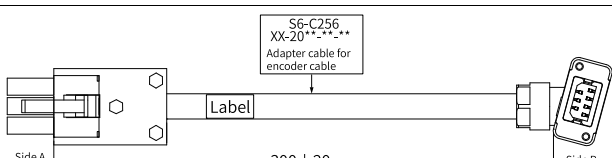
Note

^[1]The 6-conductor cable can be used normally. This type of cable is reserved for compatibility with the original battery model. It is not necessary to connect it to the battery box during use.

Connector kit

Name	Cable model	Drawing
CN1 terminal (DB26)	S6-C74	 Male
CN1 terminal (DB44)	S6-C8	 Soldering side Side face of the enclosure
CN7 terminal (DB15)	S6-C6	 Soldering face
Shield bracket	S6-C25 (optional for size A to size C)	
	S6-C27 (optional for size D to size E)	
Power connector at motor side with power below 750 W	S6-C246	
Encoder connector at motor side with power below 750 W	S6-C247	
Power connector for frame sizes 100 to 130 at motor side with power above 1000 W	S6-C248	

Cable Selection

Name	Cable model	Drawing
Power connector for frame size 180 at motor side with power above 1000 W	S6-C249	
Encoder connector at motor side with power above 1000 W	S6-C250	
CN2 (1394)	S6-C251	
Power flying leads at motor side with power below 750 W - 500 mm	S6-C253	
Power flying leads at motor side with power below 750 W - 300 mm	S6-C255	
Encoder flying leads at motor side with power below 750 W - 500 mm	S6-C254	
Encoder flying leads at motor side with power below 750 W - 300 mm	S6-C256	

5.4 Description of Cable Terminals

5.4.1 Power Cable Terminals



- Do not connect output terminals U, V, or W of the drive to a three-phase power supply. Failure to comply may result in physical injury or a fire.
- Do not connect motor terminals U, V, or 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 to prevent the cable insulation from being 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 faults.

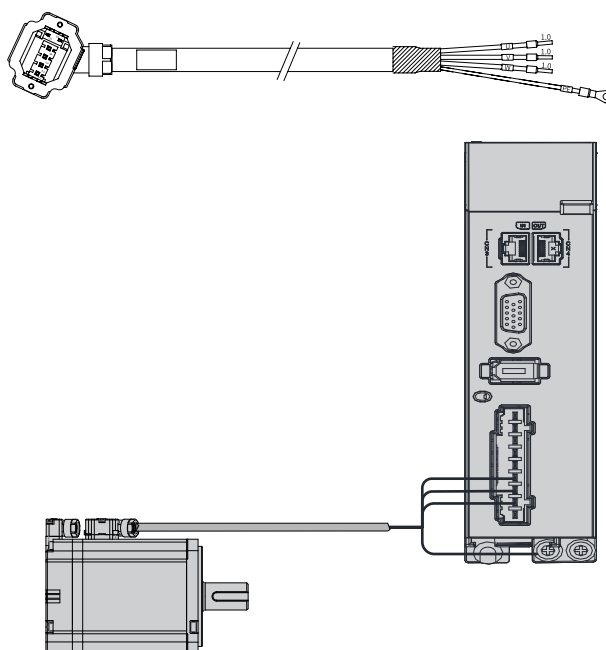
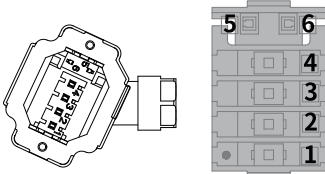


Figure 5-1 Wiring between the drive and terminal type motor

- The following tables show power cable connector of the motor with a small frame size.

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

Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Name	Color
60 80	 Black 6-pin connector	1	PE	Yellow/Green
		2	W	Red
		3	V	Black
		4	U	White
		5	Brake ^[2]	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.
- [2] During wiring of the motor that equipped with a magnetic encoder, connect the brake signal cables BK+ and BK- of the power cable to the DO+ and DO- terminals of the drive respectively. This is to prevent rotation precision of the encoder from being affected by reverse connection of the brake cable.

- The following tables show power cable connector of the motor with a large frame size.

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

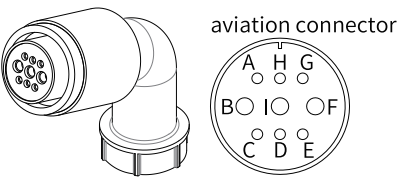
Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Name	Color
100 130	 20-18 aviation connector MIL-DTL-5015 series 3108E20-18S aviation connector	B	U	Blue
		I	V	Black
		F	W	Red
		G	PE	Yellow/Green
		C	Brake ^[2]	Red
		E		Black

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

Applicable motor frame size ^[1]	Drawing of the connector	Pin layout		
		Pin No.	Name	Color
180	 20-22 aviation connector MIL-DTL-5015 series 3108E20-22S aviation connector	A	U	Blue
		C	V	Black
		E	W	Red
		F	PE	Yellow/Green
		B	Brake ^[2]	Red
		D		Black

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 screw PE terminal of the drive if possible. For details, see System Wiring Diagram in the user guide of the servo drive.
- [2] During wiring of the motor that equipped with a magnetic encoder, connect the brake signal cables BK+ and BK- of the power cable to the DO+ and DO- terminals of the drive respectively. This is to prevent rotation precision of the encoder from being affected by reverse connection of the brake cable.

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 grounding cable of the power cable, as shown in the following figure.

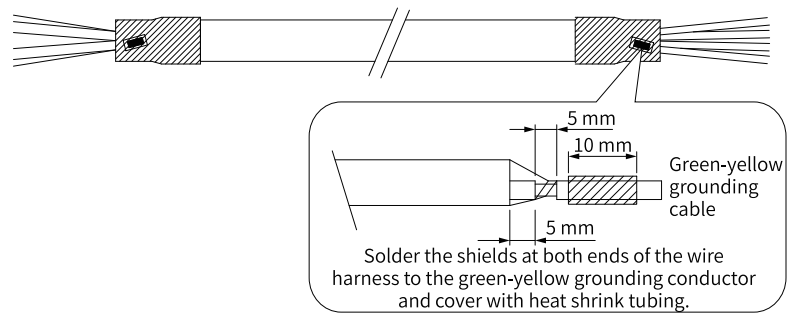


Figure 5-2 Wiring of the shield

5.4.2 Encoder Cable Terminals

Cable specifications

- Ground the shield on the drive side and motor side properly. Failure to comply can result in false alarms.
- 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) as encoder cables, with the cable length within 10 m.

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 5-4 Recommended cable specifications" on page 120](#) for details.

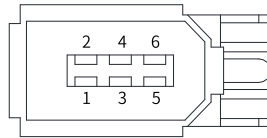
Table 5-4 Recommended cable specifications

Cable specifications (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 cables above 16AWG are required, contact Inovance sales personnel.

Terminal layout



Encoder signal terminal CN2 (drive side)

Figure 5-3 Layout of encoder terminal pins

Table 5-5 Description of encoder terminal pins

Pin No.	Definition	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

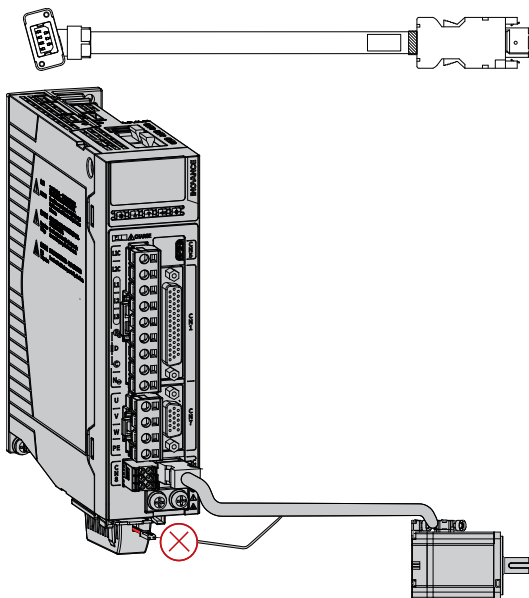


Figure 5-4 Wiring example of absolute encoder signals^[1]

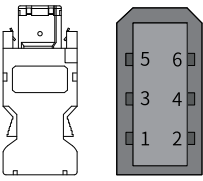
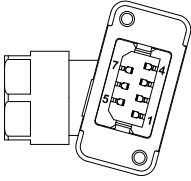
Note

^[1]The battery kit of the drive is no longer required. Connecting the battery-less encoder to the battery box by mistake will not damage the encoder.

The 6-conductor cable can be used normally. The cable is reserved for compatibility with the original battery model. The battery box does not need to be connected during use.

The encoder cable color is subject to the color of the actual product. Cable colors mentioned in this guide all refer to Inovance cables.

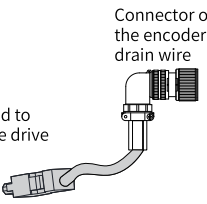
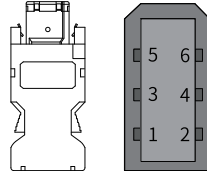
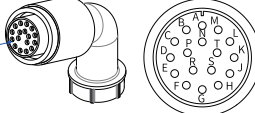
Table 5-6 Encoder cable connector for the motor with small frame size

Applicable motor frame size ^[1]	Connector appearance		Terminal pin layout			
			Pin No.	Signal name	Color	Type
60 80	Drive side	 6-pin male (right side as the coupling face)	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	-	-	Twisted pair
			4	-	-	
			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 5-7 Encoder cable connector for the motor with large frame size

Applicable motor frame size ^[1]	Connector appearance			Terminal pin layout			
				Pin No.	Signal name	Color	Type
100 130 180		Drive side	 6-pin male (right side as the coupling face)	1	+5V	Red	Twisted pair
				2	GND	Orange	
				5	PS+	Blue	Twisted pair
				6	PS-	Purple	
				Enclosure	PE	-	-
		Motor side	 20-29 aviation connector	A	PS+	Blue	Twisted pair
				B	PS-	Purple	
				E	-	-	-
				F	-	-	
				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 Plugs and socket connectors

Terminal-type power 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 the two screws shown in the following figure with a tightening torque of 1.5±0.5 kgf.cm.

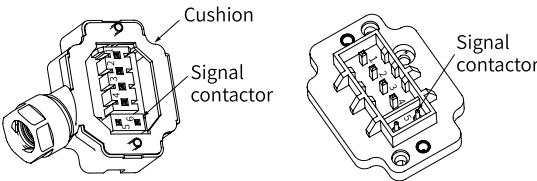


Figure 5-5 Power connector

Terminal-type 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 $1.5 \pm 0.5 \text{ kgf.cm} \cdot \text{m}$.

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.

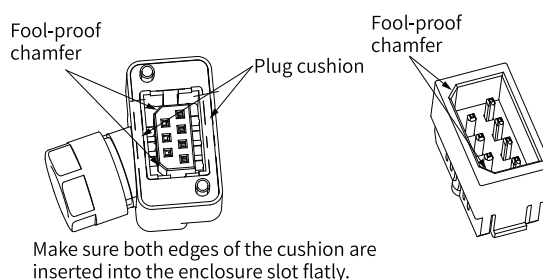


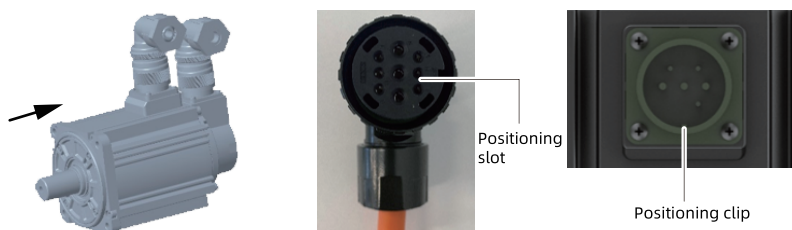
Figure 5-6 Encoder connector

Note

- The assembly direction of the connector 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 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.

Aviation connector

The aviation connector cable is connected to the motor. By default, the cable outlet direction is on the right side of the motor (viewed from the motor output shaft end), as shown in the following figure.



Check that the connector positioning slot on the cable side is in the same direction as the connector positioning clip on the motor side before tightening the connector. After inserting the connector, tighten the lock bolt to the bottom of the cable until it is fixed. Check that no threads are exposed.

To adjust the cable outlet direction, unscrew the bolts shown in the following figure to adjust the outlet direction.



Power cable and encoder cable adapter scheme

Recommended power cable connector models: Molex-39039062 and Molex-469990295;

Recommended encoder cable connector model: TE-1-172169-9 See the figure below.

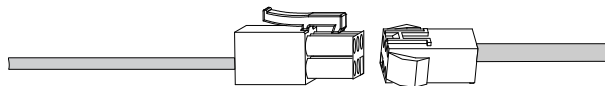


Figure 5-7 Power cable adapter scheme

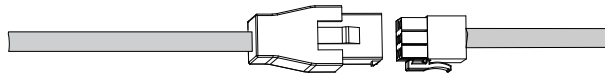
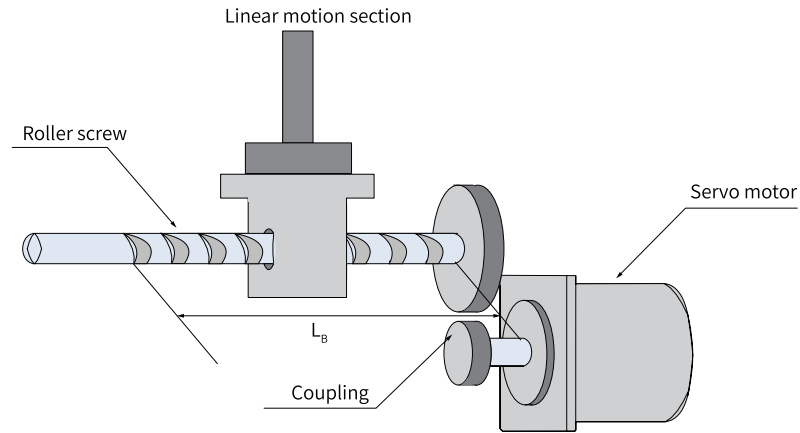


Figure 5-8 Encoder cable adapter scheme

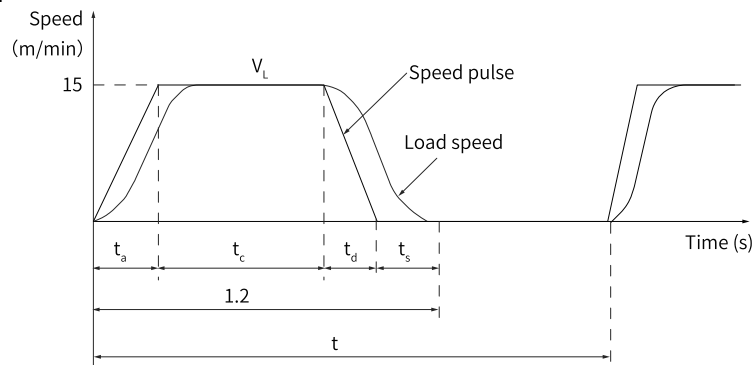
6 Servo Motor Capacity Selection

6.1 Capacity Selection Example for Position Control



Load speed $V_L = 15 \text{ m/min}$
 Linear motion section mass $m = 80 \text{ kg}$
 Roller screw length $L_B = 0.8 \text{ m}$
 Roller screw diameter $d_B = 0.016 \text{ m}$
 Roller screw lead $P_B = 0.005 \text{ m}$
 Coupling mass (m_c): 0.3 kg
 Coupling outer diameter $d_c = 0.03 \text{ m}$
 Feeding count $n = 40/\text{min}$
 Feeding distance $L = 0.25 \text{ m}$
 Feeding time $t_m < 1.2\text{s}$
 Electrical stopping precision $\delta = \pm 0.01 \text{ mm}$
 Friction coefficient $\mu = 0.2$
 Mechanical efficiency $\eta = 0.9 \text{ (90\%)}$

1. Speed diagram



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

$$T_a = t_d, t_s = 0.1(\text{s})$$

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

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

2. Speed

- Load shaft speed

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

- Motor shaft speed

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

- Linear motion section

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

- 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. Provisional settings of the servo motor

- Selection condition

$T_L \leq$ Rated torque of the motor

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

$n_M \leq$ Rated speed of the motor

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

Perform the following provisional selections according to preceding conditions:

Servo motor: MS1H1-20B30CB-V631R

Servo drive: SV680PS1R6I

- 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. Verification of the servo motor selected provisionally

Verify the start torque required

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

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

Verify the braking torque required

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

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

Verify 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 servo motor and servo drive selected provisionally are applicable in terms of capacity. The following analyzes position control.

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 (I/s).

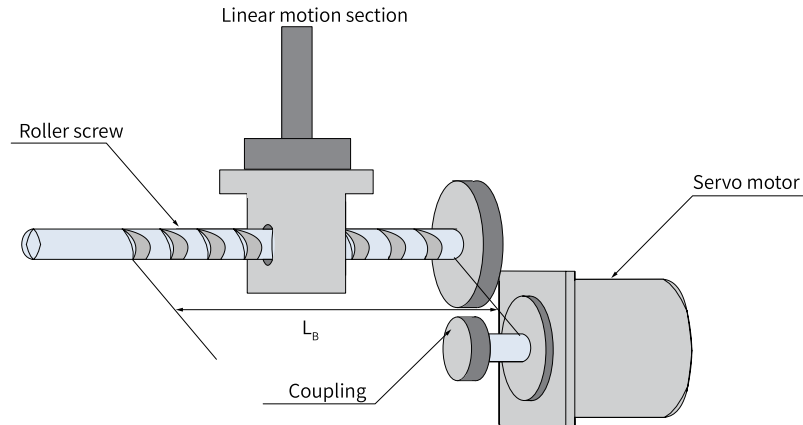
$$\varepsilon = \frac{v_s}{K_p} = \frac{25000}{30} = 833 \text{ (pulse)}$$

- Electrical stopping precision

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

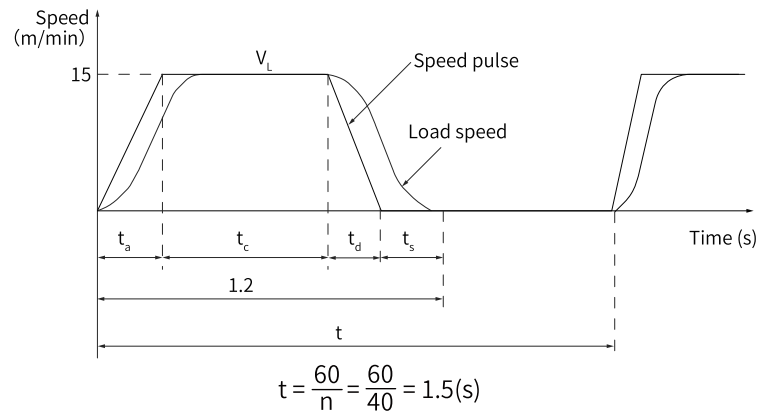
The servo motor and servo drive selected provisionally are applicable for position control.

6.2 Capacity Selection Example for Speed Control



Load speed $V_L = 15 \text{ m/min}$
 Linear motion section mass $m = 80 \text{ kg}$
 Roller screw length $L_B = 0.8 \text{ m}$
 Roller screw diameter $d_B = 0.04 \text{ m}$
 Roller screw lead $P_B = 0.01 \text{ m}$
 Coupling mass $m_c = 1 \text{ kg}$
 Coupling outer diameter $d_c = 0.06 \text{ m}$
 Feeding count $n = 40/\text{min}$
 Feeding distance $L = 0.25 \text{ m}$
 Feeding time $t_m < 1.2\text{s}$
 Friction coefficient $\mu = 0.2$
 Mechanical efficiency $\eta = 0.9 \text{ (90\%)}$

1. Speed diagram



Set t_a to the same value as t_d .

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

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

2. Speed

- Load shaft speed

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

- Motor shaft speed

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

- Linear motion section

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

- 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. Provisional settings of the servo motor

- Selection condition

$T_L \leq$ Rated torque of the motor

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

$n_M \leq$ Rated speed of the motor

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

Perform the following provisional selections according to preceding conditions:

Servo motor: MS1H4-75B30CB-V631R

Servo drive: SV680PS5R5I

- 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. Verification of the servo motor selected provisionally

Verify the start torque required

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

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

Verify the braking torque required

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

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

Verify 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 provisionally are applicable for speed control. The torque diagram is as follows.

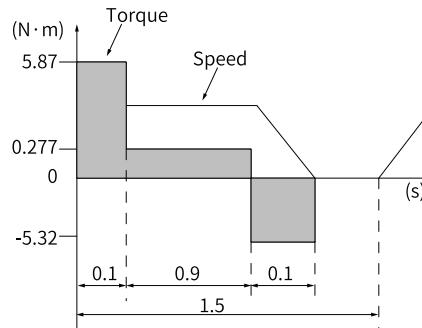


Figure 6-1 Torque diagram

7 Standards Compliance

CE certification

Directive	Standard	
EMC Directive 2014/30/EU	Servo drive	EN 61800-3
	Servo motor	EN 61800-6-2
		EN 61800-6-4
		EN 55011
Low Voltage Directive 2014/35/EU	Servo drive	EN 61800-5-1
	Servo motor	EN 60034-1 EN 60034-5
RoHS Directive 2011/65/EU 2015/863/EU	Servo drive	EN 50581
	Servo motor	

UL/cUL certification

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

Note

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

8 Service and Support

Should you encounter a safety accident during the use or operation of the product, or face challenges in operating and maintaining the equipment, which remain unresolved after the relevant documentation is consulted, we provide multiple channels to ensure prompt resolution:

- Channel #1: Contact service@inovance.com.
- Channel #2: Visit <https://www.inovance.com/global> to access document downloads, after-sales support, spare parts ordering, repair applications, and authenticity verification services.
- Channel #3: Download My Inovance app (<https://zshc-eu.inovance.com/download-pc/>) where you can access products info and documentation, and query product parameters.

We are committed to providing you with quick and professional technical support, and we look forward to your satisfaction and trust.



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