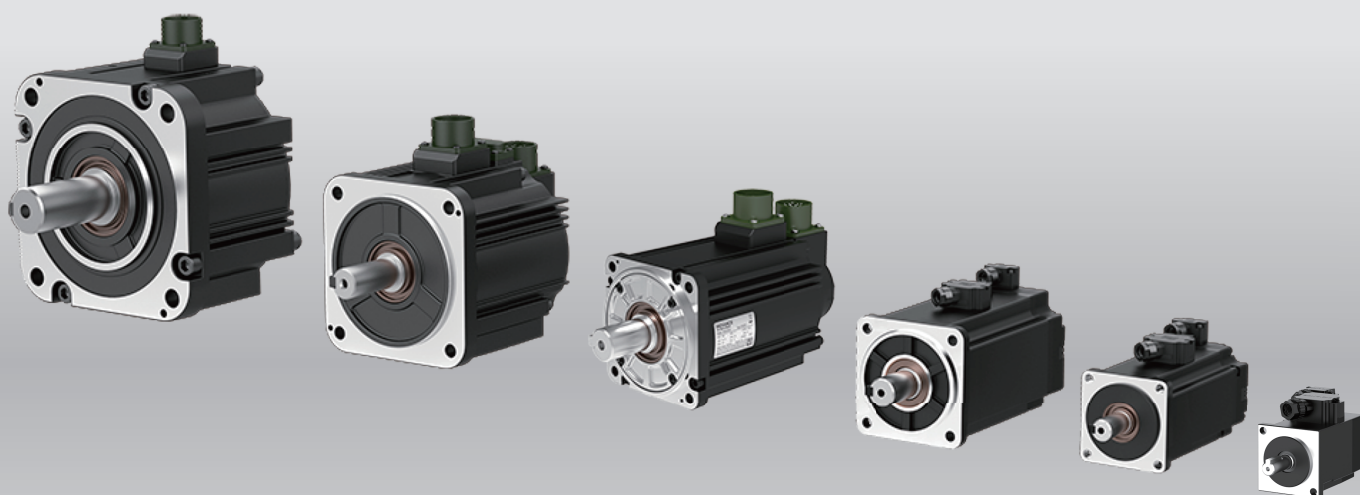




MS1-R-INT Series Servo Motor User Guide



Industrial
Automation



New Energy
Vehicle



Intelligent
Elevator



Intelligent
Robot



Digital
Energy



Rail
Transit



Data code PS00017523A03

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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.

As the latest generation of servo motors developed by Inovance, the MS1-R-INT series servo motor carries a power range from 0.03 kW to 7.5 kW, with flange sizes ranging from 25 mm to 180 mm. It offers multiple types of inertia and speed configurations, with different types of encoders configured as required by customers.

It is used for accurate position control, speed control, and torque control in industries including semiconductors, lithium batteries, silicon, machine tools, mobile phones, printing and packaging, pharmacy, textile, and display. Compared with the last generation, the new generation of servo motors features greatly improved performance and shorter motor length.

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
August 2026	A03	New: Added “ MS1H1-03B30CB-U210R-S ” on page 33. Revision: • Updated “SV660-INT Series” on page 14. • Updated “Model and Nameplate” on page 20. • Updated “3.2 Overload Characteristics” on page 27. • Updated “2.1 Product Characteristics” on page 19. • Updated “MS1H4-40B30CD-A631R-INT” on page 112. • Updated “MS1H4-40B30CD-A331R-INT” on page 113. • Updated “MS1H4-75B30CD-A631R-INT” on page 118. • Updated “MS1H4-75B30CD-A331R-INT” on page 119.
March 2026	A02	New: • Added “MS1H4-40B30CD-A631R-INT” on page 112. • Added “MS1H4-40B30CD-A331R-INT” on page 113 . • Added “MS1H4-75B30CD-A631R-INT” on page 118 . • Added “MS1H4-75B30CD-A331R-INT” on page 119 . Revision: • Updated “3.1 Mechanical Characteristics” on page 24. • Updated “3.3 Derating Characteristics” on page 30. • 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.

Date	Version	Revision
September 2025	A01	• Updated “SV680-INT Series” on page 8. • Updated “1.2 Comparison of MS1-R Series Motor and MS1-Z Series Motor” on page 17. • Updated “Model and Nameplate” on page 20. • Updated “2.3 Components” on page 21. • Updated “2.4 Motor Models” on page 23. • Updated “3.1 Mechanical Characteristics” on page 24. • Updated “4.1 Selection Precautions” on page 32. • Updated the dimension drawings and tables for all models in the "Motor Model Selection" section. • Updated frame sizes 40/80 and heatsink derating curves for MS1H3-75C* model. • Updated “5.1 Model” on page 123. • Updated “5.4.1 Power Cable Terminals” on page 144. • Updated “5.5 Plugs and Socket Connectors” on page 148. • Updated “Certifications, Directives, and Standards” on page 156.
March 2025	A00	First release.

Access to the guide

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Questions about the user guide

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

Warranty disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is caused by proper operation of the user. Maintenance fees will be charged after the warranty period expires.

Even within the warranty period, maintenance will be charged for the following product damage:

- Damage caused by operations not following the instructions in the guide
- 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
- Secondary damage caused by force majeure (natural disaster, earthquake, lightning strike)

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.

Table of Contents

Legal Information.....	1
Preface	1
1 Model Selection List	8
1.1 Applicable Drive Model List.....	8
1.1.1 26-bit Encoder Motor for SV680-INT Series Drives.....	8
1.1.2 23-bit Encoder Motor for SV670-INT Series Drives.....	11
1.1.3 20-/23-bit Encoder Motor for SV660-INT Series Drives	14
1.1.4 Matching Relationship between Servo Drive and Servo Motor Encoder Types	16
1.2 Comparison of MS1-R Series Motor and MS1-Z Series Motor	17
2 Product Information.....	19
2.1 Product Characteristics	19
2.2 Model and Nameplate	20
2.3 Components.....	21
2.4 Motor Models	23
3 Product Specifications	24
3.1 Mechanical Characteristics	24
3.2 Overload Characteristics.....	27
3.3 Derating Characteristics	30
3.4 Temperature Curve of the Oil Seal.....	30
3.5 Load Moment of Inertia	30
4 Motor Model Selection.....	32
4.1 Selection Precautions	32
4.2 MS1H1 Motors with Low Inertia and Small Capacity.....	33
4.2.1 MS1H1-03B30CB-U210R-S-INT	33
4.2.2 MS1H1-05B30CB-A6/S63*R-INT	34
4.2.3 MS1H1-05B30CB-A33*R-INT	35
4.2.4 MS1H1-10B30CB-A6/S63*R-INT	36
4.2.5 MS1H1-10B30CB-A33*R-INT	37
4.2.6 MS1H1-20B30CB-A6/S63*R-INT	38
4.2.7 MS1H1-20B30CB-A33*R-INT	39
4.2.8 MS1H1-40B30CB-A6/S63*R-INT	40
4.2.9 MS1H1-40B30CB-A33*R-INT	41

4.2.10 MS1H1-55B30CB-A6/S63*R-INT	42
4.2.11 MS1H1-55B30CB-A33*R-INT.....	43
4.2.12 MS1H1-75B30CB-A6/S63*R-INT	44
4.2.13 MS1H1-75B30CB-A33*R-INT.....	45
4.2.14 MS1H1-10C30CB-A6/S63*R-INT	46
4.2.15 MS1H1-10C30CB-A33*R-INT.....	47
4.3 MS1H2 Motors with Low Inertia and Medium Capacity.....	48
4.3.1 MS1H2-10C30CB-A6/S63*R-INT	48
4.3.2 MS1H2-10C30CB-A33*R-INT	49
4.3.3 MS1H2-10C30CD-A6/S63*R-INT	50
4.3.4 MS1H2-10C30CD-A33*R-INT	51
4.3.5 MS1H2-15C30CB-A6/S63*R-INT	52
4.3.6 MS1H2-15C30CB-A33*R-INT	53
4.3.7 MS1H2-15C30CD-A6/S63*R-INT	54
4.3.8 MS1H2-15C30CD-A33*R-INT	55
4.3.9 MS1H2-20C30CB-A6/S63*R-INT	56
4.3.10 MS1H2-20C30CB-A33*R-INT.....	57
4.3.11 MS1H2-20C30CD-A6/S63*R-INT.....	58
4.3.12 MS1H2-20C30CD-A33*R-INT.....	59
4.3.13 MS1H2-25C30CB-A6/S63*R-INT	60
4.3.14 MS1H2-25C30CB-A33*R-INT.....	61
4.3.15 MS1H2-25C30CD-A6/S63*R-INT.....	62
4.3.16 MS1H2-25C30CD-A33*R-INT.....	63
4.3.17 MS1H2-30C30CB-A6/S63*R-INT	64
4.3.18 MS1H2-30C30CB-A33*R-INT.....	65
4.3.19 MS1H2-30C30CD-A6/S63*R-INT.....	66
4.3.20 MS1H2-30C30CD-A33*R-INT.....	67
4.3.21 MS1H2-40C30CB-A6/S63*R-INT	68
4.3.22 MS1H2-40C30CB-A33*R-INT.....	69
4.3.23 MS1H2-40C30CD-A6/S63*R-INT	70
4.3.24 MS1H2-40C30CD-A33*R-INT.....	71
4.3.25 MS1H2-50C30CB-A6/S63*R-INT	72
4.3.26 MS1H2-50C30CB-A33*R-INT.....	73
4.3.27 MS1H2-50C30CD-A6/S63*R-INT.....	74
4.3.28 MS1H2-50C30CD-A33*R-INT.....	75
4.4 MS1H3 Motors with Medium Inertia and Medium Capacity	76
4.4.1 MS1H3-85B15CB-A6/S63*R-INT	76
4.4.2 MS1H3-85B15CB-A33*R-INT	77
4.4.3 MS1H3-85B15CD-A6/S63*R-INT	78

4.4.4 MS1H3-85B15CD-A33*R-INT	79
4.4.5 MS1H3-13C15CB-A6/S63*R-INT	80
4.4.6 MS1H3-13C15CB-A33*R-INT	81
4.4.7 MS1H3-13C15CD-A6/S63*R-INT	82
4.4.8 MS1H3-13C15CD-A33*R-INT	83
4.4.9 MS1H3-18C15CB-A6/S63*R-INT	84
4.4.10 MS1H3-18C15CB-A33*R-INT.....	85
4.4.11 MS1H3-18C15CD-A6/S63*R-INT.....	86
4.4.12 MS1H3-18C15CD-A33*R-INT.....	87
4.4.13 MS1H3-29C15CB-A6/S63*R-INT	88
4.4.14 MS1H3-29C15CB-A33*R-INT.....	89
4.4.15 MS1H3-29C15CD-A6/S63*R-INT.....	90
4.4.16 MS1H3-29C15CD-A33*R-INT.....	91
4.4.17 MS1H3-44C15CB-A6/S63*R-INT	92
4.4.18 MS1H3-44C15CB-A33*R-INT.....	93
4.4.19 MS1H3-44C15CD-A6/S63*R-INT	94
4.4.20 MS1H3-44C15CD-A33*R-INT.....	95
4.4.21 MS1H3-55C15CD-A6/S63*R-INT	96
4.4.22 MS1H3-55C15CD-A33*R-INT.....	97
4.4.23 MS1H3-75C15CD-A6/S63*R-INT	98
4.4.24 MS1H3-75C15CD-A33*R-INT.....	99
4.5 MS1H4 Motor with Medium Inertia and Small Capacity	100
4.5.1 MS1H4-05B30CB-A6/S63*R-INT	100
4.5.2 MS1H4-05B30CB-A33*R-INT	102
4.5.3 MS1H4-10B30CB-A6/S63*R-INT	104
4.5.4 MS1H4-10B30CB-A33*R-INT	106
4.5.5 MS1H4-20B30CB-A6/S63*R-INT	107
4.5.6 MS1H4-20B30CB-A33*R-INT	108
4.5.7 MS1H4-40B30CB-A6/S63*R-INT	109
4.5.8 MS1H4-40B30CB-A33*R-INT	111
4.5.9 MS1H4-40B30CD-A6/S63*R-INT	112
4.5.10 MS1H4-40B30CD-A33*R-INT	113
4.5.11 MS1H4-55B30CB-A6/S63*R-INT	114
4.5.12 MS1H4-55B30CB-A33*R-INT.....	115
4.5.13 MS1H4-75B30CB-A6/S63*R-INT.....	116
4.5.14 MS1H4-75B30CB-A33*R-INT.....	117
4.5.15 MS1H4-75B30CD-A6/S63*R-INT.....	118
4.5.16 MS1H4-75B30CD-A33*R-INT	119
4.5.17 MS1H4-10C30CB-A6/S63*R-INT	120

4.5.18 MS1H4-10C30CB-A33*R-INT.....	121
5 Cable Selection.....	123
5.1 Model	123
5.2 Cable Types	124
5.3 Cable Model List	126
5.3.1 SV680-INT Series	126
5.3.2 SV670-INT Series	132
5.3.3 SV660-INT Series	138
5.4 Cable Terminals.....	144
5.4.1 Power Cable Terminals	144
5.4.2 Encoder Cable Terminals	145
5.5 Plugs and Socket Connectors	148
6 Servo Motor Capacity Selection.....	150
6.1 Capacity Selection Example for Position Control.....	150
6.2 Capacity Selection Example for Speed Control.....	153
7 Certifications, Directives, and Standards Compliance.....	156
8 Service and Support.....	157

1 Model Selection List

1.1 Applicable Drive Model List

1.1.1 26-bit Encoder Motor for SV680-INT Series Drives

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							
MS1H1-05B30CB-A6/S630R-INT	MS1H1-05B30CB-A6/S632R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H1-10B30CB-A6/S630R-INT	MS1H1-10B30CB-A6/S632R-INT	40	0.1	Single-phase/ Three-phase 200 V			
MS1H1-20B30CB-A6/S631R-INT	MS1H1-20B30CB-A6/S634R-INT	60	0.2	Single-phase/ Three-phase 200 V			
MS1H1-40B30CB-A6/S631R-INT	MS1H1-40B30CB-A6/S634R-INT	60	0.4	Single-phase/ Three-phase 200 V	C	S2R8	00003
MS1H1-55B30CB-A6/S631R-INT	-	80	0.55	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H1-75B30CB-A6/S631R-INT	MS1H1-75B30CB-A6/S634R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H1-10C30CB-A6/S631R-INT	MS1H1-10C30CB-A6/S634R-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-A6/S631R-INT	MS1H2-10C30CB-A6/S634R-INT	100	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H2-10C30CD-A6/S631R-INT	MS1H2-10C30CD-A6/S634R-INT	100	1.0	Three-phase 400 V		T3R5	10001
MS1H2-15C30CB-A6/S631R-INT	MS1H2-15C30CB-A6/S634R-INT	100	1.5	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-15C30CD-A6/S631R-INT	MS1H2-15C30CD-A6/S634R-INT	100	1.5	Three-phase 400 V	C	T5R4	10002
MS1H2-20C30CB-A6/S631R-INT	MS1H2-20C30CB-A6/S634R-INT	100	2.0	Three-phase 200 V	E	S018	00008

Model Selection List

Servo motor				Servo drive			
				SV680-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kw)	Voltage class	Size	Recommend ed model	No.
MS1H2-20C30CD-A6/S631R-INT	MS1H2-20C30CD-A6/S634R-INT	100	2.0	Three-phase 400 V	D	T8R4	10003
MS1H2-25C30CB-A6/S631R-INT	MS1H2-25C30CB-A6/S634R-INT	100	2.5	Three-phase 200 V	E	S022	00009
MS1H2-25C30CD-A6/S631R-INT	MS1H2-25C30CD-A6/S634R-INT	100	2.5	Three-phase 400 V	D	T012	10004
MS1H2-30C30CB-A6/S631R-INT	MS1H2-30C30CB-A6/S634R-INT	130	3.0	Three-phase 200 V	E	S022	00009
MS1H2-30C30CD-A6/S631R-INT	MS1H2-30C30CD-A6/S634R-INT	130	3.0	Three-phase 400 V	D	T012	10004
MS1H2-40C30CB-A6/S631R-INT	MS1H2-40C30CB-A6/S634R-INT	130	4.0	Three-phase 200 V	E	S027	00010
MS1H2-40C30CD-A6/S631R-INT	MS1H2-40C30CD-A6/S634R-INT	130	4.0	Three-phase 400 V		T017	10005
MS1H2-50C30CB-A6/S631R-INT	MS1H2-50C30CB-A6/S634R-INT	130	5.0	Three-phase 200 V		S027	00010
MS1H2-50C30CD-A6/S631R-INT	MS1H2-50C30CD-A6/S634R-INT	130	5.0	Three-phase 400 V		T021	10006
Ratings of MS1H3 (n _v =1500 rpm, n _{max} = 4500 rpm) series motors							
MS1H3-85B15CB-A6/S631R-INT	MS1H3-85B15CB-A6/S634R-INT	130	0.85	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H3-85B15CD-A6/S631R-INT	MS1H3-85B15CD-A6/S634R-INT	130	0.85	Three-phase 400 V		T3R5	10001
MS1H3-13C15CB-A6/S631R-INT	MS1H3-13C15CB-A6/S634R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-A6/S631R-INT	MS1H3-13C15CD-A6/S634R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-A6/S631R-INT	MS1H3-18C15CB-A6/S634R-INT	130	1.8	Three-phase 200 V	E	S018	00008
MS1H3-18C15CD-A6/S631R-INT	MS1H3-18C15CD-A6/S634R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CB-A6/S631R-INT	MS1H3-29C15CB-A6/S634R-INT	180	2.9	Three-phase 200 V	E	S022	00009
MS1H3-29C15CD-A6/S631R-INT	MS1H3-29C15CD-A6/S634R-INT	180	2.9	Three-phase 400 V	D	T012	10004
MS1H3-44C15CB-A6/S631R-INT	MS1H3-44C15CB-A6/S634R-INT	180	4.4	Three-phase 200 V	E	S027	00010

Servo motor				Servo drive			
				SV680-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommend ed model	No.
MS1H3-44C15CD-A6/S631R-INT	MS1H3-44C15CD-A6/S634R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-A6/S631R-INT	MS1H3-55C15CD-A6/S634R-INT	180	5.5	Three-phase 400 V		T021	10006
MS1H3-75C15CD-A6/S631R-INT	MS1H3-75C15CD-A6/S634R-INT	180	7.5	Three-phase 400 V		T026	10007
Ratings of MS1H4 (n _N = 3000 rpm, n _{max} = 7000 rpm) series motors							
MS1H4-05B30CB-A6/S630R-INT	MS1H4-05B30CB-A6/S632R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-10B30CB-A6/S630R-INT	MS1H4-10B30CB-A6/S632R-INT	40	0.1	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-05B30CB-A6/S631R-INT	MS1H4-05B30CB-A6/S634R-INT	40	0.05	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-10B30CB-A6/S631R-INT	MS1H4-10B30CB-A6/S634R-INT	40	0.1	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-20B30CB-A6/S631R-INT	MS1H4-20B30CB-A6/S634R-INT	60	0.2	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-40B30CB-A6/S631R-INT	MS1H4-40B30CB-A6/S634R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H4-40B30CD-A6/S631R-INT	MS1H4-40B30CD-A6/S634R-INT	60	0.4	Three-phase 400 V	B	T1R4	10029
MS1H4-55B30CB-A6/S631R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H4-75B30CB-A6/S631R-INT	MS1H4-75B30CB-A6/S634R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H4-75B30CD-A6/S631R-INT	MS1H4-75B30CD-A6/S634R-INT	80	0.75	Three-phase 400 V	B	T2R3	10031
MS1H4-10C30CB-A6/S631R-INT	MS1H4-10C30CB-A6/S634R-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

1.1.2 23-bit Encoder Motor for SV670-INT Series Drives

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							
MS1H1-05B30CB-A330R-INT	MS1H1-05B30CB-A332R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H1-10B30CB-A330R-INT	MS1H1-10B30CB-A332R-INT	40	0.1	Single-phase/ Three-phase 200 V			
MS1H1-20B30CB-A331R-INT	MS1H1-20B30CB-A334R-INT	60	0.2	Single-phase/ Three-phase 200 V			
MS1H1-40B30CB-A331R-INT	MS1H1-40B30CB-A334R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H1-55B30CB-A331R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H1-75B30CB-A331R-INT	MS1H1-75B30CB-A334R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H1-10C30CB-A331R-INT	MS1H1-10C30CB-A334R-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-A331R-INT	MS1H2-10C30CB-A334R-INT	100	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H2-10C30CD-A331R-INT	MS1H2-10C30CD-A334R-INT	100	1.0	Three-phase 400 V		T3R5	10001
MS1H2-15C30CB-A331R-INT	MS1H2-15C30CB-A334R-INT	100	1.5	Single-phase/ Three-phase 200 V	D	S012	00007

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.
MS1H2-15C30CD-A331R-INT	MS1H2-15C30CD-A334R-INT	100	1.5	Three-phase 400 V	C	T5R4	10002
MS1H2-20C30CB-A331R-INT	MS1H2-20C30CB-A334R-INT	100	2.0	Three-phase 200 V	E	S018 ^[1]	00008
MS1H2-20C30CD-A331R-INT	MS1H2-20C30CD-A334R-INT	100	2.0	Three-phase 400 V	D	T8R4	10003
MS1H2-25C30CB-A331R-INT	MS1H2-25C30CB-A334R-INT	100	2.5	Three-phase 200 V	E	S022	00009
MS1H2-25C30CD-A331R-INT	MS1H2-25C30CD-A334R-INT	100	2.5	Three-phase 400 V	D	T012 ^[2]	10004
MS1H2-30C30CB-A331R-INT	MS1H2-30C30CB-A334R-INT	130	3.0	Three-phase 200 V	E	S022	00009
MS1H2-30C30CD-A331R-INT	MS1H2-30C30CD-A334R-INT	130	3.0	Three-phase 400 V	D	T012	10004
MS1H2-40C30CB-A331R-INT	MS1H2-40C30CB-A334R-INT	130	4.0	Three-phase 200 V	E	S027	00010
MS1H2-40C30CD-A331R-INT	MS1H2-40C30CD-A334R-INT	130	4.0	Three-phase 400 V	E	T017	10005
MS1H2-50C30CB-A331R-INT	MS1H2-50C30CB-A334R-INT	130	5.0	Three-phase 200 V		S027	00010
MS1H2-50C30CD-A331R-INT	MS1H2-50C30CD-A334R-INT	130	5.0	Three-phase 400 V		T021 ^[3]	10006
Ratings of MS1H3 (n _N =1500 rpm, n _{max} = 4500 rpm) series motors							
MS1H3-85B15CB-A331R-INT	MS1H3-85B15CB-A334R-INT	130	0.85	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H3-85B15CD-A331R-INT	MS1H3-85B15CD-A334R-INT	130	0.85	Three-phase 400 V		T3R5	10001
MS1H3-13C15CB-A331R-INT	MS1H3-13C15CB-A334R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-A331R-INT	MS1H3-13C15CD-A334R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-A331R-INT	MS1H3-18C15CB-A334R-INT	130	1.8	Three-phase 200 V	D	S012 ^[4]	00007
MS1H3-18C15CD-A331R-INT	MS1H3-18C15CD-A334R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CB-A331R-INT	MS1H3-29C15CB-A334R-INT	180	2.9	Three-phase 200 V	E	S022	00009
MS1H3-29C15CD-A331R-INT	MS1H3-29C15CD-A334R-INT	180	2.9	Three-phase 400 V	D	T012	10004

Model Selection List

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.
MS1H3-44C15CB-A331R-INT	MS1H3-44C15CB-A334R-INT	180	4.4	Three-phase 200 V	E	S027	00010
MS1H3-44C15CD-A331R-INT	MS1H3-44C15CD-A334R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-A331R-INT	MS1H3-55C15CD-A334R-INT	180	5.5	Three-phase 400 V		T021	10006
MS1H3-75C15CD-A331R-INT	MS1H3-75C15CD-A334R-INT	180	7.5	Three-phase 400 V		T026	10007
Ratings of MS1H4 (n _N = 3000 rpm, n _{max} =7000 rpm) series motors							
MS1H4-05B30CB-A330R-INT	MS1H4-05B30CB-A332R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-10B30CB-A330R-INT	MS1H4-10B30CB-A332R-INT	40	0.1	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-05B30CB-A331R-INT	MS1H4-05B30CB-A334R-INT	40	0.05	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-10B30CB-A331R-INT	MS1H4-10B30CB-A334R-INT	40	0.1	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-20B30CB-A331R-INT	MS1H4-20B30CB-A334R-INT	60	0.2	Single-phase/ Three-phase 200 V		S1R6	00002
MS1H4-40B30CB-A331R-INT	MS1H4-40B30CB-A334R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H4-40B30CD-A331R-INT	MS1H4-40B30CD-A34R-INT	60	0.4	Three-phase 400 V	B	T1R4	10029
MS1H4-55B30CB-A331R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H4-75B30CB-A331R-INT	MS1H4-75B30CB-A334R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H4-75B30CD-A331R-INT	MS1H4-75B30CD-A334R-INT	80	0.75	Three-phase 400 V	B	T2R3	10031
MS1H4-10C30CB-A331R-INT	MS1H4-10C30CB-A334R-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 in the Selection Guide. The drive parameters remain unchanged.
- [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.

1.1.3 20-/23-bit Encoder Motor for SV660-INT Series Drives

Servo motor				Servo drive SV660-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							
MS1H1-03B30CB-U210R-S-INT	-	25	0.03	Single-phase 200 V	A	S1R6	00002
MS1H1-05B30CB-A330R-INT	MS1H1-05B30CB-A332R-INT	40	0.05	Single-phase 200 V			
MS1H1-10B30CB-A330R-INT	MS1H1-10B30CB-A332R-INT	40	0.1	Single-phase 200 V			
MS1H1-20B30CB-A331R-INT	MS1H1-20B30CB-A334R-INT	60	0.2	Single-phase 200 V			
MS1H1-40B30CB-A331R-INT	MS1H1-40B30CB-A334R-INT	60	0.4	Single-phase 200 V		S2R8	00003
MS1H1-55B30CB-A331R-INT	-	80	0.55	Single-phase 200 V	B	S5R5	00005
MS1H1-75B30CB-A331R-INT	MS1H1-75B30CB-A334R-INT	80	0.75	Single-phase 200 V		S5R5	00005
MS1H1-10C30CB-A331R-INT	MS1H1-10C30CB-A334R-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-A331R-INT	MS1H2-10C30CB-A334R-INT	100	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H2-10C30CD-A331R-INT	MS1H2-10C30CD-A334R-INT	100	1.0	Three-phase 400 V		T3R5	10001
MS1H2-15C30CB-A331R-INT	MS1H2-15C30CB-A334R-INT	100	1.5	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-15C30CD-A331R-INT	MS1H2-15C30CD-A334R-INT	100	1.5	Three-phase 400 V	C	T5R4	10002

Model Selection List

Servo motor				Servo drive			
				SV660-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommend ed model	No.
MS1H2-20C30CB-A331R-INT	MS1H2-20C30CB-A334R-INT	100	2.0	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H2-20C30CD-A331R-INT	MS1H2-20C30CD-A334R-INT	100	2.0	Three-phase 400 V	D	T8R4	10003
MS1H2-25C30CD-A331R-INT	MS1H2-25C30CD-A334R-INT	100	2.5	Three-phase 400 V	D	T012 ^[1]	10004
MS1H2-30C30CD-A331R-INT	MS1H2-30C30CD-A334R-INT	130	3.0	Three-phase 400 V	D	T012	10004
MS1H2-40C30CD-A331R-INT	MS1H2-40C30CD-A334R-INT	130	4.0	Three-phase 400 V	E	T017	10005
MS1H2-50C30CD-A331R-INT	MS1H2-50C30CD-A334R-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-A331R-INT	MS1H3-85B15CB-A334R-INT	130	0.85	Single-phase/ Three-phase 200 V	C	S7R6	00006
MS1H3-85B15CD-A331R-INT	MS1H3-85B15CD-A334R-INT	130	0.85	Three-phase 400 V		T3R5	10001
MS1H3-13C15CB-A331R-INT	MS1H3-13C15CB-A334R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-A331R-INT	MS1H3-13C15CD-A334R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-A331R-INT	MS1H3-18C15CB-A334R-INT	130	1.8	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-18C15CD-A331R-INT	MS1H3-18C15CD-A334R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CD-A331R-INT	MS1H3-29C15CD-A334R-INT	180	2.9	Three-phase 400 V	D	T012	10004
MS1H3-44C15CD-A331R-INT	MS1H3-44C15CD-A334R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-A331R-INT	MS1H3-55C15CD-A334R-INT	180	5.5	Three-phase 400 V		T021	10006
MS1H3-75C15CD-A331R-INT	MS1H3-75C15CD-A334R-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 SV660-INT series			
Model without brake	Model with brake	Frame size (mm)	Capacity (kW)	Voltage class	Size	Recommend ed model	No.
MS1H4-05B30CB-A330R-INT	MS1H4-05B30CB-A332R-INT	40	0.05	Single-phase 200 V	A	S1R6	00002
MS1H4-10B30CB-A330R-INT	MS1H4-10B30CB-A332R-INT	40	0.1	Single-phase 200 V		S1R6	00002
MS1H4-05B30CB-A331R-INT	MS1H4-05B30CB-A334R-INT	40	0.05	Single-phase 200 V		S1R6	00002
MS1H4-10B30CB-A331R-INT	MS1H4-10B30CB-A334R-INT	40	0.1	Single-phase 200 V		S1R6	00002
MS1H4-20B30CB-A331R-INT	MS1H4-20B30CB-A334R-INT	60	0.2	Single-phase 200 V		S1R6	00002
MS1H4-40B30CB-A331R-INT	MS1H4-40B30CB-A334R-INT	60	0.4	Single-phase 200 V		S2R8	00003
MS1H4-55B30CB-A331R-INT	-	80	0.55	Single-phase 200 V	B	S5R5	00005
MS1H4-75B30CB-A331R-INT	MS1H4-75B30CB-A334R-INT	80	0.75	Single-phase 200 V		S5R5	00005
MS1H4-10C30CB-A331R-INT	MS1H4-10C30CB-A334R-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.

1.1.4 Matching Relationship between Servo Drive and Servo Motor Encoder

Types

Table 1-1 Matching relationship between servo drive and servo motor encoder types

Drive model	Encoder type	Reference
SV680*****INT	A6: 26-bit multi-turn absolute encoder	SV680-INT Series Servo Drive User Guide
SV680*****INT	S6: 26-bit absolute multi-turn encoder (functional safety type)	
SV670*****INT	A3: 23-bit multi-turn absolute encoder	SV670-INT Series Servo Drive User Guide
SV660*****INT	A3: 23-bit multi-turn absolute encoder	SV660P Series Servo Drive Selection Guide SV660N Series Servo Drive Selection Guide SV660F Series Servo Drive Selection Guide

Note

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

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

Power (kW)	Frame size (mm)	MS1-Z series		MS1-R series	
		Product code	Motor model	Product code	Motor model
0.05	40	01111530	MS1H1-05B30CB-A330Z-INT	01119483	MS1H1-05B30CB-A330R-INT
0.05	40	01111531	MS1H1-05B30CB-A332Z-INT	01119482	MS1H1-05B30CB-A332R-INT
0.1	40	01111532	MS1H1-10B30CB-A330Z-INT	01119485	MS1H1-10B30CB-A330R-INT
0.1	40	01111533	MS1H1-10B30CB-A332Z-INT	01119484	MS1H1-10B30CB-A332R-INT
0.2	60	01111534	MS1H1-20B30CB-A331Z-INT	01117877	MS1H4-20B30CB-A331R-INT
0.2	60	01111535	MS1H1-20B30CB-A334Z-INT	01117875	MS1H4-20B30CB-A334R-INT
0.4	60	01111536	MS1H1-40B30CB-A331Z-INT	01117873	MS1H4-40B30CB-A331R-INT
0.4	60	01111537	MS1H1-40B30CB-A334Z-INT	01117874	MS1H4-40B30CB-A334R-INT
0.55	80	01111538	MS1H1-55B30CB-A331Z-INT	01117878	MS1H4-55B30CB-A331R-INT
0.75	80	01111539	MS1H1-75B30CB-A331Z-INT	01117880	MS1H4-75B30CB-A331R-INT
0.75	80	01111540	MS1H1-75B30CB-A334Z-INT	01117879	MS1H4-75B30CB-A334R-INT
1	80	01111541	MS1H1-10C30CB-A331Z-INT	01117876	MS1H4-10C30CB-A331R-INT
0.05	40	01117871	MS1H4-10B30CB-A330Z-INT	01119489	MS1H4-10B30CB-A330R-INT
0.05	40	01117872	MS1H4-10B30CB-A332Z-INT	01119488	MS1H4-10B30CB-A332R-INT
0.4	60	01111542	MS1H4-40B30CB-A331Z-INT	01117873	MS1H4-40B30CB-A331R-INT
0.4	60	01111543	MS1H4-40B30CB-A334Z-INT	01117874	MS1H4-40B30CB-A334R-INT
0.75	80	01111544	MS1H4-75B30CB-A331Z-INT	01117880	MS1H4-75B30CB-A331R-INT
0.75	80	01111545	MS1H4-75B30CB-A334Z-INT	01117879	MS1H4-75B30CB-A334R-INT

Note

- The H1 model with frame size 40 of R version can replace the H1 model of Z version. The H4 model with frame size 40 of R version can replace the H4 model of Z version.
- The H4 inertia model of the R version in frame sizes 60 and 80 can directly replace the H1 and H4 inertia models of the Z version.

Power (kW)	Frame size (mm)	MS1-Z series		MS1-R series	
		Product code	Motor model	Product code	Motor model
1	100	01112992	MS1H2-10C30CB-A331Z-INT	01117912	MS1H2-10C30CB-A331R-INT
1	100	01113003	MS1H2-10C30CB-A334Z-INT	01117914	MS1H2-10C30CB-A334R-INT
1	100	01112983	MS1H2-10C30CD-A331Z-INT	01117913	MS1H2-10C30CD-A331R-INT
1	100	01112996	MS1H2-10C30CD-A334Z-INT	01117915	MS1H2-10C30CD-A334R-INT
1.5	100	01112966	MS1H2-15C30CB-A331Z-INT	01117916	MS1H2-15C30CB-A331R-INT
1.5	100	01112972	MS1H2-15C30CB-A334Z-INT	01117918	MS1H2-15C30CB-A334R-INT
1.5	100	01112962	MS1H2-15C30CD-A331Z-INT	01117917	MS1H2-15C30CD-A331R-INT
1.5	100	01112979	MS1H2-15C30CD-A334Z-INT	01117919	MS1H2-15C30CD-A334R-INT
2	100	01112990	MS1H2-20C30CD-A331Z-INT	01117921	MS1H2-20C30CD-A331R-INT
2	100	01112961	MS1H2-20C30CD-A334Z-S4-INT	01117923	MS1H2-20C30CD-A334R-INT

Power (kW)	Frame size (mm)	MS1-Z series		MS1-R series	
		Product code	Motor model	Product code	Motor model
2.5	100	01112985	MS1H2-25C30CD-A331Z-INT	01117925	MS1H2-25C30CD-A331R-INT
2.5	100	01112981	MS1H2-25C30CD-A334Z-S4-INT	01117927	MS1H2-25C30CD-A334R-INT
3	130	01112976	MS1H2-30C30CD-A331Z-INT	01117929	MS1H2-30C30CD-A331R-INT
3	130	01112977	MS1H2-30C30CD-A334Z-S4-INT	01117931	MS1H2-30C30CD-A334R-INT
4	130	01112971	MS1H2-40C30CD-A331Z-INT	01117933	MS1H2-40C30CD-A331R-INT
4	130	01113000	MS1H2-40C30CD-A334Z-S4-INT	01117935	MS1H2-40C30CD-A334R-INT
5	130	01112987	MS1H2-50C30CD-A331Z-INT	01117937	MS1H2-50C30CD-A331R-INT
5	130	01112973	MS1H2-50C30CD-A334Z-S4-INT	01117939	MS1H2-50C30CD-A334R-INT
0.85	130	01111562	MS1H3-85B15CB-A331Z-INT	01117995	MS1H3-85B15CB-A331R-INT
0.85	130	01111563	MS1H3-85B15CB-A334Z-INT	01118007	MS1H3-85B15CB-A334R-INT
0.85	130	01111564	MS1H3-85B15CD-A331Z-INT	01117996	MS1H3-85B15CD-A331R-INT
0.85	130	01111565	MS1H3-85B15CD-A334Z-INT	01118008	MS1H3-85B15CD-A334R-INT
1.3	130	01111566	MS1H3-13C15CB-A331Z-INT	01117997	MS1H3-13C15CB-A331R-INT
1.3	130	01111567	MS1H3-13C15CB-A334Z-INT	01118009	MS1H3-13C15CB-A334R-INT
1.3	130	01111568	MS1H3-13C15CD-A331Z-INT	01117998	MS1H3-13C15CD-A331R-INT
1.3	130	01111569	MS1H3-13C15CD-A334Z-INT	01118010	MS1H3-13C15CD-A334R-INT
1.8	130	01111571	MS1H3-18C15CD-A331Z-INT	01118000	MS1H3-18C15CD-A331R-INT
1.8	130	01111570	MS1H3-18C15CD-A334Z-INT	01118012	MS1H3-18C15CD-A334R-INT
2.9	180	01112991	MS1H3-29C15CD-A331Z-INT	01118002	MS1H3-29C15CD-A331R-INT
2.9	180	01112984	MS1H3-29C15CD-A334Z-INT	01118014	MS1H3-29C15CD-A334R-INT
4.4	180	01113002	MS1H3-44C15CD-A331Z-INT	01118004	MS1H3-44C15CD-A331R-INT
4.4	180	01112997	MS1H3-44C15CD-A334Z-INT	01118016	MS1H3-44C15CD-A334R-INT
5.5	180	01112968	MS1H3-55C15CD-A331Z-INT	01118005	MS1H3-55C15CD-A331R-INT
5.5	180	01112989	MS1H3-55C15CD-A334Z-INT	01118017	MS1H3-55C15CD-A334R-INT
7.5	180	01112982	MS1H3-75C15CD-A331Z-INT	01118006	MS1H3-75C15CD-A331R-INT
7.5	180	01112999	MS1H3-75C15CD-A334Z-INT	01118018	MS1H3-75C15CD-A334R-INT

Note

Motor model ended with "-S4" represents the duty cycle S4, indicating the motor is working under S4 duty, with the motor load ratio not exceeding 70%.

2 Product Information

2.1 Product Characteristics

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

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

2.2 Model and Nameplate

Model

MS1 H1 - 75B 30C B - A3 3 1 R - INT
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① MS1 series servo motor	② Inertia and capacity H1: Low inertia, small capacity H2: Low inertia, medium capacity H3: Medium inertia, medium capacity H4: Medium inertia, small capacity	③ Rated power (W) Comprised of one letter and two digits B: × 10 C: × 100 Example: 75B means 750 W.
④ Rated speed (rpm) Comprised of one letter and two digits B: × 10 C: × 100 Example: 30C means 3,000 rpm.	⑤ Voltage class B: 200 V D: 400 V	⑥ Encoder type Comprised of one letter and one digit A6: 26-bit multi-turn absolute encoder S6: functional safety type 26-bit multi-turn absolute encoder A3: 23-bit multi-turn absolute encoder U2: 20-bit single-turn absolute encoder (for 25-flange motors)
⑦ Shaft connection mode 3: Solid shaft, with key and threaded hole	⑧ Brake, reducer, and oil sealing 0: Without oil seal or brake 1: With oil seal, without brake 2: Without oil seal, with brake 4: With oil seal and brake	⑨ Sub-series No. R: R version ⑩ Customized function INT: International version

Note

- The description of the model only describes the naming conventions and does not recommend the specific motor models. For details of the model selection, see the Model Selection chapter.
- If you have other customized requirements, contact Inovance.

Nameplate description

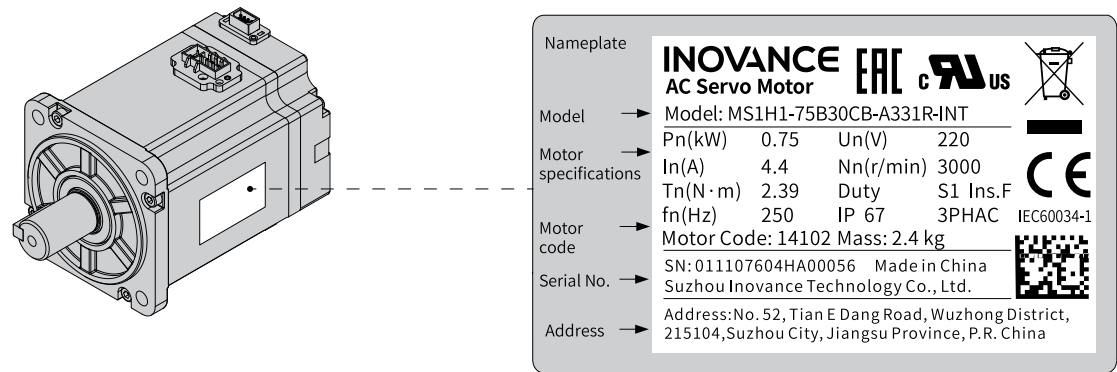


Figure 2-1 Model and Nameplate

2.3 Components

Motor (40-flange)

• Terminal-type servo motor

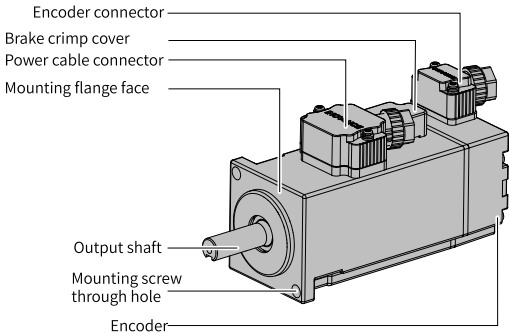
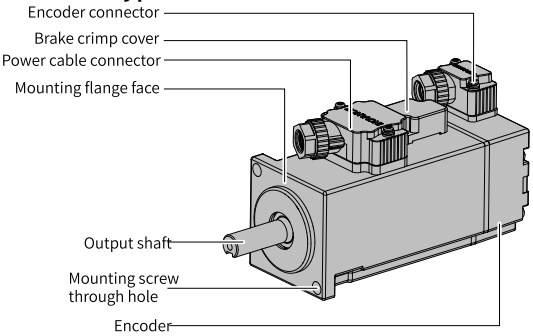


Figure 2-2 Components of terminal-type servo motors (Left: motor with front cable outlet; Right: motor with rear cable outlet)

• Flying leads type servo motors

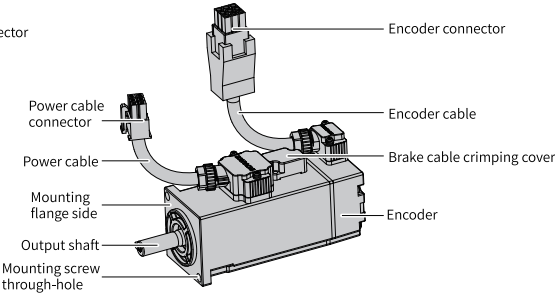
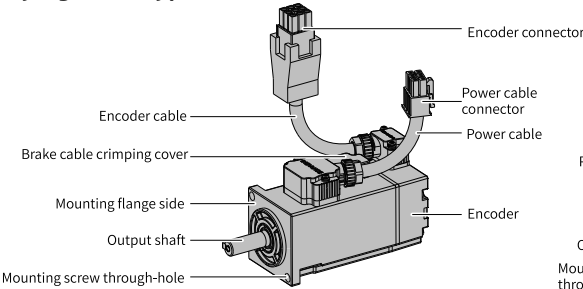


Figure 2-3 Components of the flying leads motor (left: 50 W flying leads motor, right: 100 W flying leads motor)

Note

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

Motor (60- and 80-flange)

• Terminal-type servo motor

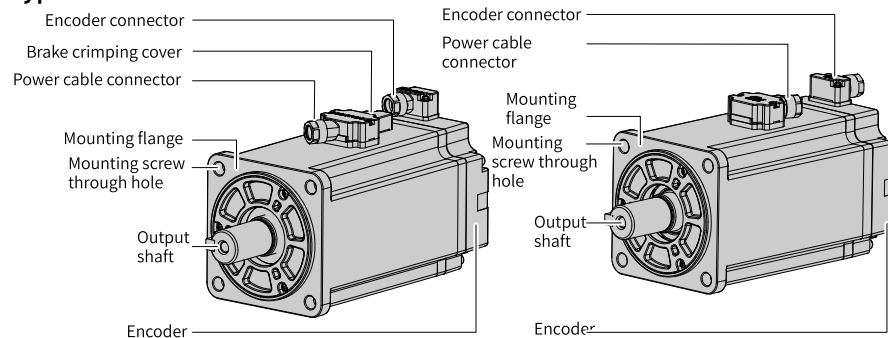


Figure 2-4 Components of terminal-type servo motors (Left: motor with front cable outlet; Right: motor with rear cable outlet)

• Flying leads type servo motors

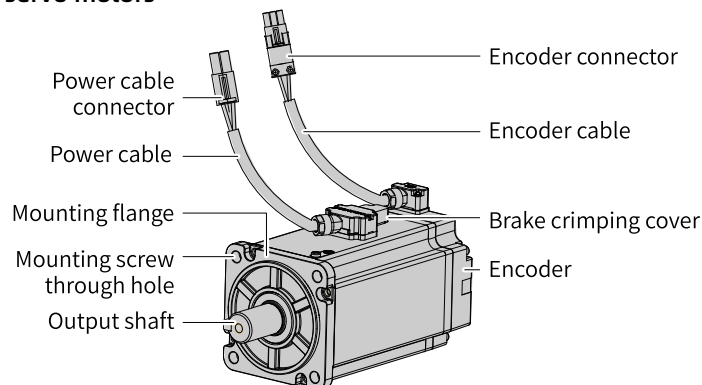


Figure 2-5 Components of the flying leads motor (front cable outlet as standard)

Motor (100-, 130- and 180-flange)

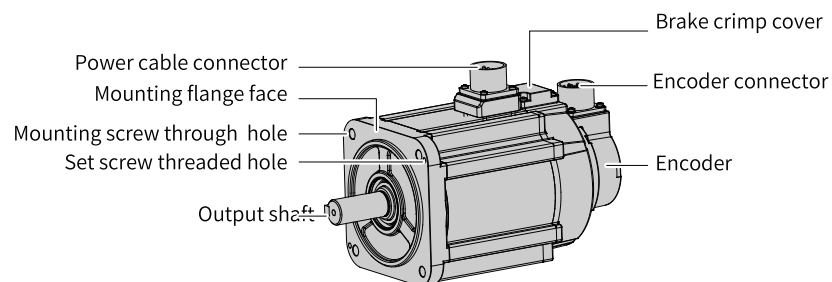


Figure 2-6 Components of servo drives in frame sizes 100/130/180

2.4 Motor Models

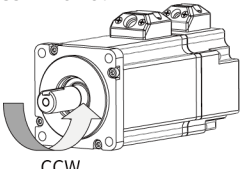
Motor type		Rated output capacity (kW)	Encoder ^[1]
Low inertia, small capacity	 MS1H1	0.05, 0.1, 0.2, 0.4, 0.55, 0.75, 1.0	A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder (functional safety type) A3: 23-bit multi-turn absolute encoder
Low inertia, medium capacity	 MS1H2	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0	A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder (functional safety type) A3: 23-bit multi-turn absolute encoder
Medium inertia, medium capacity	 MS1H3	0.85, 1.3, 1.8, 2.9, 4.4, 5.5, 7.5	A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder (functional safety type) A3: 23-bit multi-turn absolute encoder
Medium inertia, small capacity	 MS1H4	0.05, 0.1, 0.2, 0.4, 0.55, 0.75, 1.0	A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder (functional safety type) A3: 23-bit multi-turn absolute encoder

Note

[1]: 16-bit multi-turn (operation range of 65536 revolutions) position storage is available with a battery.

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 magnet
Installation method	Flange
Thermal class	F (155°C)
Insulation voltage	1500 VAC, 1 minute (220 V class) 1800 VAC, 1 minute (380 V class)
IP rating	IP67 (excluding shaft opening and flying leads type motor connectors)
Direction of rotation	Rotates counterclockwise (CCW) when viewed from the shaft extension side with a forward run command. 

Item		Description
Ambient condition	Ambient temperature	0°C to 40°C (non-freezing)
	Ambient humidity	20% RH 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 30. 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 heating stoves. • 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 environments. • Not applicable to inching (not full-turn) ^[2] and may be stuck. • The motor with brake may generate a pattering sound. • In upstream applications of the motor, ensure the force applied on the shaft end is lower than the allowable axial force and radial force of the motor. • The system should avoid continuous operation at a natural frequency. Exceeding the allowable vibration value may damage the system.
Shock resistance ^{[3][5]}	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 acceleration (taking flange side as standard)	490m/s ²
	Number of shocks	2
Vibration resistance ^{[4][5]}	Vibration acceleration (taking flange side 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.

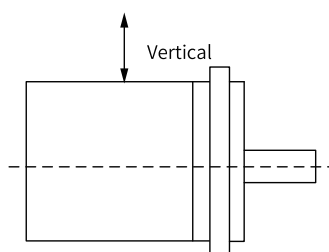


Figure 3-1 Shock applied to the servo motor

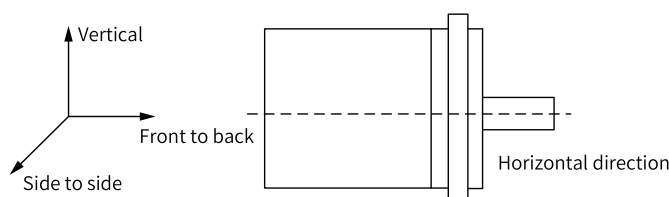


Figure 3-2 Vibration applied to the servo motor

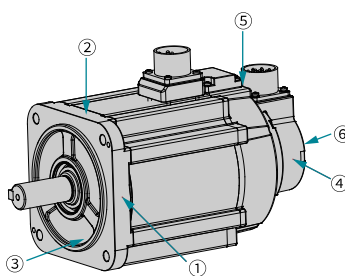


Figure 3-3 Max. allowable vibration limit of the motor

Direction	Measuring point	Limit value (10 Hz to 2000 Hz)
Radial	①②④⑤	49m/s ²
Axial	③⑥	24.5m/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 different load motors, set the motor overload protection gain based on the overload capacity of the motor. Use the default gain in general conditions. However, when one of the following conditions occurs, change the gain based on actual motor temperature:

- The motor operates in environments with high 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.

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

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

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

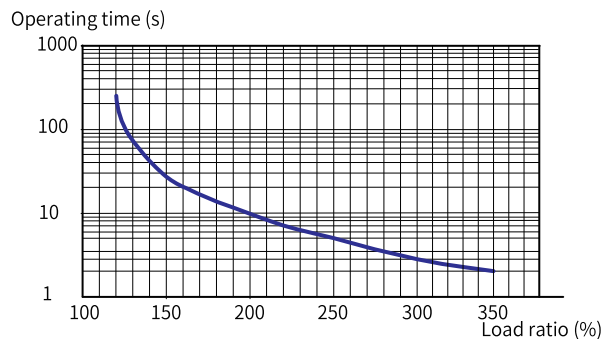


Figure 3-4 MS1H1/H4 (frame size 40/60/80) series motor overload curve

Note

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

- **MS1H2/MS1H3**

Load ratio (%)	Operating time (s)
115	6000
120	2533
125	1226
130	915
135	769
140	527
145	352
150	221
155	128
160	99
165	83
170	67
175	55
180	49
185	45
190	41
195	38
200	34
205	31
210	28
215	24
220	22
225	21
230	19
235	18
240	16
245	14
250	13
255	12
260	11
265	10
270	9
275	9
280	8
285	7
290	6
295	5
300	5

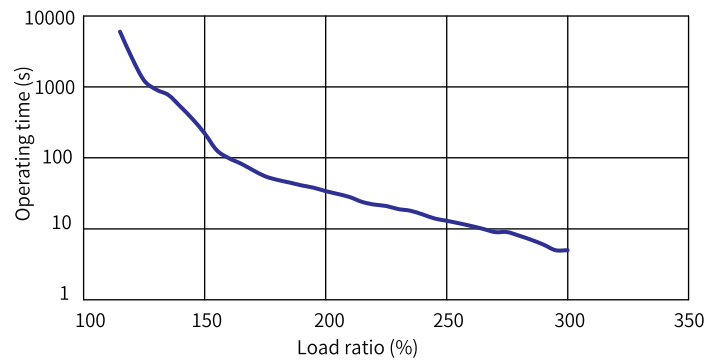


Figure 3-5 Overload curve of MS1H2 and MS1H3 series motors

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.

• MS1H1-03B30CB-U210R-S

Load ratio (%)	Operating time (s)
120	75.00
130	43.39
140	27.97
150	19.84
160	15.10
170	15.02
180	9.82
190	8.12
200	6.70
210	5.62
220	4.79
230	4.14
240	3.63
250	3.22
260	2.89
270	2.61
280	2.38
290	2.18
300	2.01
310	1.86
320	1.73
330	1.60
340	1.50
350	1.40

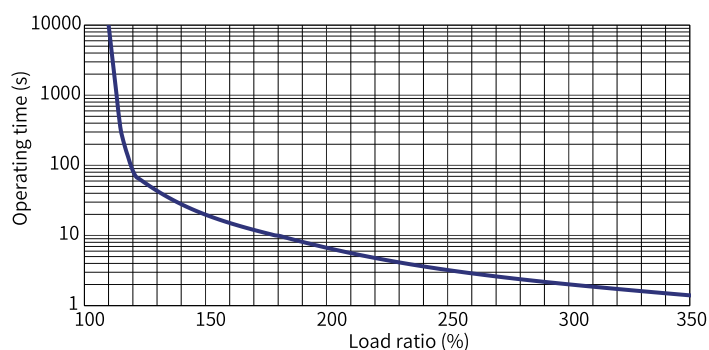


Figure 3-6 Overload curve of MS1H1-03B30CB-U210R-S series motors

3.3 Derating Characteristics

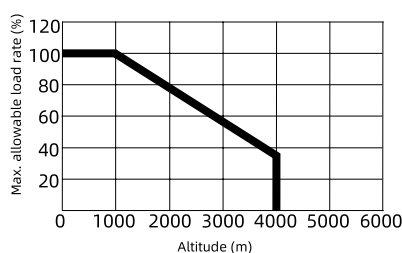
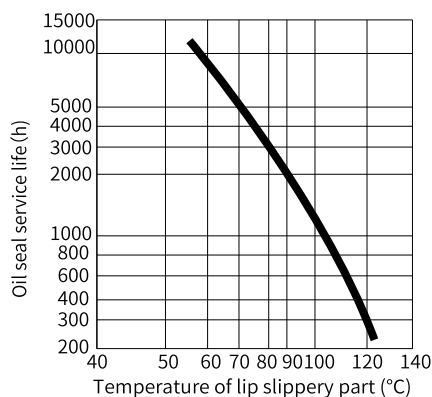


Figure 3-7 Altitude-based derating curve

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

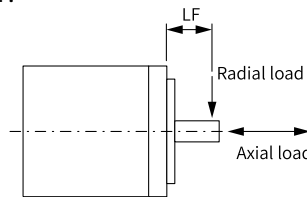


- For the built-in braking resistor of the drive, see section "Components".
 - Even if you use a built-in resistor, the energy generated in some regenerative conditions may exceed the allowable capacity loss (W) of the resistor. Therefore, an external braking resistor is required.
-

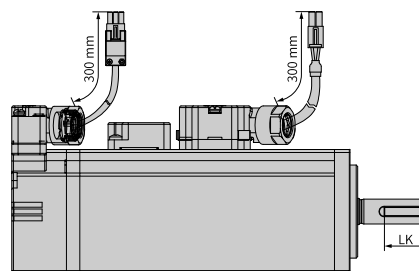
4 Motor Model Selection

4.1 Selection Precautions

- Description of torque-speed characteristics curves:
 - All parameters and torque-speed characteristic values are subject to the conditions that the motor works with an Inovance servo drive and the armature coil temperature is 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 (aluminum)
 - MS1H2-10C to 25C: 400 × 400 × 20 (steel)
 - MS1H2-30C to 50C: 400 × 400 × 20 (steel)
 - MS1H3-85B to 18C: 400 × 400 × 20 (steel)
 - MS1H3-29C to 55C: 550 × 550 × 30 (aluminum)
 - MS1H3-75C: 700 × 700 × 30 (aluminum)
- Radial and axial loads of the motor:



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



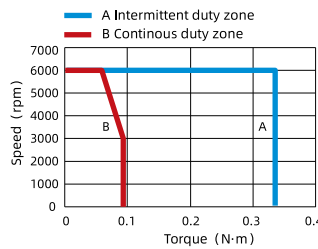
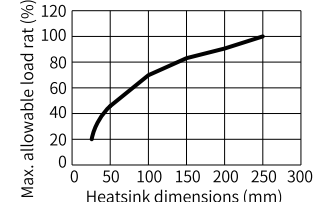
- As shown in the preceding figure, the product is marked with an LK value in the dimension diagram in the section of each model. LK indicates the length of the shaft key.
- MS1H3 (130-flange and 180-flange) comes with a key slot. When the operating speed is above 3000 rpm, the motor must run with the keyway. If you need to run the motor without the keyway at speeds higher than 3000 rpm, contact Inovance.

Note

- Values inside the parentheses in 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 Motors with Low Inertia and Small Capacity

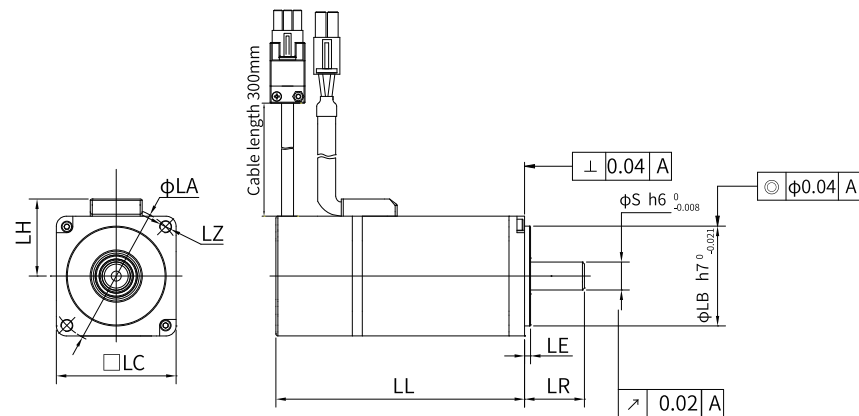
4.2.1 MS1H1-03B30CB-U210R-S-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	25			
Inertia and capacity	Low inertia, small capacity			
Rated power (kW)	0.03			
Rated voltage (V)	220			
Rated torque (N·m)	0.0955			
Maximum torque (N·m)	0.33			
Rated frequency (Hz)	150			
Rated current (A)	0.93			
Maximum current (A)	3.34			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.00668±10 %		
	Motor with brake	-		

Allowable loads

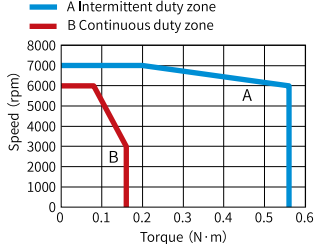
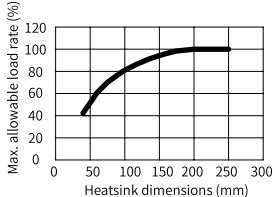
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	≤ 78	≤ 54

Product dimensions (in mm)



LL	LC	LR	LA	LZ	LH	LG	LE	
73.5	25	16±0.5	28	2 × φ3	17	-	2.5±0.3	
S	LB	TP	LK	KH	KW	W	T	Weight (kg)
5	20	-	-	-	-	-	-	0.2

4.2.2 MS1H1-05B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	40		 A Intermittent duty zone B Continuous duty zone	
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.05			
Rated voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated frequency (Hz)	250			
Rated current (A)	1.2			
Maximum current (A)	4.8		Heatsink-based derating curve	
Rated speed (rpm)	3000		 Max. allowable load rate (%) Heatsink dimensions (mm)	
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.018 ± 10%		
	Motor with brake	0.0208 ± 10%		

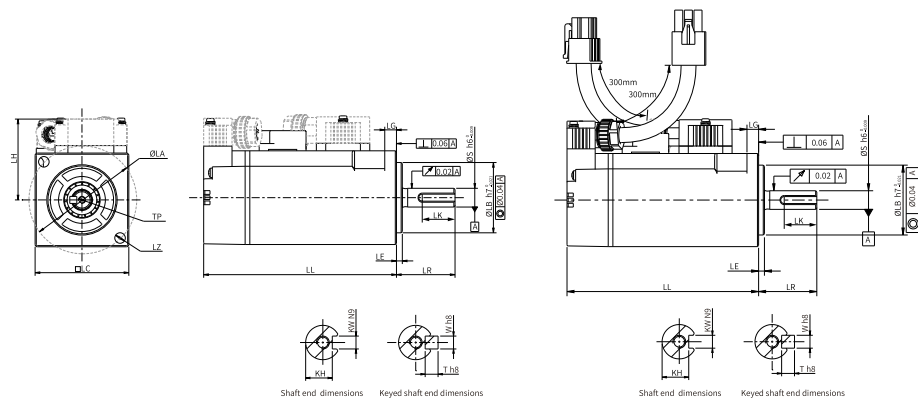
Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	
54.5 (81.8)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	14 ⁰ -0.36	6.2 ⁰ -0.1	3	3	3	0.26 (0.43)

4.2.3 MS1H1-05B30CB-A33*R-INT

Motor specifications			Torque-speed characteristics																									
Frame size (mm)	40		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>0.0</td><td>7000</td><td>6000</td></tr><tr><td>0.1</td><td>6800</td><td>6000</td></tr><tr><td>0.15</td><td>6700</td><td>3000</td></tr><tr><td>0.2</td><td>6600</td><td>0</td></tr><tr><td>0.5</td><td>6000</td><td>0</td></tr><tr><td>0.55</td><td>6000</td><td>0</td></tr><tr><td>0.6</td><td>0</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0.0	7000	6000	0.1	6800	6000	0.15	6700	3000	0.2	6600	0	0.5	6000	0	0.55	6000	0	0.6	0	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																										
0.0	7000	6000																										
0.1	6800	6000																										
0.15	6700	3000																										
0.2	6600	0																										
0.5	6000	0																										
0.55	6000	0																										
0.6	0	0																										
Inertia, capacity	Low inertia, small capacity																											
Rated power (kW)	0.05																											
Rated voltage (V)	220																											
Rated torque (N·m)	0.16																											
Maximum torque (N·m)	0.56																											
Rated frequency (Hz)	250																											
Rated current (A)	1.2																											
Maximum current (A)	4.8																											
Rated speed (rpm)	3000																											
Maximum speed (rpm)	7000																											
Torque coefficient (N·m/A)	0.15																											
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.018 ± 10%																										
	Motor with brake	0.0208 ± 10%																										

Heatsink-based derating curve															
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>45</td></tr><tr><td>100</td><td>85</td></tr><tr><td>150</td><td>95</td></tr><tr><td>200</td><td>100</td></tr><tr><td>250</td><td>100</td></tr><tr><td>300</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	50	45	100	85	150	95	200	100	250	100	300	100
Heatsink dimensions (mm)	Max. allowable load rate (%)														
50	45														
100	85														
150	95														
200	100														
250	100														
300	100														

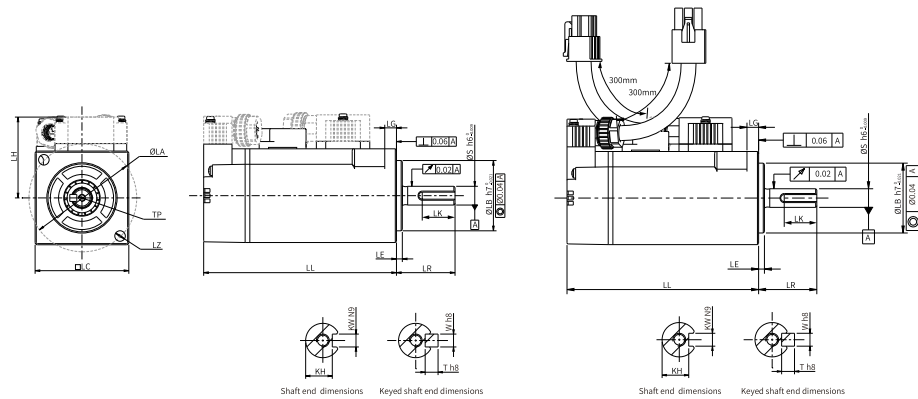
Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	
54.5 (81.8)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	140 - ^{0.36}	6.2 ⁰ - 0.1	3	3	3	0.26 (0.43)

4.2.4 MS1H1-10B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	40		A line graph showing Speed (rpm) on the y-axis (0 to 8000) versus Torque (N·m) on the x-axis (0 to 1.2). Two curves are plotted: A (Intermittent duty zone) in blue and B (Continuous duty zone) in red. Curve A starts at approximately 7000 rpm at 0 torque and decreases linearly to about 6000 rpm at 1.1 N·m, then drops vertically to 0. Curve B starts at 6000 rpm at 0 torque, remains constant until about 0.15 N·m, then drops linearly to 0 at 0.3 N·m.	
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.1			
Rated voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated frequency (Hz)	250			
Rated current (A)	1.2			
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.30		Heatsink-based derating curve A line graph showing Max. allowable load rate (%) on the y-axis (0 to 120) versus Heatsink dimensions (mm) on the x-axis (0 to 300). The curve starts at approximately 40% load rate at 50 mm and increases, leveling off at 100% load rate for dimensions greater than 150 mm.	
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.0316 ± 10%		
	Motor with brake	0.0345 ± 10%		

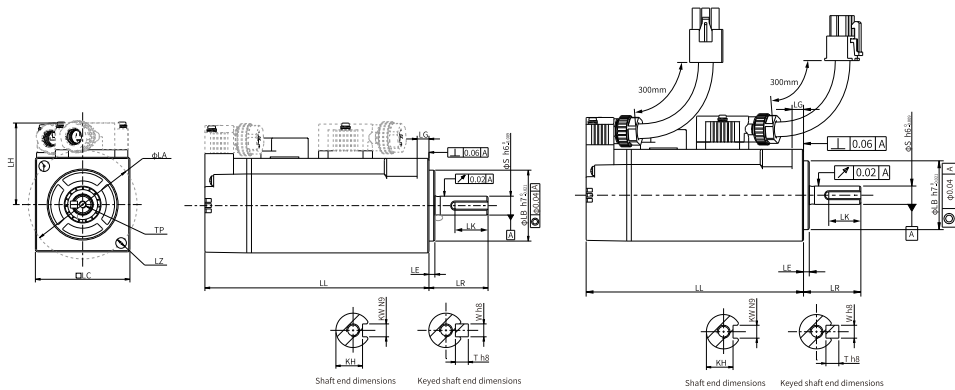
Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	
67 (94.3)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	14 ⁰ -0.36	6.2 ⁰ -0.1	3	3	3	0.35 (0.52)

4.2.5 MS1H1-10B30CB-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	40		The graph plots Speed (rpm) on the y-axis (0 to 8000) against Torque (N·m) on the x-axis (0 to 1.2). Two duty zones are shown: A (Intermittent duty zone, blue line) and B (Continuous duty zone, red line). Zone A starts at approximately 7000 rpm at 0 torque and decreases linearly to about 6000 rpm at 1.1 N·m, then drops vertically to 0. Zone B starts at 6000 rpm at 0 torque, remains constant until about 0.15 N·m, then decreases linearly to 0 at 0.3 N·m.	
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.1			
Rated voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated frequency (Hz)	250			
Rated current (A)	1.2			
Maximum current (A)	4.8			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.30			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.0316 ± 10%	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 40% load rate for 50mm dimensions and rises to 100% for 300mm dimensions.	
	Motor with brake	0.0345 ± 10%		

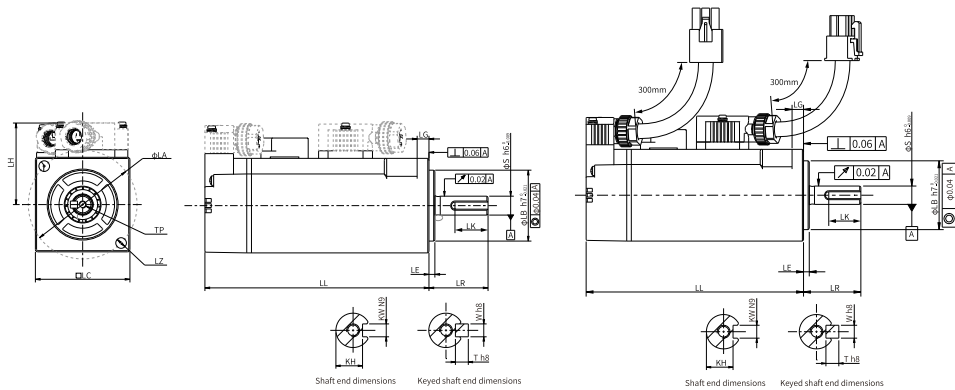
Electrical specifications of the brake

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

Allowable load

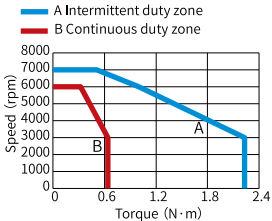
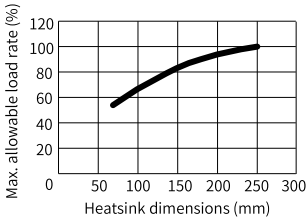
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
20	≤ 78	≤ 54

Dimensions (mm)



LL	LC	LR	LA	LZ	LH	LG	LE	
67 (94.3)	40	25 ± 0.5	46	2 × Φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	140 ^{-0.36}	6.2 ⁰ _{-0.1}	3	3	3	0.35 (0.52)

4.2.6 MS1H1-20B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60		 A Intermittent duty zone B Continuous duty zone	
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		 Max. allowable load rate (%) Heatsink dimensions (mm)	
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%		

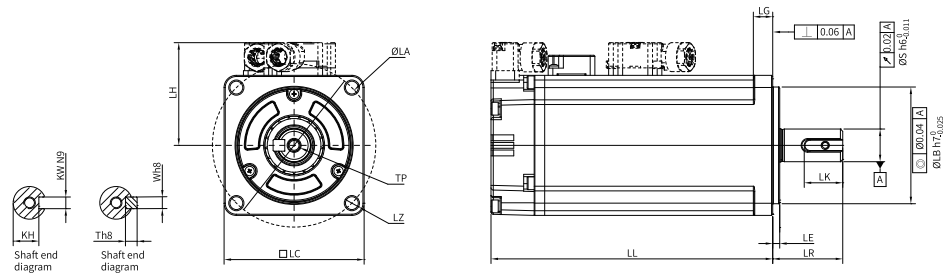
Electrical specifications of the brake

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)

4.2.8 MS1H1-40B30CB-A6/S63*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). A blue line represents the intermittent duty zone (A), starting at 7000 rpm for 0 torque and decreasing linearly to 3000 rpm at 4.45 N·m. A red line represents the continuous duty zone (B), starting at 6000 rpm for 0 torque, remaining constant until 1.27 N·m, and then decreasing linearly to 3000 rpm at 4.45 N·m. <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>7000</td><td>6000</td></tr><tr><td>1.27</td><td>6400</td><td>6000</td></tr><tr><td>4.45</td><td>3000</td><td>3000</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	7000	6000	1.27	6400	6000	4.45	3000	3000
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B														
0	7000	6000														
1.27	6400	6000														
4.45	3000	3000														
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															
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.145 ± 10%														
	Motor with brake	0.157 ± 10%														

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 load rate increases from approximately 55% at 75 mm to 100% at 250 mm. <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>75</td><td>55</td></tr><tr><td>150</td><td>85</td></tr><tr><td>250</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	75	55	150	85	250	100
Heatsink dimensions (mm)	Max. allowable load rate (%)								
75	55								
150	85								
250	100								

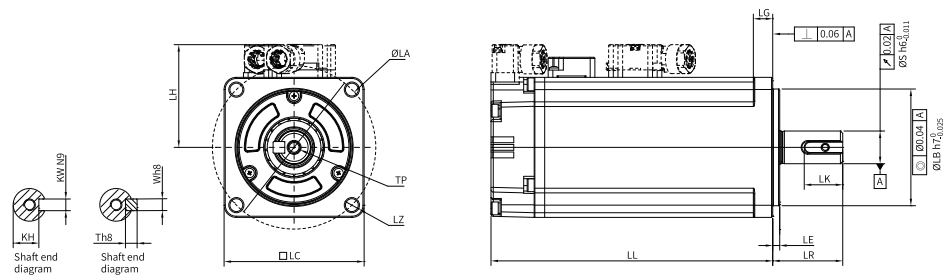
Electrical specifications of the brake

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

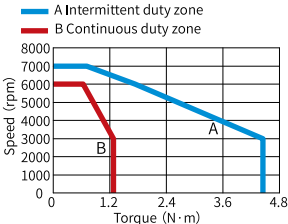
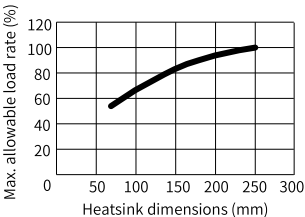
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

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)

4.2.9 MS1H1-40B30CB-A33*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%		

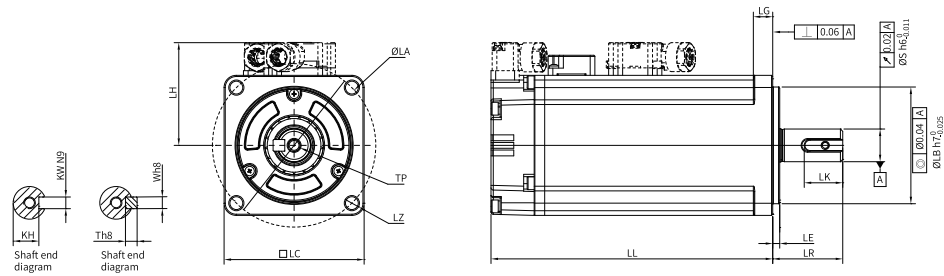
Electrical specifications of the brake

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)

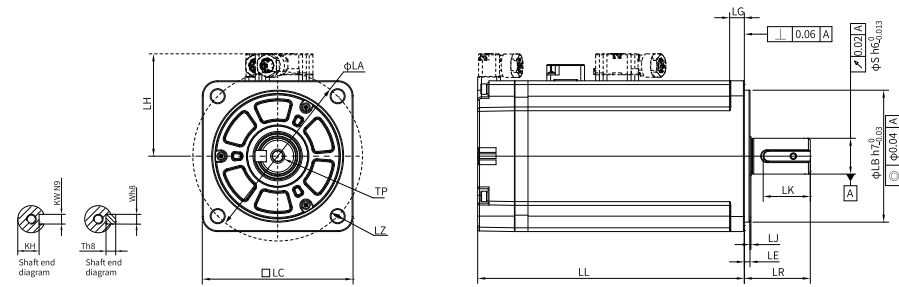
4.2.10 MS1H1-55B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80		Speed (rpm) vs Torque (N·m) graph. The graph shows two duty zones: A (Intermittent duty zone, blue line) and B (Continuous duty zone, red line). The x-axis represents Torque (N·m) from 0 to 6.4, and the y-axis represents Speed (rpm) from 0 to 8000. Zone A starts at approximately 7000 rpm at 0 torque and decreases to about 3000 rpm at 6.4 N·m. Zone B starts at approximately 6000 rpm at 0 torque and drops sharply to about 3000 rpm at 1.6 N·m, then continues to decrease to about 2000 rpm at 6.4 N·m.	
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		Heatsink-based derating curve Max. allowable load rate (%) vs Heatsink dimensions (mm) graph. The x-axis represents Heatsink dimensions (mm) from 0 to 300, and the y-axis represents Max. allowable load rate (%) from 0 to 120. The curve starts at approximately 60% load rate at 50 mm and increases to about 100% load rate at 300 mm.	
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.51			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.55 ± 10%		
	Motor with brake	-		

Allowable load

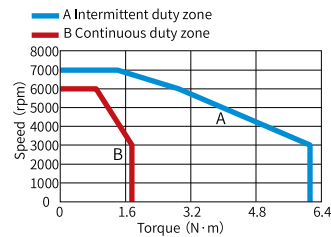
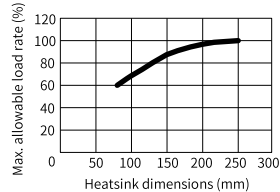
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35 ± 0.5	90	4 × 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

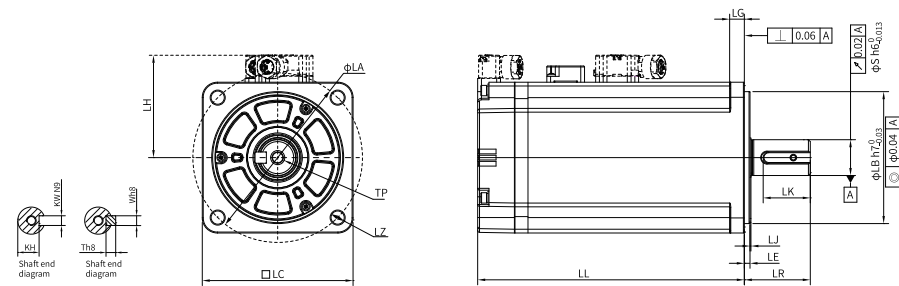
4.2.11 MS1H1-55B30CB-A33*R-INT

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		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	0.55 ± 10%		
	Motor with brake	-		

Allowable load

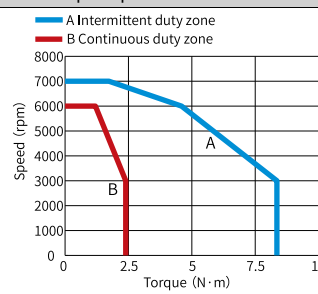
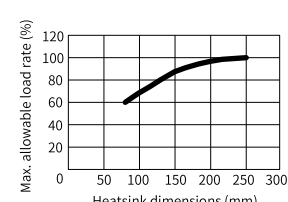
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

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	250 ^{0.62}	15.50 ^{0.1}	6	6	6	1.88

4.2.12 MS1H1-75B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.75			
Voltage (V)	220			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.36			
Rated 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)	0.62			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.68 ± 10%		
	Motor with brake	0.71 ± 10%		

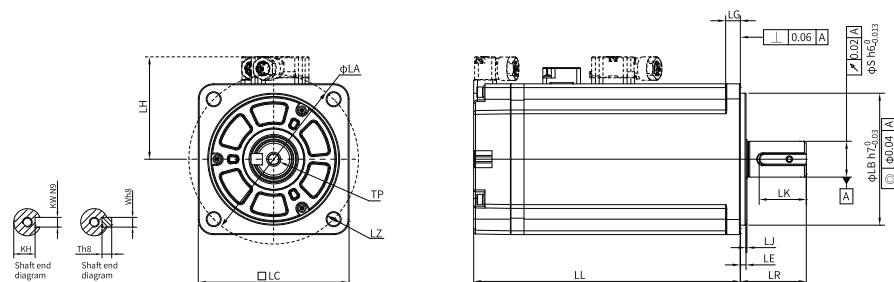
Electrical specifications of the brake

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

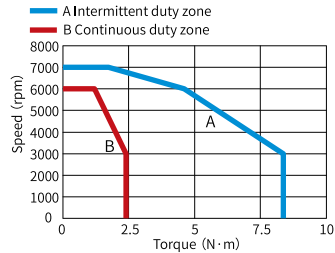
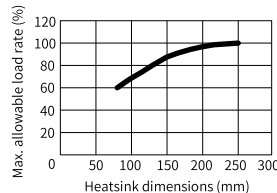
Dimensions (mm)



Motor Model Selection

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)

4.2.13 MS1H1-75B30CB-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80			
Inertia, capacity	Low inertia, small capacity			
Rated power (kW)	0.75			
Voltage (V)	220			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.36			
Rated frequency (Hz)	250			
Rated current (A)	4.4			
Maximum current (A)	16.9			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.62		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm²)	Motor without brake	0.68 ± 10%		
	Motor with brake	0.71 ± 10%		

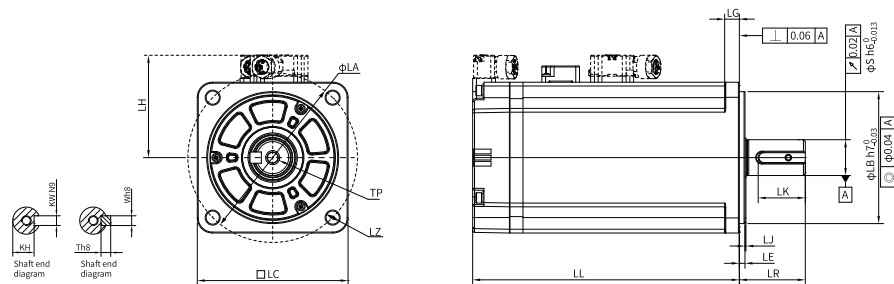
Electrical specifications of the brake

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

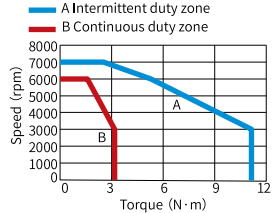
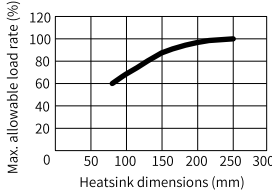
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

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)

4.2.14 MS1H1-10C30CB-A6/S63*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			
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%		

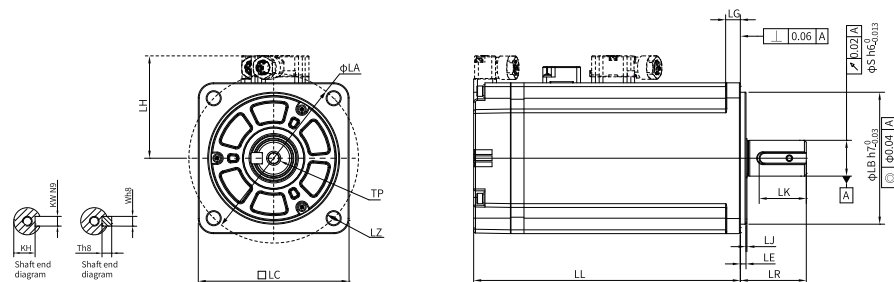
Electrical specifications of the brake

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

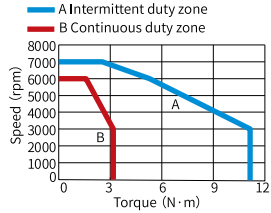
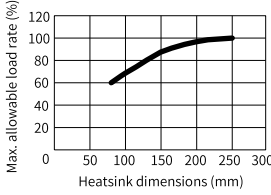
Dimensions (mm)



Motor Model Selection

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)

4.2.15 MS1H1-10C30CB-A33*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		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%		

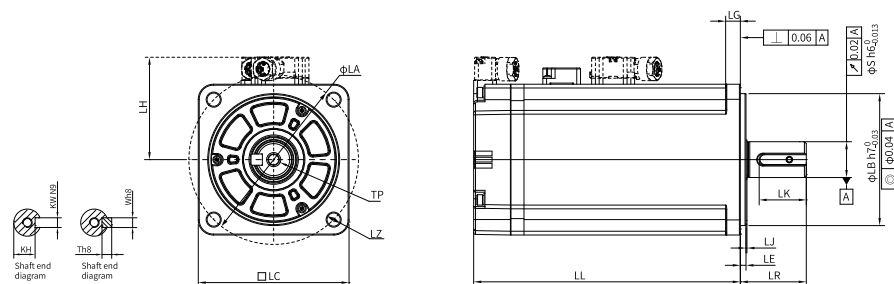
Electrical specifications of the brake

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

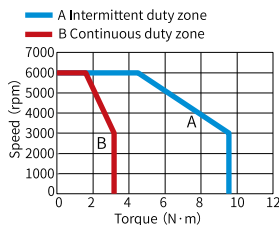
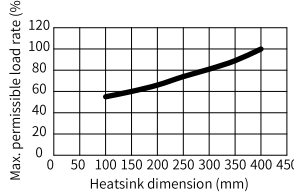
Dimensions (mm)



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	250 - ^{0.62}	15.50 -0.1	6	6	6	2.61 (3.27)

4.3 MS1H2 Motors with Low Inertia and Medium Capacity

4.3.1 MS1H2-10C30CB-A6/S63*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		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%		

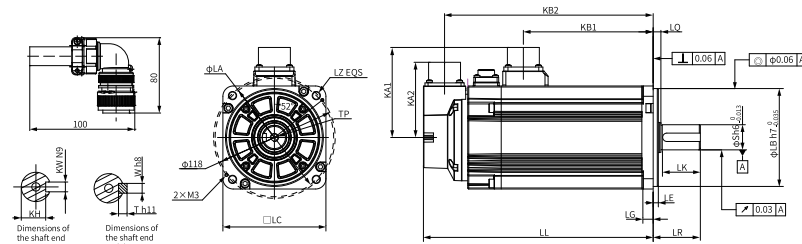
Electrical specifications of the brake

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

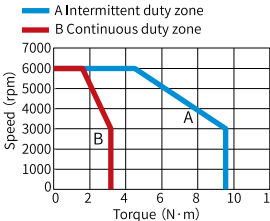
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Product dimensions (in 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)	

4.3.3 MS1H2-10C30CD-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	100		 A Intermittent duty zone B Continuous duty zone	
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			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.07		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78 ± 10%		
	Motor with brake	2.6 ± 10%		

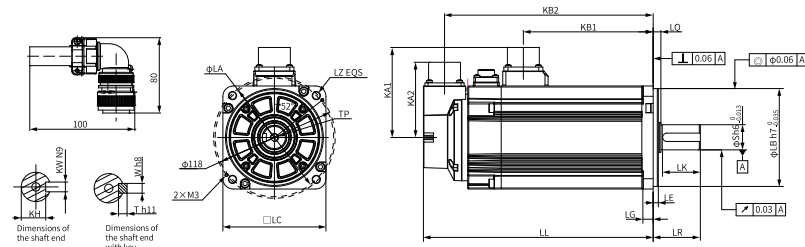
Electrical specifications of the brake

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-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	100		The graph plots Speed (rpm) on the y-axis (0 to 7000) against Torque (N·m) on the x-axis (0 to 12). Zone A (Intermittent duty zone) is shown in blue, starting at 6000 rpm for 0-4 N·m and decreasing linearly to 3000 rpm at 10 N·m. Zone B (Continuous duty zone) is shown in red, starting at 6000 rpm for 0-2 N·m and decreasing linearly to 0 rpm at 3.18 N·m.	
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			
Rated speed (rpm)	3000			
Maximum speed (rpm)	6000			
Torque coefficient (N·m/A)	1.07		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.78 ± 10%	The graph plots Max. permissible load rate (%) on the y-axis (0 to 120) against Heatsink dimension (mm) on the x-axis (0 to 450). The curve starts at approximately 55% for 100 mm and increases linearly to 100% for 400 mm.	
	Motor with brake	2.6 ± 10%		

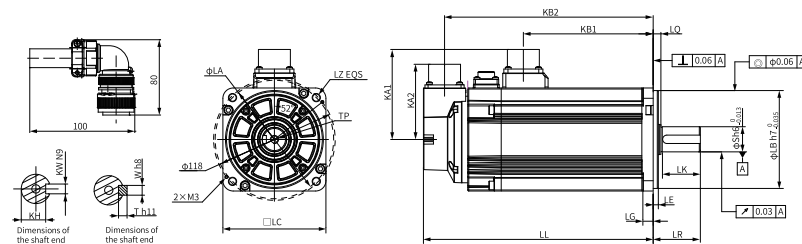
Electrical specifications of the brake

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

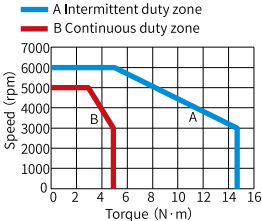
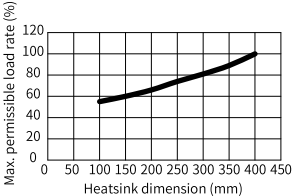
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
100	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-A33*R-INT

Motor specifications			Torque-speed characteristics																			
Frame size (mm)	100		 A line graph showing Speed (rpm) on the y-axis (0 to 7000) versus Torque (N·m) on the x-axis (0 to 16). Two duty zones are plotted: A (Intermittent) in blue and B (Continuous) in red. Zone A starts at 6000 rpm for 0-6 N·m, then decreases linearly to 3000 rpm at 14 N·m, where it drops vertically to 0. Zone B starts at 5000 rpm for 0-3 N·m, then decreases linearly to 3000 rpm at 5 N·m, where it drops vertically to 0. <table border="1"><caption>Approximate data points from the Torque-Speed graph</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>3</td><td>6000</td><td>5000</td></tr><tr><td>5</td><td>6000</td><td>3000</td></tr><tr><td>6</td><td>6000</td><td>0</td></tr><tr><td>14</td><td>3000</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	3	6000	5000	5	6000	3000	6	6000	0	14	3000	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																				
0	6000	5000																				
3	6000	5000																				
5	6000	3000																				
6	6000	0																				
14	3000	0																				
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																					
Maximum current (A)	32																					
Rated speed (rpm)	3000																					
Maximum speed (rpm)	6000																					
Torque coefficient (N·m/A)	0.62		Heatsink-based derating curve																			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35 ± 10%	 A line graph showing Max. permissible load rate (%) on the y-axis (0 to 120) versus Heatsink dimension (mm) on the x-axis (0 to 450). The curve starts at approximately 55% for 125 mm and increases to 100% for 400 mm. <table border="1"><caption>Approximate data points from the Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimension (mm)</th><th>Max. permissible load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>55</td></tr><tr><td>150</td><td>60</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>80</td></tr><tr><td>300</td><td>90</td></tr><tr><td>350</td><td>100</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimension (mm)	Max. permissible load rate (%)	125	55	150	60	200	70	250	80	300	90	350	100	400	100		
	Heatsink dimension (mm)	Max. permissible load rate (%)																				
125	55																					
150	60																					
200	70																					
250	80																					
300	90																					
350	100																					
400	100																					
	Motor with brake	3.17 ± 10%																				

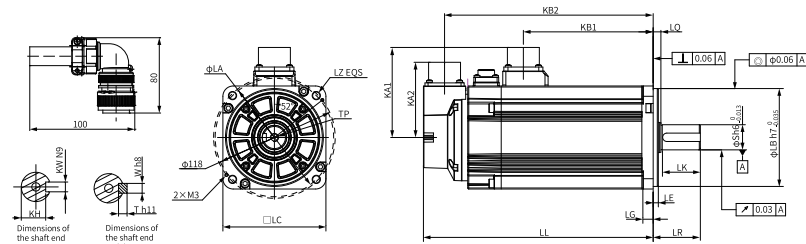
Electrical specifications of the brake

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

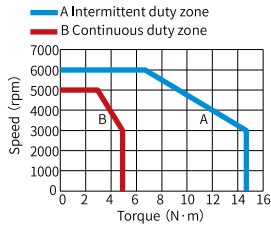
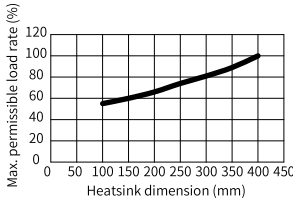
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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)

4.3.8 MS1H2-15C30CD-A33*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			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.35 ± 10%		
	Motor with brake	3.17 ± 10%		

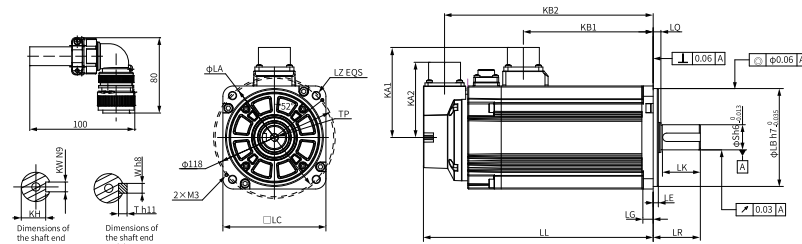
Electrical specifications of the brake

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

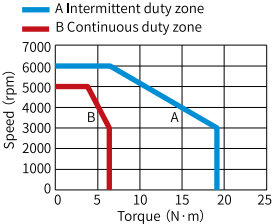
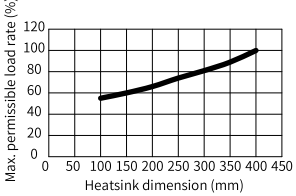
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
45	≤ 686	≤ 196

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-A6/S63*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%		

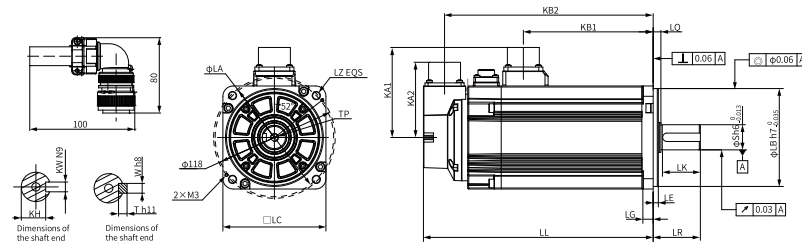
Electrical specifications of the brake

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	350 ^{-0.62}	200 ^{-0.2}	8	8	7	5.5 (6.55)

4.3.11 MS1H2-20C30CD-A6/S63*R-INT

Motor specifications			Torque-speed characteristics																			
Frame size (mm)	100		The graph plots Speed (rpm) on the y-axis (0 to 7000) against Torque (N·m) on the x-axis (0 to 25). Two duty zones are shown: Zone A (Intermittent) in blue and Zone B (Continuous) in red. Zone B is a horizontal line at 5000 rpm from 0 to 6.36 N·m, then drops vertically to 0 at 6.36 N·m. Zone A is a horizontal line at 6000 rpm from 0 to 10 N·m, then slopes down to 3000 rpm at 20 N·m, and finally drops vertically to 0 at 20 N·m. <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>5000</td></tr><tr><td>6.36</td><td>6000</td><td>5000</td></tr><tr><td>10</td><td>6000</td><td>0</td></tr><tr><td>20</td><td>3000</td><td>0</td></tr><tr><td>20</td><td>0</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	6.36	6000	5000	10	6000	0	20	3000	0	20	0	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																				
0	6000	5000																				
6.36	6000	5000																				
10	6000	0																				
20	3000	0																				
20	0	0																				
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																					
Maximum speed (rpm)	6000																					
Torque coefficient (N·m/A)	1.19		Heatsink-based derating curve The graph plots Max. permissible load rate (%) on the y-axis (0 to 120) against Heatsink dimension (mm) on the x-axis (0 to 450). A single black curve shows the relationship, starting at approximately 50% load rate for a 100mm heatsink and increasing to 100% load rate for a 400mm heatsink. <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimension (mm)</th><th>Max. permissible load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>50</td></tr><tr><td>150</td><td>55</td></tr><tr><td>200</td><td>60</td></tr><tr><td>250</td><td>65</td></tr><tr><td>300</td><td>70</td></tr><tr><td>350</td><td>80</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimension (mm)	Max. permissible load rate (%)	100	50	150	55	200	60	250	65	300	70	350	80	400	100		
Heatsink dimension (mm)	Max. permissible load rate (%)																					
100	50																					
150	55																					
200	60																					
250	65																					
300	70																					
350	80																					
400	100																					
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92 ± 10%																				
	Motor with brake	3.74 ± 10%																				

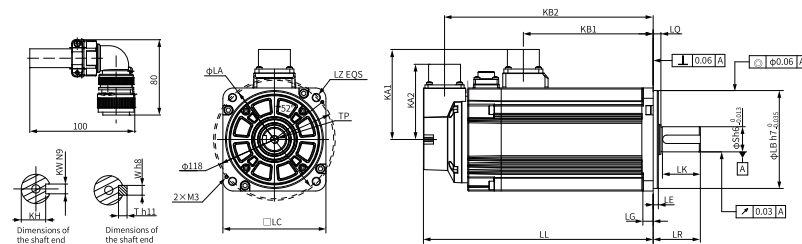
Electrical specifications of the brake

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-A33*R-INT

Motor specifications			Torque-speed characteristics																			
Frame size (mm)	100		A line graph showing speed in rpm on the y-axis (0 to 7000) versus torque in N·m on the x-axis (0 to 25). Two duty zones are plotted: Zone A (Intermittent duty zone) in blue and Zone B (Continuous duty zone) in red. Zone A starts at 6000 rpm for 0 to 10 N·m, then decreases linearly to 3000 rpm at 20 N·m, where it drops vertically to 0. Zone B starts at 6000 rpm for 0 to 5 N·m, then decreases linearly to 3000 rpm at 7 N·m, where it drops vertically to 0. <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>6000</td></tr><tr><td>5</td><td>6000</td><td>6000</td></tr><tr><td>7</td><td>6000</td><td>3000</td></tr><tr><td>10</td><td>6000</td><td>0</td></tr><tr><td>20</td><td>3000</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	6000	5	6000	6000	7	6000	3000	10	6000	0	20	3000	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																				
0	6000	6000																				
5	6000	6000																				
7	6000	3000																				
10	6000	0																				
20	3000	0																				
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																					
Maximum speed (rpm)	6000																					
Torque coefficient (N·m/A)	1.19		Heatsink-based derating curve																			
Rotor moment of inertia (kg·cm ²)	Motor without brake	2.92 ± 10%	A line graph showing the maximum permissible load rate in percent on the y-axis (0 to 120) versus heatsink dimension in mm on the x-axis (0 to 450). The curve starts at approximately 55% for 125 mm and increases to 100% for 400 mm. <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimension (mm)</th><th>Max. permissible load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>55</td></tr><tr><td>150</td><td>60</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>80</td></tr><tr><td>300</td><td>90</td></tr><tr><td>350</td><td>100</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimension (mm)	Max. permissible load rate (%)	125	55	150	60	200	70	250	80	300	90	350	100	400	100		
	Heatsink dimension (mm)	Max. permissible load rate (%)																				
125	55																					
150	60																					
200	70																					
250	80																					
300	90																					
350	100																					
400	100																					
	Motor with brake	3.74 ± 10%																				

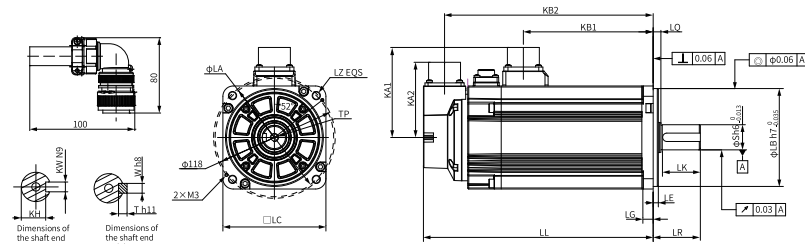
Electrical specifications of the brake

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-A6/S63*R-INT

Motor specifications			Torque-speed characteristics																												
Frame size (mm)	100		Speed (rpm) vs Torque (N·m) graph. The graph shows two duty zones: A (Intermittent duty zone) and B (Continuous duty zone). Zone A is represented by a blue line and Zone B by a red line. The x-axis is Torque (N·m) from 0 to 30, and the y-axis is Speed (rpm) from 0 to 7000. <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>5</td><td>6000</td><td>5000</td></tr><tr><td>7.96</td><td>6000</td><td>5000</td></tr><tr><td>10</td><td>6000</td><td>3000</td></tr><tr><td>15</td><td>4000</td><td>-</td></tr><tr><td>20</td><td>3000</td><td>-</td></tr><tr><td>23.9</td><td>3000</td><td>-</td></tr><tr><td>25</td><td>3000</td><td>-</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	5	6000	5000	7.96	6000	5000	10	6000	3000	15	4000	-	20	3000	-	23.9	3000	-	25	3000	-
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																													
0	6000	5000																													
5	6000	5000																													
7.96	6000	5000																													
10	6000	3000																													
15	4000	-																													
20	3000	-																													
23.9	3000	-																													
25	3000	-																													
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																														
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49 ± 10%																													
	Motor with brake	4.3 ± 10%																													

Heatsink-based derating curve																	
Max. permissible load rate (%) vs Heatsink dimension (mm) graph. The graph shows a single curve representing the derating factor. The x-axis is Heatsink dimension (mm) from 0 to 450, and the y-axis is Max. permissible load rate (%) from 0 to 120. <table border="1"><caption>Approximate data points for Heatsink-based Derating Curve</caption><thead><tr><th>Heatsink dimension (mm)</th><th>Max. permissible load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>50</td></tr><tr><td>150</td><td>55</td></tr><tr><td>200</td><td>60</td></tr><tr><td>250</td><td>65</td></tr><tr><td>300</td><td>70</td></tr><tr><td>350</td><td>80</td></tr><tr><td>400</td><td>95</td></tr></tbody></table>		Heatsink dimension (mm)	Max. permissible load rate (%)	100	50	150	55	200	60	250	65	300	70	350	80	400	95
Heatsink dimension (mm)	Max. permissible load rate (%)																
100	50																
150	55																
200	60																
250	65																
300	70																
350	80																
400	95																

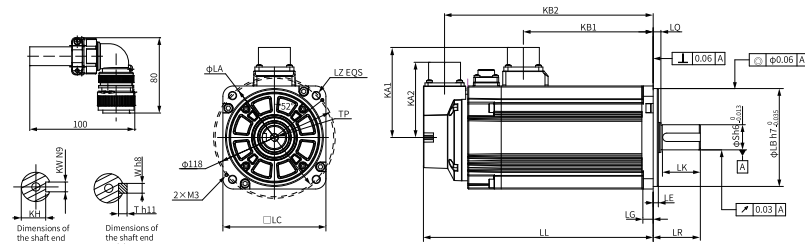
Electrical specifications of the brake

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-A33*R-INT

Motor specifications			Torque-speed characteristics																						
Frame size (mm)	100		A Intermittent duty zone B Continuous duty zone <table border="1"><caption>Data points for Torque-Speed Characteristics</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>5000</td></tr><tr><td>5</td><td>6000</td><td>5000</td></tr><tr><td>7.96</td><td>6000</td><td>5000</td></tr><tr><td>10</td><td>5500</td><td>0</td></tr><tr><td>24</td><td>3000</td><td>0</td></tr><tr><td>25</td><td>0</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	5	6000	5000	7.96	6000	5000	10	5500	0	24	3000	0	25	0	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																							
0	6000	5000																							
5	6000	5000																							
7.96	6000	5000																							
10	5500	0																							
24	3000	0																							
25	0	0																							
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																								
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49 ± 10%																							
	Motor with brake	4.3 ± 10%																							

Heatsink-based derating curve															
Max. permissible load rate (%) Heatsink dimension (mm) <table border="1"><caption>Data points for Heatsink-based Derating Curve</caption><thead><tr><th>Heatsink dimension (mm)</th><th>Max. permissible load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>55</td></tr><tr><td>150</td><td>60</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>80</td></tr><tr><td>300</td><td>90</td></tr><tr><td>350</td><td>100</td></tr></tbody></table>		Heatsink dimension (mm)	Max. permissible load rate (%)	125	55	150	60	200	70	250	80	300	90	350	100
Heatsink dimension (mm)	Max. permissible load rate (%)														
125	55														
150	60														
200	70														
250	80														
300	90														
350	100														

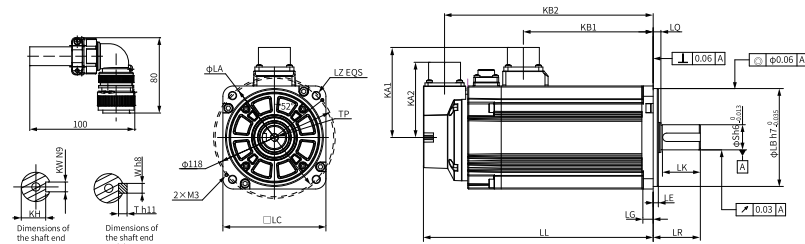
Electrical specifications of the brake

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)

4.3.15 MS1H2-25C30CD-A6/S63*R-INT

Motor specifications			Torque-speed characteristics																						
Frame size (mm)	100		— A Intermittent duty zone — B Continuous duty zone <table border="1"><caption>Data points for Torque-Speed Characteristics</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>6000</td></tr><tr><td>5</td><td>6000</td><td>5000</td></tr><tr><td>7.96</td><td>6000</td><td>5000</td></tr><tr><td>10</td><td>6000</td><td>3000</td></tr><tr><td>24</td><td>3000</td><td>3000</td></tr><tr><td>25</td><td>0</td><td>3000</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	6000	5	6000	5000	7.96	6000	5000	10	6000	3000	24	3000	3000	25	0	3000
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																							
0	6000	6000																							
5	6000	5000																							
7.96	6000	5000																							
10	6000	3000																							
24	3000	3000																							
25	0	3000																							
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																								
Rotor moment of inertia (kg·cm ²)	Motor without brake	3.49 ± 10%																							
	Motor with brake	4.3 ± 10%																							

Heatsink-based derating curve															
Max. permissible load rate (%) <table border="1"><caption>Data points for Heatsink-based Derating Curve</caption><thead><tr><th>Heatsink dimension (mm)</th><th>Max. permissible load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>50</td></tr><tr><td>150</td><td>60</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>80</td></tr><tr><td>300</td><td>90</td></tr><tr><td>350</td><td>100</td></tr></tbody></table> Heatsink dimension (mm)		Heatsink dimension (mm)	Max. permissible load rate (%)	100	50	150	60	200	70	250	80	300	90	350	100
Heatsink dimension (mm)	Max. permissible load rate (%)														
100	50														
150	60														
200	70														
250	80														
300	90														
350	100														

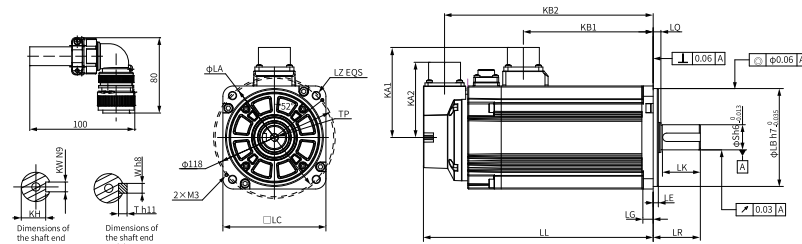
Electrical specifications of the brake

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-A6/S63*R-INT

Motor specifications			Torque-speed characteristics																	
Frame size (mm)	130		A line graph showing the torque-speed characteristics of the motor. The y-axis is 'Speed (rpm)' ranging from 0 to 7000 in increments of 1000. The x-axis is 'Torque (N·m)' ranging from 0 to 28 in increments of 4. There are two curves: a blue line labeled 'A Intermittent duty zone' and a red line labeled 'B Continuous duty zone'. Curve A starts at 6000 rpm for 0 to 8 N·m, then decreases linearly to 3000 rpm at 24 N·m, where it drops vertically to 0. Curve B starts at 5000 rpm for 0 to 8 N·m, then decreases linearly to 3000 rpm at 10 N·m, where it drops vertically to 0. <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>6000</td><td>5000</td></tr><tr><td>8</td><td>6000</td><td>5000</td></tr><tr><td>10</td><td>5400</td><td>3000</td></tr><tr><td>24</td><td>3000</td><td>-</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	6000	5000	8	6000	5000	10	5400	3000	24	3000	-	
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																		
0	6000	5000																		
8	6000	5000																		
10	5400	3000																		
24	3000	-																		
Inertia, capacity	Low inertia, medium capacity																			
Rated power (kW)	3.0																			
Voltage (V)	220																			
Rated torque (N·m)	9.8																			
Maximum torque (N·m)	24.5																			
Rated 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%	A line graph showing the heatsink-based derating curve. The y-axis is 'Max. allowable load rate (%)' ranging from 0 to 120 in increments of 20. The x-axis is 'Heatsink dimensions (mm)' ranging from 100 to 450 in increments of 50. The curve starts at approximately 35% load rate for 125 mm dimensions and increases non-linearly to 100% load rate at 425 mm dimensions. <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>35</td></tr><tr><td>150</td><td>45</td></tr><tr><td>200</td><td>65</td></tr><tr><td>250</td><td>75</td></tr><tr><td>300</td><td>85</td></tr><tr><td>350</td><td>95</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	125	35	150	45	200	65	250	75	300	85	350	95	400	100
	Heatsink dimensions (mm)	Max. allowable load rate (%)																		
125	35																			
150	45																			
200	65																			
250	75																			
300	85																			
350	95																			
400	100																			
Motor with brake	9.38 ± 10%																			

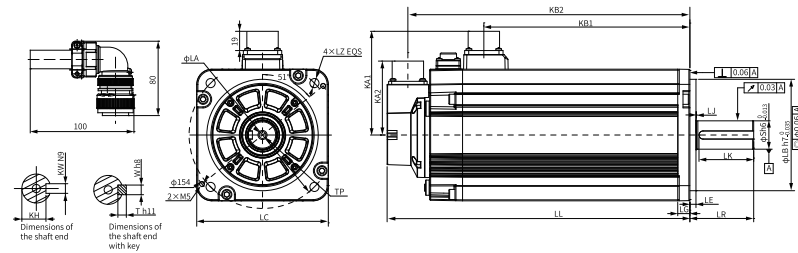
Electrical specifications of the brake

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

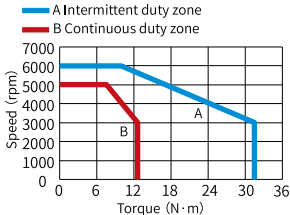
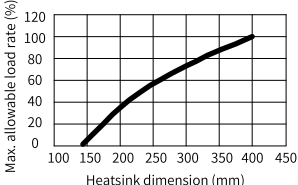
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

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	530 ^{-0.62}	240 ^{-0.2}	8	8	7	10.0 (11.9)

4.3.21 MS1H2-40C30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130		 A graph showing Speed (rpm) on the y-axis (0 to 7000) versus Torque (N·m) on the x-axis (0 to 36). Two duty zones are plotted: A (Intermittent) in blue and B (Continuous) in red. Zone A starts at 6000 rpm for 0-12 N·m and then decreases linearly to 3000 rpm at 30 N·m. Zone B starts at 5000 rpm for 0-8 N·m and then decreases linearly to 3000 rpm at 12 N·m. Both zones drop vertically to 0 rpm at their respective torque limits (30 N·m for A, 12 N·m for B).	
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		Heatsink-based derating curve  A graph showing Max. allowable load rate (%) on the y-axis (0 to 120) versus Heatsink dimension (mm) on the x-axis (100 to 450). The curve starts at approximately 10% load rate for 100 mm and increases non-linearly to 100% load rate at 400 mm.	
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%		

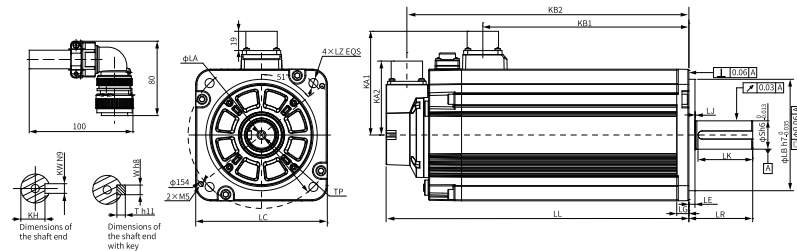
Electrical specifications of the brake

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

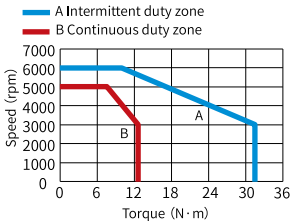
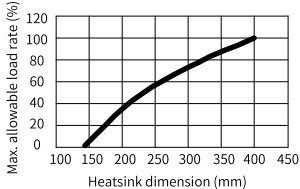
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63 ± 1	145	4 × $\phi 9$	102.4	165.5	73	215.5 (240.5)	10.5	6 ± 0.3
IJ	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-A33*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			Heatsink-based derating curve	
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%			

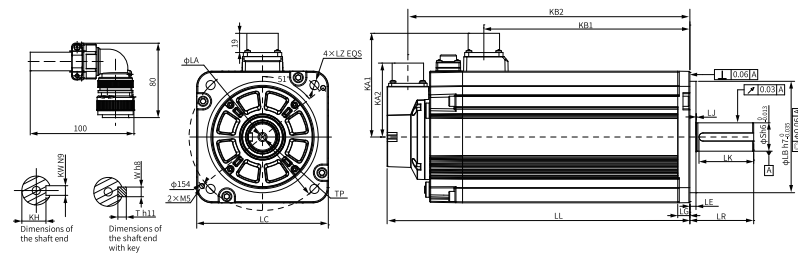
Electrical specifications of the brake

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

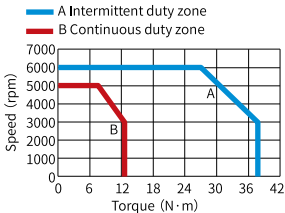
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
63	≤ 1176	≤ 392

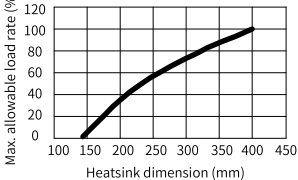
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	236 (261)	63 ± 1	145	4 × $\phi 9$	102.4	165.5	73	215.5 (240.5)	10.5	6 ± 0.3
IJ	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-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130			 Graph showing Speed (rpm) vs Torque (N·m). The graph has two duty zones: A (Intermittent duty zone) and B (Continuous duty zone). Zone A is represented by a blue line and Zone B by a red line. The x-axis ranges from 0 to 42 N·m, and the y-axis ranges from 0 to 7000 rpm. Zone A starts at 0 torque and 6000 rpm, remains constant until 24 N·m, then decreases linearly to 3000 rpm at 36 N·m. Zone B starts at 0 torque and 5000 rpm, remains constant until 12 N·m, then decreases linearly to 3000 rpm at 36 N·m.
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			
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%		

Heatsink-based derating curve	
 Graph showing Max. allowable load rate (%) vs Heatsink dimension (mm). The x-axis ranges from 100 to 450 mm, and the y-axis ranges from 0 to 120%. The curve starts at approximately 10% load rate for 100 mm dimension and increases to 100% load rate for 450 mm dimension.	

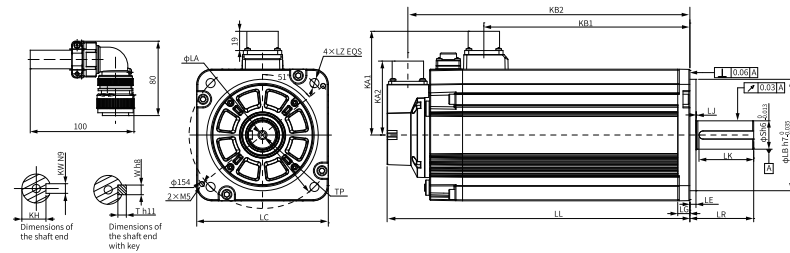
Electrical specifications of the brake

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

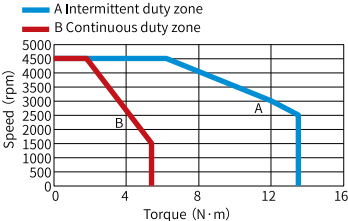
Dimensions (mm)



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
IJ	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)

4.4 MS1H3 Motors with Medium Inertia and Medium Capacity

4.4.1 MS1H3-85B15CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130		 Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 5000 rpm, and the x-axis ranges from 0 to 16 N·m. Two curves are shown: A (Intermittent duty zone) and B (Continuous duty zone). Curve A starts at 4500 rpm for 0 N·m and decreases to 2500 rpm at 14 N·m. Curve B starts at 4500 rpm for 0 N·m and decreases to 1500 rpm at 4 N·m.	
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			
Rated current (A)	6.6			
Maximum current (A)	17.2		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	0.93			
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56 ± 10%		
	Motor with brake	15.8 ± 10%		

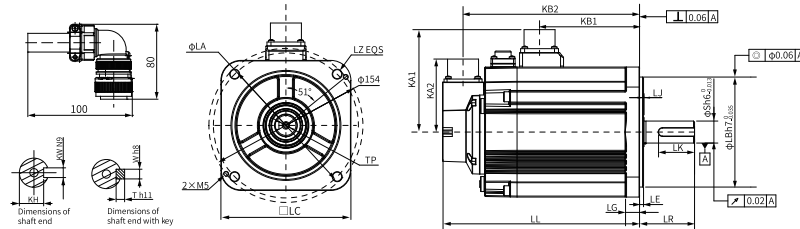
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 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 × $\phi 9$	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-A33*R-INT

Motor specifications			Torque-speed characteristics																									
Frame size (mm)	130		A line graph showing speed (rpm) on the y-axis (0 to 5000) versus torque (N·m) on the x-axis (0 to 16). Two duty zones are plotted: Zone A (Intermittent) in blue and Zone B (Continuous) in red. Zone A starts at 4500 rpm for 0 to 6 Nm, then decreases linearly to 2500 rpm at 14 Nm, where it drops vertically to 0. Zone B starts at 4500 rpm for 0 to 2 Nm, then decreases linearly to 1500 rpm at 5 Nm, where it drops vertically to 0. <table border="1"><caption>Torque-Speed Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>4500</td><td>4500</td></tr><tr><td>2</td><td>4500</td><td>4500</td></tr><tr><td>4</td><td>4500</td><td>3000</td></tr><tr><td>5</td><td>4000</td><td>1500</td></tr><tr><td>6</td><td>3500</td><td>0</td></tr><tr><td>14</td><td>2500</td><td>0</td></tr><tr><td>15</td><td>0</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	4500	4500	2	4500	4500	4	4500	3000	5	4000	1500	6	3500	0	14	2500	0	15	0	0
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																										
0	4500	4500																										
2	4500	4500																										
4	4500	3000																										
5	4000	1500																										
6	3500	0																										
14	2500	0																										
15	0	0																										
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																											
Maximum current (A)	17.2																											
Rated speed (rpm)	1500																											
Maximum speed (rpm)	4500																											
Torque coefficient (N·m/A)	0.93		Heatsink-based derating curve																									
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56 ± 10%	A line graph showing max allowable load rate (%) on the y-axis (0 to 120) versus heatsink dimensions (mm) on the x-axis (100 to 450). The curve starts at approximately 60% for 125 mm and increases linearly to 100% for 400 mm. <table border="1"><caption>Heatsink Derating Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>60</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	125	60	400	100																		
	Heatsink dimensions (mm)	Max. allowable load rate (%)																										
125	60																											
400	100																											
Motor with brake	15.8 ± 10%																											

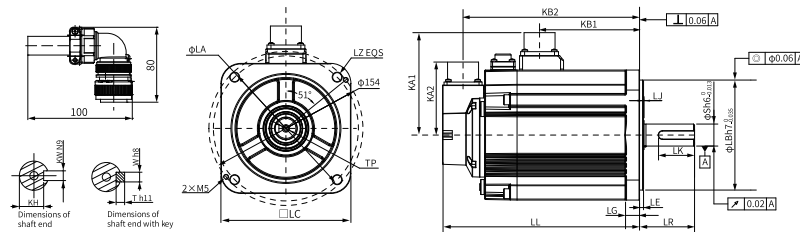
Electrical specifications of the brake

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-A33*R-INT

Motor specifications			Torque-speed characteristics																						
Frame size (mm)	130		A line graph showing speed in rpm on the y-axis (0 to 5000) versus torque in N·m on the x-axis (0 to 16). Two curves are shown: a red line for 'B Continuous duty zone' and a blue line for 'A Intermittent duty zone'. The red line starts at 4500 rpm for 0-4 N·m, drops to 1500 rpm at 5 N·m, and ends at 6 N·m. The blue line starts at 4500 rpm for 0-6 N·m, then slopes down to 2500 rpm at 14 N·m, where it drops vertically to 0 rpm. <table border="1"><caption>Torque-Speed Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone B</th><th>Speed (rpm) - Zone A</th></tr></thead><tbody><tr><td>0</td><td>4500</td><td>4500</td></tr><tr><td>4</td><td>4500</td><td>4500</td></tr><tr><td>5</td><td>1500</td><td>4500</td></tr><tr><td>6</td><td>0</td><td>4500</td></tr><tr><td>14</td><td>-</td><td>2500</td></tr><tr><td>14.5</td><td>-</td><td>0</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone B	Speed (rpm) - Zone A	0	4500	4500	4	4500	4500	5	1500	4500	6	0	4500	14	-	2500	14.5	-	0
Torque (N·m)	Speed (rpm) - Zone B	Speed (rpm) - Zone A																							
0	4500	4500																							
4	4500	4500																							
5	1500	4500																							
6	0	4500																							
14	-	2500																							
14.5	-	0																							
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																								
Maximum current (A)	8.5																								
Rated speed (rpm)	1500																								
Maximum speed (rpm)	4500																								
Torque coefficient (N·m/A)	1.84		Heatsink-based derating curve																						
Rotor moment of inertia (kg·cm ²)	Motor without brake	13.56 ± 10%	A line graph showing the maximum allowable load rate in percent on the y-axis (0 to 120) versus heatsink dimensions in mm on the x-axis (100 to 450). The curve is a straight line starting at approximately 60% for 125 mm and reaching 100% for 400 mm. <table border="1"><caption>Heatsink Derating Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>60</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	125	60	400	100															
	Heatsink dimensions (mm)	Max. allowable load rate (%)																							
125	60																								
400	100																								
Motor with brake	15.8 ± 10%																								

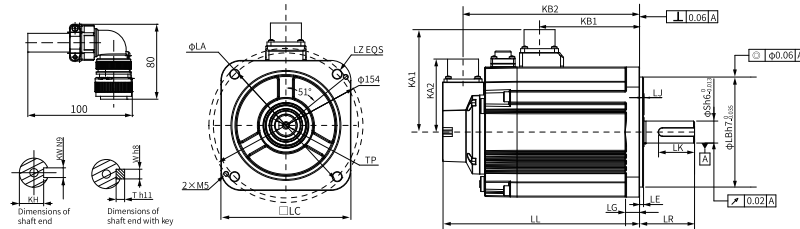
Electrical specifications of the brake

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-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130		Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 5000 rpm, and the x-axis ranges from 0 to 24 N·m. Two curves are shown: A (Intermittent duty zone) and B (Continuous duty zone). Curve A starts at 4500 rpm for 0 N·m and decreases to 2500 rpm at 24 N·m. Curve B starts at 4500 rpm for 0 N·m and decreases to 1500 rpm at 12 N·m.	
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			
Maximum current (A)	27.3			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	0.89			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25 ± 10%	Graph showing Max. allowable load rate (%) vs Heatsink dimensions (mm). The y-axis ranges from 0 to 120%, and the x-axis ranges from 100 to 450 mm. The curve starts at approximately 60% for 100 mm and increases to 100% for 450 mm.	
	Motor with brake	21.5 ± 10%		

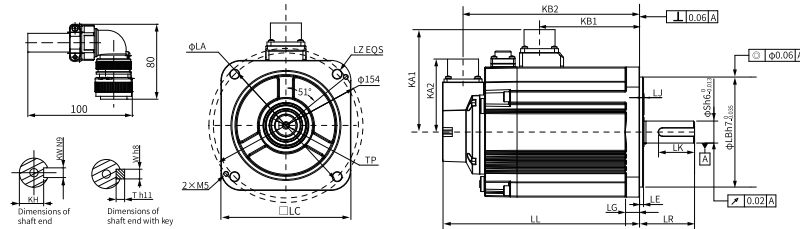
Electrical specifications of the brake

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 × $\phi 9$	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° -0.62	18° -0.2	8	8	7	7.1 (8.9)	

4.4.6 MS1H3-13C15CB-A33*R-INT

Motor specifications			Torque-speed characteristics																			
Frame size (mm)	130		A line graph showing speed in rpm on the y-axis (0 to 5000) versus torque in N·m on the x-axis (0 to 24). Two lines are plotted: a blue line for 'A Intermittent duty zone' and a red line for 'B Continuous duty zone'. Line A starts at 4500 rpm for 0 to 8 N·m, then decreases linearly to 2500 rpm at 20 N·m, and drops vertically to 0 at 22 N·m. Line B starts at 4500 rpm for 0 to 3 N·m, then decreases linearly to 1500 rpm at 8 N·m, and drops vertically to 0 at 9 N·m. <table border="1"><caption>Torque-Speed Characteristics Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>4500</td><td>4500</td></tr><tr><td>3</td><td>4500</td><td>4500</td></tr><tr><td>8</td><td>4500</td><td>1500</td></tr><tr><td>20</td><td>2500</td><td>-</td></tr><tr><td>22</td><td>0</td><td>-</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	4500	4500	3	4500	4500	8	4500	1500	20	2500	-	22	0	-
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																				
0	4500	4500																				
3	4500	4500																				
8	4500	1500																				
20	2500	-																				
22	0	-																				
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 m																					
Rated current (A)	10.5																					
Maximum current (A)	27.3																					
Rated speed (rpm)	1500																					
Maximum speed (rpm)	4500																					
Torque coefficient (N·m/A)	0.89		Heatsink-based derating curve																			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25 ± 10%	A line graph showing max allowable load rate in % on the y-axis (0 to 120) versus heatsink dimensions in mm on the x-axis (100 to 450). A single black line starts at approximately 60% for 125 mm and increases linearly to 100% for 400 mm. <table border="1"><caption>Heatsink-based Derating Curve Data</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>125</td><td>60</td></tr><tr><td>400</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	125	60	400	100												
	Heatsink dimensions (mm)	Max. allowable load rate (%)																				
125	60																					
400	100																					
Motor with brake	21.5 ± 10%																					

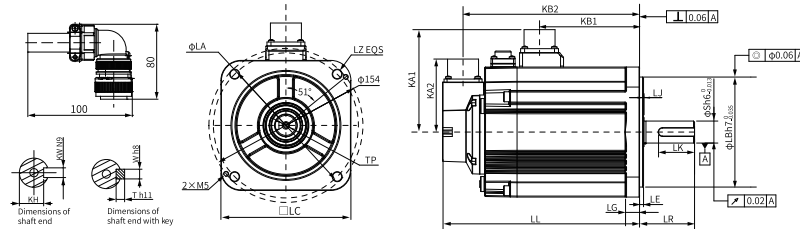
Electrical specifications of the brake

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-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130		Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 5000 rpm, and the x-axis ranges from 0 to 24 N·m. Two curves are shown: A (Intermittent duty zone) and B (Continuous duty zone). Curve A starts at 4500 rpm for 0 N·m and decreases to 2500 rpm at 24 N·m. Curve B starts at 4500 rpm for 0 N·m and decreases to 1500 rpm at 6 N·m.	
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			
Maximum current (A)	12.6			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.85			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25 ± 10%		
	Motor with brake	21.5 ± 10%		

Heatsink-based derating curve	
Graph showing Max. allowable load rate (%) vs Heatsink dimensions (mm). The y-axis ranges from 0 to 120%, and the x-axis ranges from 100 to 450 mm. The curve starts at approximately 60% for 100 mm and increases to 100% for 450 mm.	

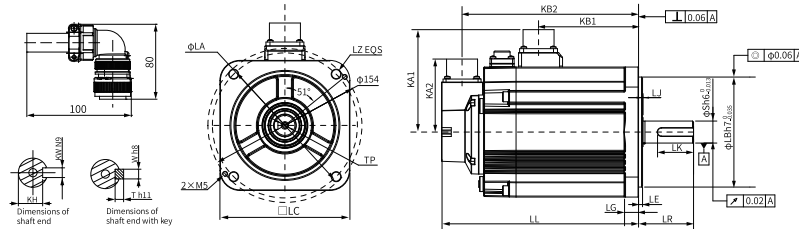
Electrical specifications of the brake

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)
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-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	130		Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 5000 rpm, and the x-axis ranges from 0 to 24 N·m. Two duty zones are shown: A (Intermittent duty zone, blue line) and B (Continuous duty zone, red line). Zone A starts at 4500 rpm for 0 N·m and drops to 2500 rpm at 24 N·m. Zone B starts at 4500 rpm for 0 N·m and drops to 1500 rpm at 6 N·m.	
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			
Maximum current (A)	12.6			
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.85			
Rotor moment of inertia (kg·cm ²)	Motor without brake	19.25 ± 10%		
	Motor with brake	21.5 ± 10%		

Heatsink-based derating curve	
Graph showing Max. allowable load rate (%) vs Heatsink dimensions (mm). The y-axis ranges from 0 to 120%, and the x-axis ranges from 100 to 450 mm. The curve shows a linear increase in load rate from approximately 60% at 100 mm to 100% at 450 mm.	

Electrical specifications of the brake

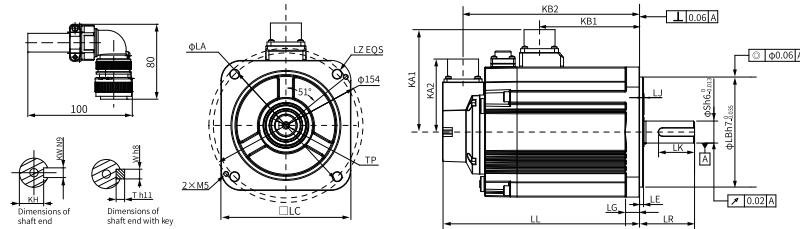
Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 10%	Excitation current (A)	Apply time (ms)	Release time (ms)	Backlash (°)
16	24	24	24	1	≤ 120	≤ 60	≤ 1

-85-

Allowable load

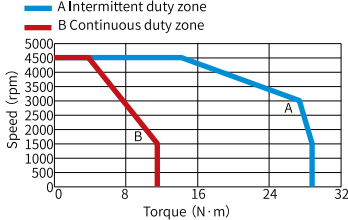
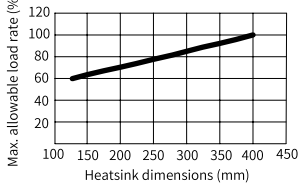
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
55	≤ 686	≤ 196

Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
130	172 (197)	55 ± 1	145	4 × $\phi 9$	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-A6/S63*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>4500</td><td>4500</td></tr><tr><td>4</td><td>4500</td><td>4500</td></tr><tr><td>8</td><td>4500</td><td>3000</td></tr><tr><td>12</td><td>4500</td><td>1500</td></tr><tr><td>16</td><td>4000</td><td>-</td></tr><tr><td>24</td><td>3000</td><td>-</td></tr><tr><td>28</td><td>1500</td><td>-</td></tr><tr><td>32</td><td>0</td><td>-</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	4500	4500	4	4500	4500	8	4500	3000	12	4500	1500	16	4000	-	24	3000	-	28	1500	-	32	0	-
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																													
0	4500	4500																													
4	4500	4500																													
8	4500	3000																													
12	4500	1500																													
16	4000	-																													
24	3000	-																													
28	1500	-																													
32	0	-																													
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																														
Maximum current (A)	17.7																														
Rated speed (rpm)	1500																														
Maximum speed (rpm)	4500																														
Torque coefficient (N·m/A)	1.87		Heatsink-based derating curve																												
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9 ± 10%	 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>100</td><td>60</td></tr><tr><td>150</td><td>65</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>75</td></tr><tr><td>300</td><td>80</td></tr><tr><td>350</td><td>85</td></tr><tr><td>400</td><td>90</td></tr><tr><td>450</td><td>95</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	100	60	150	65	200	70	250	75	300	80	350	85	400	90	450	95									
	Heatsink dimensions (mm)	Max. allowable load rate (%)																													
100	60																														
150	65																														
200	70																														
250	75																														
300	80																														
350	85																														
400	90																														
450	95																														
	Motor with brake	27.2 ± 10%																													

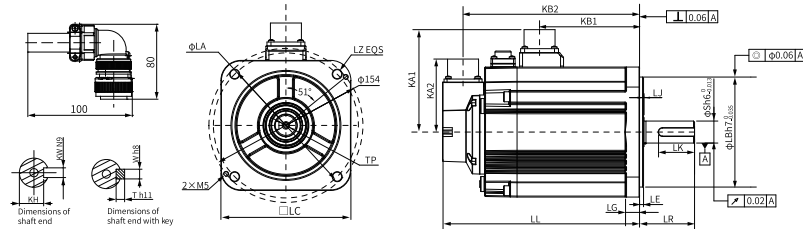
Electrical specifications of the brake

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
IJ	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-A33*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 from the Torque-Speed graph</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>4500</td><td>4500</td></tr><tr><td>4</td><td>4500</td><td>4500</td></tr><tr><td>8</td><td>4500</td><td>3000</td></tr><tr><td>12</td><td>4500</td><td>1500</td></tr><tr><td>16</td><td>4000</td><td>-</td></tr><tr><td>24</td><td>3000</td><td>-</td></tr><tr><td>28</td><td>1500</td><td>-</td></tr><tr><td>32</td><td>0</td><td>-</td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	4500	4500	4	4500	4500	8	4500	3000	12	4500	1500	16	4000	-	24	3000	-	28	1500	-	32	0	-
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																													
0	4500	4500																													
4	4500	4500																													
8	4500	3000																													
12	4500	1500																													
16	4000	-																													
24	3000	-																													
28	1500	-																													
32	0	-																													
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																														
Maximum current (A)	17.7																														
Rated speed (rpm)	1500																														
Maximum speed (rpm)	4500																														
Torque coefficient (N·m/A)	1.87																														
Rotor moment of inertia (kg·cm ²)	Motor without brake	24.9 ± 10%																													
	Motor with brake	27.2 ± 10%																													

Heatsink-based derating curve																			
Max. allowable load rate (%) Heatsink dimensions (mm) <table border="1"><caption>Approximate data points from the Heatsink-based derating curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>100</td><td>60</td></tr><tr><td>150</td><td>65</td></tr><tr><td>200</td><td>70</td></tr><tr><td>250</td><td>75</td></tr><tr><td>300</td><td>80</td></tr><tr><td>350</td><td>85</td></tr><tr><td>400</td><td>90</td></tr><tr><td>450</td><td>95</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	100	60	150	65	200	70	250	75	300	80	350	85	400	90	450	95
Heatsink dimensions (mm)	Max. allowable load rate (%)																		
100	60																		
150	65																		
200	70																		
250	75																		
300	80																		
350	85																		
400	90																		
450	95																		

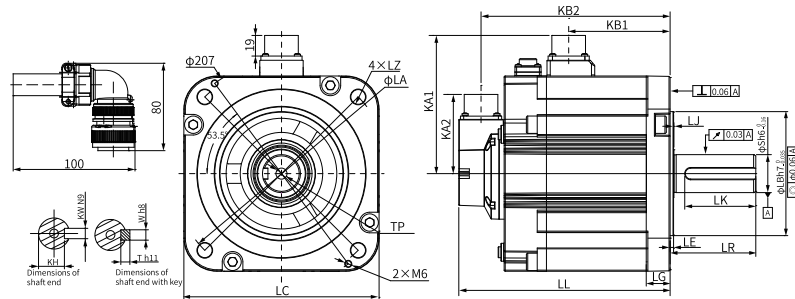
Electrical specifications of the brake

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)
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-A6/S63*R-INT

Motor specifications			Torque-speed characteristics																																		
Frame size (mm)	180		Speed (rpm) vs Torque (N·m) graph. The graph shows two duty zones: A (Intermittent duty zone) and B (Continuous duty zone). Zone A is represented by a blue line and Zone B by a red line. The x-axis ranges from 0 to 80 N·m, and the y-axis ranges from 0 to 5000 rpm. <table border="1"><caption>Data points for Torque-Speed Characteristics</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>4500</td><td>4500</td></tr><tr><td>10</td><td>4500</td><td>4500</td></tr><tr><td>20</td><td>4500</td><td>4500</td></tr><tr><td>28.4</td><td>4500</td><td>1500</td></tr><tr><td>30</td><td>4500</td><td>0</td></tr><tr><td>40</td><td>4000</td><td></td></tr><tr><td>50</td><td>3500</td><td></td></tr><tr><td>60</td><td>3000</td><td></td></tr><tr><td>70</td><td>2000</td><td></td></tr><tr><td>71.1</td><td>0</td><td></td></tr></tbody></table>		Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B	0	4500	4500	10	4500	4500	20	4500	4500	28.4	4500	1500	30	4500	0	40	4000		50	3500		60	3000		70	2000		71.1	0	
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																																			
0	4500	4500																																			
10	4500	4500																																			
20	4500	4500																																			
28.4	4500	1500																																			
30	4500	0																																			
40	4000																																				
50	3500																																				
60	3000																																				
70	2000																																				
71.1	0																																				
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																																				
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9 ± 10%																																			
	Motor with brake	72.55 ± 10%																																			

Heatsink-based derating curve															
Max. allowable load rate (%) vs Heatsink dimensions (mm) graph. The graph shows a linear relationship between the maximum allowable load rate and the heatsink dimensions. The x-axis ranges from 0 to 600 mm, and the y-axis ranges from 0 to 120%. <table border="1"><caption>Data points for Heatsink-based Derating Curve</caption><thead><tr><th>Heatsink dimensions (mm)</th><th>Max. allowable load rate (%)</th></tr></thead><tbody><tr><td>180</td><td>65</td></tr><tr><td>200</td><td>65</td></tr><tr><td>300</td><td>80</td></tr><tr><td>400</td><td>90</td></tr><tr><td>500</td><td>100</td></tr><tr><td>580</td><td>100</td></tr></tbody></table>		Heatsink dimensions (mm)	Max. allowable load rate (%)	180	65	200	65	300	80	400	90	500	100	580	100
Heatsink dimensions (mm)	Max. allowable load rate (%)														
180	65														
200	65														
300	80														
400	90														
500	100														
580	100														

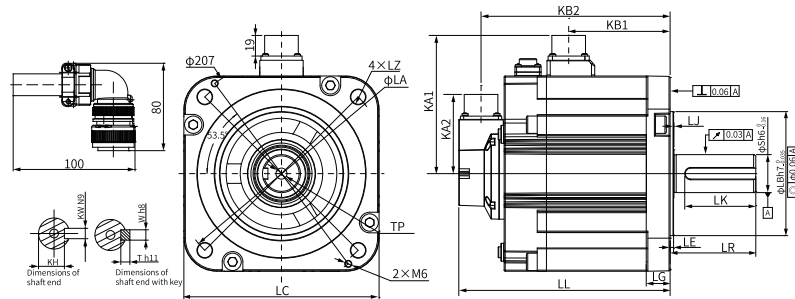
Electrical specifications of the brake

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 $\pm$ 1	200	4 $\times$ ϕ 13.5	127.4	117	73	164 (197.8)	20.5	3.2 $\pm$ 0.3
LJ	LB		S	TP	LK	KH	kW	W	T	Weight (kg)
0.3 $\pm$ 0.75	114.3		35	M12 $\times$ 25	64 ⁰ -0.74	30 ⁰ -0.2	10	10	8	17.4 (21.6)

4.4.20 MS1H3-44C15CD-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	180		Graph showing Speed (rpm) vs Torque (N·m). Zone A (Intermittent duty) is the upper curve, and Zone B (Continuous duty) is the lower curve. The graph shows a linear decrease in speed as torque increases, with a vertical drop at the maximum torque for each zone.	
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		Heatsink-based derating curve	
Rated speed (rpm)	1500		Graph showing Max. allowable load rate (%) vs Heatsink dimensions (mm). The load rate increases linearly from approximately 65% at 100mm to 100% at 600mm.	
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	1.96			
Rotor moment of inertia (kg·cm ²)	Motor without brake	64.9 ± 10%		
	Motor with brake	72.55 ± 10%		

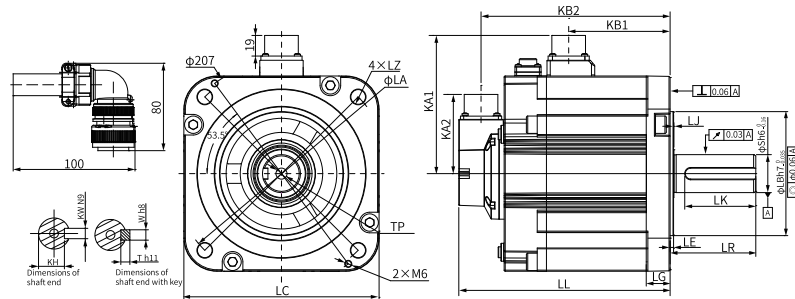
Electrical specifications of the brake

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

Allowable load

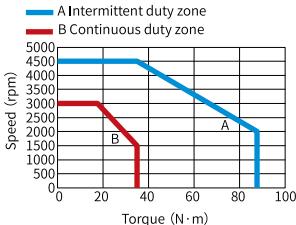
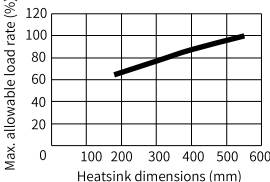
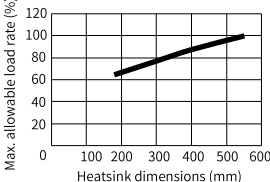
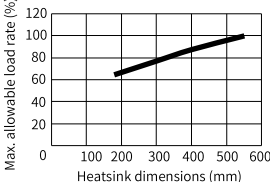
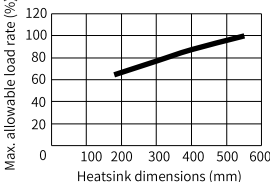
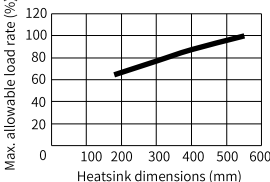
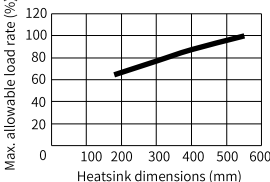
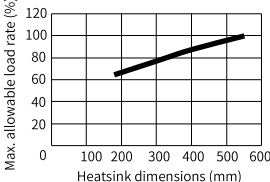
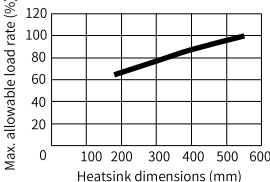
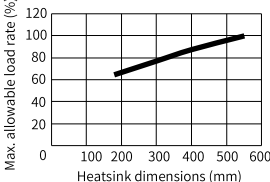
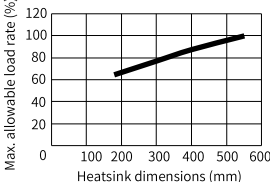
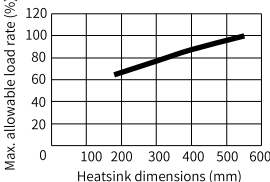
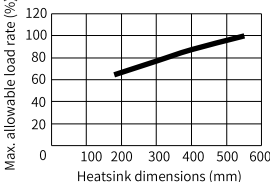
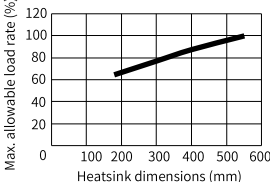
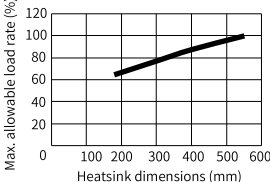
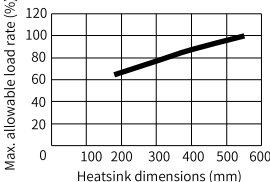
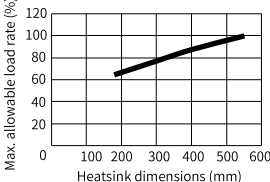
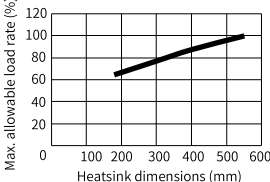
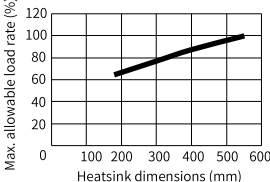
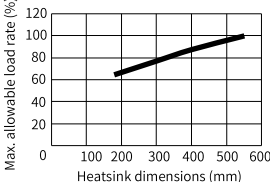
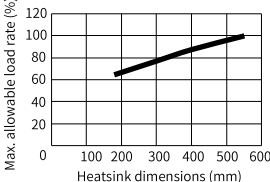
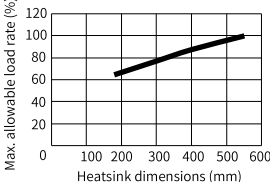
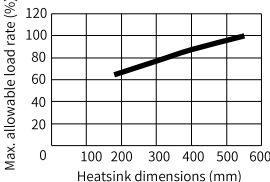
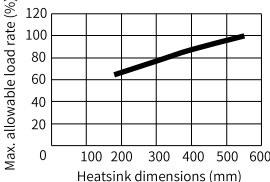
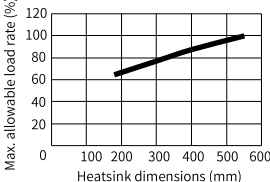
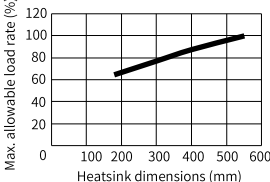
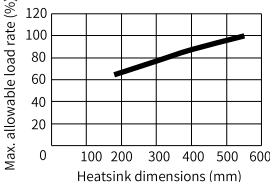
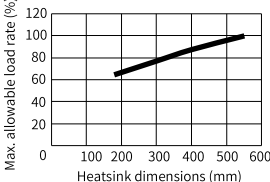
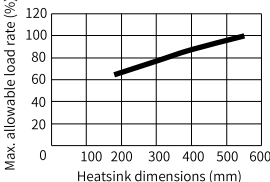
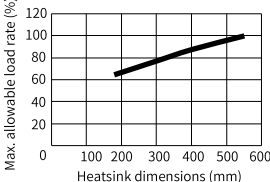
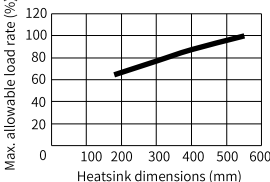
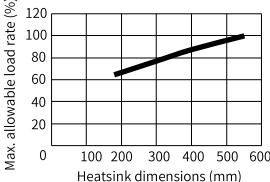
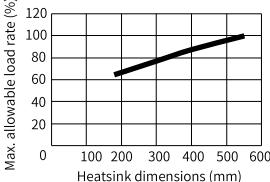
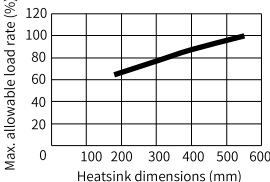
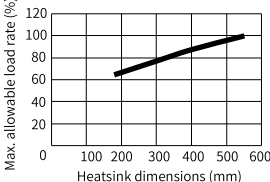
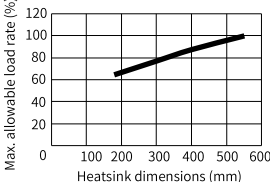
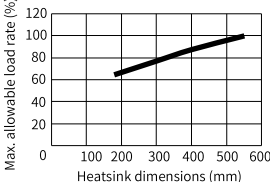
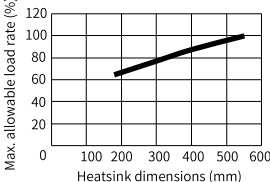
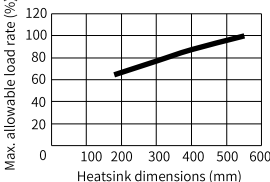
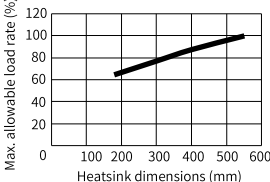
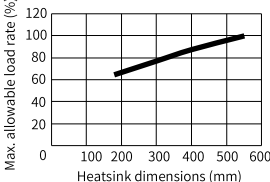
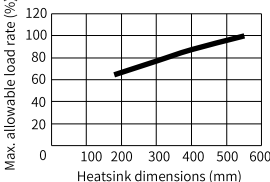
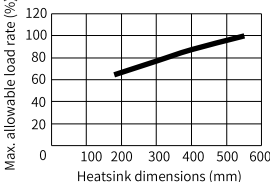
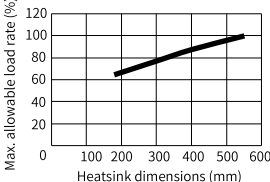
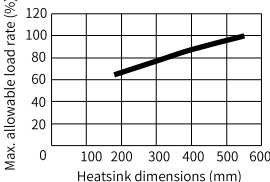
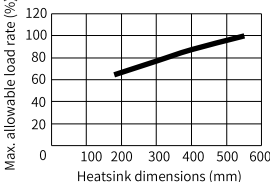
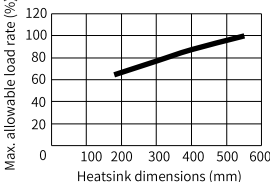
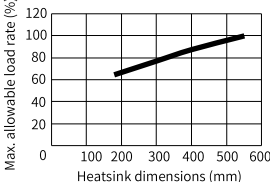
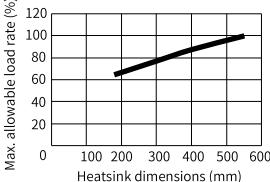
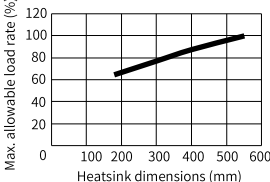
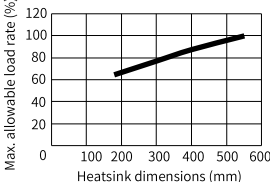
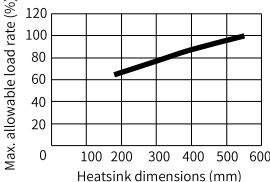
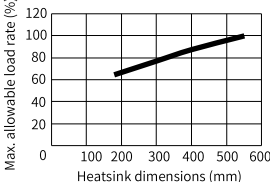
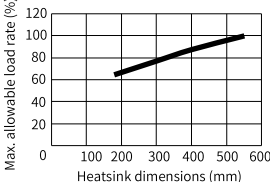
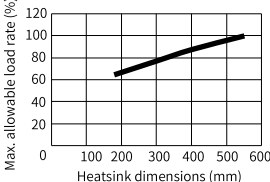
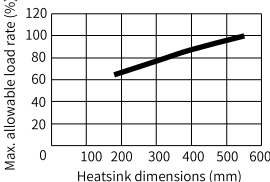
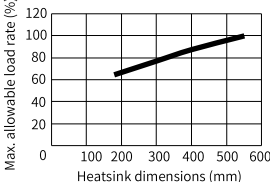
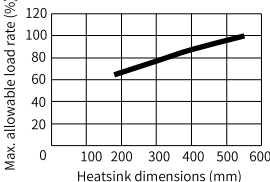
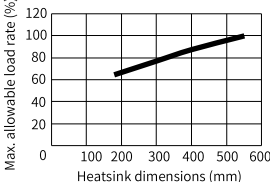
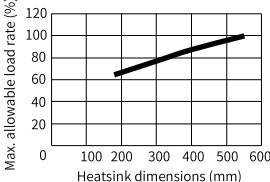
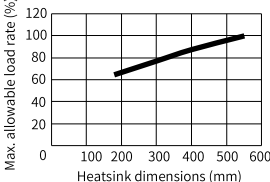
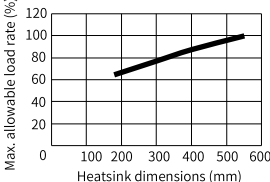
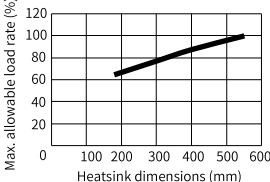
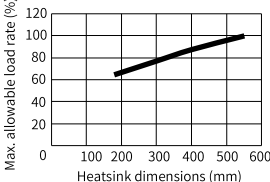
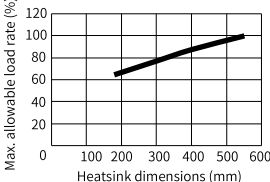
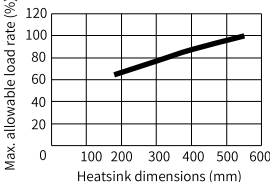
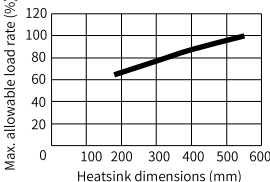
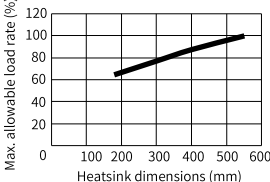
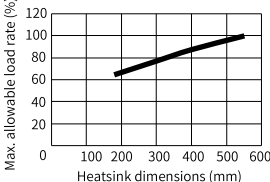
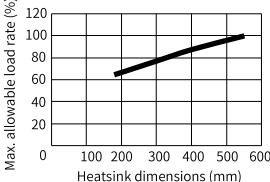
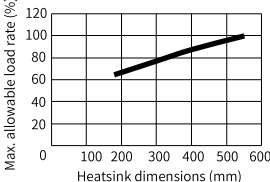
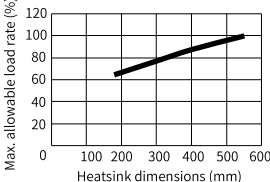
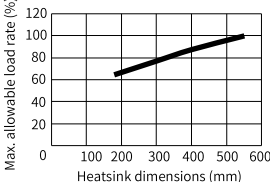
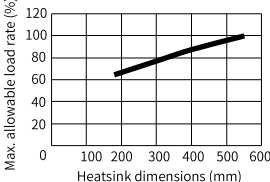
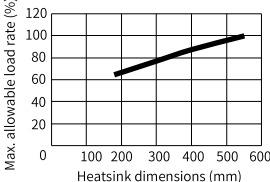
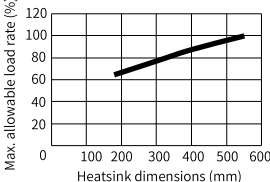
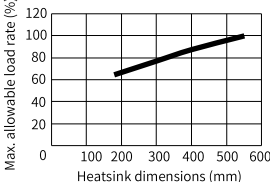
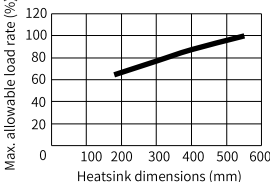
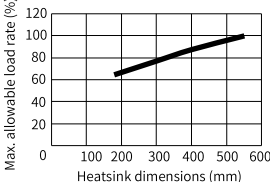
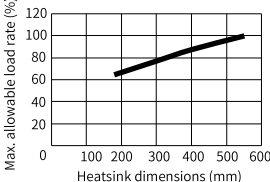
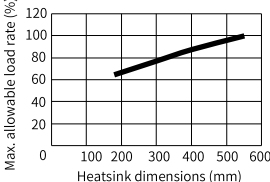
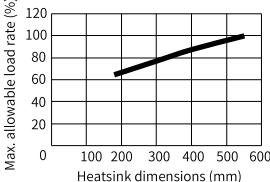
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
79	≤ 1470	≤ 490

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-A6/S63*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			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
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Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Maximum torque (N·m)	87.6			
Rated frequency (Hz)	125			
Rated current (A)	20.7			
Maximum current (A)	52		Heatsink-based derating curve	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			

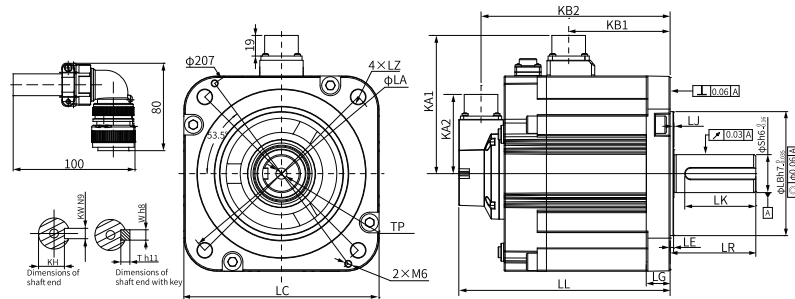
Electrical specifications of the brake

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 × $\phi 13.5$	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-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	180		Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 5000 rpm, and the x-axis ranges from 0 to 140 N·m. Two duty zones are shown: A (Intermittent duty zone, blue line) and B (Continuous duty zone, red line). Zone A starts at 4500 rpm for 0 N·m and decreases to 2000 rpm at 120 N·m. Zone B starts at 3000 rpm for 0 N·m and decreases to 1500 rpm at 40 N·m.	
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		Heatsink-based derating curve 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 700 mm. The curve starts at approximately 40% load rate for 100 mm dimensions and increases to 100% load rate for 700 mm dimensions.	
Rated speed (rpm)	1500			
Maximum speed (rpm)	4500			
Torque coefficient (N·m/A)	2.13			
Rotor moment of inertia (kg·cm ²)	Motor without brake	127.5 ± 10%		
	Motor with brake	135.15 ± 10%		

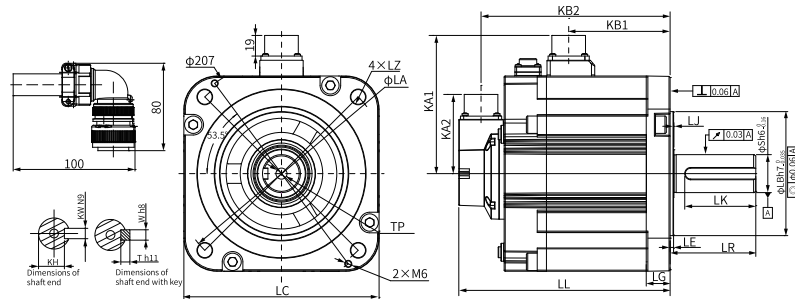
Electrical specifications of the brake

Holding torque (N·m)	Power supply voltage (VDC) ± 10%	Rated power (W)	Coil resistance (Ω) ± 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 × $\phi 13.5$	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	95 ⁰ -0.87	37 ⁰ -0.2	12	12	8	29 (33.2)	

4.4.24 MS1H3-75C15CD-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	180		Graph showing Speed (rpm) vs Torque (N·m). The y-axis ranges from 0 to 5000 rpm, and the x-axis ranges from 0 to 140 N·m. Two duty zones are shown: A (Intermittent duty zone, blue line) and B (Continuous duty zone, red line). Zone A starts at 4500 rpm for 0 N·m and decreases to 2000 rpm at 120 N·m. Zone B starts at 3000 rpm for 0 N·m and decreases to 1500 rpm at 40 N·m.	
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%	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 700 mm. The curve starts at approximately 40% for 100 mm and increases to 100% for 700 mm.	
	Motor with brake	135.15 ± 10%		

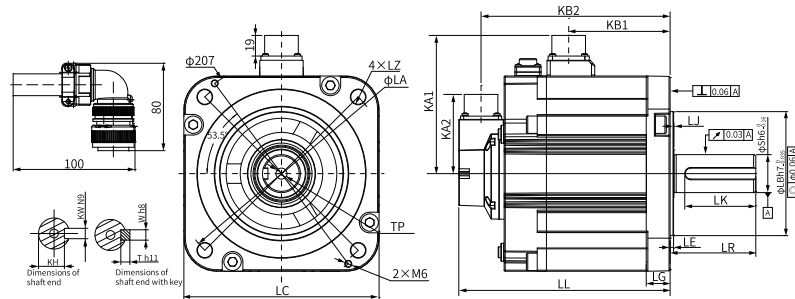
Electrical specifications of the brake

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

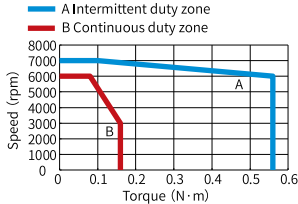
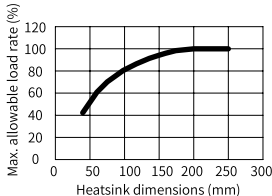
Dimensions (mm)



LC	LL	LR	LA	LZ	KA1	KB1	KA2	KB2	LG	LE
180	255 (288.8)	113 ± 1	200	4 × $\phi 13.5$	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 Motor with Medium Inertia and Small Capacity

4.5.1 MS1H4-05B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	40		 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 0.6 N·m. Two curves are shown: A (Intermittent duty zone) and B (Continuous duty zone). Curve A starts at approximately 7000 rpm at 0.1 N·m and decreases to about 6000 rpm at 0.5 N·m. Curve B starts at approximately 6000 rpm at 0.1 N·m and drops sharply to 0 at 0.2 N·m.	
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.05			
Voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated frequency (Hz)	350			
Rated current (A)	1.27		Heatsink-based derating curve  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 40% at 50 mm and increases to about 100% at 250 mm.	
Maximum current (A)	4.78			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.038 ± 10%		
	Motor with brake	0.04 ± 10%		

Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)

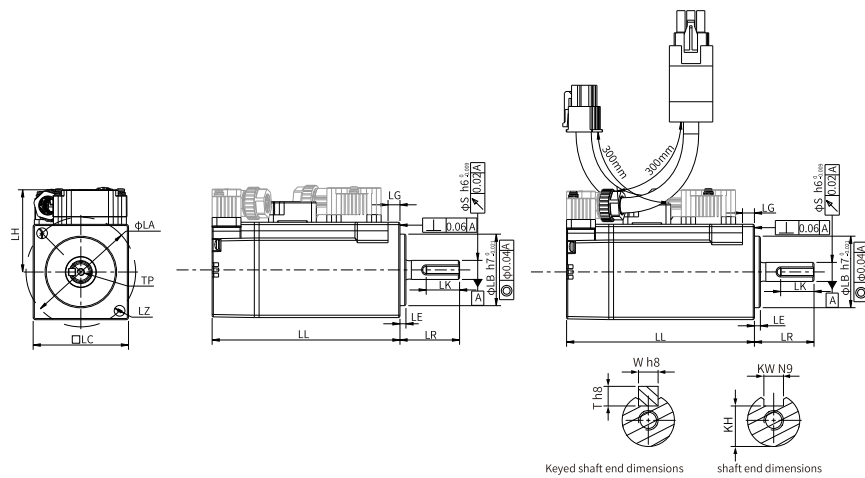


Figure 4-1 MS1H4-05B30CB-A6/S630R and MS1H4-05B30CB-A6/S632R

LL	LC	LR	LA	LZ	LH	LG	LE	
51 (78.3)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	14 ⁰ -0.36	6.2 ⁰ -0.1	3	3	3	0.24 (0.40)

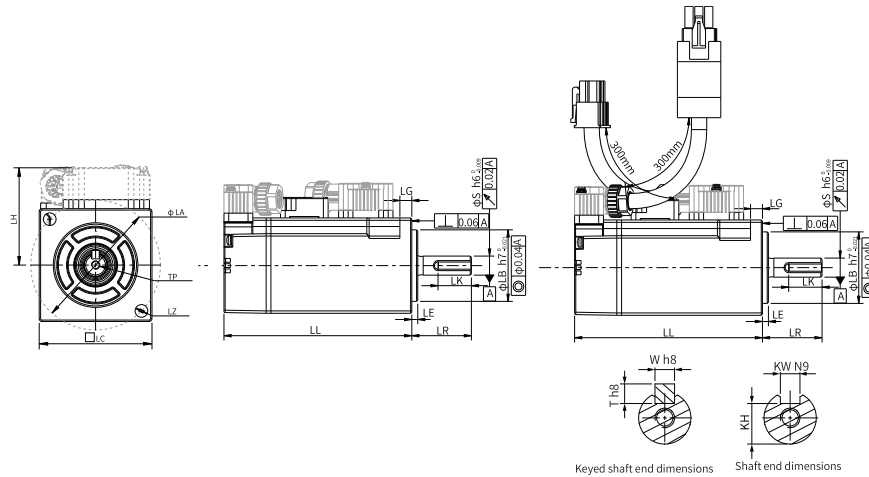
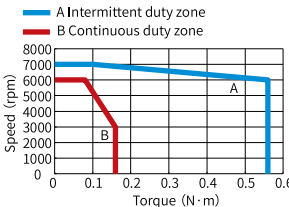
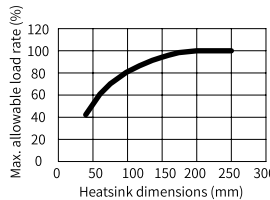


Figure 4-2 MS1H4-05B30CB-A6/S631R and MS1H4-05B30CB-A6/S634R

LL	LC	LR	LA	LZ	LH	LG	LE	
53.7 (81)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	14 ⁰ -0.36	6.2 ⁰ -0.1	3	3	3	0.26 (0.42)

4.5.2 MS1H4-05B30CB-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.05			
Voltage (V)	220			
Rated torque (N·m)	0.16			
Maximum torque (N·m)	0.56			
Rated frequency (Hz)	350			
Rated current (A)	1.27			
Maximum current (A)	4.78		Heatsink-based derating curve	
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.15			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.038 ± 10%		
	Motor with brake	0.04 ± 10%		

Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)

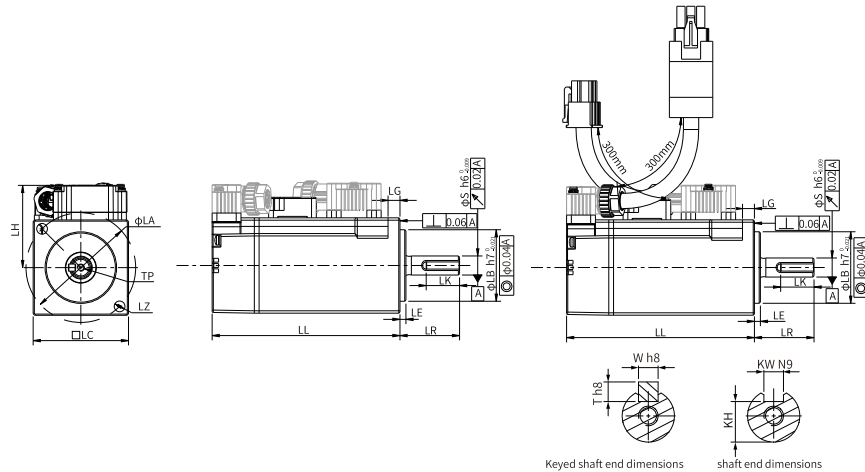


Figure 4-3 MS1H4-05B30CB-A330R and MS1H4-05B30CB-A332R

LL	LC	LR	LA	LZ	LH	LG	LE	
51 (78.3)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	140 ^{-0.36}	6.2 ⁰ _{-0.1}	3	3	3	0.24 (0.40)

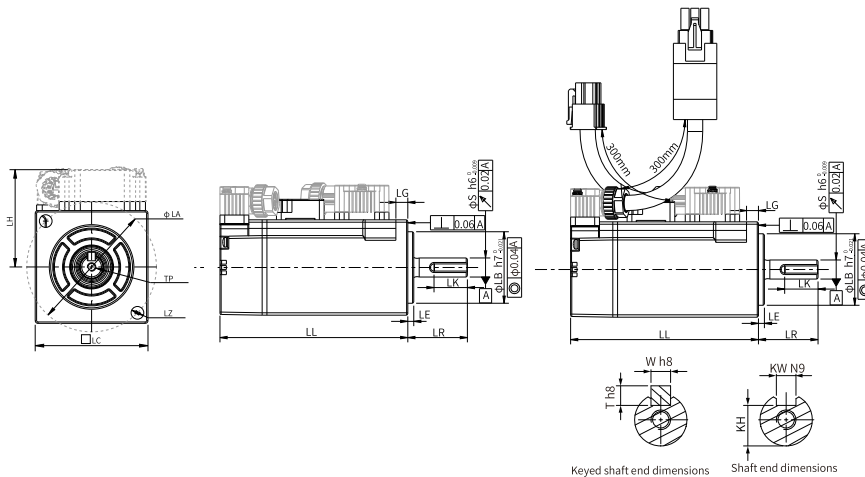
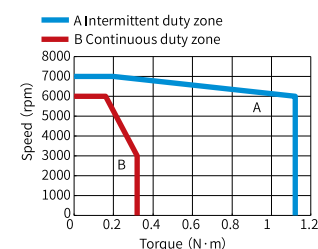
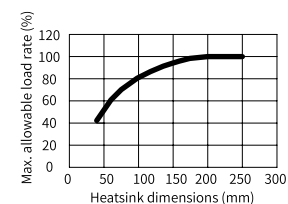


Figure 4-4 MS1H4-05B30CB-A331R and MS1H4-05B30CB-A334R

LL	LC	LR	LA	LZ	LH	LG	LE	
53.7 (81)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	140 _{-0.36}	6.2 ⁰ _{-0.1}	3	3	3	0.26 (0.42)

4.5.3 MS1H4-10B30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	40			
Inertia, capacity	Medium inertia, low capacity			
Rated output (kW)	0.1			
Voltage (V)	220			
Rated torque (N·m)	0.32			
Maximum torque (N·m)	1.12			
Rated frequency (Hz)	350			
Rated current (A)	1.27		Heatsink-based derating curve 	
Maximum current (A)	4.78			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.29			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.072 ± 10%		
	Motor with brake	0.074 ± 10%		

Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)

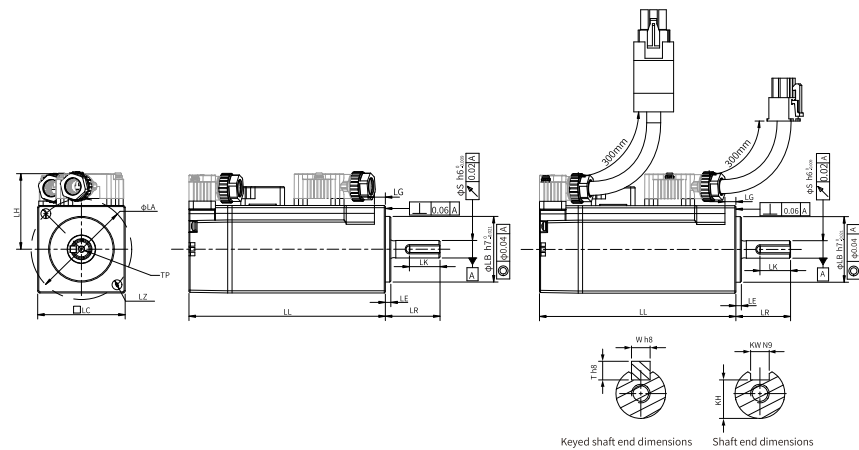


Figure 4-5 MS1H4-10B30CB-A6/S630R and MS1H4-10B30CB-A6/S632R

LL	LC	LR	LA	LZ	LH	LG	LE	
62 (89.3)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	14 ⁰ -0.36	6.2 ⁰ -0.1	3	3	3	0.32 (0.48)

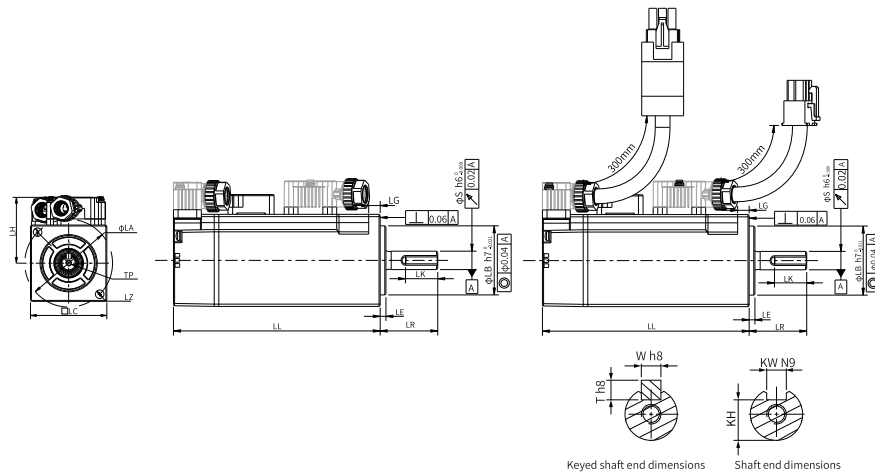
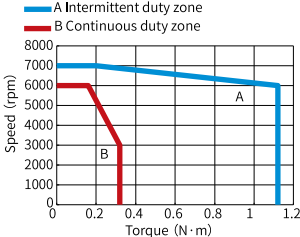
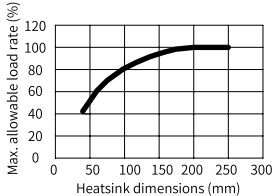


Figure 4-6 MS1H4-10B30CB-A6/S631R and MS1H4-10B30CB-A6/S634R

LL	LC	LR	LA	LZ	LH	LG	LE	
64.7 (92)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	14 ⁰ -0.36	6.2 ⁰ -0.1	3	3	3	0.34 (0.50)

4.5.4 MS1H4-10B30CB-A33*R-INT

Motor specifications			Torque-speed characteristics			
Frame size (mm)	40					
Inertia, capacity	Medium inertia, low capacity					
Rated output (kW)	0.1					
Voltage (V)	220					
Rated torque (N·m)	0.32					
Maximum torque (N·m)	1.12					
Rated frequency (Hz)	350					
Rated current (A)	1.27					
Maximum current (A)	4.78					
Rated speed (rpm)	3000					
Maximum speed (rpm)	7000					
Torque coefficient (N·m/A)	0.29		Heatsink-based derating curve			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.072 ± 10%				
	Motor with brake	0.074 ± 10%				

Electrical specifications of the brake

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

Allowable load

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

Dimensions (mm)

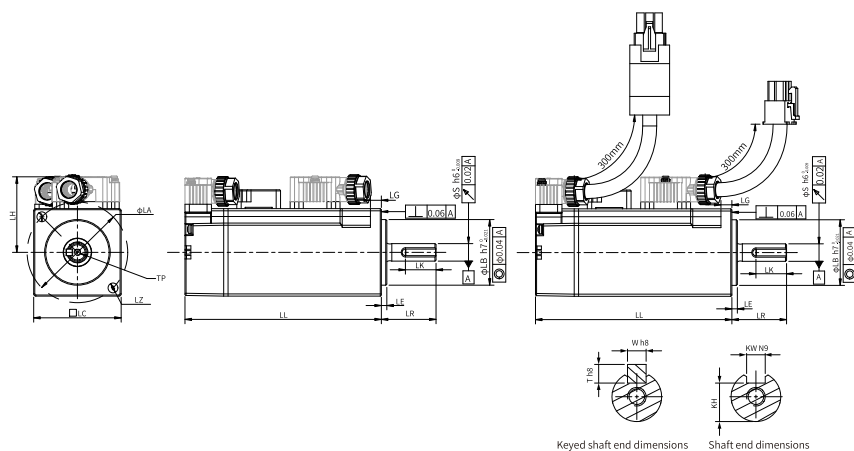


Figure 4-7 MS1H4-10B30CB-A330R and MS1H4-10B30CB-A332R

Motor Model Selection

LL	LC	LR	LA	LZ	LH	LG	LE	
62 (89.3)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	140 ^{-0.36}	6.2 ⁰ -0.1	3	3	3	0.32 (0.48)

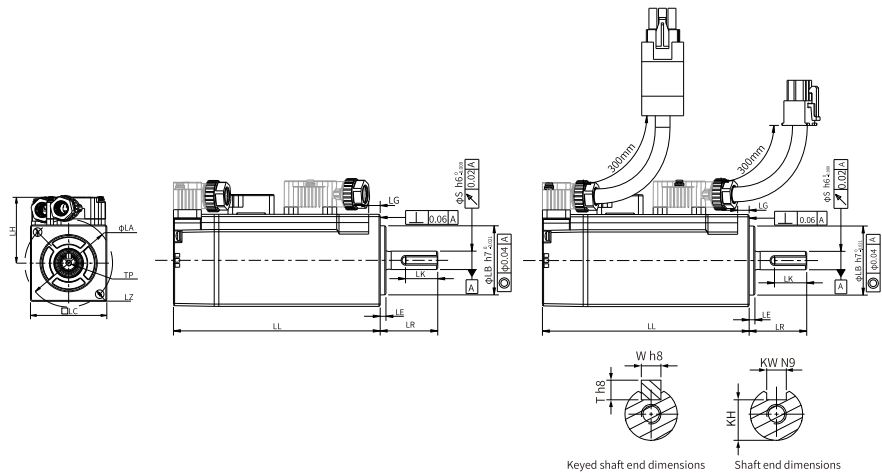
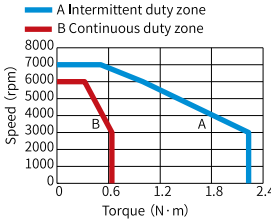
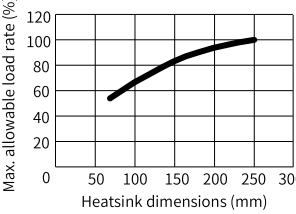


Figure 4-8 MS1H4-10B30CB-A331R and MS1H4-10B30CB-A334R

LL	LC	LR	LA	LZ	LH	LG	LE	
64.7 (92)	40	25 ± 0.5	46	2 × φ4.5	34.5	5	2.5 ± 0.5	
S	LB	TP	LK	KH	kW	W	T	Weight (kg)
8	30	M3 × 6	140 ^{-0.36}	6.2 ⁰ -0.1	3	3	3	0.34 (0.50)

4.5.5 MS1H4-20B30CB-A6/S63*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%		

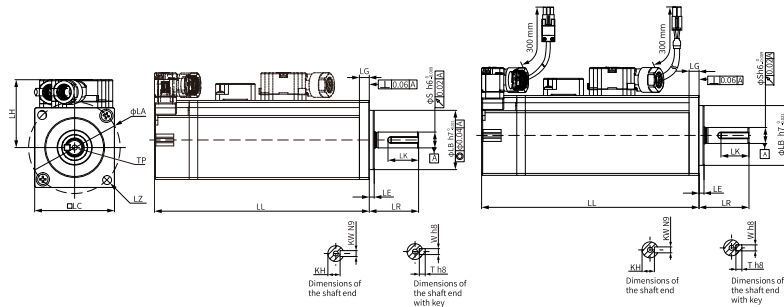
Electrical specifications of the brake

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

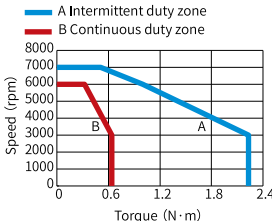
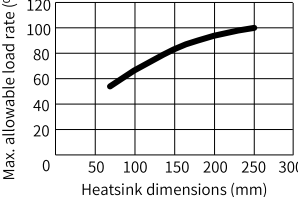
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

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	16.5 ⁰ -0.53	11 ⁰ -0.1	5	5	5	0.78 (1.16)

4.5.6 MS1H4-20B30CB-A33*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		Heatsink-based derating curve	
Maximum current (A)	5.3			
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.55			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.22 ± 10%		
	Motor with brake	0.23 ± 10%		

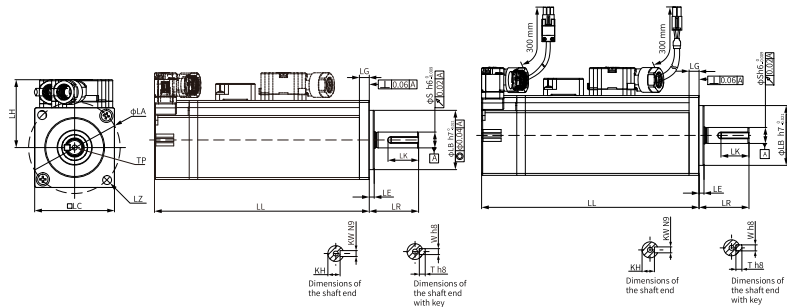
Electrical specifications of the brake

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

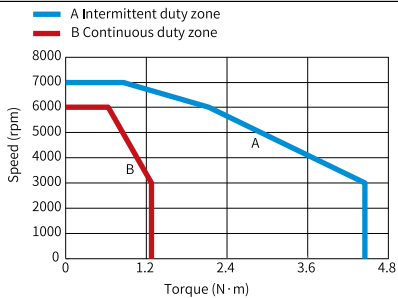
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

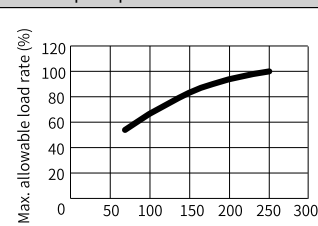
Dimensions (mm)



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)

4.5.7 MS1H4-40B30CB-A6/S63*R-INT

Motor specifications		Torque-speed characteristics	
Frame size (mm)	60		
Inertia and capacity	Medium 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)	2.4	Heatsink-based derating curve	

Motor specifications			Torque-speed characteristics	
Maximum current (A)	9.2			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm²)	Motor without brake	0.43±10%		
	Motor with brake	0.44±10%		

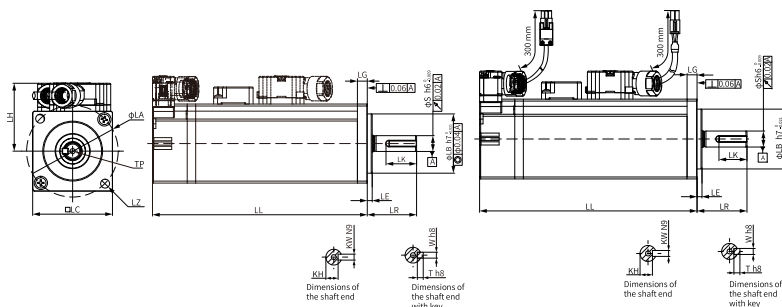
Electrical specifications of the brake

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 loads

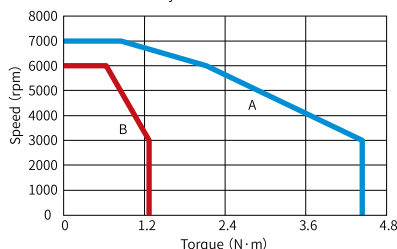
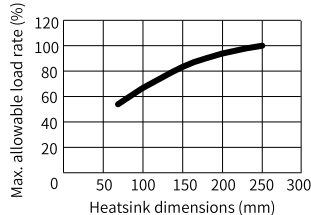
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Product dimensions (in 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)

4.5.8 MS1H4-40B30CB-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60			
Inertia and capacity	Medium 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)	2.4		Heatsink-based derating curve 	
Maximum current (A)	9.2			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.43±10%		
	Motor with brake	0.44±10%		

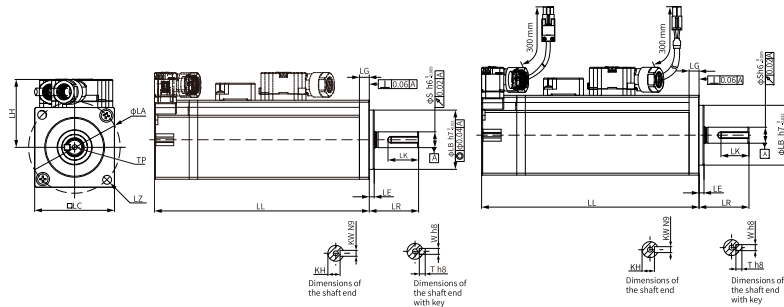
Electrical specifications of the brake

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

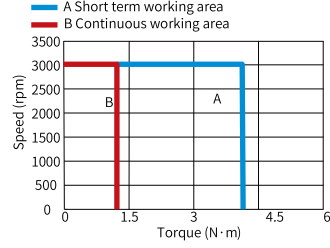
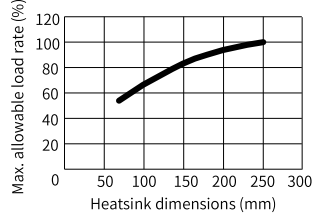
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Product dimensions (in 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)

4.5.9 MS1H4-40B30CD-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60			
Inertia and capacity	Medium inertia, small capacity			
Rated power (kW)	0.4			
Voltage (V)	380			
Rated torque (N·m)	1.27			
Maximum torque (N·m)	4.45			
Rated frequency (Hz)	250			
Rated current (A)	1.33			
Maximum current (A)	5.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	3000			
Torque coefficient (N·m/A)	0.95		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm²)	Motor without brake	0.43±10%		
	Motor with brake	0.44±10%		

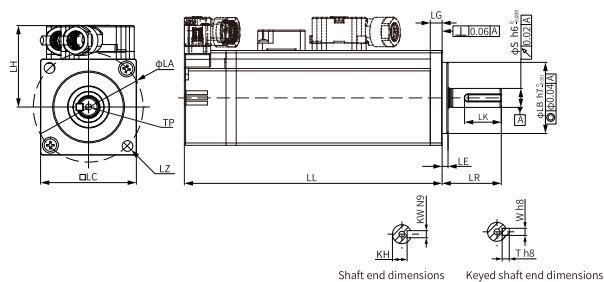
Electrical specifications of the brake

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

Allowable loads

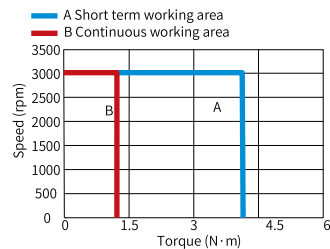
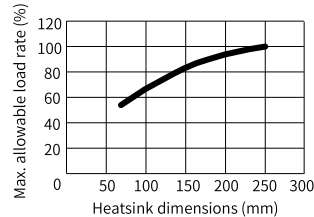
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Product dimensions (in 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)

4.5.10 MS1H4-40B30CD-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	60			
Inertia and capacity	Medium inertia, small capacity			
Rated power (kW)	0.4			
Voltage (V)	380			
Rated torque (N·m)	1.27			
Maximum torque (N·m)	4.45			
Rated frequency (Hz)	250			
Rated current (A)	1.33			
Maximum current (A)	5.8			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	3000			
Torque coefficient (N·m/A)	0.95			
Rotor moment of inertia (kg·cm ²)	Motor without brake	0.43±10%		
	Motor with brake	0.44±10%		

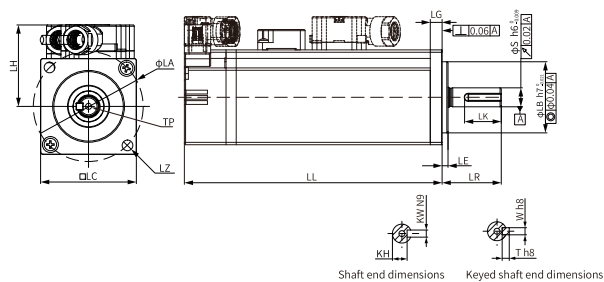
Electrical specifications of the brake

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

Allowable loads

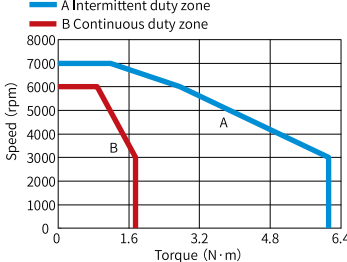
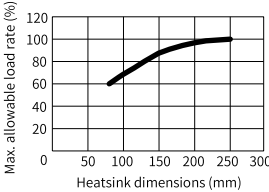
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
25	≤ 245	≤ 74

Product dimensions (in mm)



LC	LL	LR	LA	LZ	LH	LG	LE	
60	92 (119.8)	30±0.5	70	4 x φ5.5	44	8.0	3±0.5	
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
50	14	M5 x 8	16.5 ⁰ -0.53	11 ⁰ -0.1	5	5	5	1.11 (1.48)

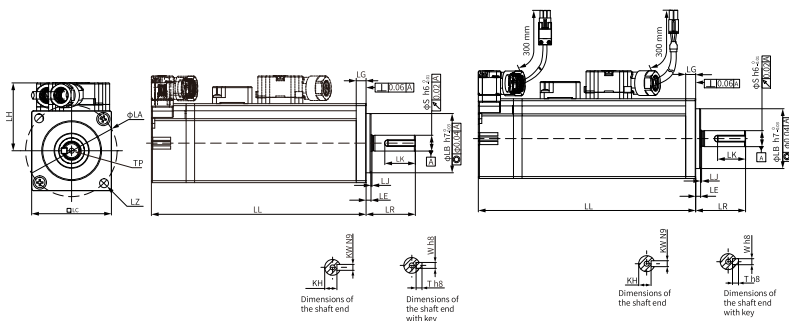
4.5.11 MS1H4-55B30CB-A6/S63*R-INT

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 6.4). Curve A (Intermittent duty zone) starts at 7000 rpm for 0 torque and decreases to 3000 rpm at 6.4 N·m. Curve B (Continuous duty zone) starts at 6000 rpm for 0 torque, drops to 3000 rpm at 1.6 N·m, and then continues to 3000 rpm at 6.4 N·m.	
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		Heatsink-based derating curve  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 250 mm.	
Rated speed (rpm)	3000			
Maximum speed (rpm)	7000			
Torque coefficient (N·m/A)	0.58			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.12 ± 10%		
	Motor with brake	-		

Allowable load

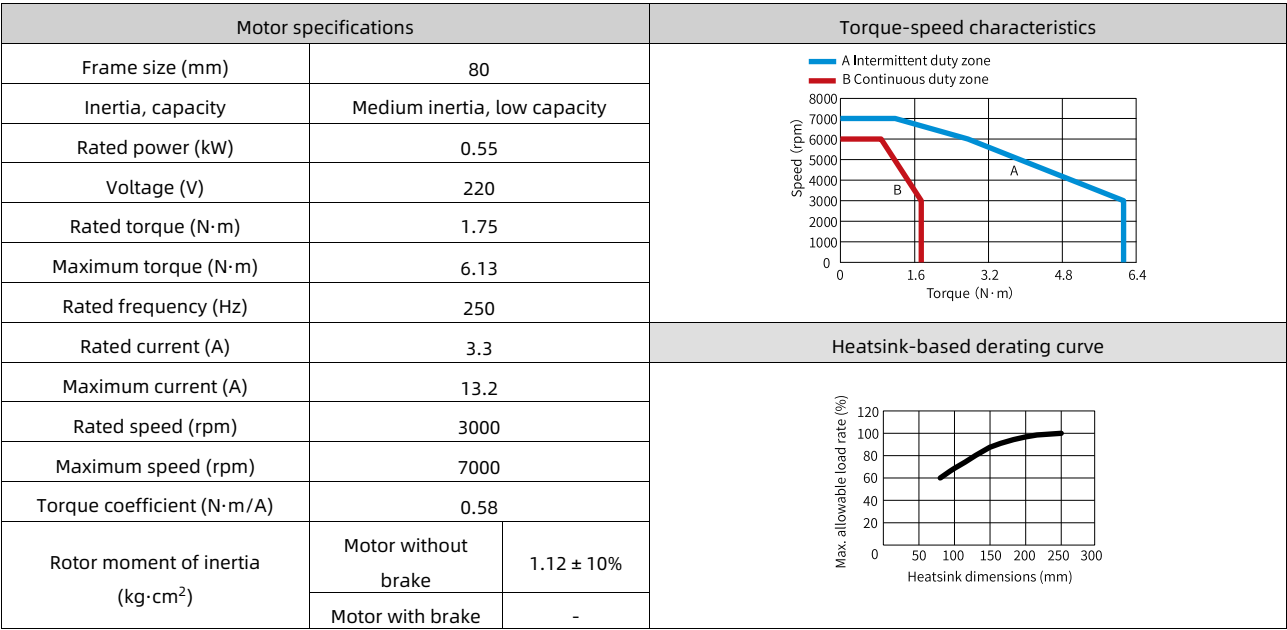
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	96.7	35 ± 0.5	90	4 × 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

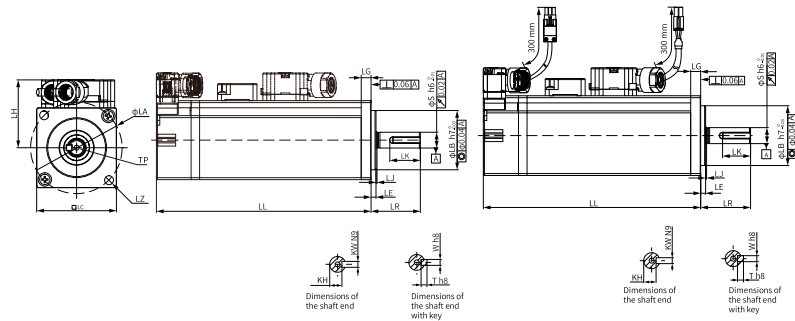
4.5.12 MS1H4-55B30CB-A33*R-INT



Allowable load

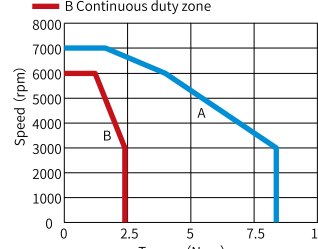
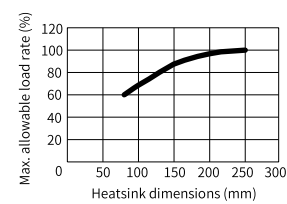
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

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

4.5.13 MS1H4-75B30CB-A6/S63*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			
Maximum current (A)	16.9		Heatsink-based derating curve 	
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 %		

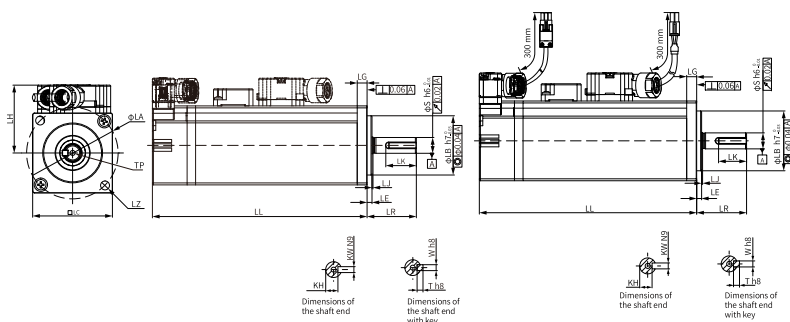
Electrical specifications of the brake

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

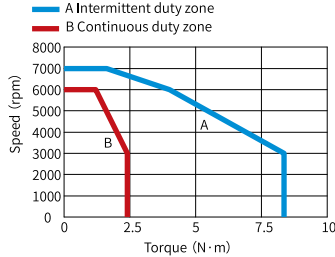
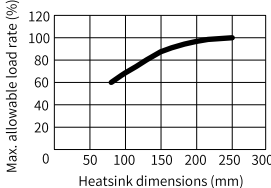
Dimensions (mm)



Motor Model Selection

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)

4.5.14 MS1H4-75B30CB-A33*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		
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%	

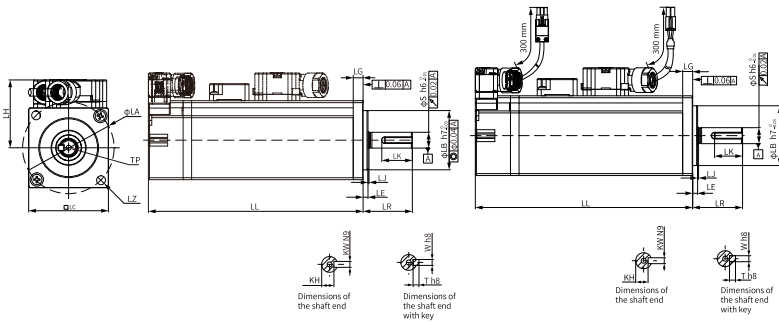
Electrical specifications of the brake

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

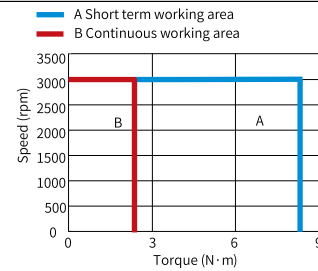
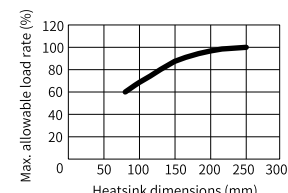
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Product dimensions (mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (140.5)	35±0.5	90	4 x φ7	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)

4.5.15 MS1H4-75B30CD-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80			
Inertia and capacity	Medium inertia, small capacity			
Rated power (kW)	0.75			
Voltage (V)	380			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.37			
Rated frequency (Hz)	250			
Rated current (A)	2.23			
Maximum current (A)	9.1			
			Heatsink-based derating curve	
Rated speed (rpm)	3000			
Maximum Speed (rpm)	3000			
Torque coefficient (N·m/A)	1.07			
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.46±10%		
	Motor with brake	1.51±10%		

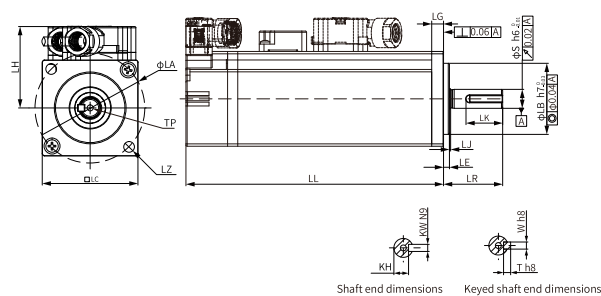
Electrical specifications of the brake

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

Allowable loads

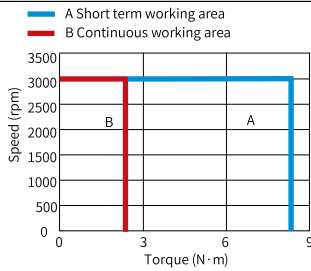
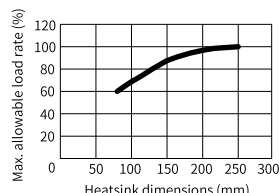
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Product dimensions (in 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	25 ⁰ - 0.62	15.5 ⁰ - 0.1	6	6	6	2.18 (2.82)

4.5.16 MS1H4-75B30CD-A33*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80			
Inertia and capacity	Medium inertia, small capacity			
Rated power (kW)	0.75			
Voltage (V)	380			
Rated torque (N·m)	2.39			
Maximum torque (N·m)	8.37			
Rated frequency (Hz)	250			
Rated current (A)	2.23			
Maximum current (A)	9.1			
Rated speed (rpm)	3000			
Maximum Speed (rpm)	3000			
Torque coefficient (N·m/A)	1.07		Heatsink-based derating curve	
Rotor moment of inertia (kg·cm ²)	Motor without brake	1.46±10%		
	Motor with brake	1.51±10%		

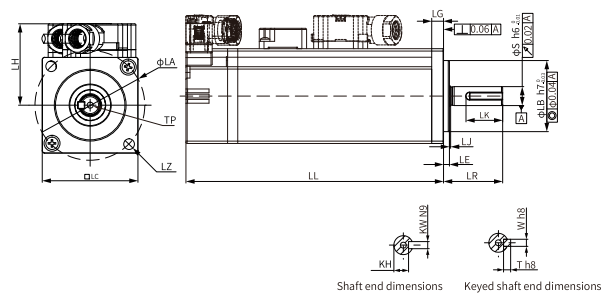
Electrical specifications of the brake

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

Allowable loads

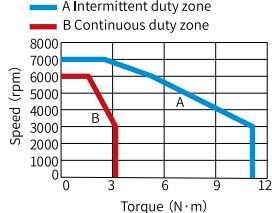
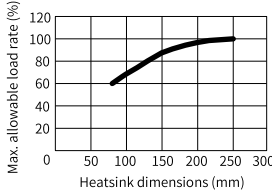
LF (mm)	Allowable radial load (N)	Allowable axial load (N)
35	≤ 392	≤ 147

Product dimensions (in mm)



LC	LL	LR	LA	LZ	LH	LG	LE	LJ
80	107.3 (140.5)	35±0.5	90	4 x ϕ7	54	7.5	3±0.5	0.5±0.35
LB	S	TP	LK	KH	KW	W	T	Weight (kg)
70	19	M6 x 20	25 ⁰ -0.62	15.5 ⁰ -0.1	6	6	6	2.18 (2.82)

4.5.17 MS1H4-10C30CB-A6/S63*R-INT

Motor specifications			Torque-speed characteristics	
Frame size (mm)	80			
Inertia, capacity	Medium inertia, low capacity			
Rated power (kW)	1.0			
Voltage (V)	220			
Rated torque (N·m)	3.18			
Maximum torque (N·m)	11.13			
Rated frequency (Hz)	250			
Rated current (A)	6.5			
Maximum current (A)	24		Heatsink-based derating curve	
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%		

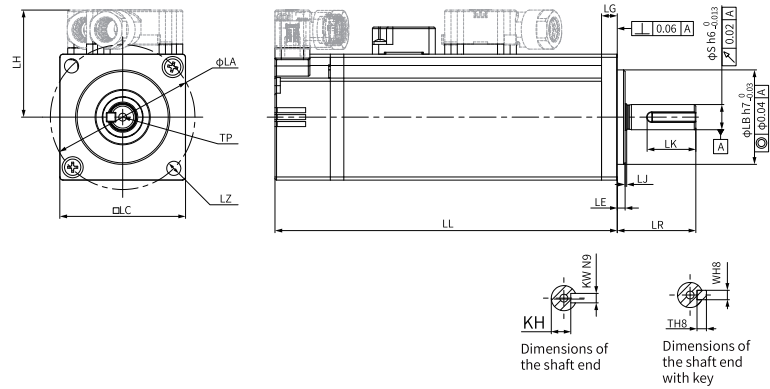
Electrical specifications of the brake

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)

4.5.18 MS1H4-10C30CB-A33*R-INT

Motor specifications			Torque-speed characteristics																			
Frame size (mm)	80		A line graph showing the torque-speed characteristics of the motor. The y-axis is Speed (rpm) from 0 to 8000 in increments of 1000. The x-axis is Torque (N·m) from 0 to 12 in increments of 3. Two regions are marked: 'A Intermittent duty zone' (blue line) and 'B Continuous duty zone' (red line). The blue line starts at (0, 8000), remains constant until 3 N·m, then slopes down to (12, 3000). The red line starts at (0, 8000), remains constant until 3 N·m, then slopes down to (3, 0). <table border="1"><caption>Torque-Speed Data</caption><thead><tr><th>Torque (N·m)</th><th>Speed (rpm) - Zone A</th><th>Speed (rpm) - Zone B</th></tr></thead><tbody><tr><td>0</td><td>8000</td><td>8000</td></tr><tr><td>3</td><td>8000</td><td>8000</td></tr><tr><td>6</td><td>7000</td><td>-</td></tr><tr><td>9</td><td>6000</td><td>-</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	8000	8000	3	8000	8000	6	7000	-	9	6000	-	12	3000	-
Torque (N·m)	Speed (rpm) - Zone A	Speed (rpm) - Zone B																				
0	8000	8000																				
3	8000	8000																				
6	7000	-																				
9	6000	-																				
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		A line graph showing the maximum allowable load rate as a function of heatsink dimensions. The y-axis is Max. allowable load rate (%) from 0 to 120 in increments of 20. The x-axis is Heatsink dimensions (mm) from 0 to 300 in increments of 50. The curve starts at (50, 60) and rises to (300, 100). <table border="1"><caption>Heatsink-based Derating Data</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%																				

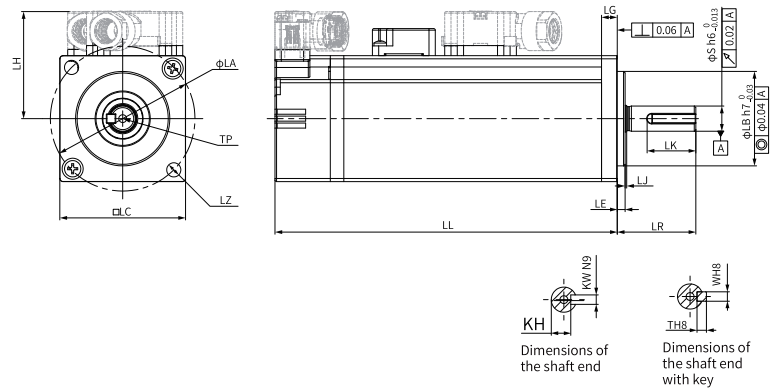
Electrical specifications of the brake

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 × $\phi 7$	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

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 40/60/80 1: Frame sizes 100/130/180 2: Frame size 180 (motors of 4.4 kW and above)	⑤ Cable length (m) 3.0: 3 5.0: 5 10.0: 10
② Connector type on the drive end 0: U-shaped terminal 1: Ferrule-type terminal	④ Connector type on the motor end 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 _: Non-flexible cable 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 application mode 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 on the drive end 1: 1394 connector (5-pin)	④ Connector type on the motor end 1: 17-core aviation connector 4: MS1 custom connector (front outlet) 5: MS1 custom connector (rear outlet)	⑥ Special requirements _: Non-flexible cable 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.

Description of communication cable model

S6-L- $\frac{T}{①} \frac{00}{②} - \frac{3.0}{③}$

① Cable type	② Cable connection type	③ Cable length (m)
T: Communication cable	00: Servo drive to PC communication cable 01: Servo drive network communication cable (CAN&485) 02: Servo drive to PLC communication cable 03: Servo drive communication termination resistor cable (CAN&485) 04: Servo drive network communication cable (EtherCAT)	0.3: 0.3

Note

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

5.2 Cable Types

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

Oil-resistant cables

Cables for global series motors are made of oil-resistant cables, which is suitable for use in applications requiring shielding of power cables such as machine tools, cutting fluids, and cutting oils.

More information

The R-version motor cables are fully compatible with the previous Z-version motor cables.

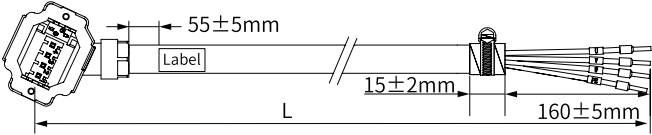
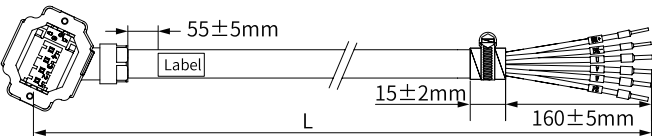
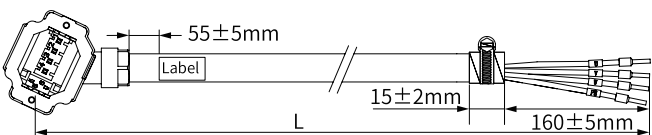
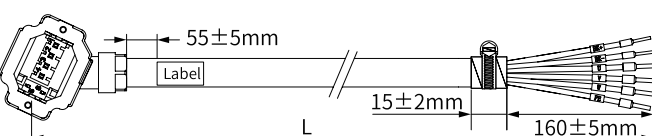
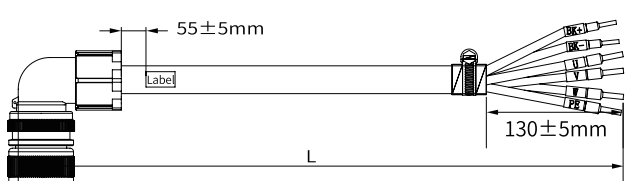
The terminal-type motor power cables and encoder cables require dedicated equipment and tooling for assembly. Order finished cables from authorized channels by Inovance.

For motor information, see the hardware guide.

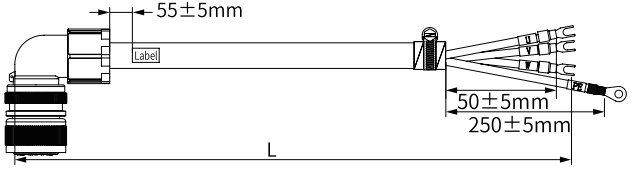
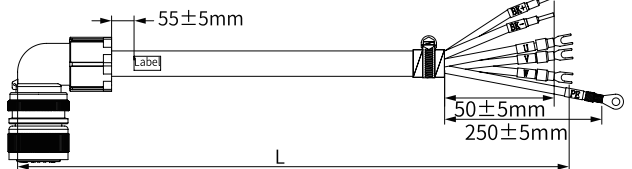
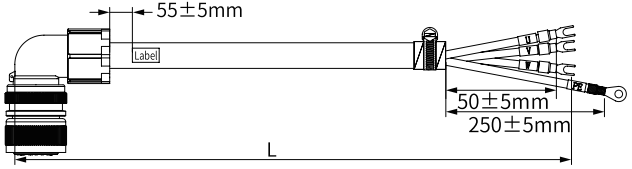
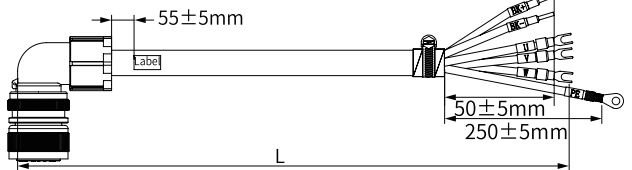
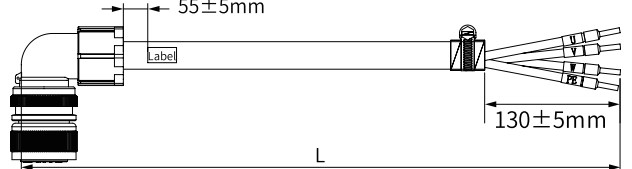
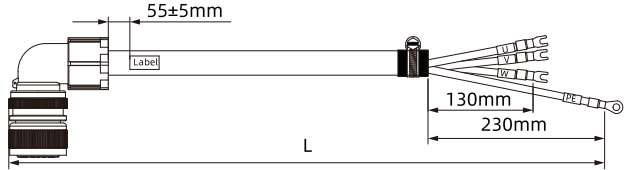
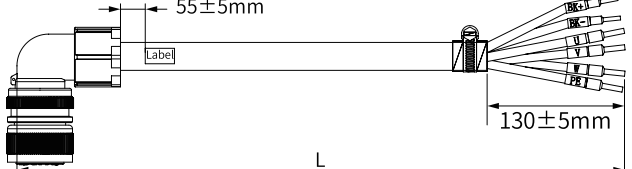
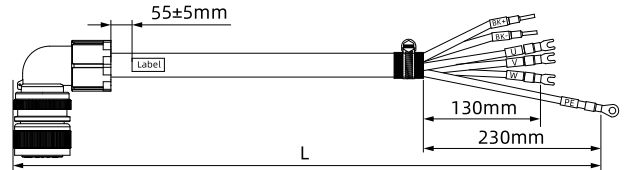
5.3 Cable Model List

5.3.1 SV680-INT Series

Power cable

Motor model	Cable name		Cable model	Cable length (mm)	Appearance
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 or below/ MS1H3 motors rated 1.8 kW or below (400 V voltage class)	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	

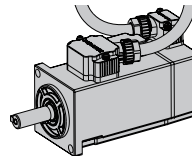
Cable Selection

Motor model	Cable name	Cable model	Cable length (mm)	Appearance
MS1H2 motors rated 3 kW or below/ MS1H3 motors rated 1.8 kW or below (200 V voltage class)	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	
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 (2.9 kW) (400 V voltage class)	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	
		S6-L-M012-3.0 (-T) -INT	3000	
		S6-L-M012-5.0 (-T) -INT	5000	
		S6-L-M012-10.0 (-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	
		S6-L-B012-3.0 (-T) -INT	3000	
		S6-L-B012-5.0 (-T) -INT	5000	
		S6-L-B012-10.0 (-T) -INT	10000	

Motor model	Cable name	Cable model	Cable length (mm)	Appearance
MS1H3 motors (2.9 kW) (200 V voltage class)	Without brake	S6-L-M012-3.0 (-T) -INT	3000	
		S6-L-M012-5.0 (-T) -INT	5000	
		S6-L-M012-10.0 (-T) -INT	10000	
	With brake	S6-L-B012-3.0 (-T) -INT	3000	
		S6-L-B012-5.0 (-T) -INT	5000	
		S6-L-B012-10.0 (-T) -INT	10000	
MS1H3 rated 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	

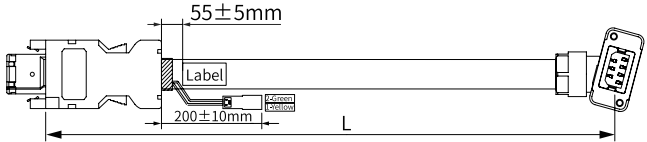
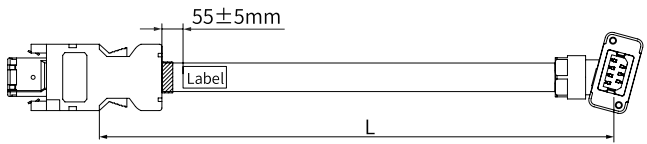
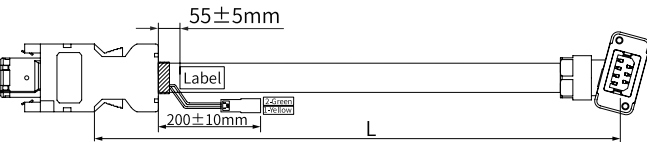
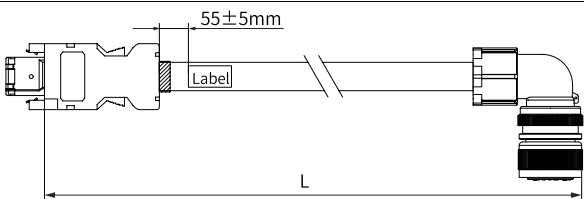
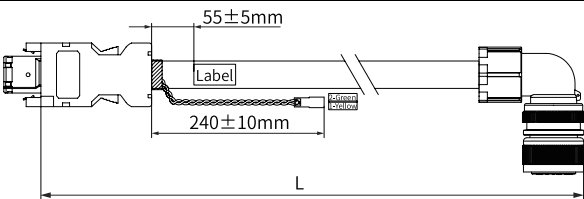
Note

- To ensure that the mounting flange is not being disturbed by power cables, the power cables of 50 W motors must be routed through the rear outlet mode as shown in the following figure.



- Power cables are equipped with a shield as standard. Select a shield bracket and lock the clamp on the cable to the shield bracket.
- T: Flexible cable is optional.

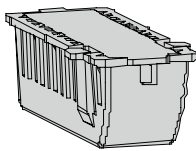
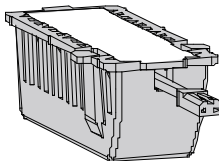
Encoder cable

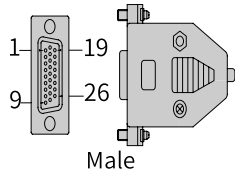
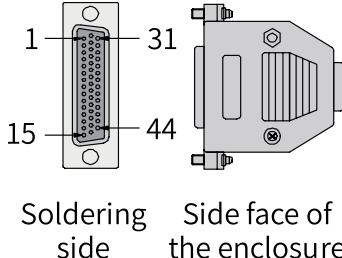
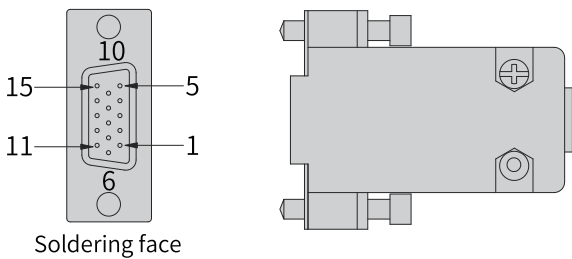
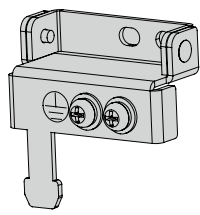
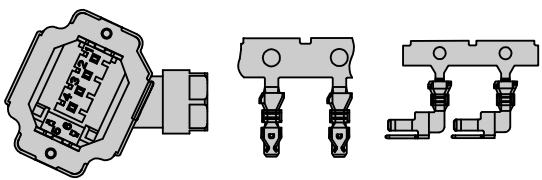
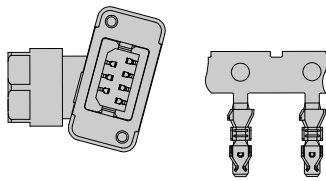
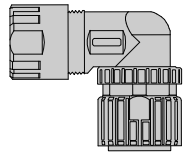
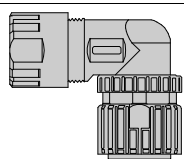
Motor model	Cable name		Cable model	Cable length (mm)	Appearance
MS1H1 / MS1H4 terminal-type motor	Front outlet	Single-turn absolute	S6-L-P114-3.0 (-T) -INT	3000	
			S6-L-P114-5.0 (-T) -INT	5000	
			S6-L-P114-10.0 (-T) -INT	10000	
		Multi-turn absolute	S6-L-P124-3.0 (-T) -INT	3000	
			S6-L-P124-5.0 (-T) -INT	5000	
			S6-L-P124-10.0 (-T) -INT	10000	
	Rear outlet	Single-turn absolute	S6-L-P115-3.0 (-T) -INT	3000	
			S6-L-P115-5.0 (-T) -INT	5000	
			S6-L-P115-10.0 (-T) -INT	10000	
		Multi-turn absolute	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 motors	Single-turn absolute		S6-L-P111-3.0 (-T) -INT	3000	
			S6-L-P111-5.0 (-T) -INT	5000	
			S6-L-P111-10.0 (-T) -INT	10000	
	Multi-turn absolute		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

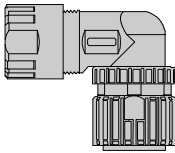
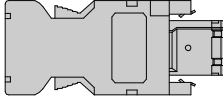
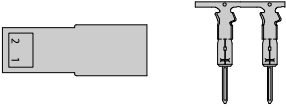
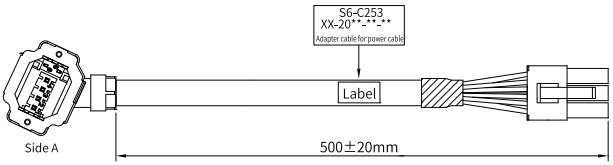
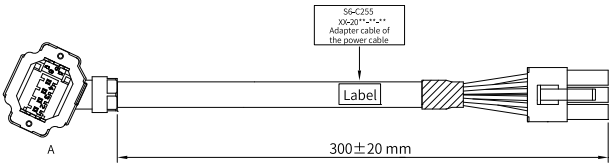
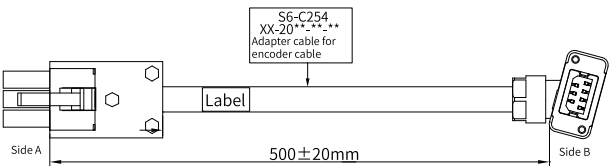
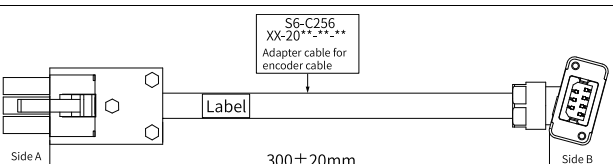
The encoder cable is equipped with a shield as standard.

Connector kit

Cable name	Cable model	Appearance
Battery box kit (without battery)	S6-C4A-NB	
Battery kit	S6-C4A	

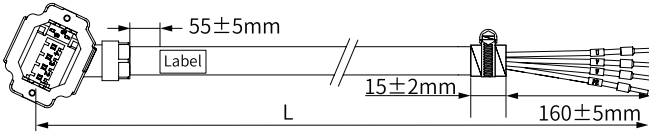
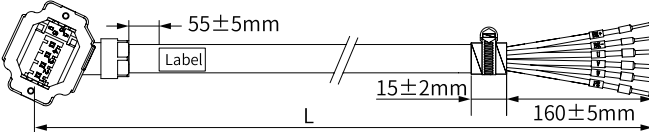
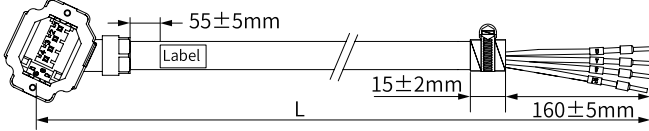
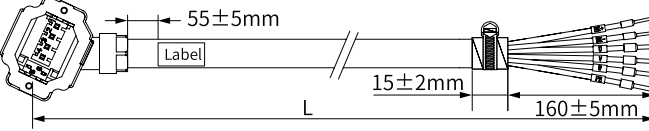
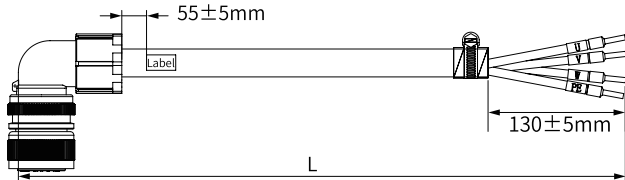
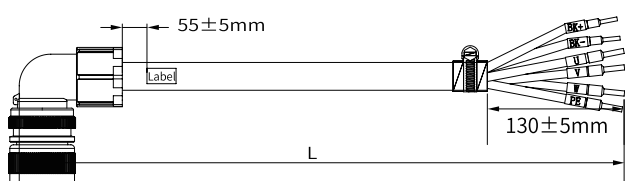
Cable name	Cable model	Appearance
CN1 terminal (DB26)	S6-C74	 Male
CN1 terminal (DB44)	S6-C8	 Soldering side Side face of the enclosure
CN7 terminal (DB15)	S6-C6	 Soldering face
Shield bracket	S6-C25 (Optional for size A to size C)	
	S6-C27 (Optional for size D to size E)	
Power connector for motor-side power below 750 W	S6-C246	
Encoder connector for motor-side power below 750 W	S6-C247	
Power connector for frame sizes 100 to 130 for motor-side power above 1000 W	S6-C248	
Power connector for frame size 180 for motor-side power above 1000 W	S6-C249	

Cable Selection

Cable name	Cable model	Appearance
Encoder connector for motor-side power above 1000 W	S6-C250	
CN2(1394)	S6-C251	
Battery box connector	S6-C252	
Power flying leads for motor-side power below 750 W - 500 mm	S6-C253	
Power flying leads for motor-side power below 750 W - 300 mm	S6-C255	
Encoder flying leads for motor-side power below 750 W - 500 mm	S6-C254	
Encoder flying leads for motor-side power below 750 W - 300 mm	S6-C256	

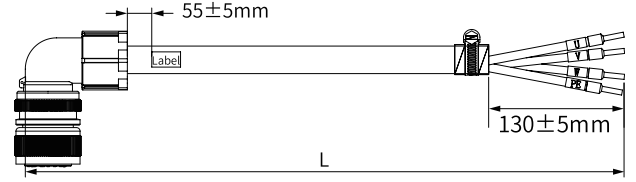
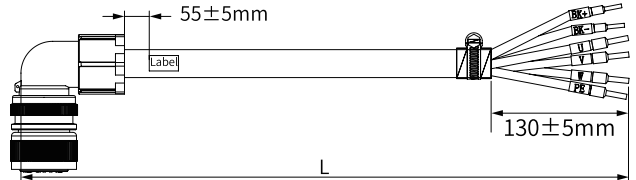
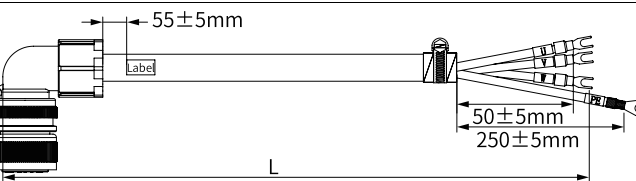
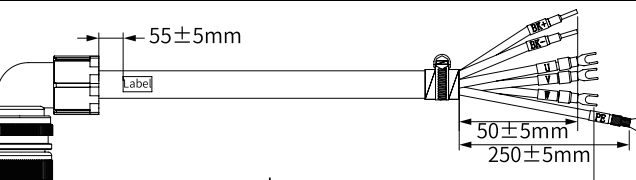
5.3.2 SV670-INT Series

Power cable

Motor model	Cable name		Cable model	Cable length (mm)	Appearance
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 (400 V voltage class)	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		

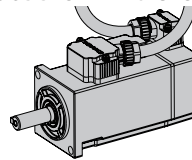
Cable Selection

Motor model	Cable name	Cable model	Cable length (mm)	Appearance
MS1H2 motors rated 3 kW or below/ MS1H3 motors rated 1.8 kW or below (200 V voltage class)	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	
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 (2.9 kW) (400 V voltage class)	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	
		S6-L-M012-3.0 (-T) -INT	3000	
		S6-L-M012-5.0 (-T) -INT	5000	
		S6-L-M012-10.0 (-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	
		S6-L-B012-3.0 (-T) -INT	3000	
		S6-L-B012-5.0 (-T) -INT	5000	
		S6-L-B012-10.0 (-T) -INT	10000	

Motor model	Cable name	Cable model	Cable length (mm)	Appearance
MS1H3 motors (2.9 kW) (200 V voltage class)	Without brake	S6-L-M012-3.0 (-T) -INT	3000	
		S6-L-M012-5.0 (-T) -INT	5000	
		S6-L-M012-10.0 (-T) -INT	10000	
	With brake	S6-L-B012-3.0 (-T) -INT	3000	
		S6-L-B012-5.0 (-T) -INT	5000	
		S6-L-B012-10.0 (-T) -INT	10000	
MS1H3 rated 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	

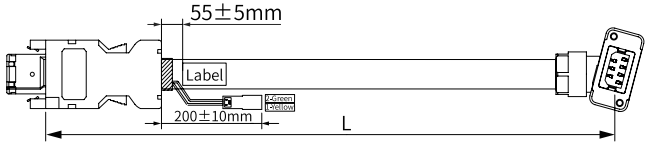
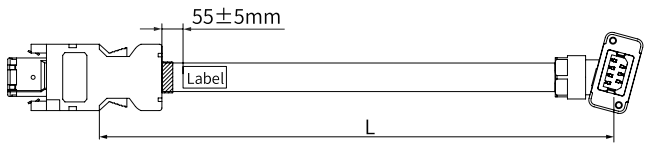
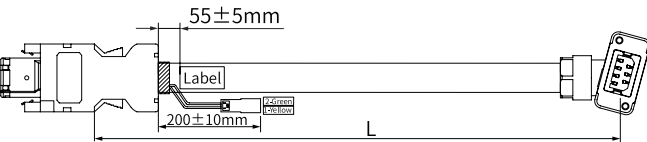
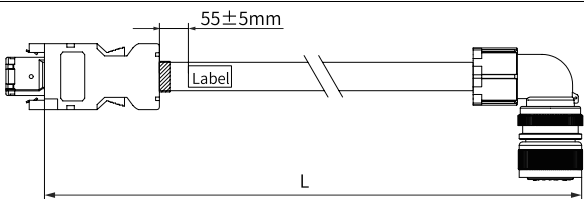
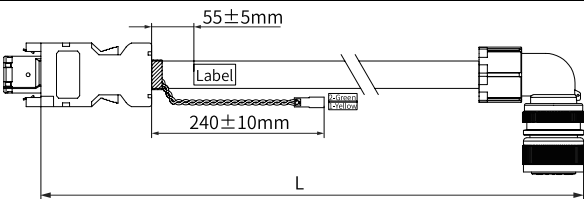
Note

- To ensure that the mounting flange is not being disturbed by power cables, the power cables of 50 W motors must be routed through the rear outlet mode as shown in the following figure.



- Power cables are equipped with a shield as standard. Select a shield bracket and lock the clamp on the cable to the shield bracket.
- T: Flexible cable is optional.

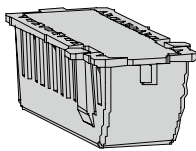
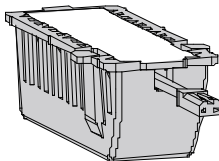
Encoder cable

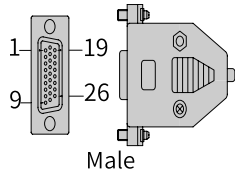
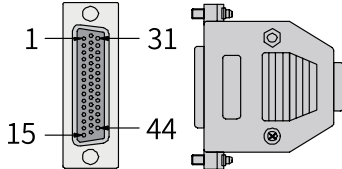
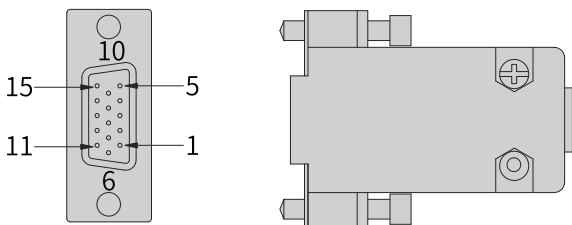
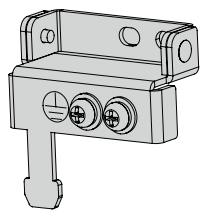
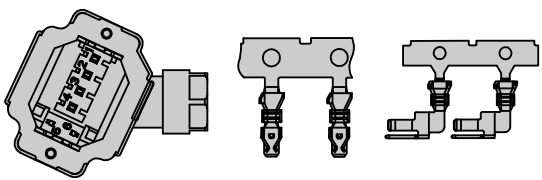
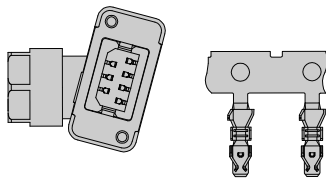
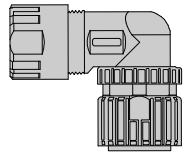
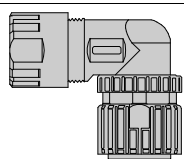
Motor model	Cable name		Cable model	Cable length (mm)	Appearance
MS1H1 / MS1H4 terminal-type motor	Front outlet	Single-turn absolute	S6-L-P114-3.0 (-T) -INT	3000	
			S6-L-P114-5.0 (-T) -INT	5000	
			S6-L-P114-10.0 (-T) -INT	10000	
		Multi-turn absolute	S6-L-P124-3.0 (-T) -INT	3000	
			S6-L-P124-5.0 (-T) -INT	5000	
			S6-L-P124-10.0 (-T) -INT	10000	
	Rear outlet	Single-turn absolute	S6-L-P115-3.0 (-T) -INT	3000	
			S6-L-P115-5.0 (-T) -INT	5000	
			S6-L-P115-10.0 (-T) -INT	10000	
		Multi-turn absolute	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 motors	Single-turn absolute		S6-L-P111-3.0 (-T) -INT	3000	
			S6-L-P111-5.0 (-T) -INT	5000	
			S6-L-P111-10.0 (-T) -INT	10000	
	Multi-turn absolute		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

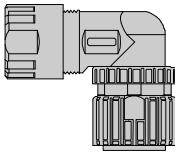
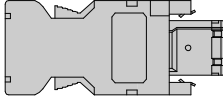
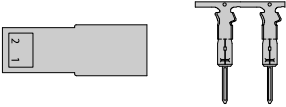
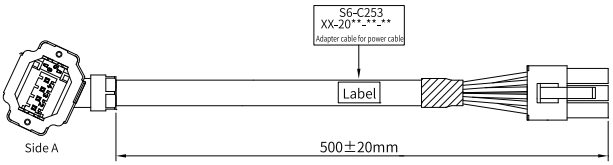
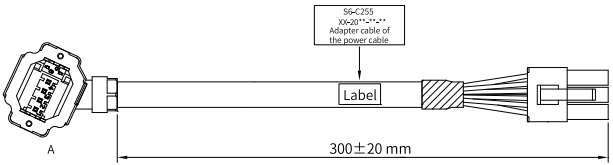
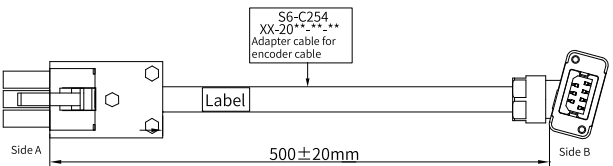
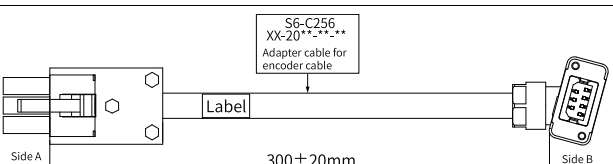
The encoder cable is equipped with a shield as standard.

Connector kit

Cable name	Cable model	Appearance
Battery box kit (without battery)	S6-C4A-NB	
Battery kit	S6-C4A	

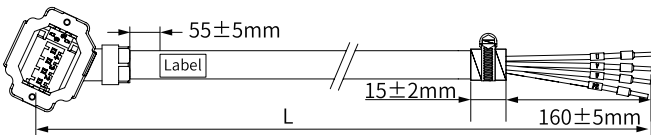
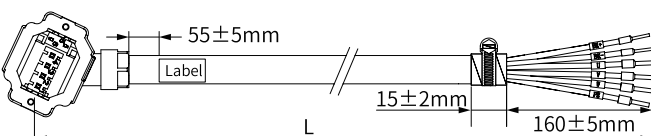
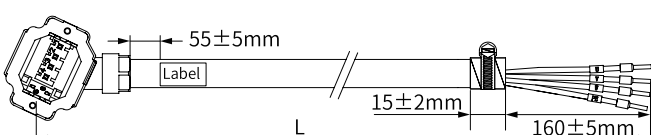
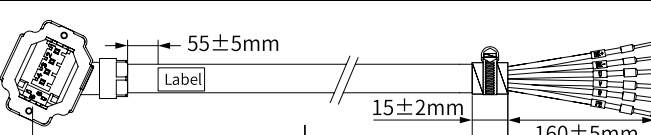
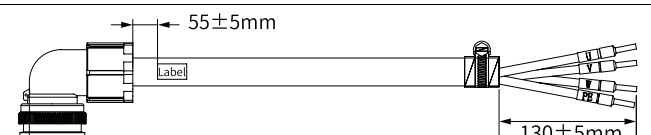
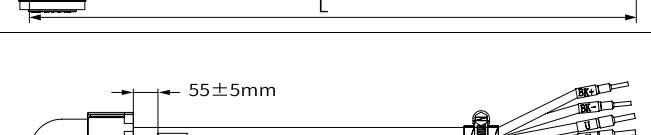
Cable name	Cable model	Appearance
CN1 terminal (DB26)	S6-C74	 Male
CN1 terminal (DB44)	S6-C8	 Soldering side Side face of the enclosure
CN7 terminal (DB15)	S6-C6	 Soldering face
Shield bracket	S6-C25 (Optional for size A to size C)	
	S6-C27 (Optional for size D to size E)	
Power connector for motor-side power below 750 W	S6-C246	
Encoder connector for motor-side power below 750 W	S6-C247	
Power connector for frame sizes 100 to 130 for motor-side power above 1000 W	S6-C248	
Power connector for frame size 180 for motor-side power above 1000 W	S6-C249	

Cable Selection

Cable name	Cable model	Appearance
Encoder connector for motor-side power above 1000 W	S6-C250	
CN2(1394)	S6-C251	
Battery box connector	S6-C252	
Power flying leads for motor-side power below 750 W - 500 mm	S6-C253	
Power flying leads for motor-side power below 750 W - 300 mm	S6-C255	
Encoder flying leads for motor-side power below 750 W - 500 mm	S6-C254	
Encoder flying leads for motor-side power below 750 W - 300 mm	S6-C256	

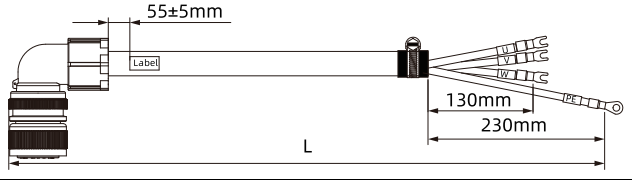
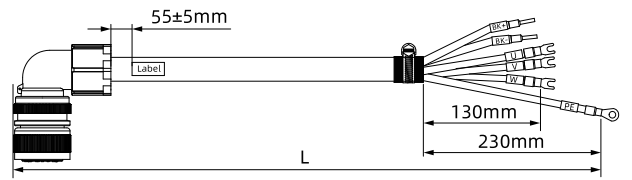
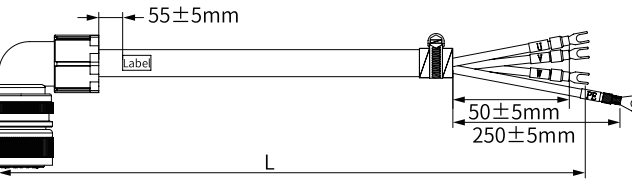
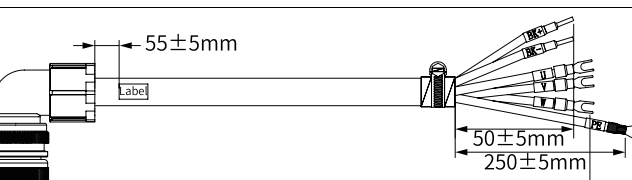
5.3.3 SV660-INT Series

Power cable

Motor model	Cable name		Cable model	Cable length (mm)	Appearance
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 or below/ MS1H3 motors rated 1.8 kW or below (400 V voltage class)	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	

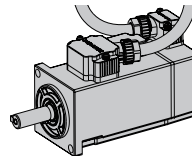
Cable Selection

Motor model	Cable name	Cable model	Cable length (mm)	Appearance
MS1H2 motors rated 3 kW or below/ MS1H3 motors rated 1.8 kW or below (200 V voltage class)	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	
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 (2.9 kW) (400 V voltage class)	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	
		S6-L-M012-3.0 (-T) -INT	3000	
		S6-L-M012-5.0 (-T) -INT	5000	
		S6-L-M012-10.0 (-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	
		S6-L-B012-3.0 (-T) -INT	3000	
		S6-L-B012-5.0 (-T) -INT	5000	
		S6-L-B012-10.0 (-T) -INT	10000	

Motor model	Cable name	Cable model	Cable length (mm)	Appearance
MS1H3 motors (2.9 kW) (200 V voltage class)	Without brake	S6-L-M012-3.0 (-T) -INT	3000	
		S6-L-M012-5.0 (-T) -INT	5000	
		S6-L-M012-10.0 (-T) -INT	10000	
	With brake	S6-L-B012-3.0 (-T) -INT	3000	
		S6-L-B012-5.0 (-T) -INT	5000	
		S6-L-B012-10.0 (-T) -INT	10000	
MS1H3 rated 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	

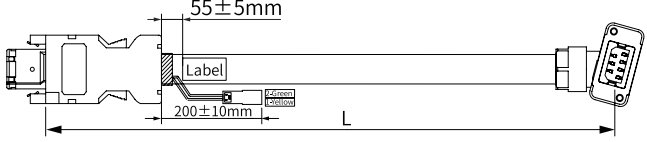
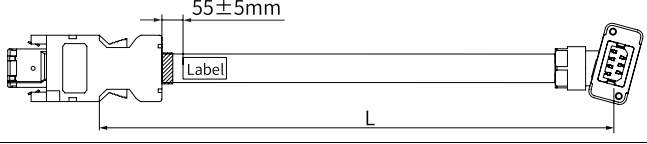
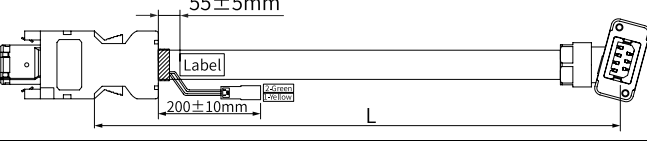
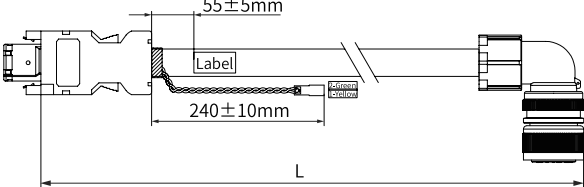
Note

- To ensure that the mounting flange is not being disturbed by power cables, the power cables of 50 W motors must be routed through the rear outlet mode as shown in the following figure.



- Power cables are equipped with a shield as standard. Select a shield bracket and lock the clamp on the cable to the shield bracket.
- T: Flexible cable is optional.

Encoder cable

Motor model	Cable name		Cable model	Cable length (mm)	Appearance
MS1H1 / MS1H4 terminal-type motor	Front outlet	Single-turn absolute	S6-L-P114-3.0 (-T) -INT	3000	
			S6-L-P114-5.0 (-T) -INT	5000	
			S6-L-P114-10.0 (-T) -INT	10000	
		Multi-turn absolute	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	Single-turn absolute	S6-L-P115-3.0 (-T) -INT	3000	
			S6-L-P115-5.0 (-T) -INT	5000	
			S6-L-P115-10.0 (-T) -INT	10000	
		Multi-turn absolute	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 motors	Single-turn absolute		S6-L-P111-3.0 (-T) -INT	3000	
			S6-L-P111-5.0 (-T) -INT	5000	
			S6-L-P111-10.0 (-T) -INT	10000	
	Multi-turn absolute		S6-L-P121-3.0 (-T) -INT	3000	
			S6-L-P121-5.0 (-T) -INT	5000	
			S6-L-P121-10.0 (-T) -INT	10000	

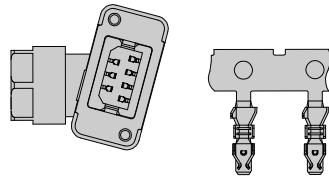
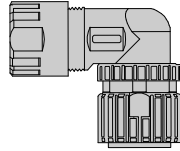
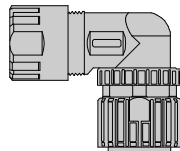
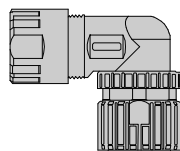
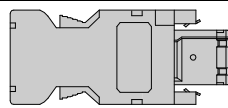
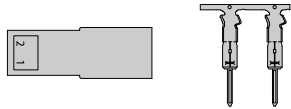
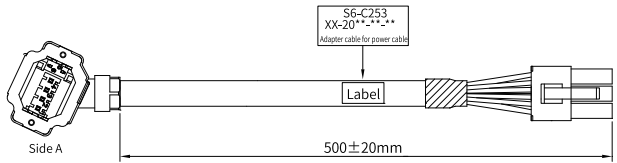
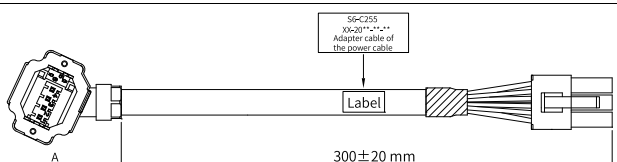
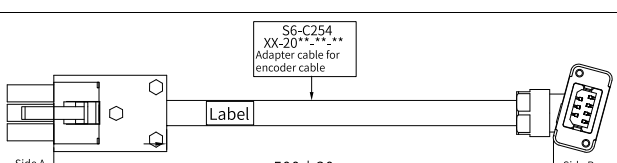
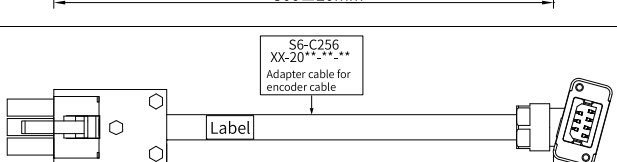
Note

The encoder cable is equipped with a shield as standard.

Connector kit

Cable name	Cable model	Appearance
Battery box kit (without battery)	S6-C4A-NB	
Battery kit	S6-C4A	
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 for motor-side power below 750 W	S6-C246	

Cable Selection

Cable name	Cable model	Appearance
Encoder connector for motor-side power below 750 W	S6-C247	
Power connector for frame sizes 100 to 130 for motor-side power above 1000 W	S6-C248	
Power connector for frame size 180 for motor-side power above 1000 W	S6-C249	
Encoder connector for motor-side power above 1000 W	S6-C250	
CN2(1394)	S6-C251	
Battery box connector	S6-C252	
Power flying leads for motor-side power below 750 W - 500 mm	S6-C253	
Power flying leads for motor-side power below 750 W - 300 mm	S6-C255	
Encoder flying leads for motor-side power below 750 W - 500 mm	S6-C254	
Encoder flying leads for motor-side power below 750 W - 300 mm	S6-C256	

5.4 Cable Terminals

5.4.1 Power Cable Terminals

- The connection diagram for a terminal-type motor is shown in the following figure.

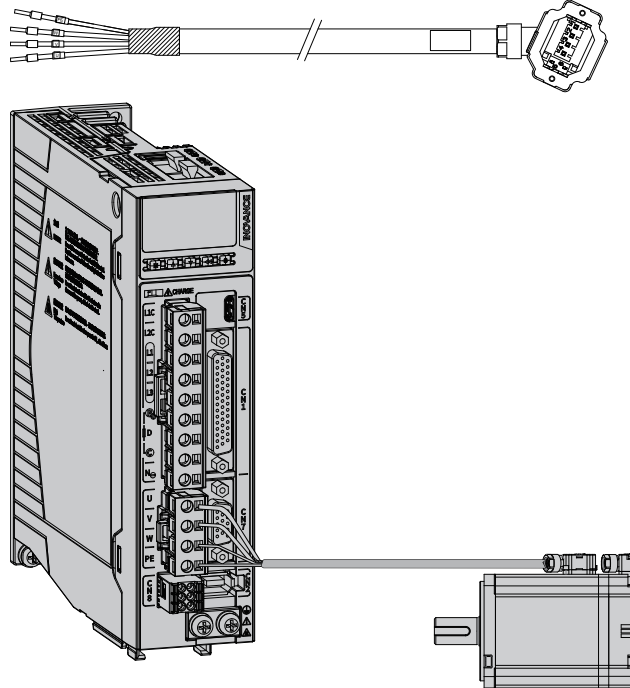
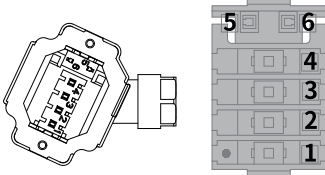


Figure 5-1 Wiring between the drive output and motor

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

Applicable frame size [1]	Connector appearance	Terminal pin layout		
		Pin No.	Signal name	Color
Terminal-type: 40 60 80	 Black 6-pin connector	1	PE	Yellow/Green
		2	W	Black 3
		3	V	Black 2
		4	U	Black 1
		5	Brake ^[2]	White
		6		Brown

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

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

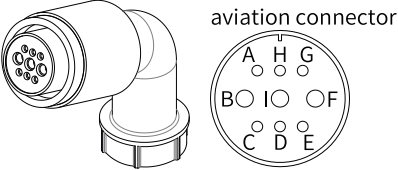
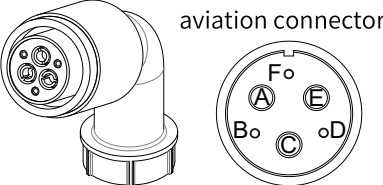
Applicable frame size ^[1]	Connector appearance	Terminal pin layout		
		Pin No.	Signal name	Color
100 130	 20-18 aviation connector MIL-DTL-5015 series 3108E20-18S aviation connector	B	U	Black 1
		I	V	Black 2
		F	W	Black 3
		G	PE	Yellow/Green
		C	Brake ^[2]	Black 4
		E		Black 5

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

Applicable frame size ^[1]	Connector appearance	Terminal pin layout		
		Pin No.	Signal name	Color
180	 20-22 aviation connector MIL-DTL-5015 series 3108E20-22S aviation connector	A	U	Black 1
		C	V	Black 2
		E	W	Black 3
		F	PE	Yellow/Green
		B	Brake ^[2]	Black 4
		D		Black 5

Note

- [1] The frame size refers to the width of the mounting flange.
- Power cable colors are subject to the actual product. All cable colors mentioned in this guide refer to Inovance cable colors.
- Ground the motor to the PE position of the drive screw if possible. For details, see System Wiring Diagram.
- [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.

5.4.2 Encoder Cable Terminals

Terminal layout

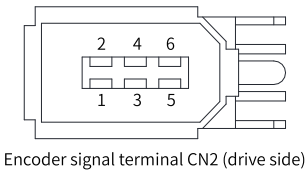
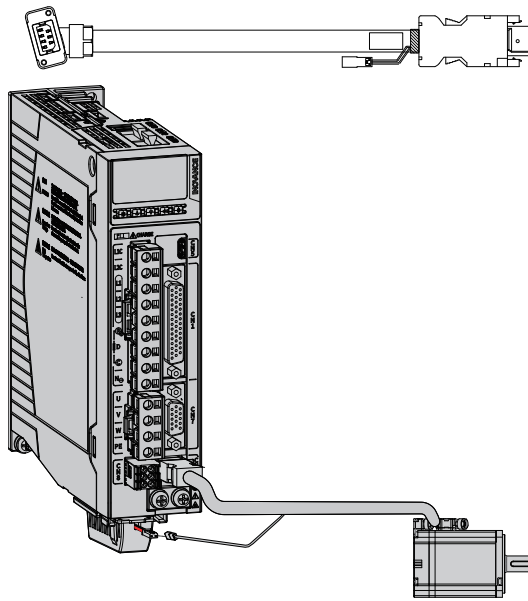


Figure 5-2 Layout of encoder terminal pins

Table 5-4 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 5-3 Wiring example of absolute encoder signals^[1]

Note

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

Color of battery box outer lead:

Pin No.	Color	Assignment
1	Red	Power (+)

Pin No.	Color	Assignment
2	Black	Power (-)

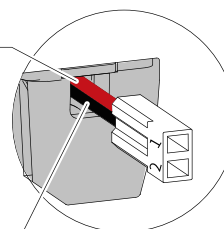


Figure 5-4 Lead wires of the absolute encoder battery

Note

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

Table 5-5 Terminal-type motor encoder cable connector

Applicable motor frame size ^[1]	Connector appearance		Terminal pin layout			
			Pin No.	Signal name	Color	Type
Terminal-type: 40 60 80	Drive side	 6-pin male (right side as the coupling face)	1	+5V	White	Twisted pair
			2	GND	Brown	
			5	PS+	Gray	Twisted pair
			6	PS-	Pink	
			Enclosure	PE	-	-
	Motor side	 7-pin connector	1	PS+	Gray	Twisted pair
			2	PS-	Pink	
			3	DC+	Yellow	Twisted pair
			4	DC-	Green	
			5	+5V	White	Twisted pair
			6	GND	Brown	
			7	PE	-	-

Note

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

Table 5-6 High power motor encoder cable connector

Applicable motor frame size ^[1]	Connector appearance			Terminal pin layout			
				Pin No.	Signal name	Color	Type
100 130 180	 Connected to CN2 of the drive	Drive side	 6-pin male (right side as the coupling face)	1	+5V	White	Twisted pair
				2	GND	Brown	
				5	PS+	Gray	Twisted pair
				6	PS-	Pink	
				Enclosure	PE	-	-
		Motor side	 20-29 aviation connector Viewed from this side	A	PS+	Gray	Twisted pair
				B	PS-	Pink	
				E	DC+	Yellow	Twisted pair
				F	DC-	Green	
				G	+5V	White	-
				H	GND	Brown	
				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 slightly. After insertion, screw down with a tightening torque of 1.5 ± 0.5 kgf.cm.

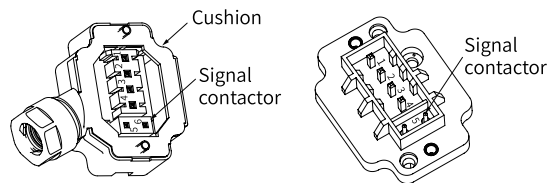


Figure 5-5 Power connector

Terminal-type encoder connector

Note

Check that the connector cushion is in place before connection.

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

Check that the connector cushion is in place before connection.

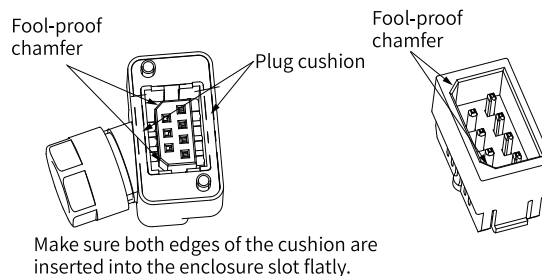


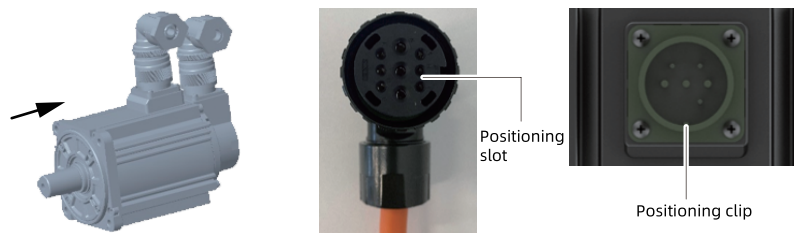
Figure 5-6 Encoder connector

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.



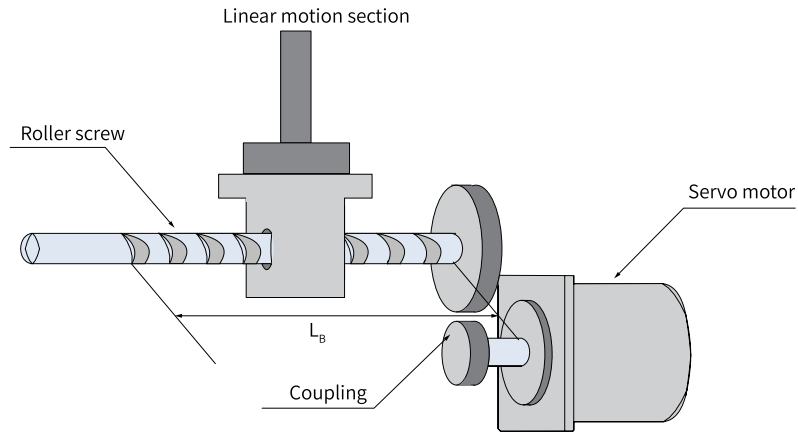
Check that the connector positioning slot on the cable side is in the same direction as the connector positioning clip on the motor side before tightening the connector. After inserting the connector, screw down the lock bolt to the bottom of the cable until it is fixed. Check that no threads are exposed.

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



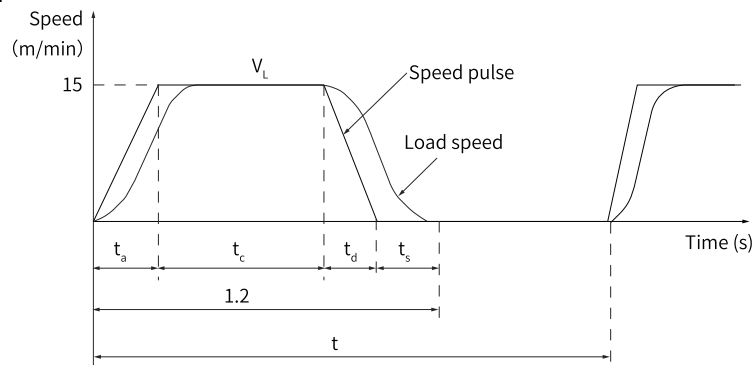
6 Servo Motor Capacity Selection

6.1 Capacity Selection Example for Position Control



Load speed $V_L = 15 \text{ m/min}$
 Linear motion section mass (m) = 80 kg
 Roller screw length $L_B = 0.8 \text{ m}$
 Roller screw diameter $d_B = 0.016 \text{ m}$
 Roller screw pitch $P_B = 0.005 \text{ m}$
 Coupling mass $m_c = 0.3 \text{ kg}$
 Coupling outer diameter $d_c = 0.03 \text{ m}$
 Number of feeding operations (n) = 40/min
 Feeding distance (L) = 0.25 m
 Feeding time $t_m = 1.2 \text{ s}$ or less
 Electrical stopping precision (δ) = $\pm 0.01 \text{ mm}$
 Friction coefficient (μ) = 0.2
 Mechanical efficiency (η) = 0.9 (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

$T_L \leq$ motor rated torque

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

$n_M \leq$ motor rated speed

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

Perform the following provisional selections according to preceding conditions:

Servo motor: MS1H1-20B30CB-A330R

Servo drive: SV670PS1R6I

- Specifications of the servo motor and servo drive

Rated output: 200 (W)

Rated speed: 3000 (RPM)

Rated torque: 0.64 (N·m)

Maximum instantaneous torque: 1.95 (N·m)

Motor rotor moment of inertia: $0.082 \times 10^{-4} (\text{kg} \cdot \text{m}^2)$

Permissible load inertia of mechanism: $1.64 \times 10^{-4} (\text{kg} \cdot \text{m}^2)$

Number of encoder pulses: 67108864 (P/R)

8. Verification of the servo motor selected provisionally

Verify the start torque required

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

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

Verify the braking torque required

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

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

Verify the effective torque value

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

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

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

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 position loop gain $K_p = 30 (\text{l/s})$

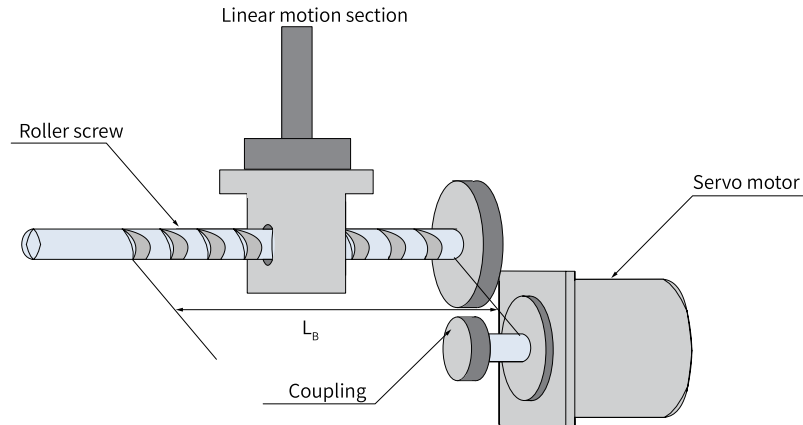
$$\varepsilon = \frac{v_s}{K_p} = \frac{25000}{30} = 833 (\text{pulse})$$

- 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 kg

Roller screw length $L_B = 0.8 \text{ m}$

Roller screw diameter $d_B = 0.04 \text{ m}$

Roller screw pitch $P_B = 0.01 \text{ m}$

Coupling mass $m_c = 1 \text{ kg}$

Coupling outer diameter $d_c = 0.06 \text{ m}$

Number of feeding operations (n) = 40/min

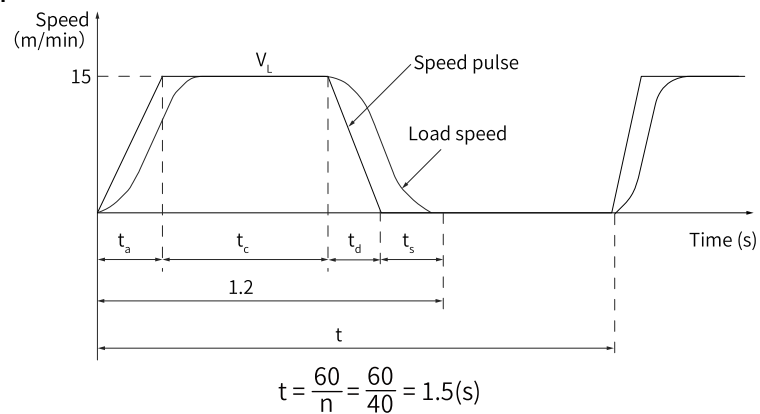
Feeding distance (L) = 0.25 m

Feeding time $t_m = 1.2 \text{ s}$ or less

Friction coefficient (μ) = 0.2

Mechanical efficiency (η) = 0.9 (90%)

1. Speed diagram



Set $t_a = t_d$

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

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

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

$T_L \leq$ motor rated torque

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

$n_M \leq$ motor rated speed

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

Perform the following provisional selections according to preceding conditions:

Servo motor: MS1H4-75B30CB-A331R

Servo drive: SV670PS5R5I

- Specifications of the servo motor and servo drive
- Rated output: 750 (W)
- Rated speed: 3000 (RPM)
- Rated torque: 2.39 (N·m)
- Maximum instantaneous torque: 8.365 (N·m)
- Motor rotor moment of inertia: $1.38 \times 10^{-4}(\text{kg} \cdot \text{m}^2)$
- Permissible load inertia of mechanism: $69.58 \times 10^{-4}(\text{kg} \cdot \text{m}^2)$

8. Verification of the servo motor selected provisionally

Verify the start torque required

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

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

Verify the braking torque required

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

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

Verify the effective torque value

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

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

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

9. Selection result

The servo motor and servo drive selected provisionally are applicable for speed control. The torque diagram is as follows.

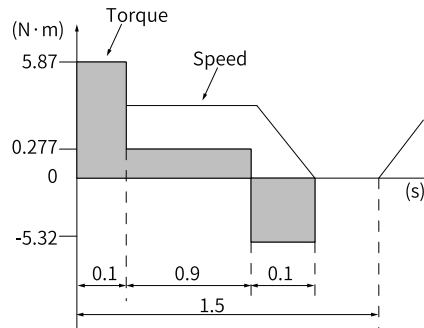


Figure 6-1 Torque diagram

7 Certifications, Directives, and Standards Compliance

CE certification

Directive	Standard	
EMC directive 2014/30/EU	Servo drive	EN 61800-3
	Servo motor	EN 61000-6-2
		EN 61000-6-4
		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	-
	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

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.

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