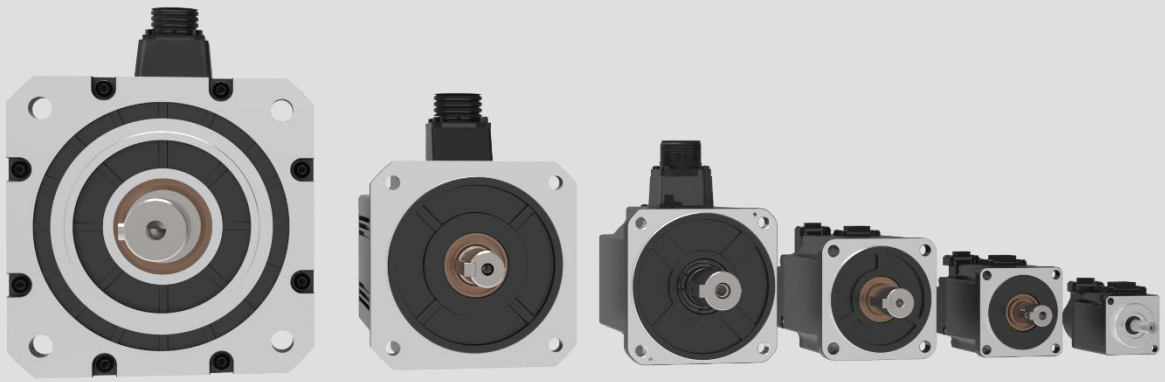
IMS20B Series Small Power Servo Motor Product Manual



深圳市英威腾电气股份有限公司
SHENZHEN INVT ELECTRIC CO., LTD.

Preface

Overview

Thank you for purchasing the IMS20B series small power servo motor.

IMS20B series small power servo motor is a newly developed servo motor product by INVT, covering a power range of 0.05kW–7.5kW, with frame sizes of 40 to 180. It offers various inertia configurations and speed ranges, and different types of encoders can be configured according to customer requirements.

This product is suitable for the general automation industry, working with servo drives to achieve fast and precise position control, speed control, and torque control.

This manual provides product information, specifications, dimensions, and other relevant details about the motor. If you have any questions, please contact our technical support staff.

Readers

Personnel with electrical professional knowledge (such as qualified electrical engineers or personnel with equivalent knowledge).

Change history

The manual is subject to change irregularly without prior notice due to product version upgrades or other reasons.

No.	Change description	Version	Release date
1	First release.	V1.0	2024.11

Contents

1 Safety precautions

1.1 Safety declaration

Read this manual carefully and follow all safety precautions before moving, installing, operating and servicing the VFD. Otherwise, equipment damage or physical injury or death may be caused.

We shall not be liable or responsible for any physical injury or equipment damage caused due to failure to follow the safety precautions.

1.1 Safety level definition

Safety level	Description
	Severe personal injury or even death can result if related requirements are not followed.
	Personal injury or equipment damage can result if related requirements are not followed.

1.2 Personnel requirements

People operating the equipment must have received professional electrical and safety training and obtained the certificates, and must be familiar with all steps and requirements of equipment installing, commissioning, running and maintaining and capable to prevent any emergencies according to experiences.

1.3 Safety guidelines

Unpacking inspection	
	● Please confirm that the packaging of the servo motor product is intact, with no damage, rust, moisture, dampness, or deformation. ● Please handle with care when unpacking and retrieving the motor to avoid any collisions and damage to the motor. ● After opening the packaging box, please confirm that the machine is undamaged or unbroken, that all components are complete, and that the nameplate and label on the product body match the ordered model.

Delivery	
	● Ensure that the motor is securely installed during transportation to prevent accidental falls. ● Do not transport motor products with items that could cause damage. ● Before handling large motor products, please check the fixed lifting position of the motor and ensure the safety of the lifting equipment during the handling process. ● Do not move the motor by pulling the cables or the shaft.

Installation	
	● Please read this manual carefully before installation and strictly follow all safety precautions. ● Please ensure that the mechanical strength of the installation location is sufficient to support the weight of the equipment. ● Please check for any abnormalities in the motor mounting holes before installation. ● Do not disassemble any components or parts of the motor. If any modifications are needed, please contact a professional. ● When performing installation work, please cover the product to prevent metal shavings and foreign objects from entering the motor, which could affect its safety.

Cable selection	
	● Do install the overcurrent protector, leakage current protector and emergency device and confirm their effectiveness after wiring. ● Please ensure that the AC power supply voltage matches the rated voltage of the servo motor. ● Do not place the power cables and encoder cables in a strong magnetic field environment. ● Please ensure that the equipment and products have good grounding.
	● Before wiring, please check the integrity of the power cables. Do not use power cables that are damaged or exposed. ● Please ensure that the drive is correctly wired to the motor.

Check before power-on	
	● Please ensure that the product wiring connections are correct. ● Please ensure that there are no personnel lingering around the drive, motor, and related equipment. ● Please ensure that the key is securely fixed. If there is no coupling to secure the key, please remove the key to prevent it from flying out during motor operation.

	• Please ensure that the emergency stop switch is properly connected to the drive.

Running	
	• De-couple the motor load and run the motor independently during the trial operation to avoid accidents. • Do not touch conductive parts directly while in operation. • Do not connect or short-circuit any external cables of the motor, especially those related to electricity, with the housing or each other. • If you need to rewire the motor, please disconnect the power and wait for 15 minutes before proceeding.
	• Set the corresponding parameters before operation, otherwise the motor may run abnormally or beyond the expectation because of the load. • The motor housing heat sink can reach high temperatures during operation. Do not touch the motor housing heat sink.

Maintenance and repair	
	• Non-professional personnel are strictly prohibited from installing, wiring, maintaining, inspecting, or replacing components of the equipment. • For maintenance, repair, and component replacement of the motor, please contact a qualified technician. • Maintenance of the equipment is strictly prohibited while it is powered on.

Scrapping	
	• The components inside the motor contain heavy metals. Please follow the relevant national regulations and standards for the disposal of equipment and products. After disposal, the motor must be treated as industrial waste.

1.4 Warning symbols

To ensure safe operation, please strictly adhere to the safety labels affixed to the equipment. Do not damage or remove the safety labels. The warning symbols are as follows:

Warning symbols	Description
	Caution: high temperature on the motor surface!
	Caution: risk of electric shock!
	Do not strike the motor shaft extension!

2 Motor model selection

Small-power servo motor					Servo drive	
Frame size	Output power (kW)	Rated torque (N•m)	Motor model	Rated current (A)	Rated voltage (V)	Recommended drive model
40	0.05	0.16	IMS20B-04L05B30C-2-**(5)	0.6	1PH/ 3PH 220	DA200A-*-2R8-S-2-*
	0.1	0.32	IMS20B-04L10B30C-2-**(4)	1.0	1PH/ 3PH 220	DA200A-*-2R8-S-2-*
60	0.2	0.64	IMS20B-06M20B30C-2-**(4)	1.4	1PH/ 3PH 220	DA200A-*-2R8-S-2-*
	0.2	0.64	IMS20B-06M20B30C-4-**(4)	1.1	1PH/ 3PH 380	DA200A-*-5R5-T-2-*
	0.4	1.27	IMS20B-06M40B30C-2-**(4)	2.7	1PH/ 3PH 220	DA200A-*-2R8-S-2-*
	0.4	1.27	IMS20B-06M40B30C-4-**(4)	1.6	1PH/ 3PH 380	DA200A-*-5R5-T-2-*
80	0.75	2.39	IMS20B-08M75B30C-2-**(4)	4.8	1PH/ 3PH 220	DA200A-*-6R0-S-2-*
	0.75	2.39	IMS20B-08M75B30C-4-**(4)	2.8	1PH/ 3PH 380	DA200A-*-5R5-T-2-*
	1	3.18	IMS20B-08M10C30C-2-**(4)	5.5	1PH/ 3PH 220	DA200A-*-6R0-S-2-*
	1	3.18	IMS20B-08M10C30C-4-**(4)	3.5	1PH/ 3PH 380	DA200A-*-5R5-T-2-*
100	1	3.2	IMS20B-10M10C30C-2-**(4)	6.6	3PH 220	DA200A-*-6R0-S-2-*
	1	3.2	IMS20B-10M10C30C-4-**(4)	3.7	3PH 380	DA200A-*-5R5-T-2-*
	1.5	4.8	IMS20B-10M15C30C-2-**(4)	8.8	3PH 220	DA200A-*-8R0-S-2-*
	1.5	4.8	IMS20B-10M15C30C-4-**(4)	5.1	3PH 380	DA200A-*-5R5-T-2-*
	2	6.4	IMS20B-10M20C30C-2-**(4)	10.7	3PH 220	DA200A-*-010-S-2-*
	2	6.4	IMS20B-10M20C30C-4-**(4)	7.0	3PH 380	DA200A-*-5R5-T-2-*
	2.5	8.0	IMS20B-10M25C30C-2-**(4)	13.3	3PH 220	DA200A-*-013-S-2-*
	2.5	8.0	IMS20B-10M25C30C-4-**(4)	8.2	3PH 380	DA200A-*-8R5-T-2-*
130	3	9.8	IMS20B-13L30C30C-4**(4)	10.1	3PH 380	DA200A-*-012-T-2-*
	4	12.6	IMS20B-13L40C30C-4**(4)	13	3PH 380	DA200A-*-016-T-2-*
	5	15.8	IMS20B-13L50C30C-4**(4)	16.8	3PH 380	DA200A-*-021-T-2-*
	1	4.8	IMS20B-13M10C20C-2-**(4)	5.4	3PH 220	DA200A-*-6R0-S-2-*
	1	4.8	IMS20B-13M10C20C-4-**(4)	3.0	3PH 380	DA200A-*-5R5-T-2-*
	1.5	7.2	IMS20B-13M15C20C-2-**(4)	7.6	3PH 220	DA200A-*-8R0-S-2-*
	1.5	7.2	IMS20B-13M15C20C-4-**(4)	4.8	3PH 380	DA200A-*-5R5-T-2-*
	2	9.6	IMS20B-13M20C20C-2-**(4)	9.0	3PH 220	DA200A-*-010-S-2-*
	2	9.6	IMS20B-13M20C20C-4-**(4)	5.6	3PH 380	DA200A-*-5R5-T-2-*
	3	14.3	IMS20B-13M30C20C-2-**(4)	13.0	3PH 220	DA200A-*-013-S-2-*
	3	14.3	IMS20B-13M30C20C-4-**(4)	7.7	3PH 380	DA200A-*-8R5-T-2-*

Small-power servo motor					Servo drive	
Frame size	Output power (kW)	Rated torque (N•m)	Motor model	Rated current (A)	Rated voltage (V)	Recommended drive model
	0.85	5.4	IMS20B-13H85B15C-2-**(4)	6.2	3PH 220	DA200A-*-6R0-S-2-*
	0.85	5.4	IMS20B-13H85B15C-4-**(4)	3.3	3PH 380	DA200A-*-5R5-T-2-*
	1.3	8.3	IMS20B-13H13C15C-2-**(4)	9.9	3PH 220	DA200A-*-010-S-2-*
	1.3	8.3	IMS20B-13H13C15C-4-**(4)	5.2	3PH 380	DA200A-*-5R5-T-2-*
	1.8	11.5	IMS20B-13H18C15C-2-**(4)	12.8	3PH 220	DA200A-*-013-S-2-*
	1.8	11.5	IMS20B-13H18C15C-4-**(4)	7.7	3PH 380	DA200A-*-8R5-T-2-*
180	3	19.1	IMS20B-18M30C15C-4-**(4)	9.7	3PH 380	DA200A-*-012-T-2-*
	4.4	28	IMS20B-18M44C15C-4-**(4)	13.5	3PH 380	DA200A-*-016-T-2-*
	5.5	35	IMS20B-18M55C15C-4-**(4)	16.8	3PH 380	DA200A-*-016-T-2-*
	7.5	47.8	IMS20B-18M75C15C-4-**(4)	20.9	3PH 380	DA200A-*-021-T-2-*

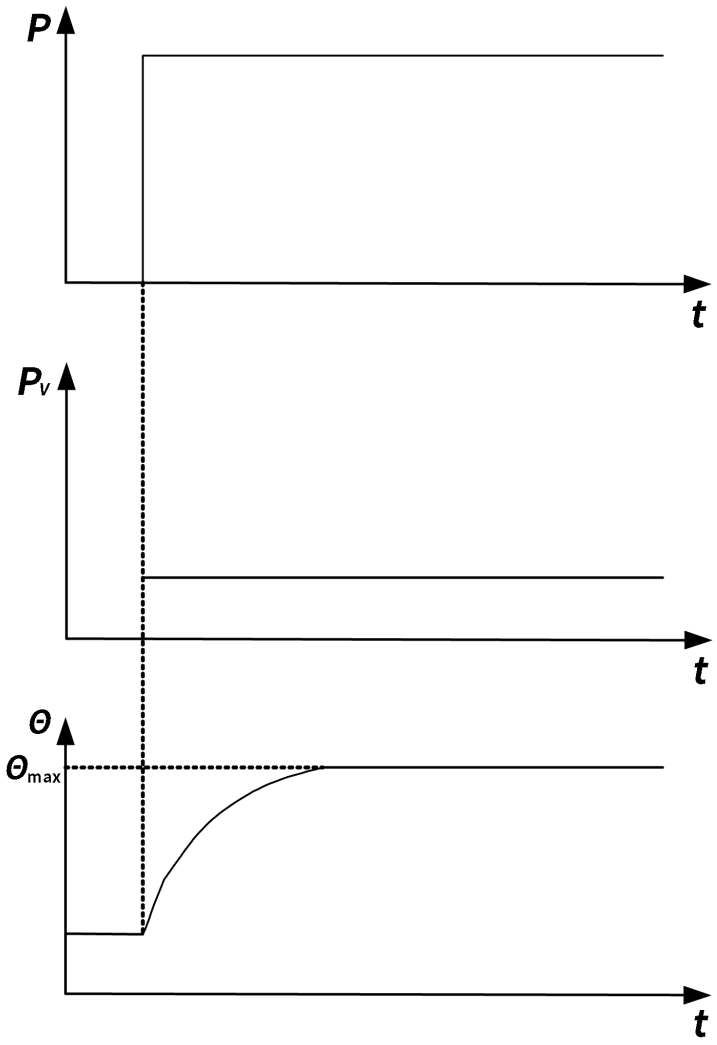
3 Common terms

3.1 Duty

A description of a series of load conditions that the motor experiences, including starting, electrical braking, no-load, shutdown, power interruption, as well as their duration and sequence. The duty complies with GB755.

S1 duty: Continuous duty

Operate under a constant load until reaching thermal stability, as shown in the following figure.



P : Load

P_V : Electrical losses

Θ : Temperature

Θ_{max} : Reach the maximum temperature

t : Time

3.2 Ingress protection (IP) rating

The motor ingress protection rating is represented by a code that contains 2 letters and 2 digits. Including:

- IP (Ingress Protection): The code letters indicate the protection levels against the contact and ingress of solid objects and water.
- First digit: 0 to 6, indicates the level of protection provided by the enclosure against contact with persons and against ingress of solid objects inside the enclosure.
- Second digit: 0 to 8, indicates the level of protection against harmful effects due to the ingress of water into the enclosure.

Ingress protection rating	First digit	Meaning	Second digit	Meaning
IP	0	No protection at all	0	No protection at all
	1	Protection against solid objects with a diameter greater than 50mm	1	Protection against vertical water drops
	2	Protection against solid objects with a diameter greater than 12mm	2	Protection against vertical water drops at an angle of up to 15°
	3	Protection against solid objects with a diameter greater than 2.5mm	3	Protection against sprayed water at an angle of up to 60°
	4	Protection against solid objects with a diameter greater than 1mm	4	Protection against the splashing of water from any direction
	5	Protection against the ingress of dust in such an amount that it will not interfere with the operation of the equipment	5	Protection against the water jets from any direction
	6	Total protection against the ingress of any dust	6	Protection against powerful water jets from any direction
	-	-	7	Protection against the ingress of water when temporary immersed between 0.15m and 1m
	-	-	8	Protection against long periods of immersion under the conditions specified by the manufacturer

3.3 Rated parameters

Terms	Description
Rated power	The continuous operating power of the motor under specified conditions. Special duty type need to be specified.
Rated rotation speed	The rotational speed of the motor when it outputs the rated power at rated voltage and rated frequency.
Rated torque	The output torque of the motor when it reaches thermal steady state at

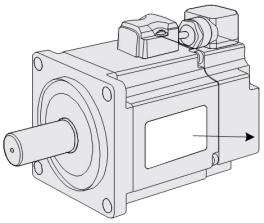
Terms	Description
	rated power and rated speed.
Rated current	The current of the motor when it operates under rated conditions and reaches thermal steady state.

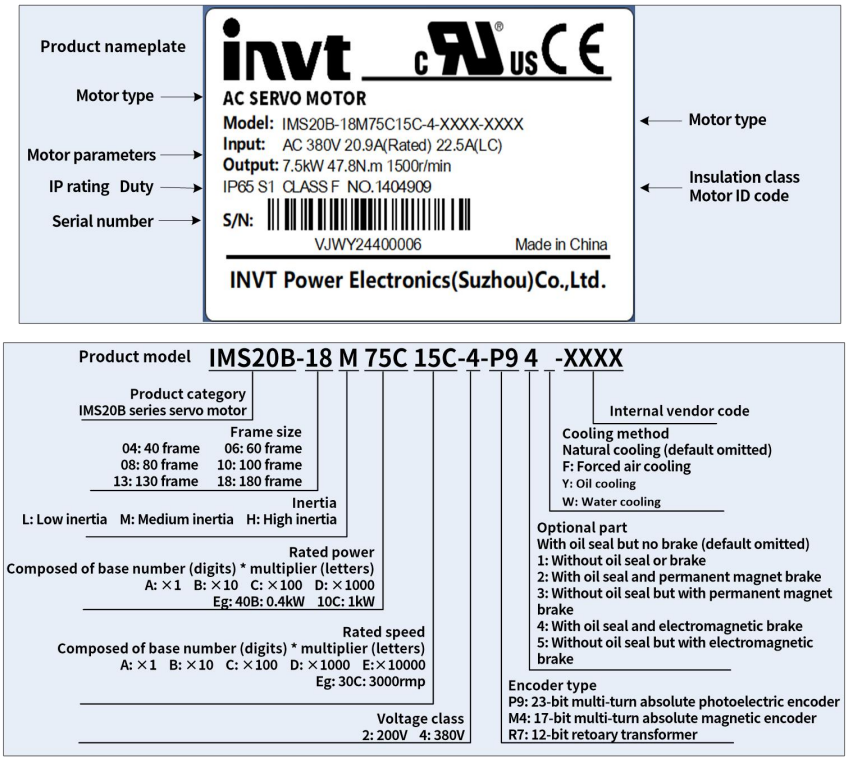
4 Product overview

4.1 Product features

- Comprehensive motor model: Involves 40 to 180 frame size motors, with a power range of 0.05kW to 7.5kW.
- Excellent motor performance: The motor has strong overload capacity.
- High control precision: The motor includes a 17-bit absolute encoder and a 23-bit absolute encoder.

4.2 Model and nameplate





Note: The UL label indicates that this model complies with UL certification. UL certification for frame sizes 40, 100, 130, and 180 has not yet been initiated.

4.3 Product parameters

Frame size	Output power (kW)	Rated speed (rpm)	Max. speed (rpm)	Rated current (A)	Peak current (A)	Rated torque (Nm)	Peak torque (Nm)	Motor model	Selectable encoder type
40	0.05	3000	6000	0.6	2.2	0.16	0.56	IMS20B-04L05B30C-2-**	M4
								IMS20B-04L05B30C-2-**5	P9
	0.1	3000	6000	1.0	3.9	0.32	1.12	IMS20B-04L10B30C-2-**	M4

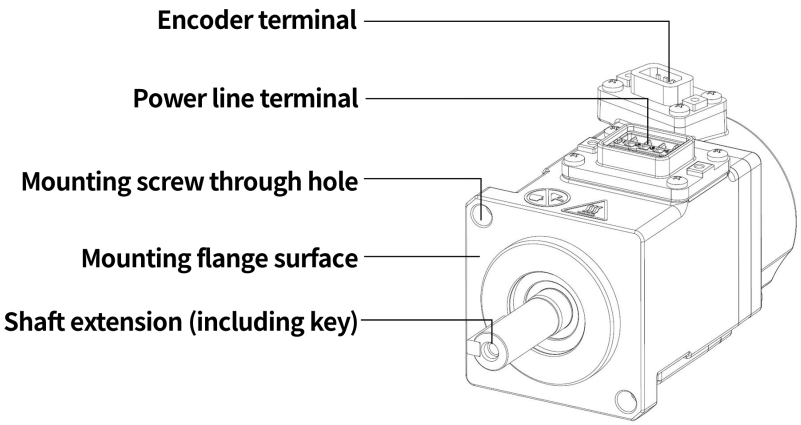
Frame size	Output power (kW)	Rated speed (rpm)	Max. speed (rpm)	Rated current (A)	Peak current (A)	Rated torque (Nm)	Peak torque (Nm)	Motor model	Selectable encoder type
								IMS20B-04L10B30C-2-**4	P9
60	0.2	3000	7000	1.4	4.6	0.64	2.24	IMS20B-06M20B30C-2-**	M4 P9
								IMS20B-06M20B30C-2-**4	
	0.2	3000	7000	1.1	3.6	0.64	2.24	IMS20B-06M20B30C-4-**	
								IMS20B-06M20B30C-4-**4	
	0.4	3000	7000	2.7	8.9	1.27	4.45	IMS20B-06M40B30C-2-**	M4 P9
								IMS20B-06M40B30C-2-**4	
	0.4	3000	7000	1.6	5.3	1.27	4.45	IMS20B-06M40B30C-4-**	
								IMS20B-06M40B30C-4-**4	
80	0.75	3000	7000	4.8	16.0	2.39	8.37	IMS20B-08M75B30C-2-**	M4 P9
								IMS20B-08M75B30C-2-**4	
	0.75	3000	7000	2.8	9.3	2.39	8.37	IMS20B-08M75B30C-4-**	
								IMS20B-08M75B30C-4-**4	
	1	3000	7000	5.5	19.0	3.18	11.13	IMS20B-08M10C30C-2-**	
								IMS20B-08M10C30C-2-**4	
	1	3000	7000	3.5	11.7	3.18	11.13	IMS20B-08M10C30C-4-**	
								IMS20B-08M10C30C-4-**4	
100	1	3000	6000	6.6	19.8	3.2	9.6	IMS20B-10M10C30C-2-**	M4 P9
								IMS20B-10M10C30C-2-**4	
	1	3000	6000	3.7	11.3	3.2	9.6	IMS20B-10M10C30C-4-**	
								IMS20B-10M10C30C-4-**4	
	1.5	3000	6000	8.8	24.4	4.8	14.3	IMS20B-10M15C30C-2-**	
								IMS20B-10M15C30C-2-**4	
	1.5	3000	6000	5.1	14.9	4.8	14.3	IMS20B-10M15C30C-4-**	
								IMS20B-10M15C30C-4-**4	
	2	3000	6000	10.7	31.0	6.4	19.1	IMS20B-10M20C30C-2-**	
								IMS20B-10M20C30C-2-**4	
	2	3000	6000	7.0	22.2	6.4	19.1	IMS20B-10M20C30C-4-**	
								IMS20B-10M20C30C-4-**4	
	2.5	3000	6000	13.3	38.5	8.0	23.9	IMS20B-10M25C30C-2-**	
								IMS20B-10M25C30C-2-**4	
	2.5	3000	6000	8.2	27.8	8.0	23.9	IMS20B-10M25C30C-4-**	
								IMS20B-10M25C30C-4-**4	

Frame size	Output power (kW)	Rated speed (rpm)	Max. speed (rpm)	Rated current (A)	Peak current (A)	Rated torque (Nm)	Peak torque (Nm)	Motor model	Selectable encoder type
130	3	3000	6000	10.1	30.8	9.8	29.4	IMS20B-13L30C30C-4-**	M4 P9
								IMS20B-13L30C30C-4-**4	
	4	3000	6000	13	38.6	12.6	37.8	IMS20B-13L40C30C-4-**	
								IMS20B-13L40C30C-4-**4	
	5	3000	6000	16.8	48.3	15.8	47.4	IMS20B-13L50C30C-4-**	
								IMS20B-13L50C30C-4-**4	
	1	2000	4500	5.4	16.9	4.8	14.3	IMS20B-13M10C20C-2-**	
								IMS20B-13M10C20C-2-**4	
	1	2000	4500	3.0	8.6	4.8	14.3	IMS20B-13M10C20C-4-**	
								IMS20B-13M10C20C-4-**4	
	1.5	2000	4500	7.6	22.2	7.2	21.5	IMS20B-13M15C20C-2-**	
								IMS20B-13M15C20C-2-**4	
	1.5	2000	4500	4.8	13.4	7.2	21.5	IMS20B-13M15C20C-4-**	
								IMS20B-13M15C20C-4-**4	
	2	2000	4500	9.0	27.8	9.6	28.7	IMS20B-13M20C20C-2-**	
								IMS20B-13M20C20C-2-**4	
	2	2000	4500	5.6	15.9	9.6	28.7	IMS20B-13M20C20C-4-**	
								IMS20B-13M20C20C-4-**4	
	3	2000	3000	13.0	37.5	14.3	43	IMS20B-13M30C20C-2-**	
								IMS20B-13M30C20C-2-**4	
	3	2000	3000	7.7	21.1	14.3	43	IMS20B-13M30C20C-4-**	
								IMS20B-13M30C20C-4-**4	
	0.85	1500	4500	6.2	14.9	5.4	13.5	IMS20B-13H85B15C-2-**	
130	0.85	1500	4500	6.2	14.9	5.4	13.5	IMS20B-13H85B15C-2-**4	M4 P9
	0.85	1500	4500	3.3	8.3	5.4	13.5	IMS20B-13H85B15C-4-**	
								IMS20B-13H85B15C-4-**4	
	1.3	1500	4500	9.9	24.8	8.3	20.7	IMS20B-13H13C15C-2-**	
								IMS20B-13H13C15C-2-**4	
	1.3	1500	4500	5.2	12.6	8.3	20.7	IMS20B-13H13C15C-4-**	
								IMS20B-13H13C15C-4-**4	
	1.8	1500	4500	12.8	31.1	11.5	28.7	IMS20B-13H18C15C-2-**	
								IMS20B-13H18C15C-2-**4	
	1.8	1500	4500	7.7	17.8	11.5	28.7	IMS20B-13H18C15C-4-**	

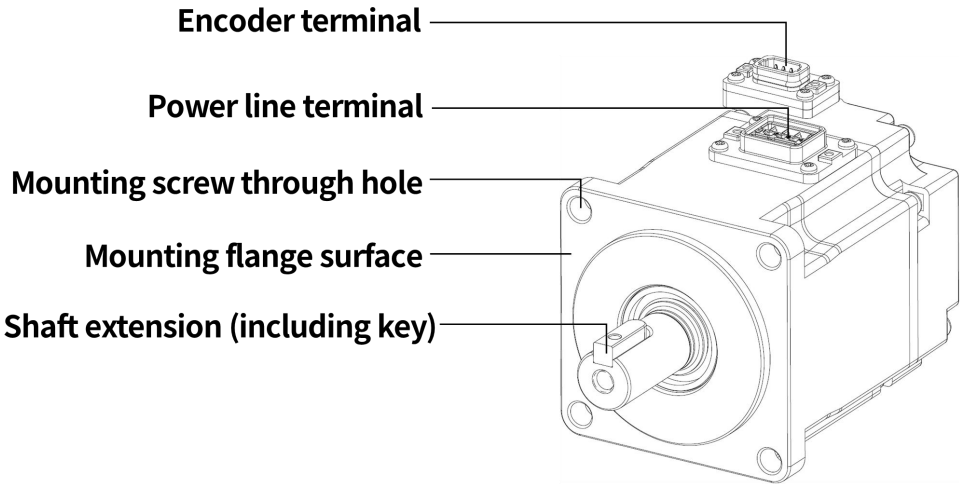
Frame size	Output power (kW)	Rated speed (rpm)	Max. speed (rpm)	Rated current (A)	Peak current (A)	Rated torque (Nm)	Peak torque (Nm)	Motor model	Selectable encoder type
								IMS20B-13H18C15C-4-**4	
180	3	1500	4500	9.7	22	19.1	47.8	IMS20B-18M30C15C-4-**	M4 P9
								IMS20B-18M30C15C-4-**4	
	4.4	1500	4500	13.5	29.8	28	70	IMS20B-18M44C15C-4-**	
								IMS20B-18M44C15C-4-**4	
	5.5	1500	4500	16.8	37.7	35	87.5	IMS20B-18M55C15C-4-**	
								IMS20B-18M55C15C-4-**4	
	7.5	1500	4500	20.9	46.4	47.8	119.4	IMS20B-18M75C15C-4-**	
								IMS20B-18M75C15C-4-**4	

4.4 Product component

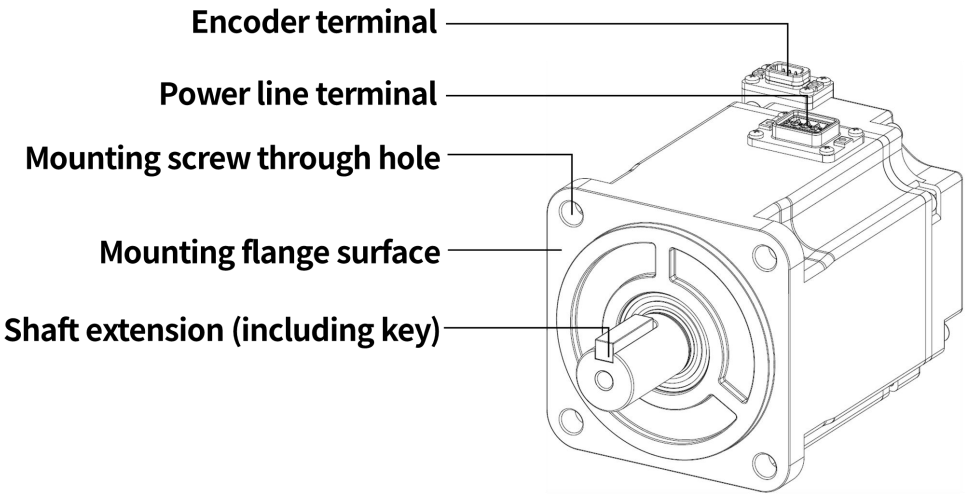
(1) Schematic diagram of components for frame size 40 motor



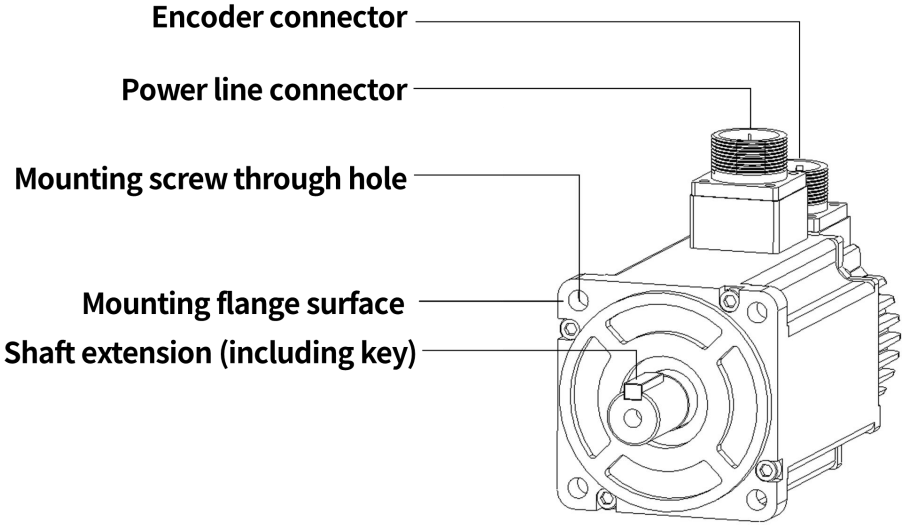
(2) Schematic diagram of components for frame size 60 motor



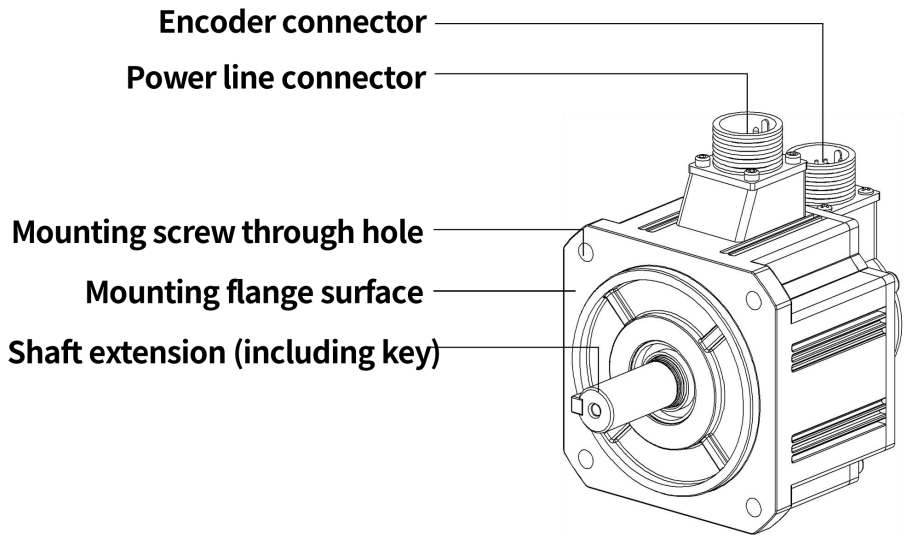
(3) Schematic diagram of components for frame size 80 motor



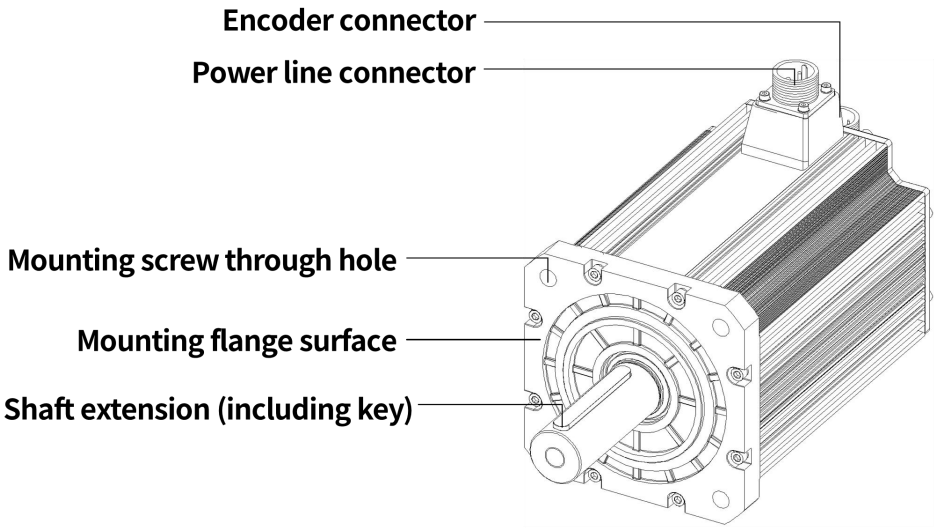
(4) Schematic diagram of components for frame size 100 motor



(5) Schematic diagram of components for frame size 130 motor



(6) Schematic diagram of components for frame size 180 motor



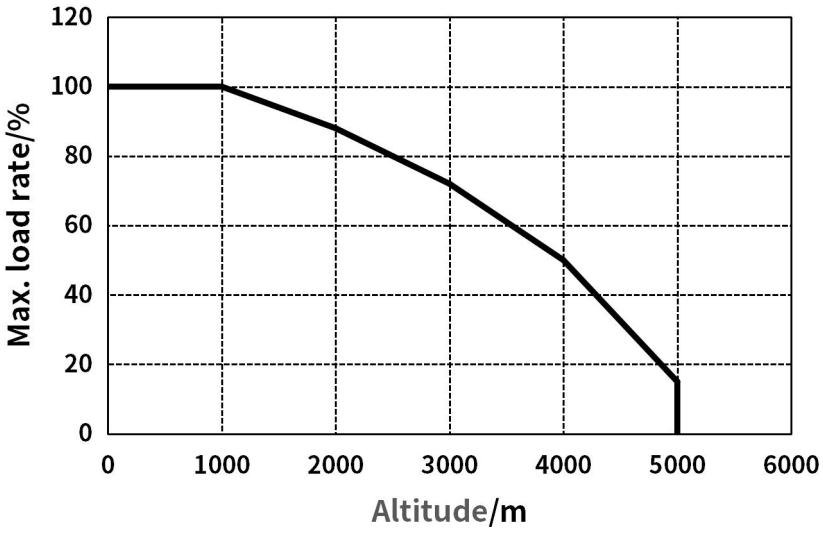
5 General specifications

5.1 Mechanical characteristics

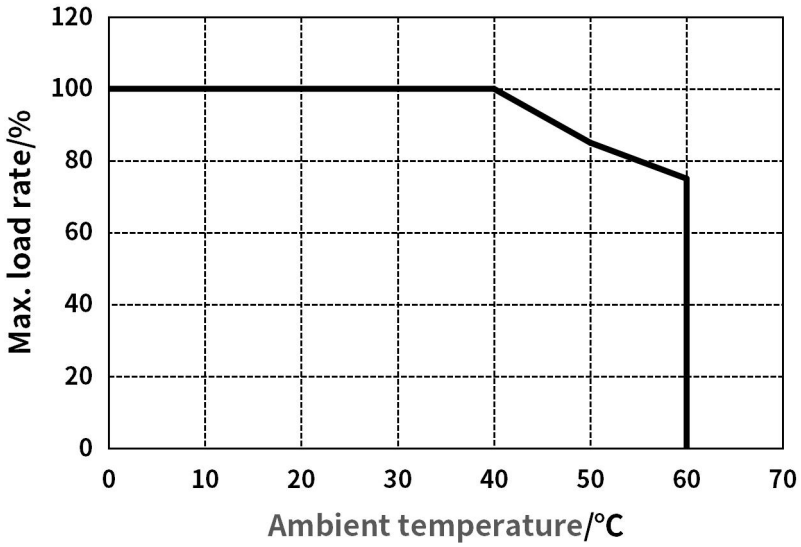
Item	Small-power servo motor
Duty	S1 continuous
Running environment temperature	0℃–40℃
Storage temperature	-20℃–+60°C
Running environment humidity	20%–80% RH (no condensation)
Vibration	49m/s²
Impact	490m/s²
Exciting method	Permanent magnetic
Installation methods	IMB5 (flange-mounted)
Insulation class	F
Insulation resistance	DC500V, > 100MΩ
Insulation voltage	AC 1500V for 1 minute (220V class); AC 1800V for 1 minute (380V class)
Enclosure IP rating	IP67 for frame sizes 40, 60, 80, and 100 (excluding shaft extension and cable ends). IP65 for frame sizes 130 and 180 (excluding shaft extension and cable ends).
Rotation direction	Under the forward command, the rotation appears counterclockwise (CCW) when viewed from the load side.
Altitude	Below 1000 meters. For altitudes above 1000 meters, please derate. For details, refer to the altitude derating curve.

5.2 Derating characteristics

5.2.1 Derating due to altitude

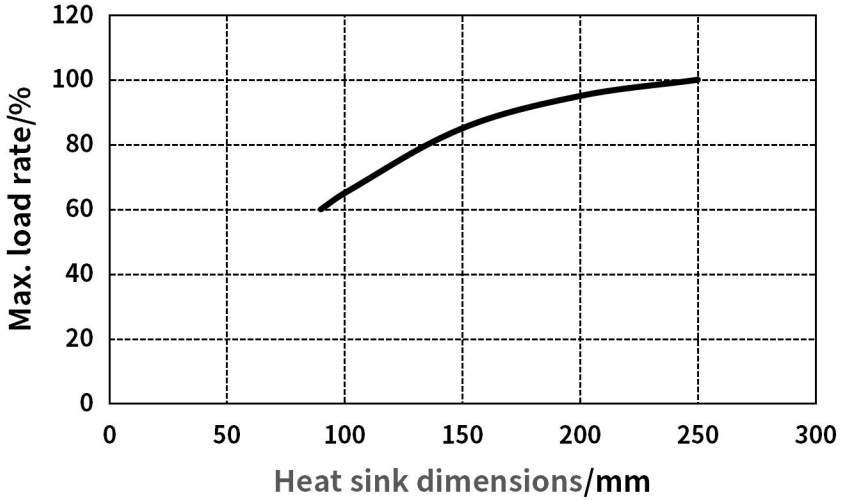


5.2.1 Derating due to temperature

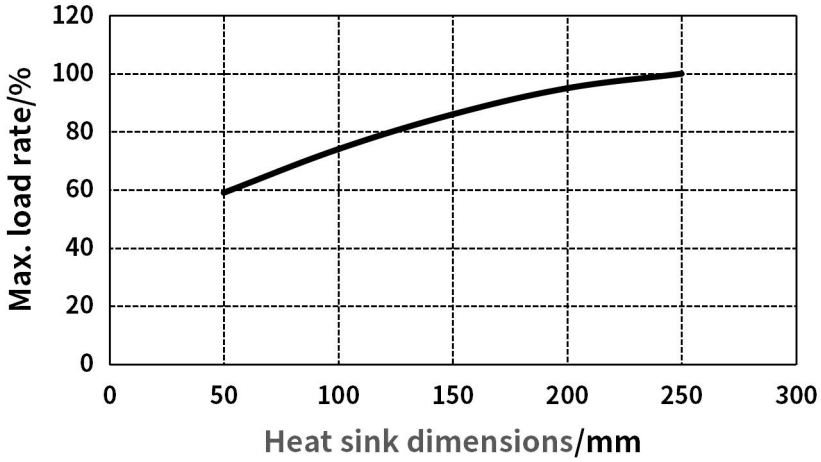


5.2.2 Derating due to heat dissipation

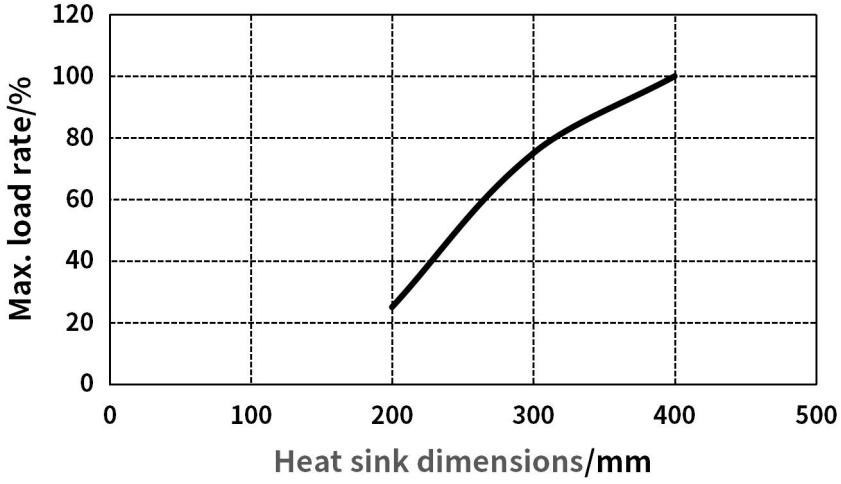
(1) Frame size 40



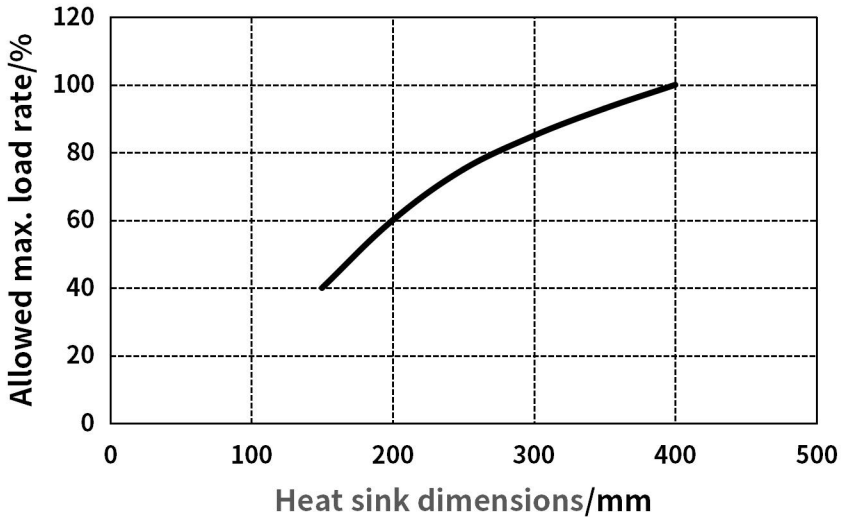
(2) Frame size 60/80



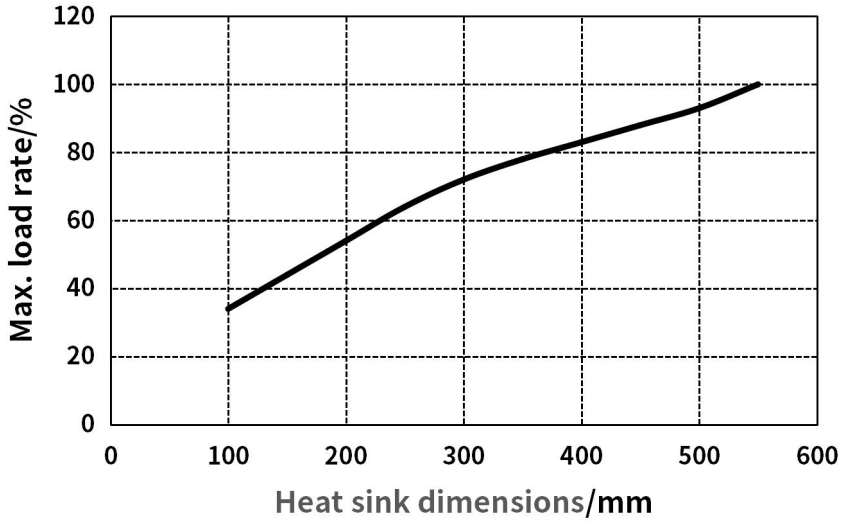
(3) Frame size 100



(4) Frame size 130



(5) Frame size 180



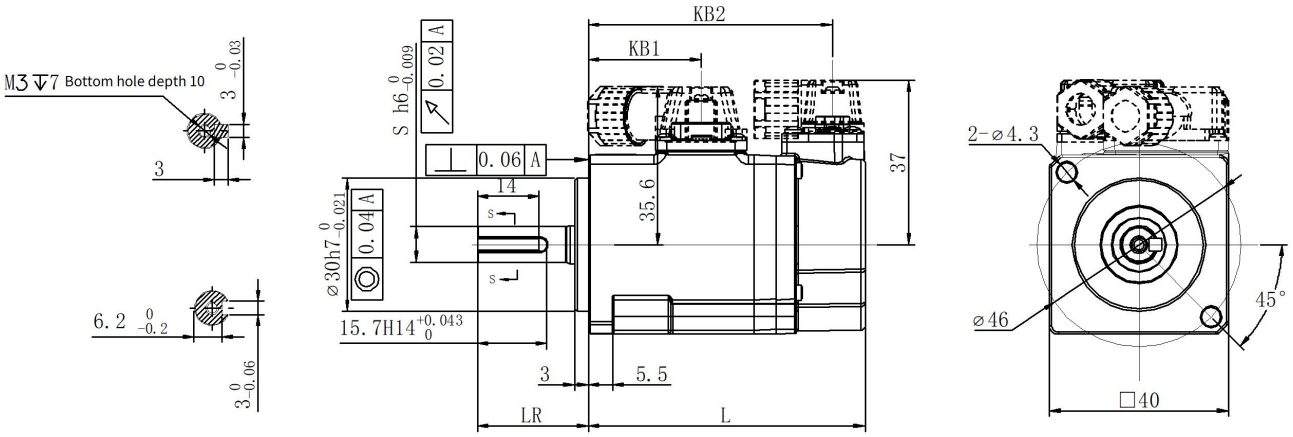
6 Small-power servo motor

6.1 40 frame

6.1.1 Motor parameters

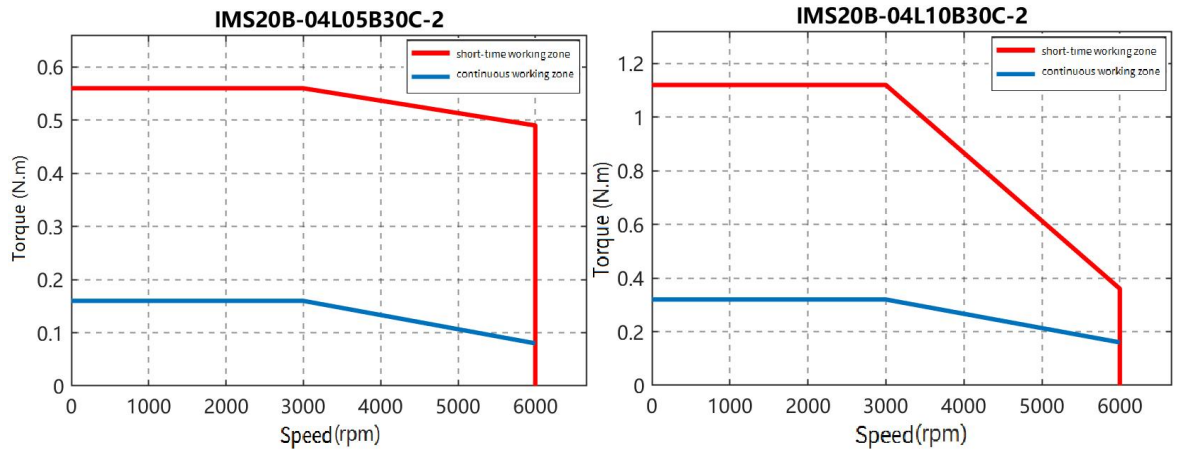
Model		IMS20B-04L	
		05B30C-2	10B30C-2
Frame size		40	40
Rated voltage (V)		220	220
Rated power (kW)		0.05	0.1
Rated speed (rpm)		3000	3000
Peak speed (rpm)		6000	6000
Rated torque (N•m)		0.16	0.32
Peak torque (N•m)		0.56	1.12
Rated current (A)		0.6	1.0
Peak current (A)		2.2	3.9
Torque coefficient (N•m/A)		0.28	0.33
Rotor rotation inertia (kg•cm2)	Standard	0.0018	0.031
	Brake type	0.021	0.034
Motor weight (kg)	Standard	0.28	0.36
	Brake type	0.47	0.55
Brake specifications	Holding torque (N·m)	0.32	
	Supply voltage (DC V)	24±10%	
	Rated power (W)	6.9	
	Pick-up voltage (V)	≤16.8	
	Drop-out voltage (V)	≥1.5	
	Pick-up time (ms)	≤40	
	Drop-out time (ms)	≤20	
	Coil resistance (Ω)	83.5±7%	
Allowable load	Radial allowable load (N•m)	78	
	Axial allowable load (N•m)	54	

6.1.2 Motor dimension



Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-04L05B30C	25.5	55.5(81.2)	25	8	62.4(88.1)	0.28(0.47)
IMS20B-04L10B30C	37.5	67.5(93.2)	25	8	74.4(100.1)	0.36(0.55)

6.1.3 External characteristic curve



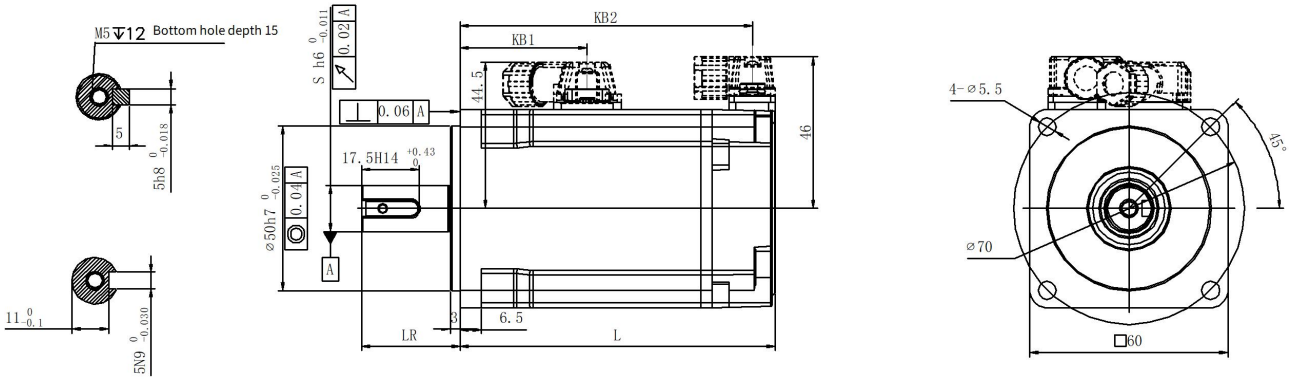
6.2 60 frame

6.2.1 Motor parameters

Model	IMS20B-06M			
	20B30C-2	40B30C-2	20B30C-4	40B30C-4
Frame size	60			
Rated voltage (V)	220		380	
Rated power (kW)	0.2	0.4	0.2	0.4
Rated speed (rpm)	3000	3000	3000	3000
Peak speed (rpm)	7000	7000	7000	7000
Rated torque (N•m)	0.64	1.27	0.64	1.27
Peak torque (N•m)	2.24	4.45	2.24	4.45

Rated current (A)		1.4	2.7	1.1	1.6
Peak current (A)		4.6	8.9	3.6	5.3
Torque coefficient (N•m/A)		0.51	0.5	0.65	0.85
Rotor rotation inertia (kg•cm2)	**Standard**	0.28	0.5	0.28	0.5
	Brake type	0.31	0.53	0.31	0.53
Motor weight (kg)	**Standard**	0.8	1.2	0.8	1.2
	Brake type	1.1	1.4	1.1	1.4
Brake specifications	**Holding torque (N·m)**	1.3			
	Supply voltage (DC V)	24±10%			
	Rated power (W)	7.5			
	Pick-up voltage (V)	≤16.8			
	Drop-out voltage (V)	0.5~8			
	Pick-up time (ms)	≤60			
	Drop-out time (ms)	≤20			
	Coil resistance (Ω)	76.8±7%			
Allowable load	**Radial allowable load (N•m)**	245			
	Axial allowable load (N•m)	74			

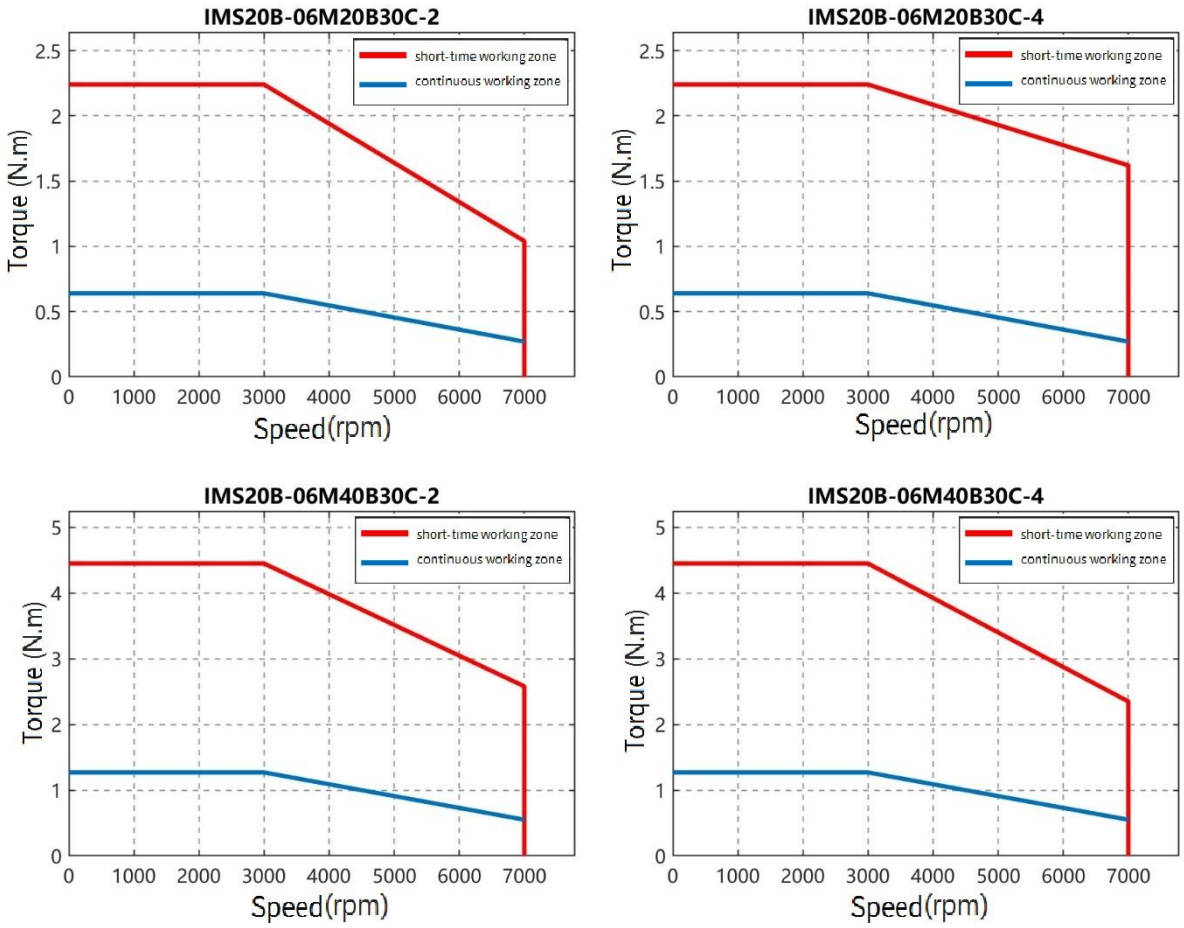
6.2.2 Motor dimension



Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-06M20B30C	38.5	66(88.5)	30	14	73(95.5)	0.8(1.1)
IMS20B-06M40B30C	58	85.5(107.5)	30	14	92.5(114.5)	1.2(1.4)

Note: The data in parentheses refers to the brake motor specifications.

6.2.3 External characteristic curve



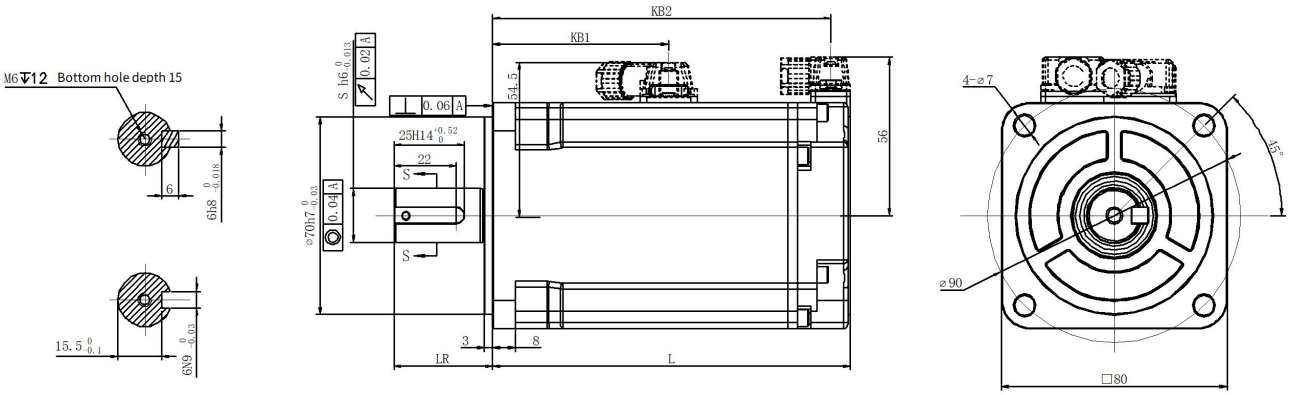
6.3 80 frame

6.3.1 Motor parameters

Model		IMS20B-08M			
		75B30C	10C30C	75B30C	10C30C
Frame size		80			
Rated voltage (V)		220		380	
Rated power (kW)		0.75	1	0.75	1
Rated speed (rpm)		3000	3000	3000	3000
Peak speed (rpm)		7000	7000	7000	7000
Rated torque (N•m)		2.39	3.18	2.39	3.18
Peak torque (N•m)		8.36	11.14	8.36	11.14
Rated current (A)		4.8	5.5	2.8	3.5
Peak current (A)		16.0	19.0	9.3	11.7
Torque coefficient (N•m/A)		0.52	0.61	0.91	0.97
Rotor rotation inertia	Standard	1.7	2.2	1.7	2.2

	Brake type	1.74	2.24	1.74	2.24
Motor weight (kg)	**Standard**	2.14	2.62	2.14	2.62
	Brake type	2.7	3.18	2.7	3.18
Brake specifications	**Holding torque (N·m)**	3.2			
	Supply voltage (DC V)	24±10%			
	Rated power (W)	11.5			
	Pick-up voltage (V)	≤16.8			
	Drop-out voltage (V)	≥1.5			
	Pick-up time (ms)	≤40			
	Drop-out time (ms)	≤20			
	Coil resistance (Ω)	50±7%			
Allowable load	**Radial allowable load (N•m)**	392			
	Axial allowable load (N•m)	147			

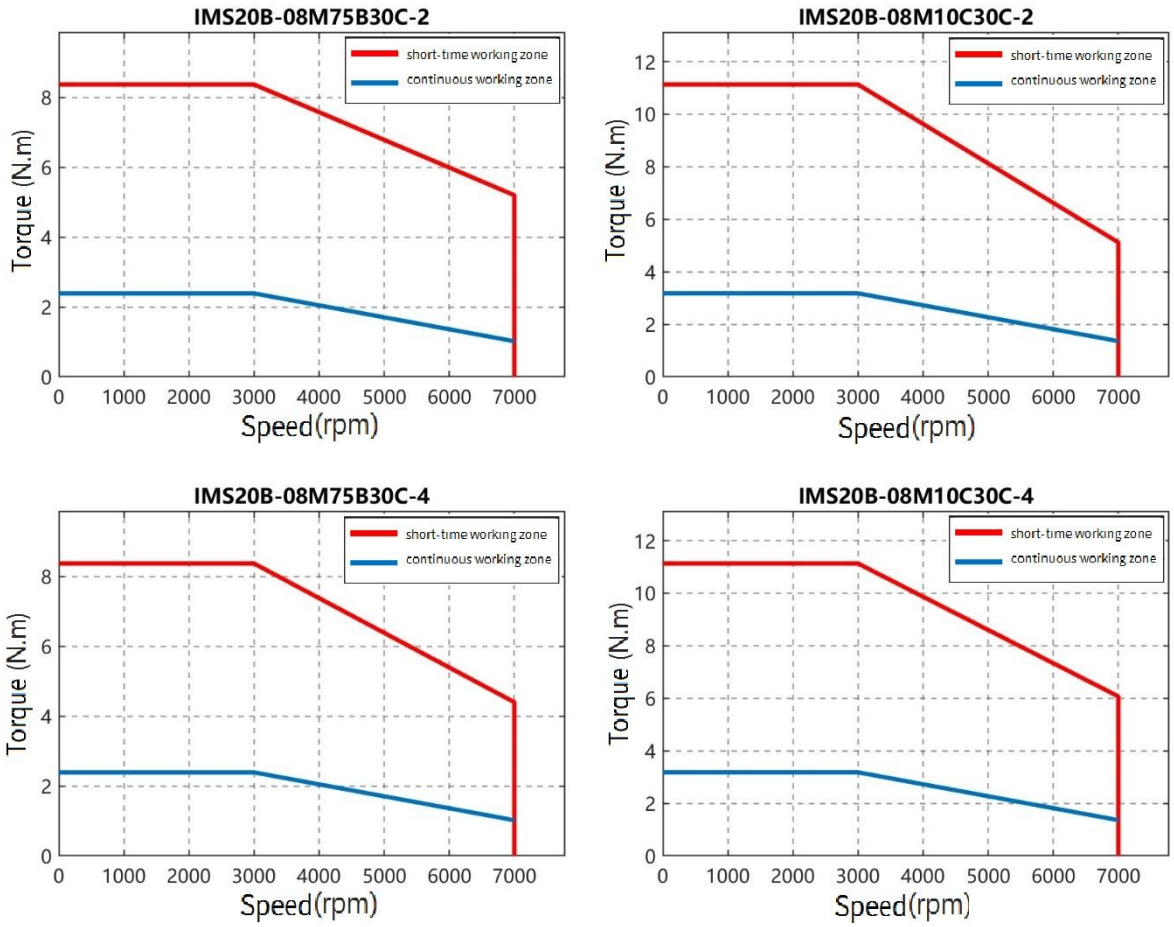
6.3.2 Motor dimension



Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-08M75B30C	62.5	89.8(120)	35	19	96.8(127)	2.14(2.7)
IMS20B-08M10C30C	76.5	103.8(134)	35	19	110.8(141)	2.62(3.18)

Note: The data in parentheses refers to the brake motor specifications.

6.3.3 External characteristic curve



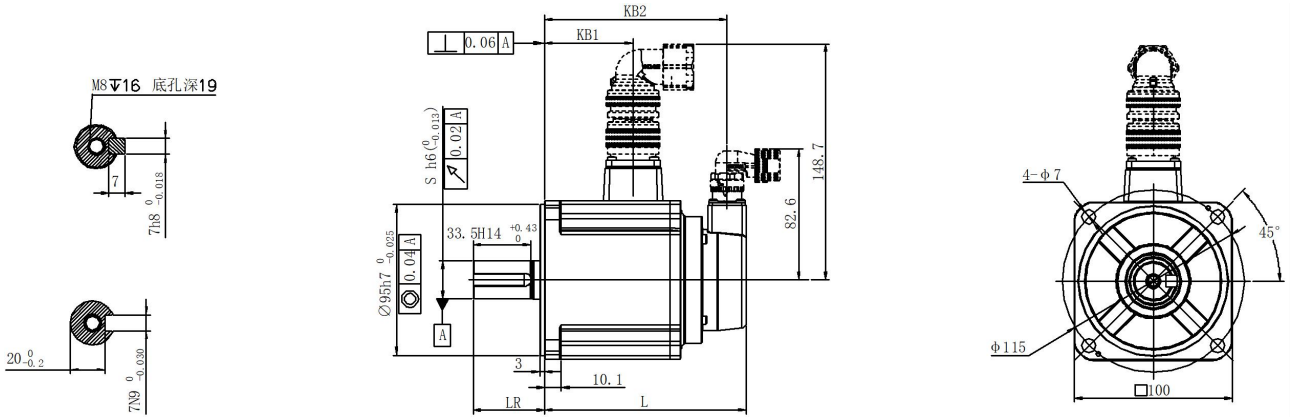
6.4 100 frame

6.4.1 Motor parameters

Model		IMS20B-10M							
		10C30C	15C30C	20C30C	25C30C	10C30C	15C30C	20C30C	25C30C
Frame size		100							
Rated voltage (V)		220				380			
Rated power (kW)		1	1.5	2	2.5	1	1.5	2	2.5
Rated speed (rpm)		3000	3000	3000	3000	3000	3000	3000	3000
Peak speed (rpm)		6000	6000	6000	6000	6000	6000	6000	6000
Rated torque (N•m)		3.2	4.8	6.4	8.0	3.2	4.8	6.4	8.0
Peak torque (N•m)		9.6	14.3	19.1	26.5	9.6	14.3	19.1	26.5
Rated current (A)		6.6	8.8	10.7	13.3	3.7	5.1	7.0	8.2
Peak current (A)		19.8	24.4	31.0	38.5	11.3	14.9	22.2	27.8
Torque coefficient (N•m/A)		0.48	0.54	0.6	0.6	0.86	0.94	0.92	0.97
Rotor rotation	Standard	1.84	2.75	3.65	4.36	1.84	2.75	3.65	4.36

	Brake type	2.59	3.5	4.4	5.11	2.59	3.5	4.4	5.11
Motor weight (kg)	**Standard**	3.3	4.3	5.3	6.3	3.3	4.3	5.3	6.3
	Brake type	4.1	5.1	6.1	7.1	4.1	5.1	6.1	7.1
Brake specifications	**Holding torque (N·m)**	8							
	Supply voltage (DC V)	24±10%							
	Rated power (W)	17.6							
	Pick-up voltage (V)	≤16.8							
	Drop-out voltage (V)	≥1.5							
	Pick-up time (ms)	≤50							
	Drop-out time (ms)	≤20							
	Coil resistance (Ω)	32.7±7%							
Allowable load	**Radial allowable load (N•m)**	686							
	Axial allowable load (N•m)	196							

6.4.2 Motor dimension

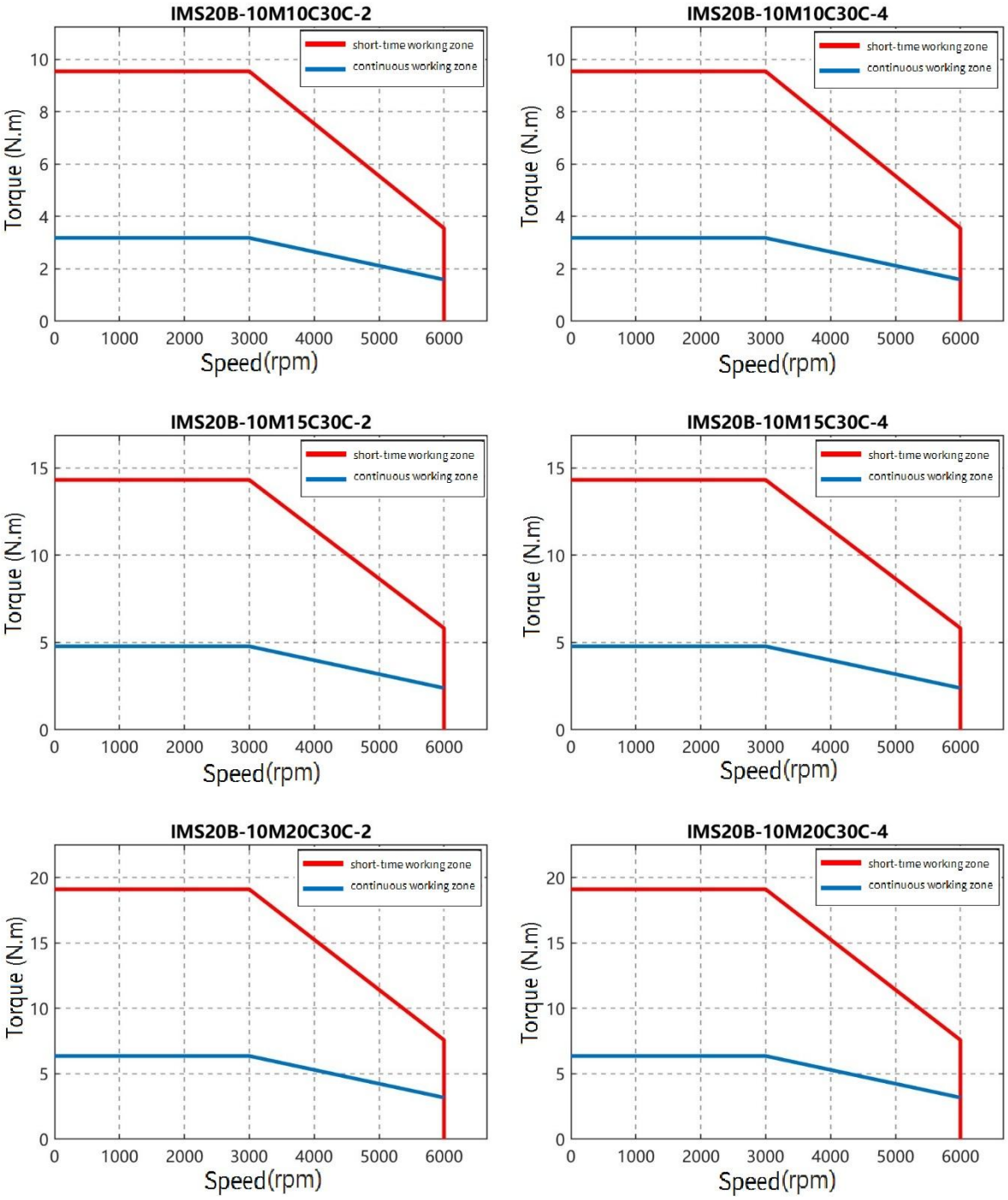


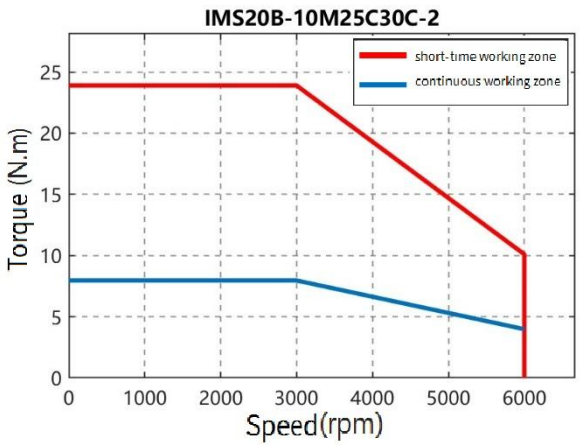
Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-10M10C30C	56	115.4(144)	45	24	127.4 (156)	3.3(4.1)
IMS20B-10M15C30C	76	135.4(164)	45	24	147.4(165.9)	4.3(5.1)
IMS20B-10M20C30C	96	155.4(184)	45	24	167.4(196)	5.3 (6.1)

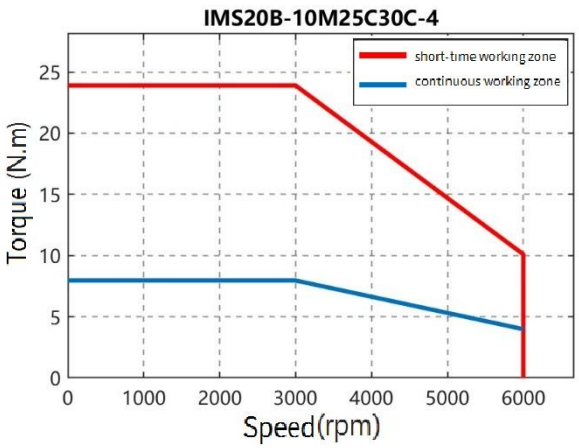
IMS20B-10M25C30C	113	172.4(201)	45	24	184.4(213)	6.3 (7.1)

Note: The data in parentheses refers to the brake motor specifications.

6.4.3 External characteristic curve







6.5 130 frame

6.5.1 Motor parameters

Model		IMS20B-13L		
		30C30C	40C30C	50C30C
Frame size		130		
Rated voltage (V)		380		
Rated power (kW)		3	4	5
Rated speed (rpm)		3000	3000	3000
Peak speed (rpm)		6000	6000	6000
Rated torque (N•m)		9.8	12.6	15.8
Peak torque (N•m)		29.4	37.8	47.4
Rated current (A)		10.1	13	16.8
Peak current (A)		30.8	38.6	48.3
Torque coefficient (N•m/A)		0.97	0.97	0.94
Rotor rotation inertia (kg•cm2)	Standard	7.28	10.1	13.3
	Brake type	8.22	11.04	14.24
Motor weight (kg)	Standard	9.9	13	17
	Brake type	11.6	14.7	18.7
Brake specifications	Holding torque (N·m)	16		
	Supply voltage (DC V)	24±10%		
	Rated power (W)	24		
	Pick-up voltage (V)	≤16		
	Drop-out voltage (V)	≥1		
	Pick-up time (ms)	≤120		
	Drop-out time (ms)	≤60		

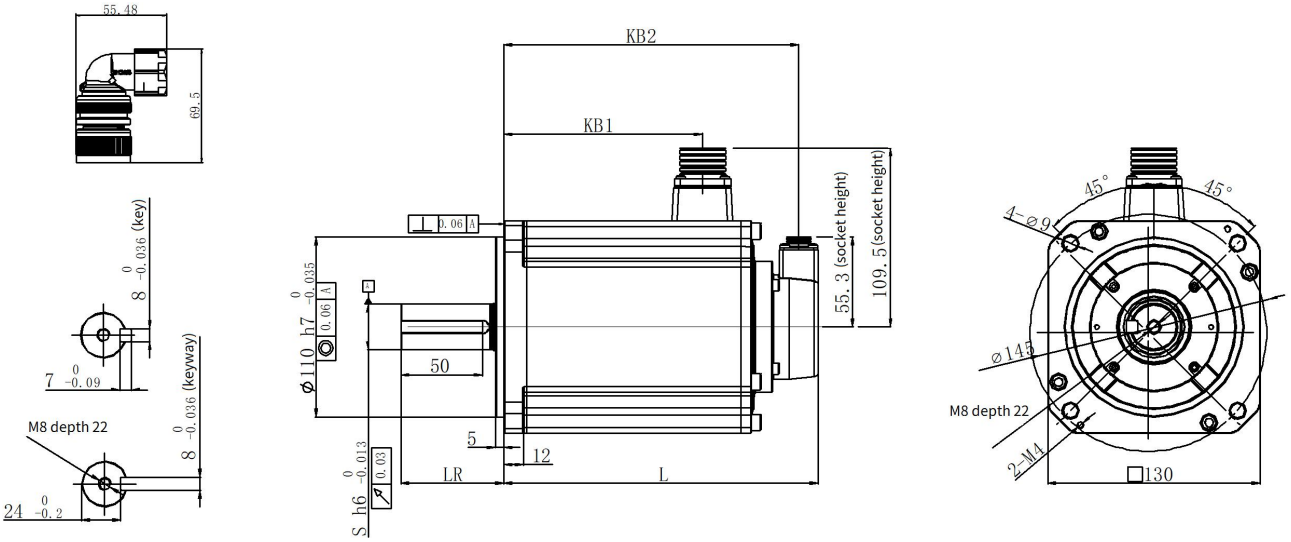
	Coil resistance (Ω)	24±7%
Allowable load	**Radial allowable load (N•m)**	565
	Axial allowable load (N•m)	196

Model		IMS20B-13M							
		10C20C	15C20C	20C20C	30C20C	10C20C	15C20C	20C20C	30C20C
Frame size		130							
Rated voltage (V)		220				380			
Rated power (kW)		1	1.5	2	3	1	1.5	2	3
Rated speed (rpm)		2000	2000	2000	2000	2000	2000	2000	2000
Peak speed (rpm)		4500	4500	4500	3000	4500	4500	4500	3000
Rated torque (N•m)		4.8	7.2	9.6	14.3	4.8	7.2	9.6	14.3
Peak torque (N•m)		14.3	21.5	28.7	43.0	14.3	21.5	28.7	43.0
Rated current (A)		5.4	7.6	9.0	13.0	3.0	4.8	5.6	7.7
Peak current (A)		16.9	22.2	27.8	37.5	8.6	13.4	15.9	21.1
Torque coefficient (N•m/A)		0.88	0.99	1.04	1.19	1.7	1.64	1.84	2.07
Rotor rotation inertia (kg•cm2)	**Standard**	6.3	9.1	12.9	21.7	6.3	9.1	12.9	21.7
	Brake type	7.95	10.8	14.6	23.4	7.95	10.8	14.6	23.4
Motor weight (kg)	**Standard**	4.4	5.6	6.9	10.3	4.4	5.6	6.9	10.3
	Brake type	6.0	7.2	8.5	11.9	6.0	7.2	8.5	11.9
Brake specifications	**Holding torque (N·m)**	18							
	Supply voltage (DC V)	24±10%							
	Rated power (W)	23							
	Pick-up voltage (V)	≤18							
	Drop-out voltage (V)	≥1.5							
	Pick-up time (ms)	≤100							
	Drop-out time (ms)	≤60							

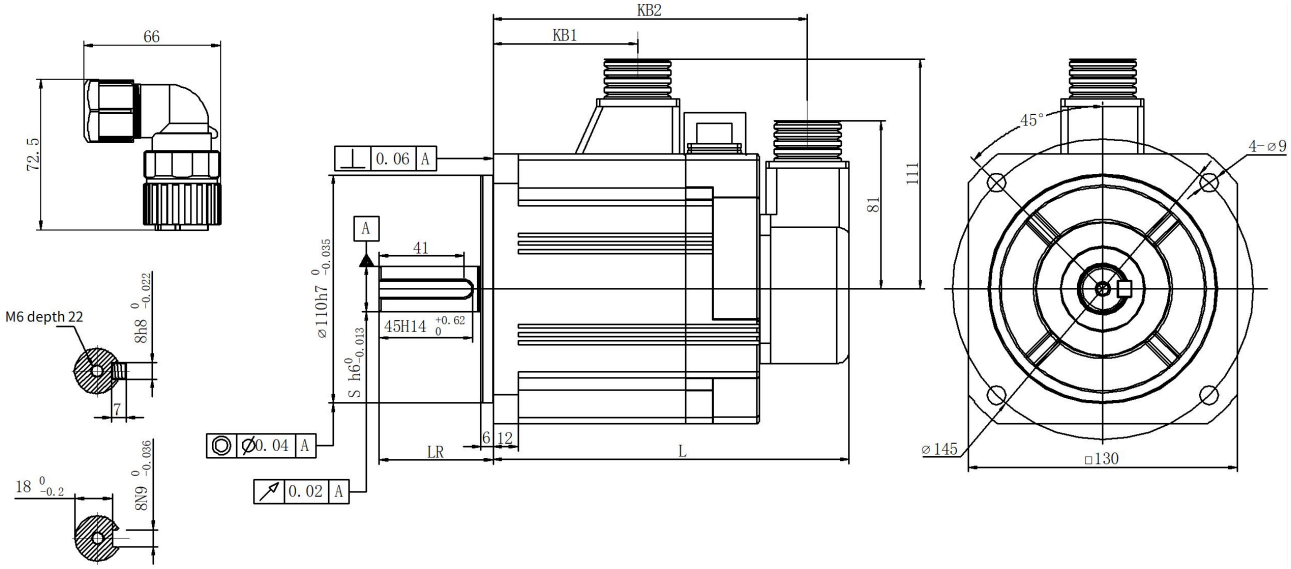
	Coil resistance (Ω)	25±7%
Allowable load	**Radial allowable load (N•m)**	565
	Axial allowable load (N•m)	196

Model		IMS20B-13H					
		85B15C	13C15C	18C15C	85B15C	13C15C	18C15C
Frame size		130					
Rated voltage (V)		220			380		
Rated power (kW)		0.85	1.3	1.8	0.85	1.3	1.8
Rated speed (rpm)		1500	1500	1500	1500	1500	1500
Peak speed (rpm)		4500	4500	4500	4500	4500	4500
Rated torque (N•m)		5.4	8.3	11.5	5.4	8.3	11.5
Peak torque (N•m)		13.5	20.7	28.7	13.5	20.7	28.7
Rated current (A)		6.2	9.9	12.8	3.3	5.2	7.7
Peak current (A)		14.9	24.8	31.1	8.3	12.6	17.8
Torque coefficient (N•m/A)		0.91	0.83	0.93	1.65	1.65	1.63
Rotor rotation inertia (kg•cm2)	**Standard**	13.1	17.9	24.3	13.1	17.9	24.3
	Brake type	14.3	19.1	25.6	14.3	19.1	25.6
Motor weight (kg)	**Standard**	5.7	7.2	9	5.7	7.2	9
	Brake type	7.3	8.8	10.6	7.3	8.8	10.6
Brake specifications	**Holding torque (N·m)**	18					
	Supply voltage (DC V)	24±10%					
	Rated power (W)	23					
	Pick-up voltage (V)	≤18					
	Drop-out voltage (V)	≥1.5					
	Pick-up time (ms)	25±7%					
Allowable load	**Drop-out time (ms)**	565					
	Coil resistance (Ω)	196					

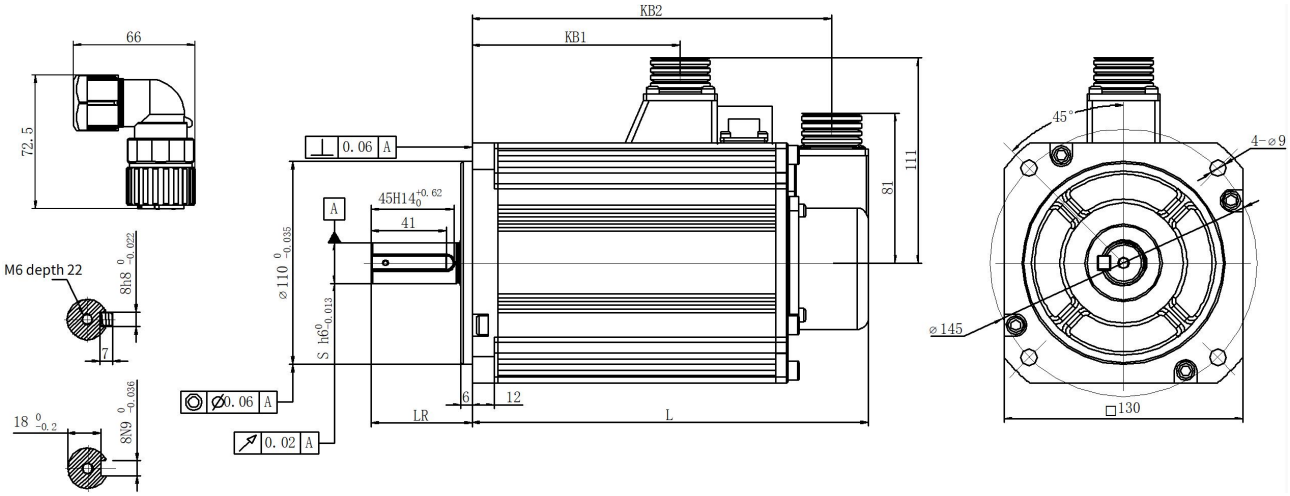
6.5.2 Motor dimension



Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-13L30C30C	121.9	180.9(211.9)	63	28	192.9(223.9)	9.9(11.6)
IMS20B-13L40C30C	159.9	218.9(249.9)	63	28	230.9(261.9)	13(14.7)
IMS20B-13L50C30C	202.9	261.9(292.9)	63	28	273.9(304.9)	17(18.7)



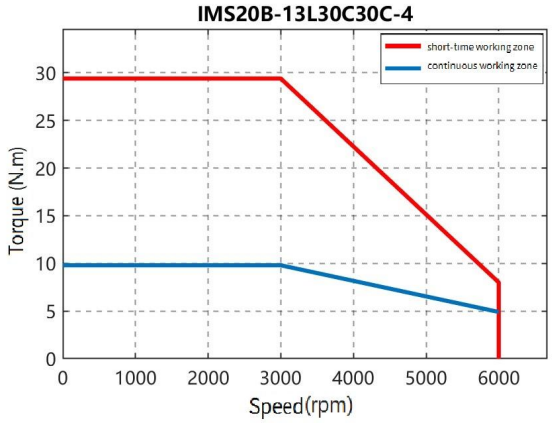
Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-13M10C20C	57	110(139)	55	22	130(159)	4.4(6.0)
IMS20B-13M15C20C	70	123(152)	55	22	143(172)	5.6(7.2)
IMS20B-13M20C20C	87	140(169)	55	22	160(189)	6.9(8.5)
IMS20B-13H85B15C	65	118(147)	55	22	138(167)	5.7(7.3)
IMS20B-13H13C15C	82	135(164)	55	22	155(184)	7.2(8.8)

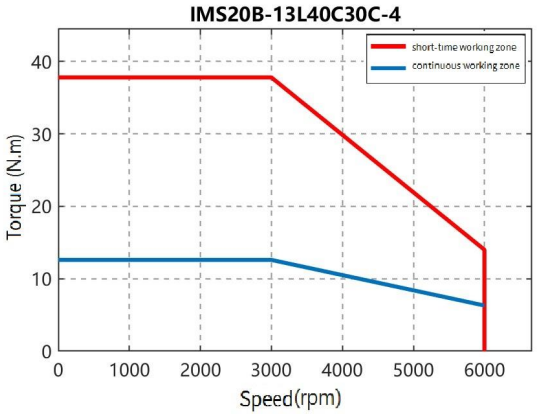


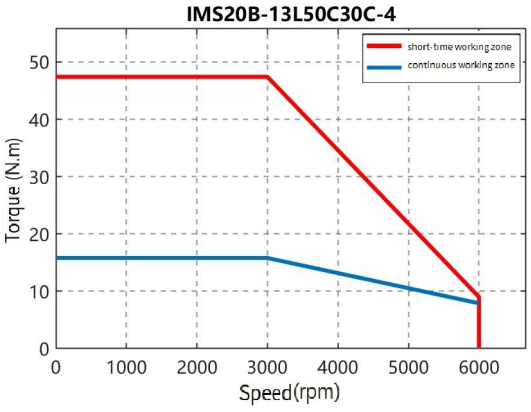
Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-13M30C20C	138.5	190.5(220)	55	22	210.5(240.2)	10.3(11.9)
IMS20B-13H18C15C	110	165(195)	55	22	185(215)	9(10.6)

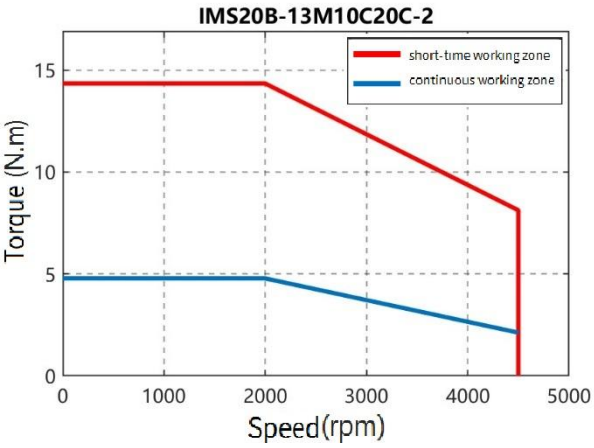
Note: The data in parentheses refers to the brake motor specifications.

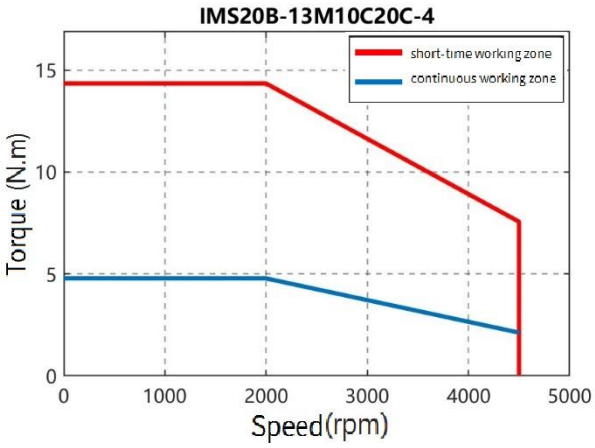
6.5.3 External characteristic curve

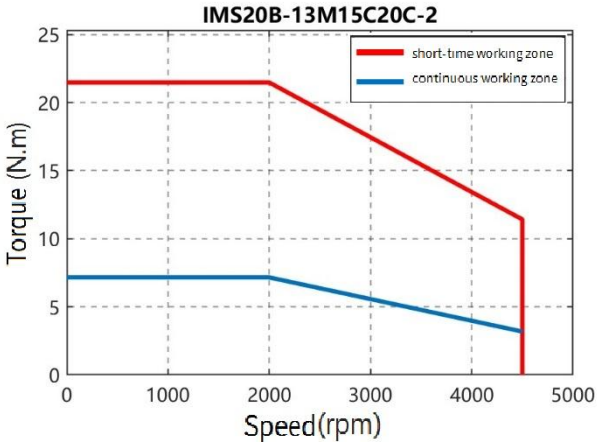


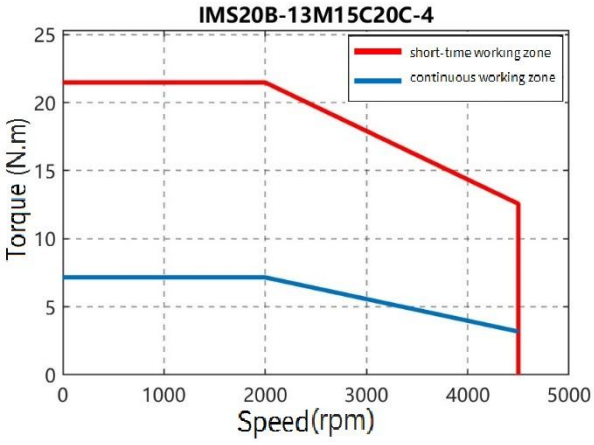


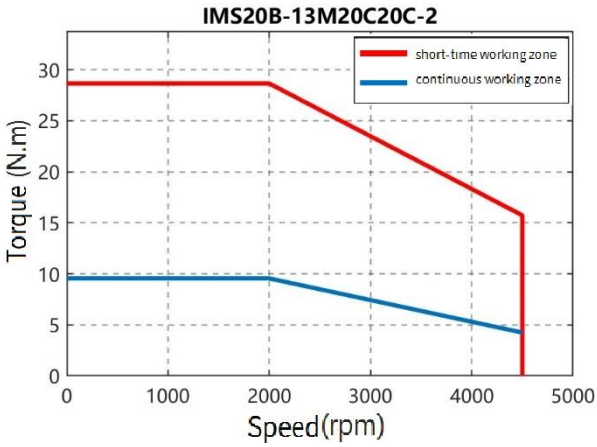


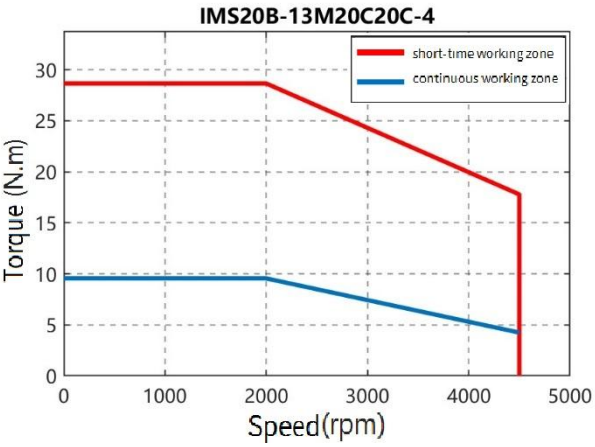

IMS20B-13M10C20C-2
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
5
10
15
0
1000
2000
3000
4000
5000

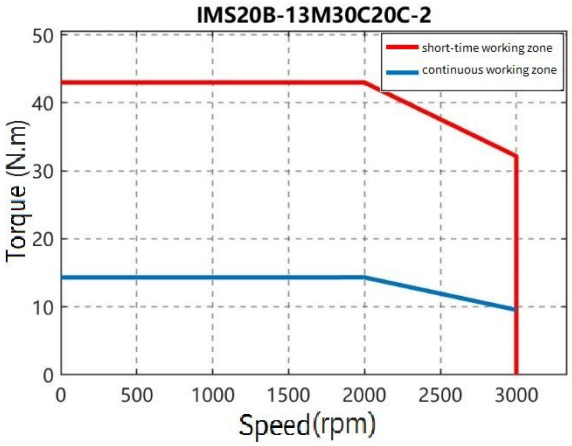

IMS20B-13M10C20C-4
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
5
10
15
0
1000
2000
3000
4000
5000

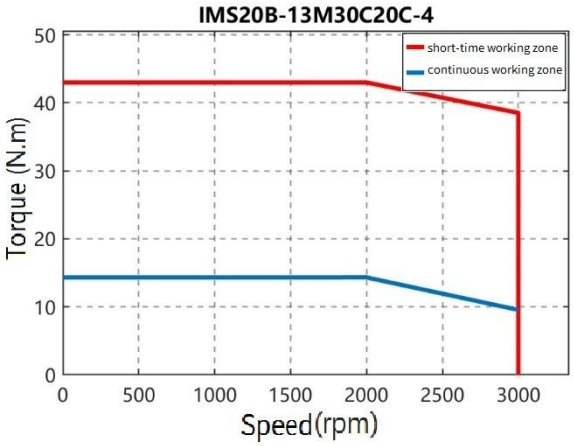

IMS20B-13M15C20C-2
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
5
10
15
20
25
0
1000
2000
3000
4000
5000

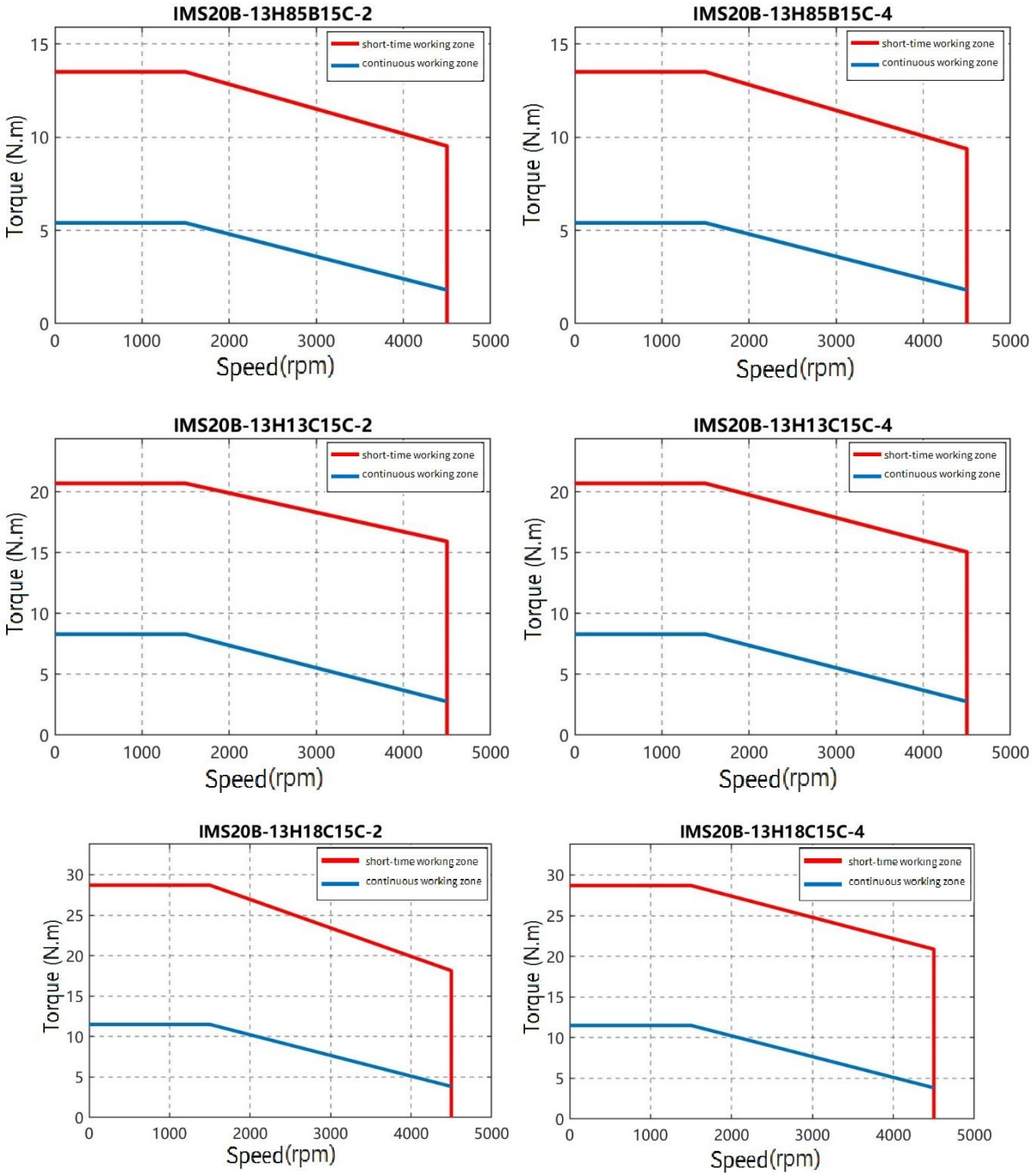

IMS20B-13M15C20C-4
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
5
10
15
20
25
0
1000
2000
3000
4000
5000


IMS20B-13M20C20C-2
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
5
10
15
20
25
30
0
1000
2000
3000
4000
5000


IMS20B-13M20C20C-4
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
5
10
15
20
25
30
0
1000
2000
3000
4000
5000


IMS20B-13M30C20C-2
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
10
20
30
40
50
0
500
1000
1500
2000
2500
3000


IMS20B-13M30C20C-4
short-time working zone
continuous working zone
Torque (N.m)
Speed(rpm)
0
10
20
30
40
50
0
500
1000
1500
2000
2500
3000



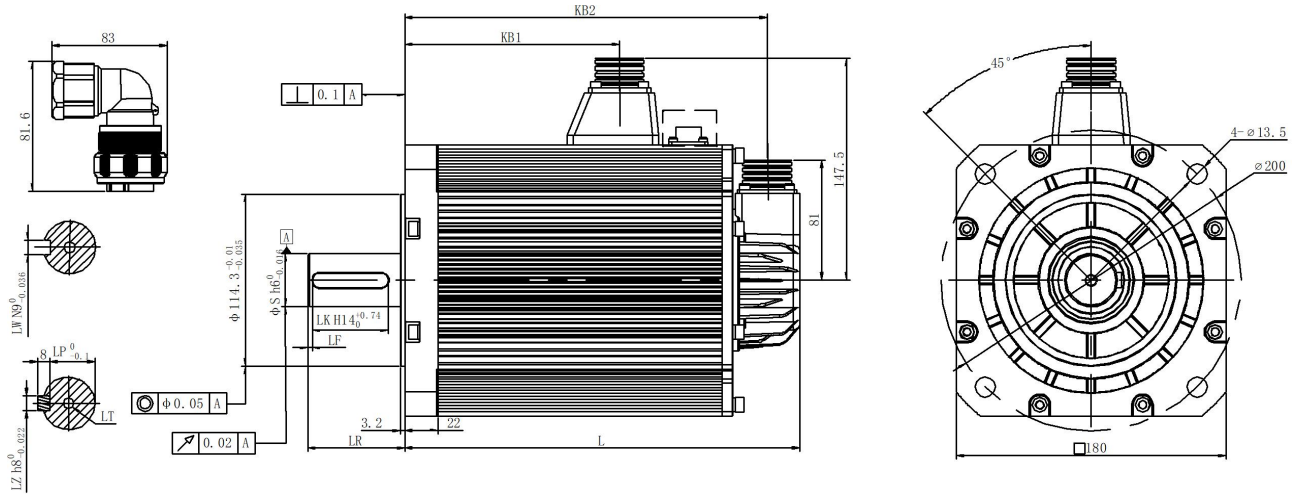
6.6 180 frame

6.6.1 Motor parameters

Model	IMS20B-18M			
	30C15C	44C15C	55C15C	75C15C
Frame size	180			
Rated voltage (V)	380			
Rated power (kW)	3	4.4	5.5	7.5
Rated speed (rpm)	1500	1500	1500	1500
Peak speed (rpm)	4500	4500	4500	4500
Rated torque (N•m)	19.1	28.0	35.0	47.8

Peak torque (N•m)		47.8	70.0	88.8	119.5
Rated current (A)		9.7	13.5	16.8	20.9
Peak current (A)		22.0	29.8	37.7	46.4
Torque coefficient (N•m/A)		2.08	2.25	2.22	2.45
Rotor rotation inertia (kg•cm2)	**Standard**	47.8	64.4	82.9	106.1
	Brake type	52.8	69.4	87.9	111.1
Motor weight (kg)	**Standard**	19.2	23.2	27.7	32.7
	Brake type	21.2	25.2	29.7	34.7
Brake specifications	**Holding torque (N·m)**	44			
	Supply voltage (DC V)	24±10%			
	Rated power (W)	36			
	Pick-up voltage (V)	≤18			
	Drop-out voltage (V)	≥1.2			
	Pick-up time (ms)	≤150			
	Drop-out time (ms)	≤20			
	Coil resistance (Ω)	16±7%			
Allowable load	**Standard**	1470			
	Brake type	490			

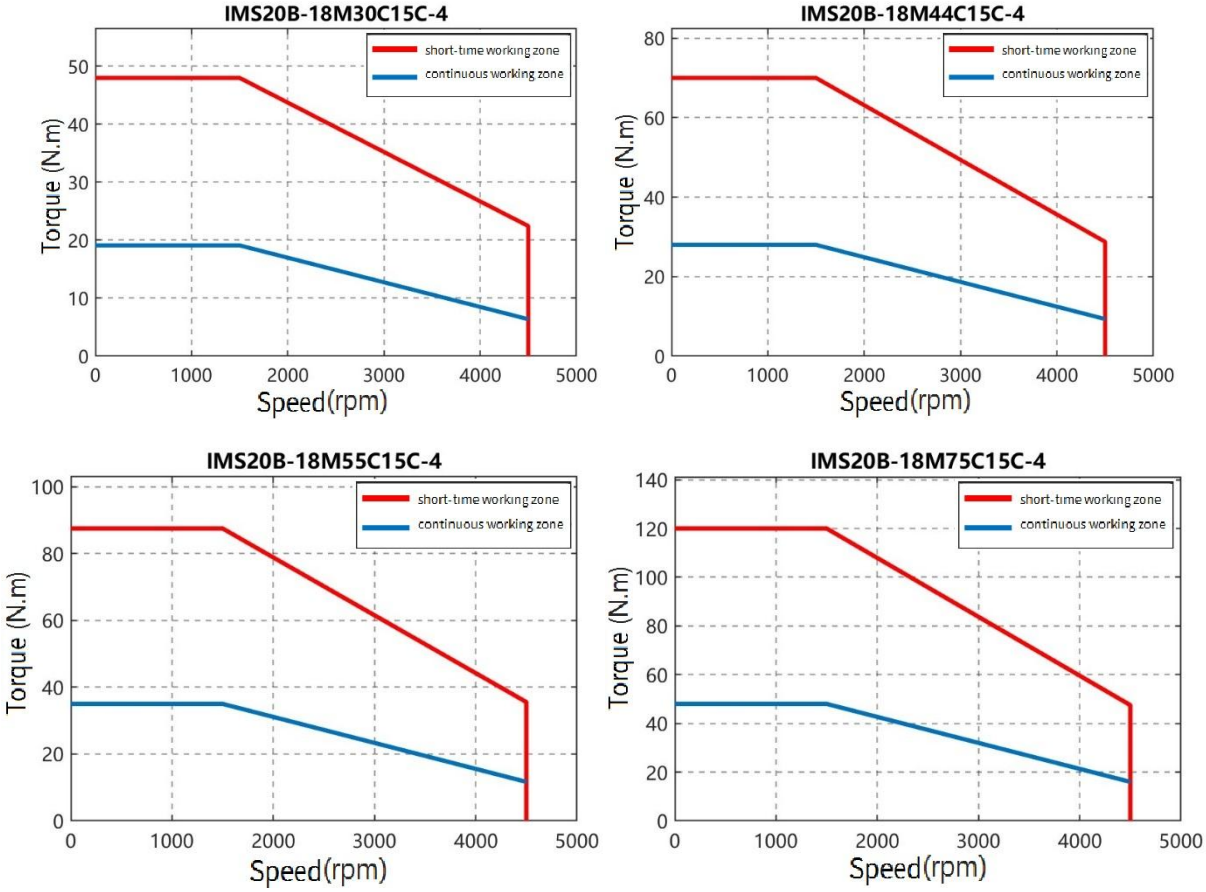
6.6.2 Motor dimension



Model	KB1(mm)	KB2(mm)	LR(mm)	S(mm)	L(mm)	Weight (kg)
IMS20B-18M30C15C	143	201.5(241.5)	65/79	35	223(263)	19.2(21.2)
IMS20B-18M44C15C	168	226.5(266.5)	65/79	35	248(288)	23.2(25.2)
IMS20B-18M55C15C	198	256.5(296.5)	65/113	35/42	273(313)	27.7(29.7)
IMS20B-18M75C15C	228	286.5(326.5)	65/113	35/42	308(348)	32.7(34.7)

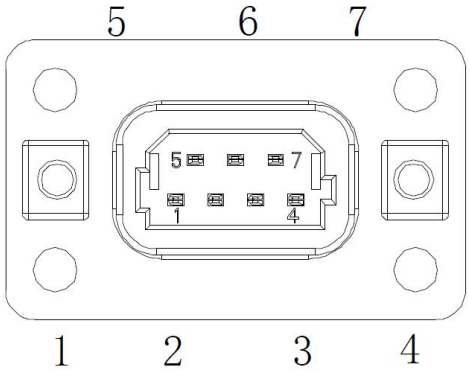
Note: The data in parentheses refers to the brake motor specifications.

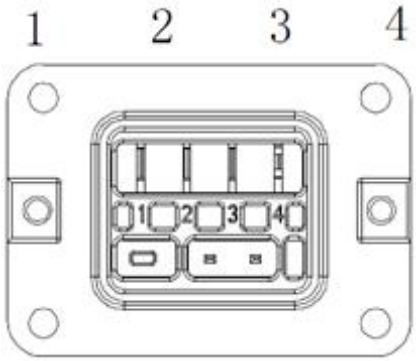
6.6.3 External characteristic curve

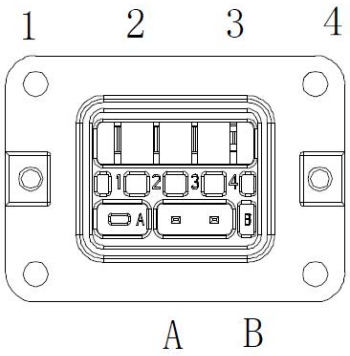


7 Terminal description

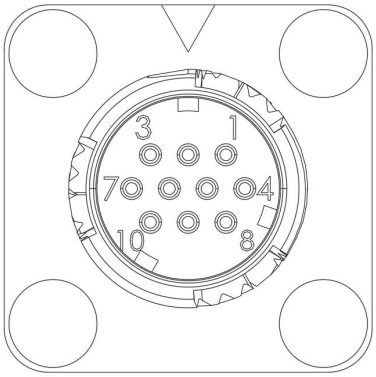
- 40/60/80 frame terminal

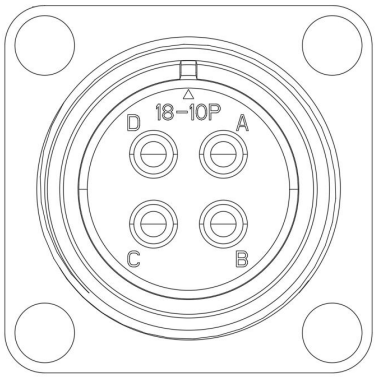
Encoder terminal outline diagram	Pin No.	Pin definition
	1	SD+
	2	SD-
	3	BAT+
	4	BAT-
	5	5V+
	6	0V
	7	GND

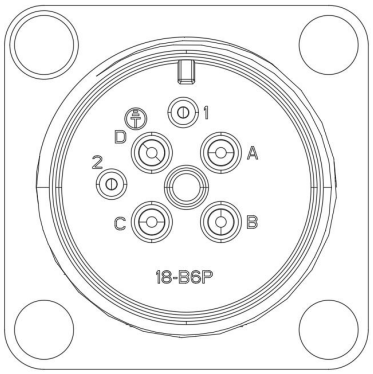
Power line terminal outline diagram	Pin No.	Pin definition
	1	V
	2	U
	3	W
	4	PE

Power line (with brake) terminal outline diagram	Pin No.	Pin definition
	1	V
	2	U
	3	W
	4	PE
	A	Brake
	B	Brake

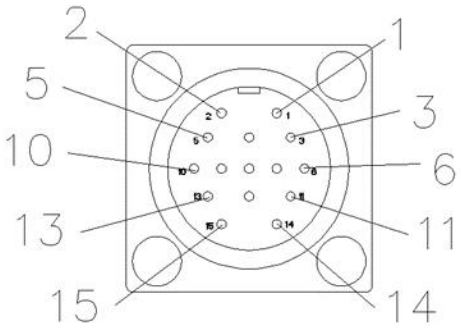
- 100 frame terminal

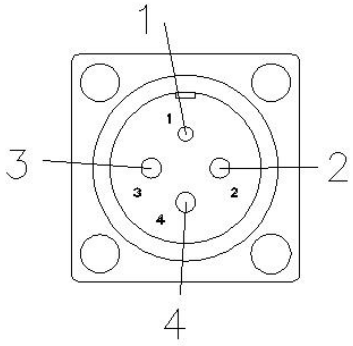
Encoder terminal outline diagram	Pin No.	Pin definition
	1	DATA+
	2	DATA-
	3	None
	4	+5V
	5	BAT -
	6	BAT+
	7	None
	8	None
	9	0V
	10	FG

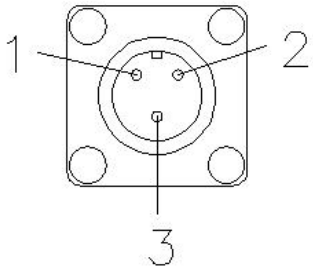
Power line terminal outline diagram	Pin No.	Pin definition
	1	U
	2	V
	3	W
	4	PE

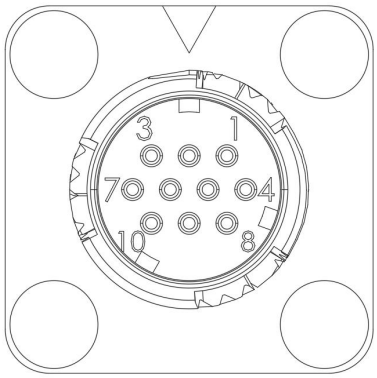
Power line (with brake) terminal outline diagram	Pin No.	Pin definition
	1	U
	2	V
	3	W
	4	PE
	5	Brake
	6	Brake

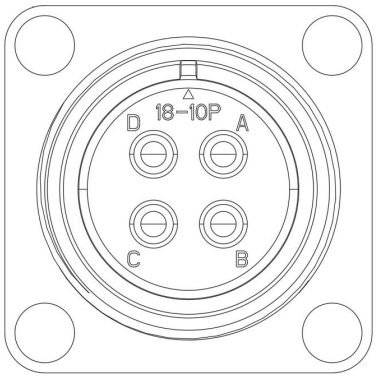
- 130/180 frame terminal

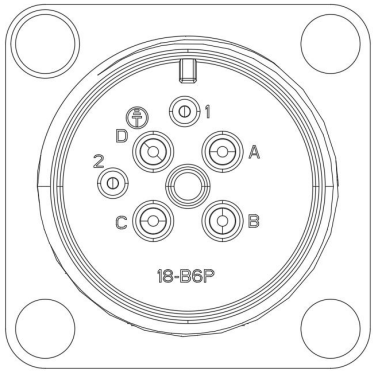
Encoder terminal outline diagram	Pin No.	Pin definition
 15-Pin Xinfeng YD28J15Z aviation connector	1	PE+
	2	SD+
	3	SD-
	4	5V
	5	GND
	6	VB_5V
	7	VB_GND

Power line terminal outline diagram	Pin No.	Pin definition
 4-Pin Xinfeng YD28J4Z aviation connector	1	PE
	2	U
	3	V
	4	W

Brake terminal outline diagram	Pin No.	Pin definition
 3-Pin Xinfeng XS16 aviation connector	1	24V+
	2	24V-
	3	Empty

Encoder terminal outline diagram	Pin No.	Pin definition
 Sunchu SC-CMV1-R10PB2S00-0	1	DATA+
	2	DATA-
	3	None
	4	+5V
	5	BAT-
	6	BAT+
	7	None
	8	None
	9	0V
	10	FG

Power line terminal outline diagram	Pin No.	Pin definition
 Sunchu CMS3102A18-10PB	A	U
	B	V
	C	W
	D	PE

Brake terminal outline diagram	Pin No.	Pin definition
 Sunchu CMS05A18-B6MB0000-1	A	U
	B	V
	C	W
	D	PE
	1	Brake power supply
	2	Brake power supply

8 Installation instructions

8.1 Unpacking inspection

After receiving the product, please perform the following checks to ensure the safe use of the product.

Inspecting the packaging

Before unpacking, check whether the product package is intact–whether the package is damaged, dampened, soaked, or deformed. After unpacking, check whether the interior surface of the packing box is abnormal, for example, in wet condition.

Inspecting the machine and its components

After unpacking, check whether the equipment enclosure is damaged or cracked, whether the parts inside the packing box are complete, and whether the nameplate and label on the product body are consistent with the model ordered.

8.2 Mechanical installation

8.2.1 Preparing

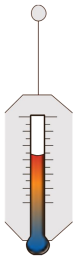
■ **Safety instructions**

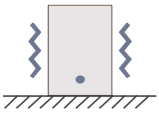
Only qualified personnel who have received training are allowed to perform the tasks described in this chapter. Please read the following installation preparations carefully before proceeding with the installation to ensure a smooth process and to avoid personal injury or equipment damage.

Item	Description
	● Carry out operations according to the safety instructions. Ensure the motor power has been disconnected before installation. If the motor has been powered on, disconnect the drive and wait for at least 15 minutes, and ensure the POWER indicator is off before proceeding to the next step. ● The motor installation must be designed and done according to applicable local laws and regulations. We do not assume any liability whatsoever for any equipment installation which breaches local laws or regulations.

■ **Installation environment and site**

Environment requirements

Environment	Requirements	
Temperature		● Refer to the motor mechanical characteristics description. ● The temperature does not change rapidly. ● When the equipment is installed in a closed space, such as control cabinet, use a cooling fan or air conditioner for cooling when necessary. ● When the temperature is too low, if you want to use the equipment that has been idled for a long time, install an external heating device before the use to eliminate the freeze inside the equipment. Otherwise, the equipment may be damaged.

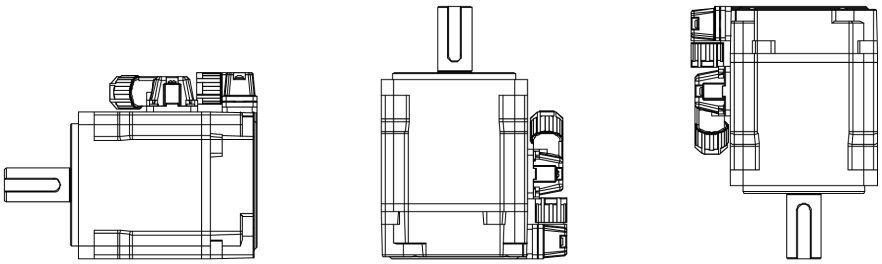
Relative humidity (RH)		● See section 5.1 Mechanical characteristics ● The max. RH cannot exceed 60% in the environment with corrosive gases.
Altitude		● Lower than 1000m. ● When the altitude exceeds 1000m, please derate according to the altitude derating curve. ● When the altitude exceeds 3000m, consult our local dealer or office for details.
Vibration		See section 5.1 Mechanical characteristics

Site requirement

Site	Requirements	
Indoor		Without electromagnetic radiation sources and direct sunlight **Note:** The motor must be installed in a clean and well-ventilated environment based on the housing IP rating.
		Without foreign objects such as oil mist, metal powder, conductive dust, and water
		Without radioactive, corrosive, hazard, and combustible and explosive substances **Note:** Do not install the motor onto combustible objects.
		With low salt content

8.2.2 Installation direction

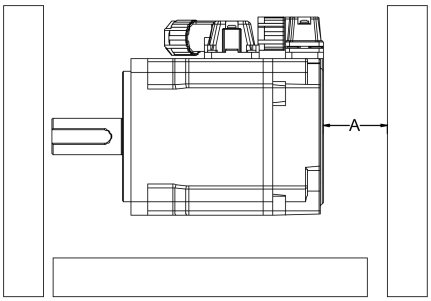
Motor installation direction



Note: Vertical installation is a must. Do not install the motor in other directions such as horizontal, transverse or upside-down.

8.2.3 Installation space

Motor installation space



Installation dimensions

IMS20B motor frame	Mounting plate dimensions (mm)	A（mm）
40	250×250×8	25
60		30
80		35
100	400×400×20	35
130		55
180	550×550×30	79

Note: Please install the servo motor vertically and keep enough installation space for good ventilation and future maintenance.

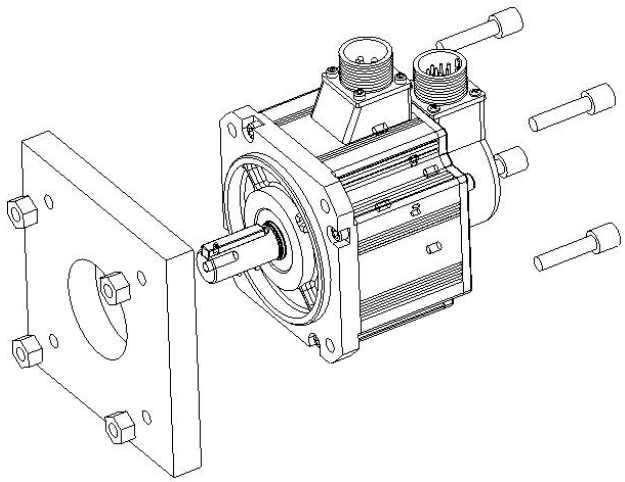
8.2.4 Mounting method

The installation procedures are as follows:

Step 1 Clear the installation area and prepare the necessary tools and components.

Step 2 Check and confirm that all components are in good condition and that the motor operates normally.

Step 3 Choose an appropriate installation method to ensure that the drive center axis is aligned and does not exceed the allowable tolerance range. Secure the motor using bolts, avoiding any striking to prevent damage.



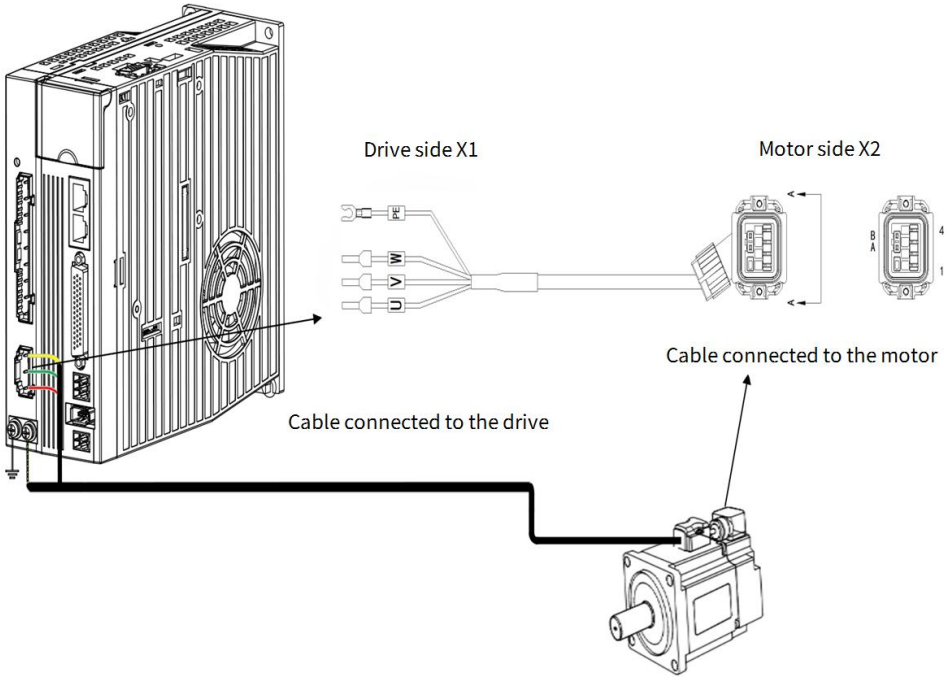
Note:

- During the handling of the motor, do not pull on the motor leads or output shaft.
- Do not strike or hammer during the motor assembly to avoid damage to the encoder or shafts.
- After installation, check each component individually, and only start trial operation after confirming that all connections are secure.
- Please wipe the slushing oil on the motor shaft before using.

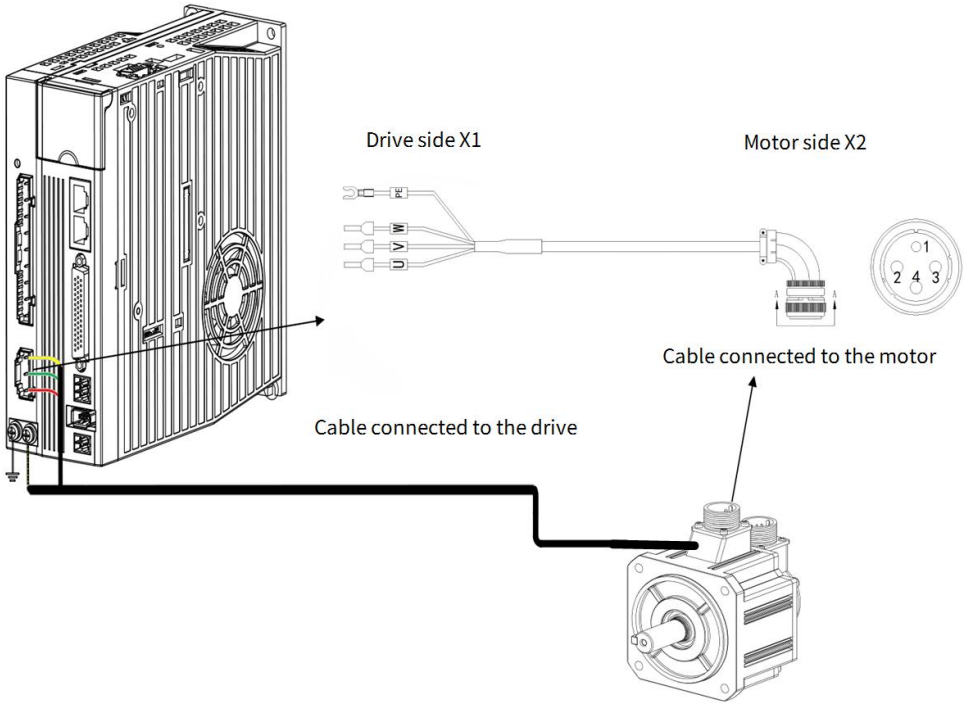
8.3 Electrical installation

8.3.1 Power cable wiring

(1) Through-hole type



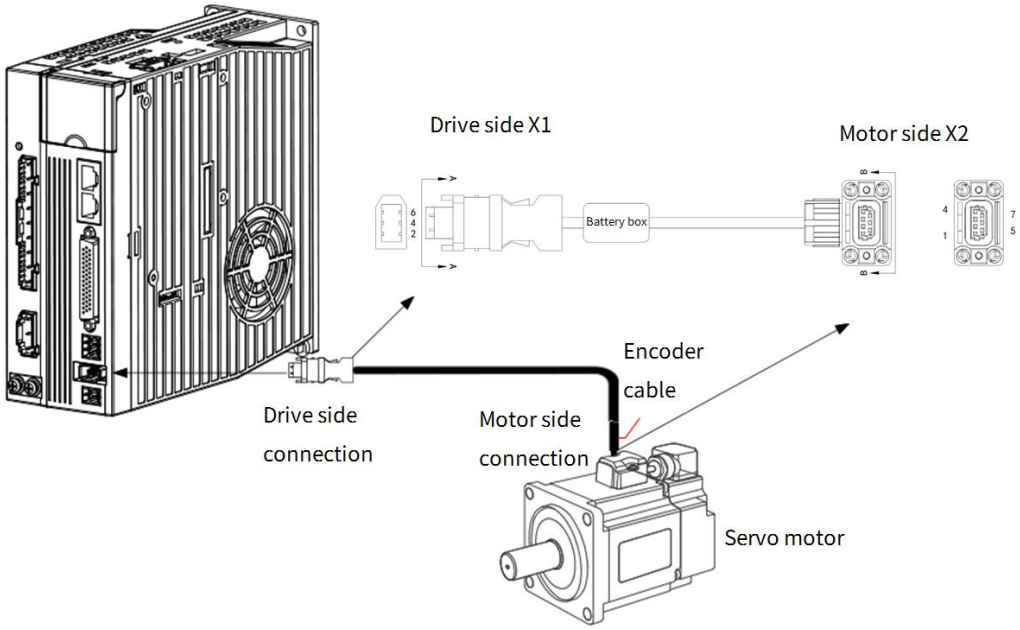
(2) Aviation connector type



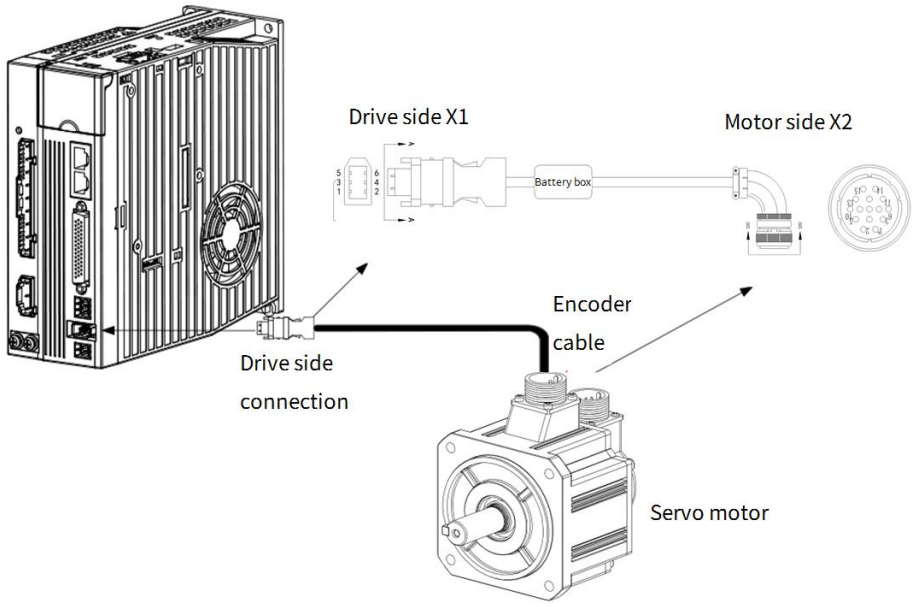
Note: For detailed wiring steps and terminal descriptions, please refer to the "DA200A Series AC Servo Drive User Manual".

8.3.2 Encoder wiring

(1) Through-hole type



(2) Aviation connector type



Note: For detailed wiring steps and terminal descriptions, please refer to the "DA200A Series AC Servo Drive User Manual".

8.4 Check after installation

After installation, please check each item in the following table.

Check items	Content	Confirmation
Ambient environment	Ambient temperature is less than 40℃.	☐
	RH is less than 90%.	☐
	Vibration acceleration is less than 0.5G(4.9m/S^2).	☐
	No dust, corrosive gases, or oil contamination.	☐
	No tools or foreign objects (including cable ends, metal shavings, and other hazardous materials) are piled around.	☐
	No condensation or water droplets on the exterior of the machine.	☐
Mechanical parts	The motor installation location meets design and specification requirements.	☐
	The installation of the motor and the connection of shafts and mechanics are reliable.	☐
	The motor and the machines are available to run.	☐
	Do not run the motor at negative load. **Note:** Negative load indicates that the direction of the output torque of the motor is contrary to the motor speed direction.	☐
Wiring parts	All wiring comply with the standard wiring shown in the installation section.	☐
	The external terminal (SON) for servo enabling is set to OFF.	☐
	The cable stress is within the designated range.	☐
	The motor is properly grounded.	☐

9 Certification categories and standards

9.1 CE certification

Certification	Standard
EMC command 2014/30/EU	EN 61000-6-4: 2019 EN 61000-6-4: 2019
Low voltage directive (LVD) 2014/35/EU	EN 60034-1: 2010

9.2 UL certification

Certification	Standard
UL/cUL certification	UL 1004-1 UL 1004-6 CSA C22.2 No. 100

9.3 China energy efficiency label