Вектор Технологий

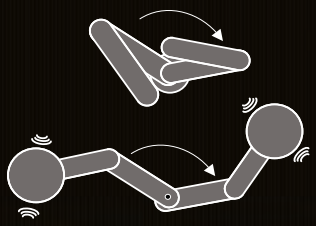
AC SERVO

SD3 SERIES

СЕРВОМОТОРЫ

Inheriting State-of-the-Art Technology for Robot Control
—— Robust Control

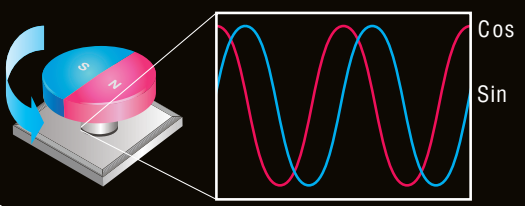
The SD3 Servo Amplifier is equipped with servo control which takes advantage of our expertise in LCD and semiconductor robotics. Decoupling command responsiveness and disturbance compensation using observer-based model matching and feedforward, our Servo Amplifier offers control for two degrees of freedom.
Even under load fluctuations, you can expect smooth motion without needing to change tuning parameters. This control method is ideal for applications with high rigidity such as ball drives, where you will experience excellent command responsiveness.



【Robust Control】
Robust Control is a control method which maintains expected robustness and stability even when the actual specifications of robots are slightly different from the initially intended control model.

Ultimate Toughness and Low Current Consumption
—— Magnetic Absolute Encoder

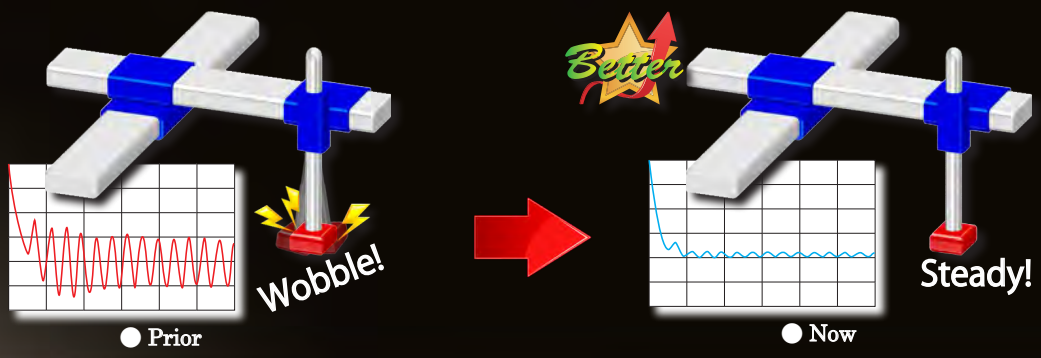
No other type of encoder matches the ultimate toughness of the magnetic rotary encoder - which is its greatest advantage. Magnetic rotary encoders are resistant to oil and dust, and exhibit robust power in harsh production environments. SD3 original 1 pole magnetic absolute encoder has a straightforward, hard-to-break structure, and its resolution is comparable to optical encoders. Our new encoder is your one-stop solution for the ever-challenging threesome of goals: “toughness in harsh environments”, “resolution”, and “cost”.
Also, our encoder features battery-free single-turn absolute position detection.
Furthermore, its current consumption upon battery backup is among the lowest in the industry.



Per in-house testing, our current consumption is less than a half of that used by a standard absolute encoder.

Learning in the Field and Constantly Evolving
—— Amplifier Performance

Our new stronger damping filter helps your machine better suppress machine tip wobbles. With the newly developed "γ-notch" filter, you may flexibly set responsiveness in frequency ranges higher than the notch frequency. Our new Servo offers shorter settling time for positioning, while maintaining the same damping features as before.



Specialized Tool Based on Ergonomics
—— Servo Studio

Servo studio is a powerful Software that eases setup, tuning, state monitoring, and effective use of SD3 Servo Amplifier. Now with its enhanced features, Servo studio is even more user-friendly and powerful.
With the greatly enhanced functionality, you can now setup our new damping filter from the intuitive interface, use an additional function "vibration noise frequency measurement (FFT)", and get a log of the amplifier alarm.
In addition, smooth startup of your machine is facilitated through an amplifier point table (that can be set up to 16 points), and the test run features.

01 Motor Models

Low Inertia

Middle Inertia

High Inertia

Inertia

- Low Inertia
- Middle Inertia
- High Inertia

Flange Size

- 40 mm x 40 mm
- 60 mm x 60 mm
- 80 mm x 80 mm
- 130 mm x 130 mm

Rotational Speed

Rated Motor Speed / Max. [r/min]

- 2,000 / 3,000 [r/min]
- 3,000 / 6,000 [r/min]

IP Code

- IP65
- IP67

01 Motor Models

Features

Suitable for applications with high speed rotations
Can be used for most applications

Use Applications

Embroidery Machine
Textile Machine
Packaging Machine etc.

Features

Suitable for applications with low mechanical rigidity such as drive belt machinery

Use Applications

Removal Robot
Conveyer Machine
Processing Machine

Features

Suitable for applications with low mechanical rigidity such as drive belt machinery

Use Applications

Removal Robot
Conveyer Machine
Processing Machine

Model Number

M3B 200 C K N S C ＊＊

Control Number

Encoder

Code	Specifications
C	17 bit (Incremental)
A	17 bit (Absolute)

Oil Seal

Code	Specifications
S	With
N	Without

Brake

Code	Holding Brake
N	Without
A	With

Shaft end specifications

Code	Rated Output
S	Straight
K	Key
T	Straight
L	Key

( ) Exclusively for 200 W, Shaft diameter = Φ11
The straight shaft products are not tapped end.

Voltage

Code	Specifications
C	AC200 V to 240 V

Rated Output

Code	Rated Output
005	50 W
010	100 W
020	200 W
040	400 W
075	750 W
100	1 kW
150	1.5 kW
200	2 kW

Series

Code	Specifications
M3B	Low Inertia
M5B	Middle Inertia
M5A	
M5G	
M7B	High Inertia
M7A	

Installing Precautions

Never remove the encoder or dismantle the motor body.
The motor shaft has anti-rust oil applied at the shipment. Please wipe off the oil before installing the motor.
Make sure to perform centering (alignment) carefully and properly.
Operating the motor without sufficient alignments might cause vibrations or a shorter service life of the motor.

Connecting with a Mechanical System

When connecting the motor to a load, use a coupling to absorb misalignments so that the motor shaft load remains.
Within the rated load to the motor shaft.
Improper use may cause a shorter service life of the motor bearing and damage the shaft.
We recommend the use of flexible couplings.

Installation Orientations and Oil Seals

The motor can be installed either vertically or horizontally. Please observe the following precautions.
- Horizontal installation: Face the cable pull unit down in order to protect the motor against oil, water and dust.
- Vertical installation : For a motor combined with a decelerator being on top of the motor shaft, use an oil sealed motor to prevent the decelerator oil from seeping into the motor.

Specifications

Motor Model : M5B005C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	40 sq.
Approximate mass	Without brake	kg	0.4
	With brake		0.6
Compatible amplifier model		–	SD3005CY**
Voltage		V	AC200 V to 240 V
Rated output		W	50
Rated torque		N·m	0.16
Instantaneous maximum torque		N·m	0.56
Rated current		A	0.68
Instantaneous maximum current		A	2.4
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.25
Voltage constant-KE		mV/(r/min)	8.8
Rated power	Without brake	kW/s	6.5
	With brake		5.4
Mechanical time constant	Without brake	ms	1.92
	With brake		2.31
Electrical time constant		ms	0.74
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.039
	With brake		0.047

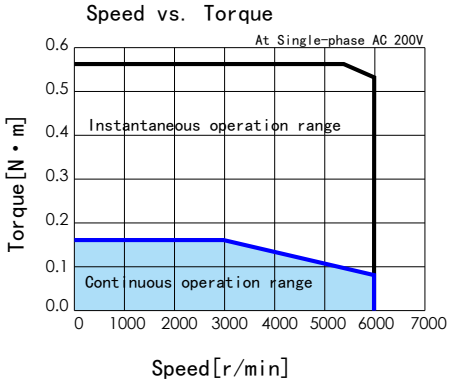
Brake Specifications

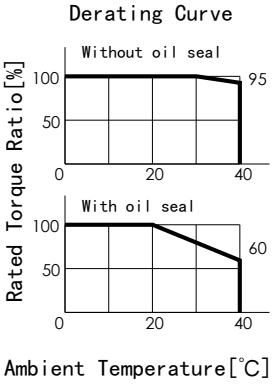
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.25
Static friction torque	N·m	≥ 0.16
Pull-in time	ms	≤ 35
Release time	ms	≤ 20
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	68
Thrust	N	58

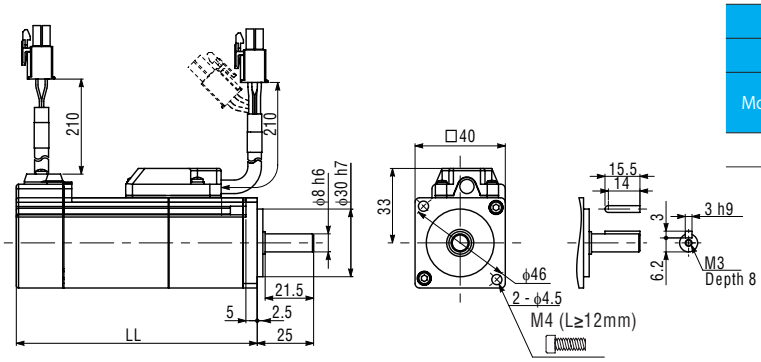
Torque Characteristics





External Dimensions

(mm)



Brake	Without		With	
Oil Seal	Without	With	Without	With
Motor Model	M5B005C*NN	M5B005C*NS	M5B005C*BN	M5B005C*BS
L L	66.4	72.0	106.8	112.4

The straight shaft products are not tapped end.

Specifications

Motor Model : M5G005C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	40 sq.
Approximate mass	Without brake	kg	0.4
	With brake		0.6
Compatible amplifier model		–	SD3005CY**
Voltage		V	AC200 V to 240 V
Rated output		W	50
Rated torque		N·m	0.16
Instantaneous maximum torque		N·m	0.56
Rated current		A	0.68
Instantaneous maximum current		A	2.4
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.25
Voltage constant-KE		mV/(r/min)	8.8
Rated power	Without brake	kW/s	6.6
	With brake		5.4
Mechanical time constant	Without brake	ms	2.02
	With brake		2.45
Electrical time constant		ms	0.65
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.039
	With brake		0.047

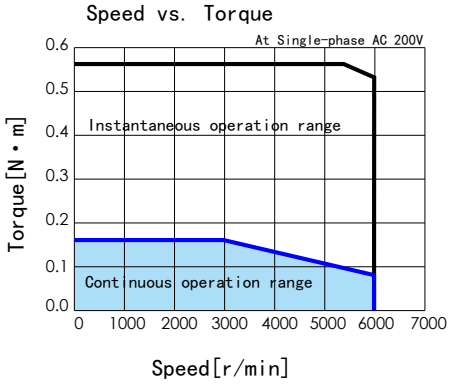
Brake Specifications

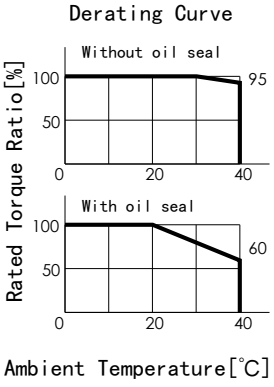
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.25
Static friction torque	N·m	≥ 0.16
Pull-in time	ms	≤ 35
Release time	ms	≤ 20
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	68
Thrust	N	58

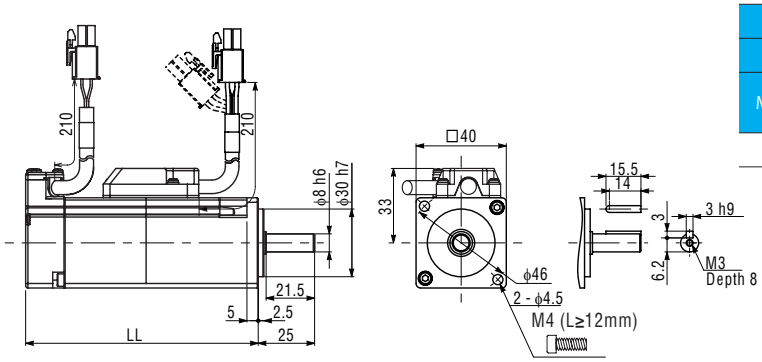
Torque Characteristics





External Dimensions

(mm)



Brake	Without		With	
Oil Seal	Without	With	Without	With
Motor Model	M5G005C*NN	M5G005C*NS	M5G005C*BN	M5G005C*BS
L L	57.1	64.7	89.5	97.1

The straight shaft products are not tapped end.

Specifications

Motor Model : M5B010C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	40 sq.
Approximate mass	Without brake	kg	0.5
	With brake		0.8
Compatible amplifier model		–	SD3010CZ**
Voltage		V	AC200 V to 240 V
Rated output		W	100
Rated torque		N·m	0.32
Instantaneous maximum torque		N·m	1.12
Rated current		A	0.97
Instantaneous maximum current		A	3.3
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.35
Voltage constant-KE		mV/(r/min)	12.3
Rated power	Without brake	kW/s	16.5
	With brake		14.6
Mechanical time constant	Without brake	ms	1.17
	With brake		1.32
Electrical time constant		ms	0.89

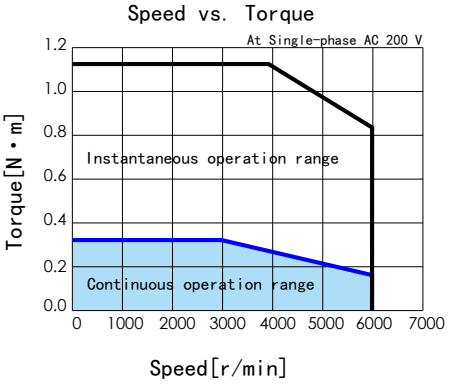
Brake Specifications

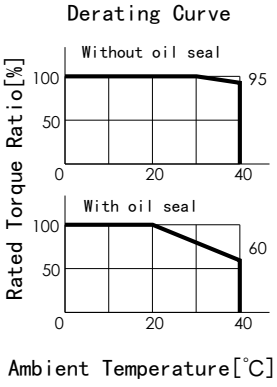
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.25
Static friction torque	N·m	≥ 0.32
Pull-in time	ms	≤ 35
Release time	ms	≤ 20
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	68
Thrust	N	58

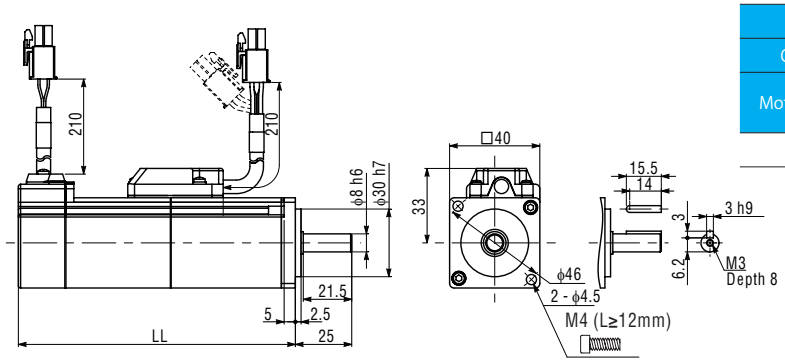
Torque Characteristics





External Dimensions

(mm)



Brake	Without		With	
Oil Seal	Without	With	Without	With
Motor Model	M5B010C*NN	M5B010C*NS	M5B010C*BN	M5B010C*BS
L L	82.4	88.0	122.8	128.4

The straight shaft products are not tapped end.

Specifications

Motor Model : M5G010C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	40 sq.
Approximate mass	Without brake	kg	0.5
	With brake		0.7
Compatible amplifier model		–	SD3010CZ**
Voltage		V	AC200 V to 240 V
Rated output		W	100
Rated torque		N·m	0.32
Instantaneous maximum torque		N·m	1.12
Rated current		A	0.93
Instantaneous maximum current		A	3.3
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.35
Voltage constant-KE		mV/(r/min)	12.3
Rated power	Without brake	kW/s	15.8
	With brake		14.1
Mechanical time constant	Without brake	ms	1.32
	With brake		1.49
Electrical time constant		ms	0.78
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.064
	With brake		0.072

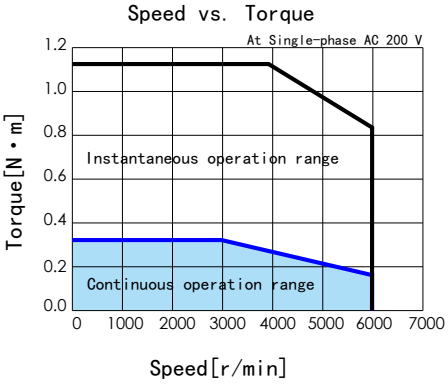
Brake Specifications

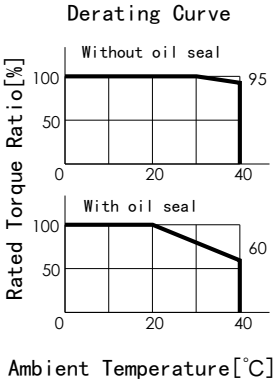
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.25
Static friction torque	N·m	≥ 0.32
Pull-in time	ms	≤ 35
Release time	ms	≤ 20
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	68
Thrust	N	58

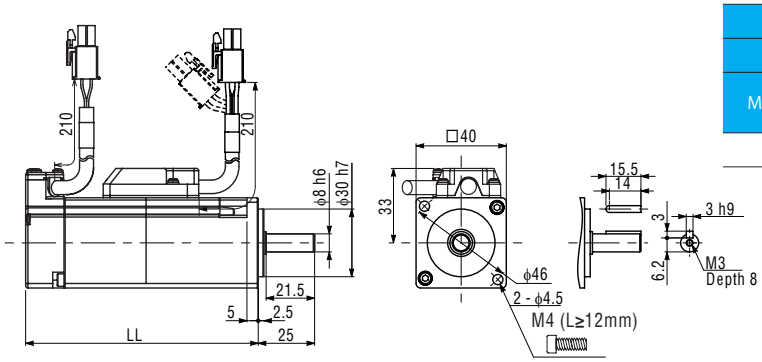
Torque Characteristics





External Dimensions

(mm)



Brake	Without		With	
Oil Seal	Without	With	Without	With
Motor Model	M5G010C*NN	M5G010C*NS	M5G010C*BN	M5G010C*BS
LL	70.7	78.3	103.1	110.7

The straight shaft products are not tapped end.

Specifications

Motor Model : M3B020C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Low
Fitting flange size		mm	60 sq.
Approximate mass	Without brake	kg	0.8
	With brake		1.3
Compatible amplifier model		–	SD3020C1**
Voltage		V	AC200 V to 240 V
Rated output		W	200
Rated torque		N·m	0.64
Instantaneous maximum torque		N·m	1.91
Rated current		A	1.7
Instantaneous maximum current		A	5.2
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.41
Voltage constant-KE		mV/(r/min)	14.3
Rated power	Without brake	kW/s	28.2
	With brake		23.5
Mechanical time constant	Without brake	ms	0.72
	With brake		0.87
Electrical time constant		ms	2.53
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.14
	With brake		0.17

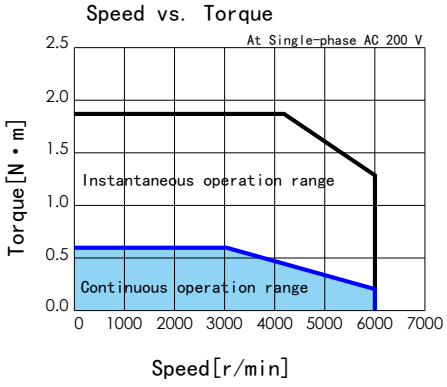
Brake Specifications

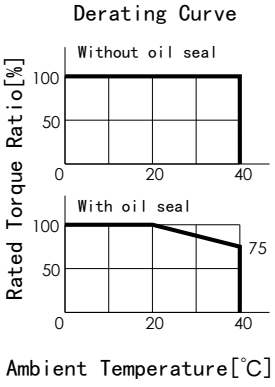
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24V ± 10 %
Rated current	A	0.3
Static friction torque	N·m	≥ 1.27
Pull-in time	ms	≤ 50
Release time	ms	≤ 15
Release voltage	V	≥ DC 1 V

Allowable load

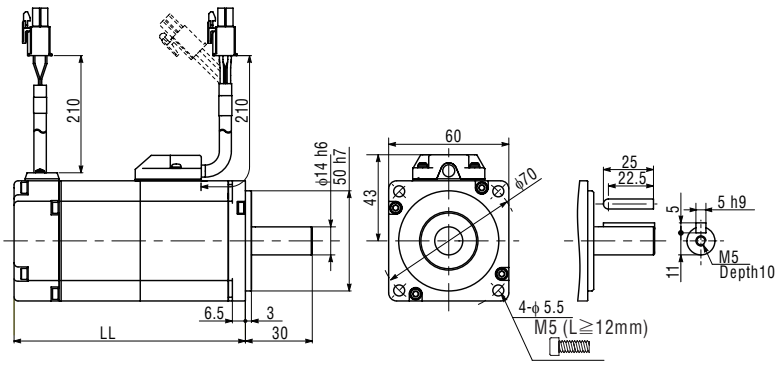
Item	Unit	Specifications
Radial	N	245
Thrust	N	98

Torque Characteristics





External Dimensions



(mm)

Brake	Without	With
Motor Model	M3B020C*N	M3B020C*B
L L	76.5	113.0

The straight shaft products are not tapped end.

Specifications

Motor Model : M7B020C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	High
Fitting flange size		mm	60 sq.
Approximate mass	Without brake	kg	1.0
	With brake		1.5
Compatible amplifier model		–	SD3020C1**
Voltage		V	AC200 V to 240 V
Rated output		W	200
Rated torque		N·m	0.64
Instantaneous maximum torque		N·m	1.91
Rated current		A	1.7
Instantaneous maximum current		A	5.2
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.41
Voltage constant-KE		mV/(r/min)	14.3
Rated power	Without brake	kW/s	9.1
	With brake		8.6
Mechanical time constant	Without brake	ms	2.23
	With brake		2.38
Electrical time constant		ms	2.53
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.44
	With brake		0.47

Brake Specifications

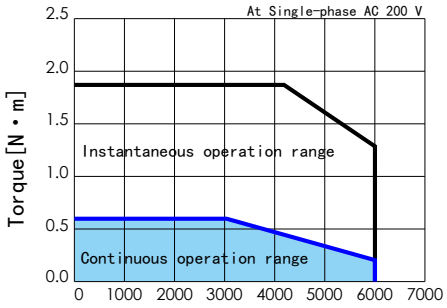
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.3
Static friction torque	N·m	≥ 1.27
Pull-in time	ms	≤ 50
Release time	ms	≤ 15
Release voltage	V	≥ DC 1 V

Allowable load

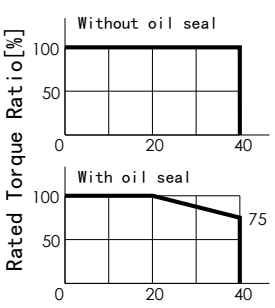
Item	Unit	Specifications
Radial	N	245
Thrust	N	98

Torque Characteristics

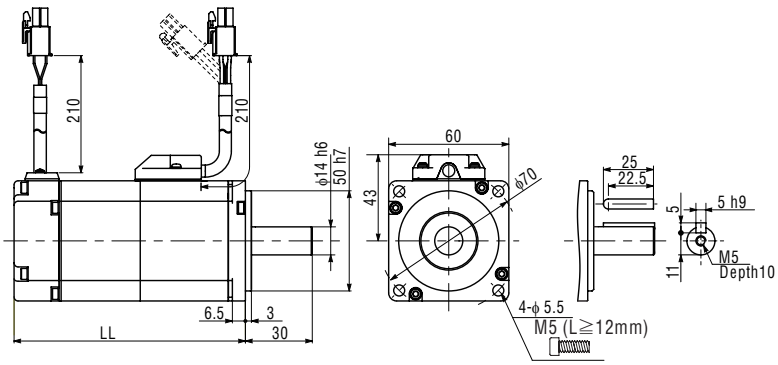
Speed vs. Torque



Derating Curve



External Dimensions



(mm)

Brake	Without	With
Motor Model	M7B020C*N	M7B020C*B
L L	93.5	130.0

The straight shaft products are not tapped end.

Specifications

Motor Model : M3B040C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Low
Fitting flange size		mm	60 sq.
Approximate mass	Without brake	kg	1.3
	With brake		1.8
Compatible amplifier model		–	SD3040C2**
Voltage		V	AC200 V to 240 V
Rated output		W	400
Rated torque		N·m	1.27
Instantaneous maximum torque		N·m	3.82
Rated current		A	2.7
Instantaneous maximum current		A	8.5
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.49
Voltage constant-KE		mV/(r/min)	17.1
Rated power	Without brake	kW/s	69.4
	With brake		61.8
Mechanical time constant	Without brake	ms	0.47
	With brake		0.53
Electrical time constant		ms	2.92
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.23
	With brake		0.26

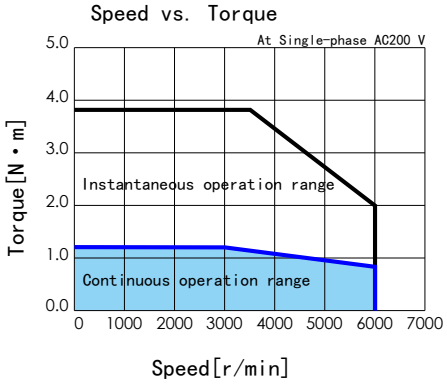
Brake Specifications

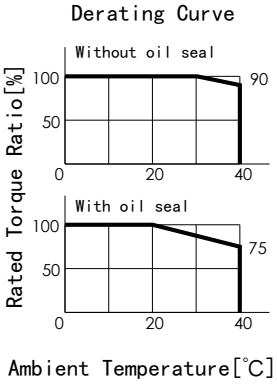
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.3
Static friction torque	N·m	≥ 1.27
Pull-in time	ms	≤ 50
Release time	ms	≤ 15
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	245
Thrust	N	98

Torque Characteristics





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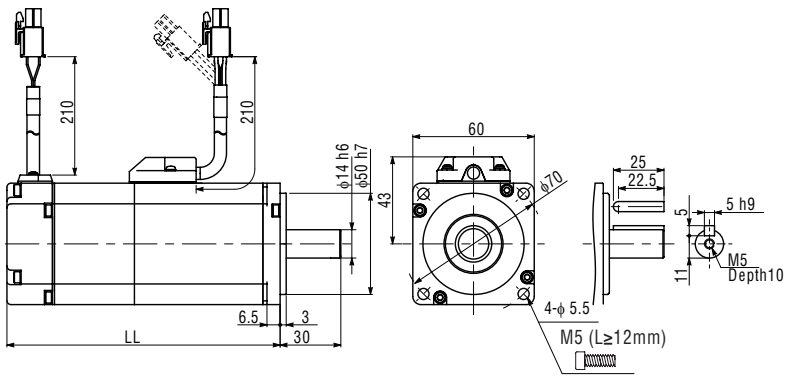


(mm)

Brake	Without	With
Motor Model	M3B040C*N	M3B040C*B
L L	93.5	130.0

The straight shaft products are not tapped end.

Specifications

Motor Model : M7B040C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	High
Fitting flange size		mm	60 sq.
Approximate mass	Without brake	kg	1.5
	With brake		2.0
Compatible amplifier model		–	SD3040C2**
Voltage		V	AC200 V to 240 V
Rated output		W	400
Rated torque		N·m	1.27
Instantaneous maximum torque		N·m	3.82
Rated current		A	2.7
Instantaneous maximum current		A	8.5
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.49
Voltage constant-KE		mV/(r/min)	17.1
Rated power	Without brake	kW/s	23.0
	With brake		22.1
Mechanical time constant	Without brake	ms	1.42
	With brake		1.47
Electrical time constant		ms	2.92
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.71
	With brake		0.73

Brake Specifications

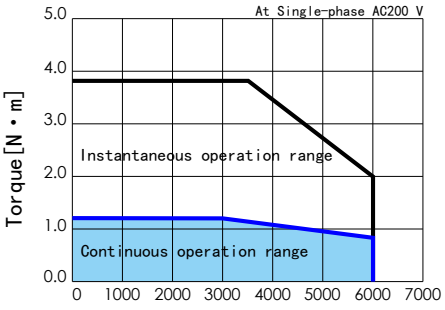
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.3
Static friction torque	N·m	≥ 1.27
Pull-in time	ms	≤ 50
Release time	ms	≤ 15
Release voltage	V	≥ DC 1 V

Allowable load

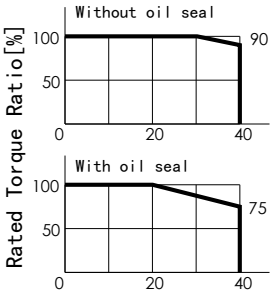
Item	Unit	Specifications
Radial	N	245
Thrust	N	98

Torque Characteristics

Speed vs. Torque



Derating Curve



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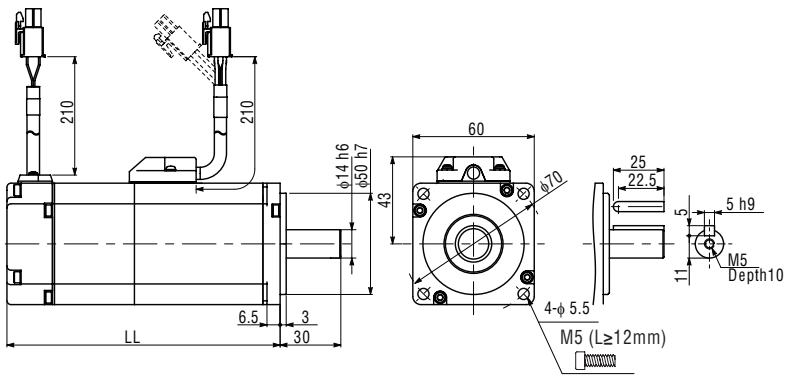


(mm)

Brake	Without	With
Motor Model	M7B040C*N	M7B040C*B
L L	110.5	147.0

The straight shaft products are not tapped end.

Specifications

Motor Model : M3B075C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Low
Fitting flange size		mm	80 sq.
Approximate mass	Without brake	kg	2.2
	With brake		3.0
Compatible amplifier model		–	SD3080C3**
Voltage		V	AC200 V to 240 V
Rated output		W	750
Rated torque		N·m	2.39
Instantaneous maximum torque		N·m	7.1
Rated current		A	4.2
Instantaneous maximum current		A	12.2
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.63
Voltage constant-KE		mV/(r/min)	21.9
Rated power	Without brake	kW/s	76.6
	With brake		60.7
Mechanical time constant	Without brake	ms	0.40
	With brake		0.50
Electrical time constant		ms	4.60
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	0.74
	With brake		0.94

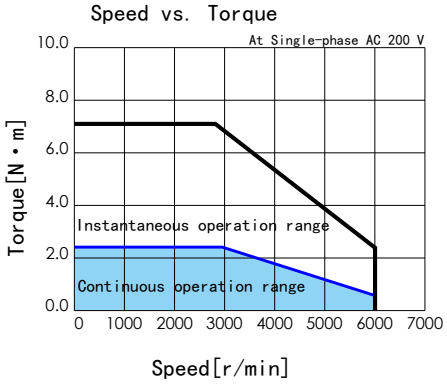
Brake Specifications

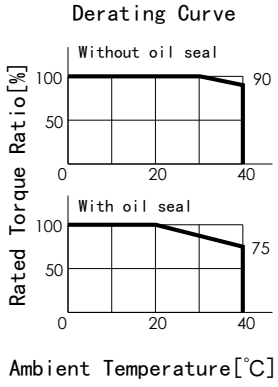
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.4
Static friction torque	N·m	≥ 2.39
Pull-in time	ms	≤ 70
Release time	ms	≤ 20
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	392
Thrust	N	147

Torque Characteristics





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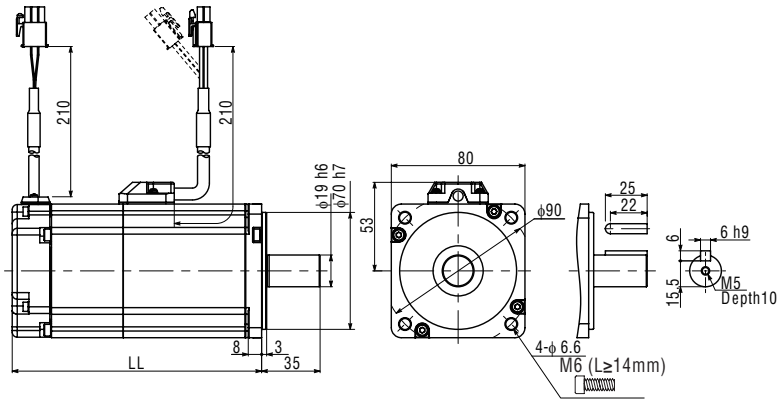


(mm)

Brake	Without	With
Motor Model	M3B075C*N	M3B075C*B
L L	107.3	144.3

The straight shaft products are not tapped end.

Specifications

Motor Model : M7B075C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	High
Fitting flange size		mm	80 sq.
Approximate mass	Without brake	kg	2.5
	With brake		3.3
Compatible amplifier model		–	SD3080C3**
Voltage		V	AC200 V to 240 V
Rated output		W	750
Rated torque		N·m	2.39
Instantaneous maximum torque		N·m	7.1
Rated current		A	4.2
Instantaneous maximum current		A	12.2
Rated speed		r/min	3,000
Maximum speed		r/min	6,000
Torque constant		N·m/A	0.63
Voltage constant-KE		mV/(r/min)	21.9
Rated power	Without brake	kW/s	35.4
	With brake		31.6
Mechanical time constant	Without brake	ms	0.86
	With brake		0.96
Electrical time constant		ms	4.60
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	1.61
	With brake		1.81

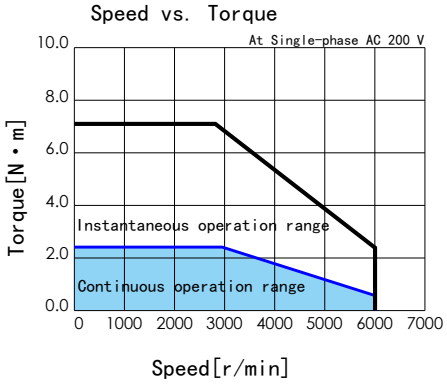
Brake Specifications

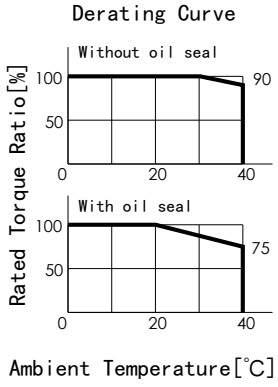
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	0.4
Static friction torque	N·m	≥ 2.39
Pull-in time	ms	≤ 70
Release time	ms	≤ 20
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	392
Thrust	N	147

Torque Characteristics





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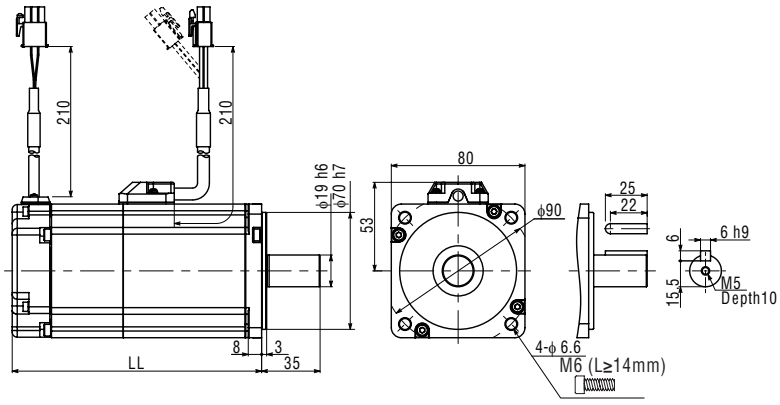


(mm)

Brake	Without	With
Motor Model	M7B075C*N	M7B075C*B
L L	122.3	159.3

The straight shaft products are not tapped end.

Specifications

Motor Model : M5A100C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	130 sq.
Approximate mass	Without brake	kg	5.6
	With brake		7.0
Compatible amplifier model		–	SD3100C4**
Voltage		V	AC200 V to 240 V
Rated output		W	1,000
Rated torque		N·m	4.77
Instantaneous maximum torque		N·m	14.3
Rated current		A	5.6
Instantaneous maximum current		A	16.8
Rated speed		r/min	2,000
Maximum speed		r/min	3,000
Torque constant		N·m/A	0.88
Voltage constant-KE		mV/(r/min)	30.9
Rated power	Without brake	kW/s	50.0
	With brake		36.5
Mechanical time constant	Without brake	ms	0.76
	With brake		1.05
Electrical time constant		ms	10.1
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	4.56
	With brake		6.24

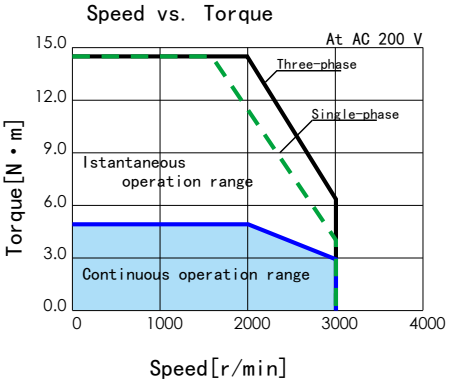
Brake Specifications

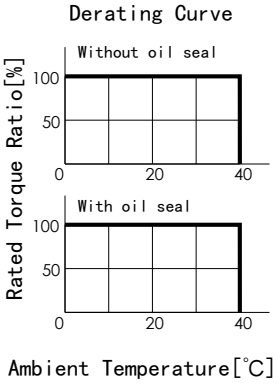
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	1.0
Static friction torque	N·m	≥ 9.55
Pull-in time	ms	≤ 120
Release time	ms	≤ 30
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	490
Thrust	N	196

Torque Characteristics





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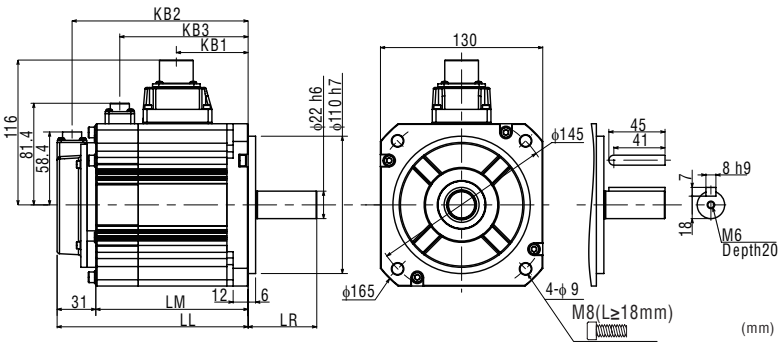


(mm)

Brake	Without	With
Motor Model	M5A100C*N	M5A100C*B
L L	128.0	153.0
LM	97.0	122.0
LR	55.0	
KB1	57.5	
KB2	116.0	141.0
KB3	–	102.8

The straight shaft products are not tapped end.

Specifications

Motor Model : M7A100C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	High
Fitting flange size		mm	130 sq.
Approximate mass	Without brake	kg	7.6
	With brake		9.0
Compatible amplifier model		–	SD3100C4**
Voltage		V	AC200 V to 240 V
Rated output		W	1,000
Rated torque		N·m	4.77
Instantaneous maximum torque		N·m	14.3
Rated current		A	5.6
Instantaneous maximum current		A	16.8
Rated speed		r/min	2,000
Maximum speed		r/min	3,000
Torque constant		N·m/A	0.88
Voltage constant-KE		mV/(r/min)	30.9
Rated power	Without brake	kW/s	9.2
	With brake		8.6
Mechanical time constant	Without brake	ms	4.17
	With brake		4.43
Electrical time constant		ms	10.1
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	24.9
	With brake		26.4

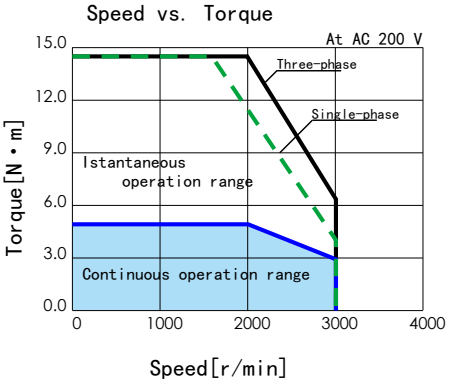
Brake Specifications

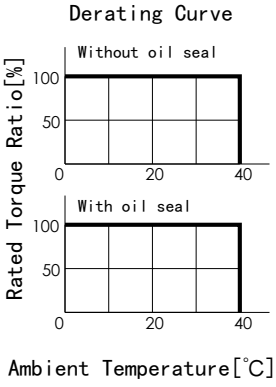
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	1.0
Static friction torque	N·m	≥ 9.55
Pull-in time	ms	≤ 120
Release time	ms	≤ 30
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	490
Thrust	N	196

Torque Characteristics





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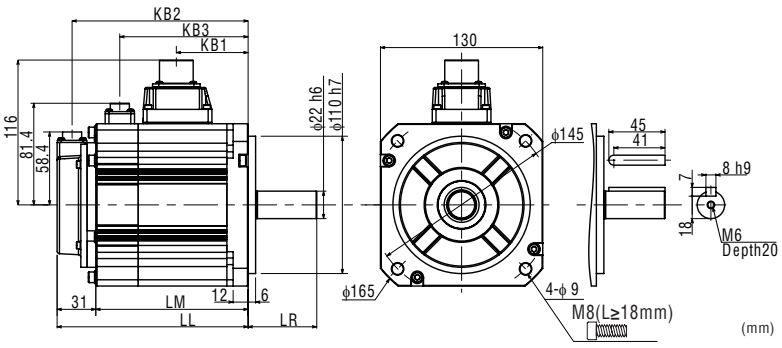


(mm)

Brake	Without	With
Motor Model	M7A100C*N	M7A100C*B
L L	163.0	188.0
LM	132.0	157.0
LR	70.0	
KB1	92.5	
KB2	151.0	176.0
KB3	–	137.8

The straight shaft products are not tapped end.

Specifications

Motor Model : M5A150C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	130 sq.
Approximate mass	Without brake	kg	7.0
	With brake		8.4
Compatible amplifier model		–	SD3150C6**
Voltage		V	AC200 V to 240 V
Rated output		W	1,500
Rated torque		N·m	7.16
Instantaneous maximum torque		N·m	21.5
Rated current		A	9.0
Instantaneous maximum current		A	27
Rated speed		r/min	2,000
Maximum speed		r/min	3,000
Torque constant		N·m/A	0.81
Voltage constant-KE		mV/(r/min)	28.4
Rated power	Without brake	kW/s	76.9
	With brake		61.4
Mechanical time constant	Without brake	ms	0.60
	With brake		0.75
Electrical time constant		ms	12.2
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	6.67
	With brake		8.35

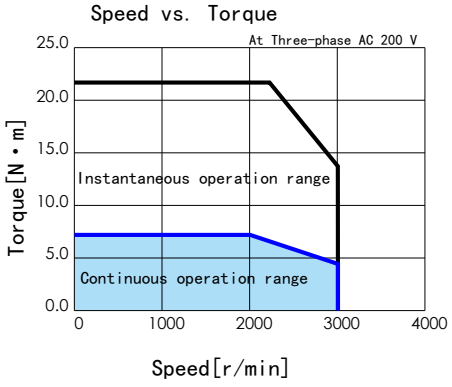
Brake Specifications

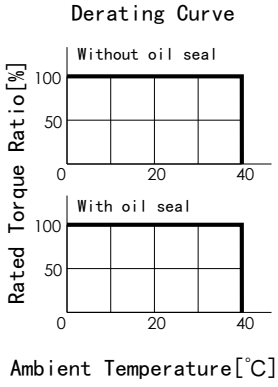
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	1.0
Static friction torque	N·m	≥ 9.55
Pull-in time	ms	≤ 120
Release time	ms	≤ 30
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	490
Thrust	N	196

Torque Characteristics





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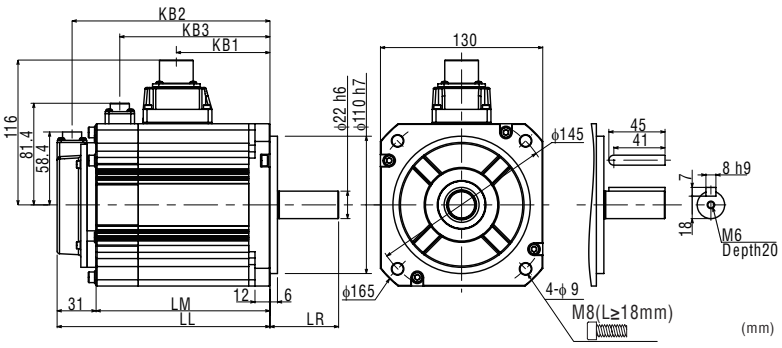


(mm)

Brake	Without	With
Motor Model	M5A150C*N	M5A150C*B
L L	145.5	170.5
LM	114.5	139.5
LR	55.0	
KB1	75.0	
KB2	133.5	158.5
KB3	–	120.3

The straight shaft products are not tapped end.

Specifications

Motor Model : M7A150C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	High
Fitting flange size		mm	130 sq.
Approximate mass	Without brake	kg	9.0
	With brake		10.4
Compatible amplifier model		–	SD3150C6**
Voltage		V	AC200 V to 240 V
Rated output		W	1,500
Rated torque		N·m	7.16
Instantaneous maximum torque		N·m	21.5
Rated current		A	9.0
Instantaneous maximum current		A	27
Rated speed		r/min	2,000
Maximum speed		r/min	3,000
Torque constant		N·m/A	0.81
Voltage constant-KE		mV/(r/min)	28.4
Rated power	Without brake	kW/s	13.8
	With brake		13.3
Mechanical time constant	Without brake	ms	3.32
	With brake		3.46
Electrical time constant		ms	12.2
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	37.12
	With brake		38.65

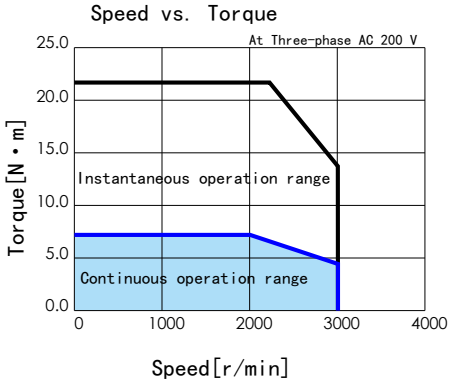
Brake Specifications

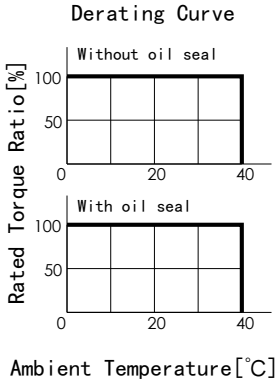
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	1.0
Static friction torque	N·m	≥ 9.55
Pull-in time	ms	≤ 120
Release time	ms	≤ 30
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	490
Thrust	N	196

Torque Characteristics





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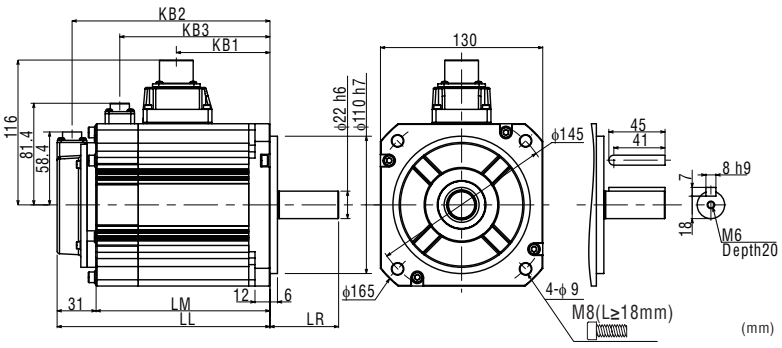


(mm)

Brake	Without	With
Motor Model	M7A150C*N	M7A150C*B
L L	180.5	205.5
LM	149.5	174.5
LR	70.0	
KB1	110.0	
KB2	168.5	19.35
KB3	–	155.3

The straight shaft products are not tapped end.

Specifications

Motor Model : M5A200C □□□□＊＊

Basic Specifications

Item		Unit	Specifications
Rotor inertia		–	Middle
Fitting flange size		mm	130 sq.
Approximate mass	Without brake	kg	8.4
	With brake		9.8
Compatible amplifier model		–	SD3200C8**
Voltage		V	AC200 V to 240 V
Rated output		W	2,000
Rated torque		N·m	9.55
Instantaneous maximum torque		N·m	28.6
Rated current		A	11.9
Instantaneous maximum current		A	35.7
Rated speed		r/min	2,000
Maximum speed		r/min	3,000
Torque constant		N·m/A	0.85
Voltage constant-KE		mV/(r/min)	29.6
Rated power	Without brake	kW/s	104.9
	With brake		87.9
Mechanical time constant	Without brake	ms	0.58
	With brake		0.69
Electrical time constant		ms	12.2
Rotor moment of inertia	Without brake	$\times 10^{-4}$ kg·m^2	8.70
	With brake		10.38

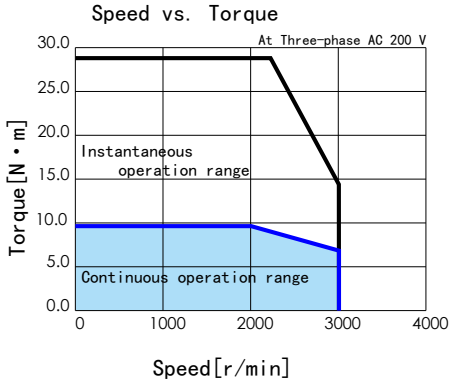
Brake Specifications

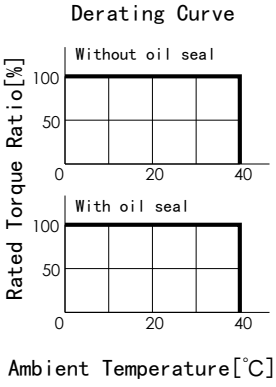
Item	Unit	Specifications
Usage	–	Holding
Rated voltage	V	DC 24 V ± 10 %
Rated current	A	1.0
Static friction torque	N·m	≥ 9.55
Pull-in time	ms	≤ 120
Release time	ms	≤ 30
Release voltage	V	≥ DC 1 V

Allowable load

Item	Unit	Specifications
Radial	N	490
Thrust	N	196

Torque Characteristics





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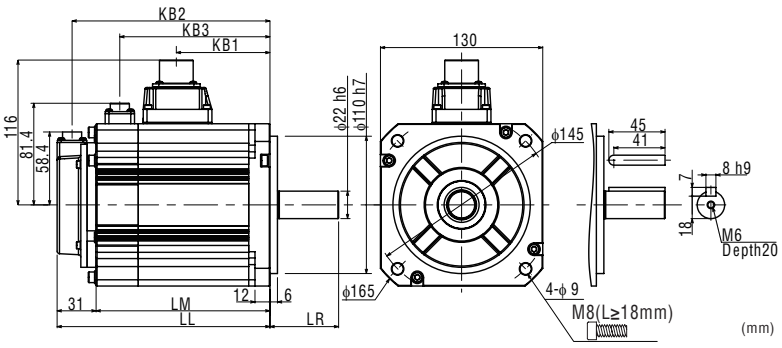


(mm)

Brake	Without	With
Motor Model	M5A200C*N	M5A200C*B
L L	163.0	188.0
LM	132.0	157.0
LR	55.0	
KB1	92.5	
KB2	151.0	176.0
KB3	–	137.8

The straight shaft products are not tapped end.

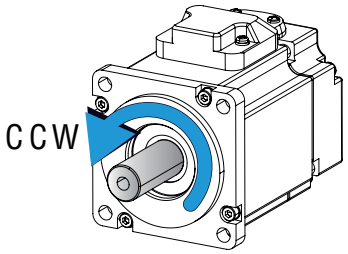
Motor Basic Specifications

Item	Specifications
Ambient temperature for operation	0 to 40 ℃
Ambient humidity for operation	20 to 85 %RH （non-condensing）
Ambient temperature for storage	− 20 to 65 ℃ （non-condensing） (not subjected to direct sunlight) 80 ℃ for 72 hours
Ambient humidity for storage	20 to 85 %RH （non-condensing）
Atmosphere for operation / storage	Indoors（not subject to direct sunlight）, Free from corrosive gases, flammable gases, oil mist, dust, flammables, grinding fluid
Insulation resistance	≥ 5 MΩ at 1,000 VDC
Insulation strength	AC 1500 V for one minute across the primary and FG
Altitude	≤ 1,000 m
Vibration class	V15 (JEC2121)
Vibration resistance	49 m/s^2 （5 G）
Impact resistance	98 m/s^2 （10 G）
IP Rating	IP65：50 W to 750 W, IP67：1 kW to 2 kW
Electric shock protection	Class I（Mandatory grounding）
Overvoltage category	II
Installation environment	Pollution degree 2

Encoder Specifications

Item			Specifications	
Motor model			M□□□□□C□□□C＊＊	M□□□□□C□□□A＊＊
Resolution			Incremental 17 bit	Absolute 17 bit
Environmental requirements	Ambient operating temperature		0 to 85 ℃	
	External disturbance magnetic field		±2 mT (20 G) or below	
Electrical specifications	Power supply	Voltage	DC 4.5 to 5.5 V (Power supply ripple ≤ 5 %)	
		Current consumption	160 mA typ. (Not including rush current)	
	External battery	Voltage	–	DC 2.4 to 4.2V
		Current consumption	–	10 μA typ. (*1)
	Multi-turn count		–	65,536 counts
	Maximum revolving speed		6,000 r/min	
	Count-up direction		CCW (*2)	
	Input/output type		Differential transform	
Communication specification	Transmission method		Half-duplex asynchronous serial communication	
	Communication speed		2.5 Mbps	

*1) Measurement conditions
room temperature, the motor not in motion, battery voltage of 3.6 V.
*2) CCW when viewed from the load side shaft end.



Precautions

Using the motor with rotations of 180 degrees or less will reduce the encoder's rotational accuracy.
For a motor equipped with a brake, follow the brake voltage and polarity specifications.
If the brake voltage is less than 12 V or the polarity is reversed, the encoder's rotational accuracy will be reduced.

Symbol	Precautions (Dos and Don'ts)	Anticipated Hazards
	⚠ CAUTION	
	Handling &Operations	
	Do not step on this product or place any heavy object on it.	
	To avoid unstable motions, never make drastic changes in tuning.	
	Do not approach your machine after power restoration following power outage. It may restart unexpectedly. Configure your machine to ensure safety of your personnel against its unexpected restarts.	
	Do not use the product where it could be exposed to direct sunlight.	
	Do not apply impact load to the product.	
	Never operate or stop the motor using the electromagnetic contactor installed on the main power supply side.	
	The brake installed in the motor is only for holding. Do not use it as a decelerating device.	
	Do not use if the motor or amplifier is malfunctioning, broken, or damaged.	
	Confirm that your power supply specifications comply with this product's.	
	The holdong brake is not a stopping device to secure machine safety. To ensure safety, prepare a stopping device for your machinery.	
	Upon occurrence of an alarm, eliminate the cause and secure safety before resetting the alarm and restarting your machine.	
	Connect the brake control relay and the emergency stop relay in series.	
	Transportation & Storage	
	Do not store the product where it could be subjected to water, moisture, toxic gases, or liquids.	
	Do not hold the cables or the motor shaft when transporting.	
	Do not let the product fall off or fall over during transportation or installation.	
	If the product was stored away for an extended period of time, check with our distributor.	
	Store the product in a location that meets the requirement of storage environments described in the instruction manual.	
	Disposal	
	Prior to disposal of batteries, insulate them with tape or other material. Dispose of them following the local laws and regulations.	
	When disposing of the SD3 product, treat it as industrial waste.	
	Maintenance & Inspection	
	Overhauls must not be done by anyone but FATEK Automation Corporation.	
	Do not turn the power supply on and off too frequently.	
	Your motor, heat sink of the amplifier, or regenerative resistor may become dangerously hot. Do not touch any of them with hands when power is on or for a while after power shutdown.	
	If your amplifier or motor fails, shut down both of the control power supply and the main circuit power supply.	
	When not using the product for an extended period of time, be sure to turn the power off.	

Other Considerations and Precautions

Export of this product or its applications

If the end user or application of the product assumes to be involved in military activities or weapons, its export may be subject to "Foreign Exchange and Foreign Trade Law (Japan)" (or equivalent in your country). Have adequate legal reviews and follow any required export procedures.

Medical applications

Do not attempt to use this product or its application for human life related field. This product has been designed and manufactured for general industrial use and its medical applications are not allowed.

Applications for special environments or purposes such as nuclear power, aerospace and transportation

Please contact us in advance.

Applications that could cause serious accidents or damages due to our product failures

Be sure to have safety device or protection device installed before using your equipment.

Applying voltage over the rated power supply of this product

Could become fire or smoke hazard to the amplifier. Be sure to check and confirm proper wiring before turning the power on.
Be particularly careful in a location such as clean room.

Operations with the motor shaft not grounded electrically

Depending on the device or installation environment, bearing noise might get increased by galvanic corrosion of the motor bearings. Carry out careful check and test on grounding.

Operations in environment under significant influences of external noise and static electricity

This product has been designed and manufactured along with extensive noise tests. However, there is a possibility of unexpected behaviors, depending on user' s environment. Practice a fail-safe design and also take adequate measures to ensure safety within the range of machine motion.

Use of this product in a manner not specified by the manufacture

Such use shall void the manufacture warranty. Be mindful before you attempt to do so.

Maintenance and Inspection

Perform regular maintenance and inspections for safe use of this product. Ensure the safety before each inspection work. This product assumes the following operation conditions.

- Ambient temperature： Average annual temperature of 30 ℃ (not exceeding the rated temperature range)
- Maximum load factor： 80 %
- Maximum operating hours： 20 hours a day

Daily Inspection： Check the following before each operation.

- Check ambient temperature, humidity and atmosphere.
- No foreign objects or dust, especially nothing is blocking the vent holes.
- No over bent or damages of the wires.
- Power supply voltage is within the specifications.
- No foreign objects in mobile components of the device and the range of motions.
- When the power is on, there is no unusual noise or smell right after the machinery starts.

Periodic Inspection： Check for the following at least once a year.

- No loose clamp screw problems in the amplifier and motor.
- No deformation or no discoloration in the amplifier, motor, cables, and terminal blocks due to overheat
- No looseness in wiring fixings and terminal block screws

Warranty Information

Terms of Warranty

The term of warranty for this product is twelve (12) months after the date of product manufacture. However, brake equipped motors whose number of axis accelerations and decelerations exceeded the rated maximum shall not be covered by the warranty.

Conditions of Warranty

Should any failure develop during the warranty period under normal operations following the SD3 instruction manual.
However, even during the warranty period, Manufacture makes only fee-based repair if the failure is due to the following reasons:

- Misuse, improper repair, or alternation of the product
- Dropped after the purchase or damaged during transportation
- Use of this product in a manner not specified by Manufacture
- Fire, earthquake, lightning, storm and flood damage, salt damage, abnormal voltage, or any other acts of God or natural disasters
- Ingress of foreign matter such as water, oil or metal chips.

This warranty does not apply to parts or accessories that have been used longer than each rated service life.
The warranty applies to delivered products only and Manufacture shall not be liable for any indirect, incidental or consequential damage caused by the product failure or damage.

Contact to :

Вектор Технологий

+375 29 685 60 15
+375 17 516 84 37
info@vec-tech.by
www.vec-tech.by

Please study this manual first and use the product properly and safely.

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