

BD3E SERVO SYSTEM SELECTION MANUAL



- BD3E(EB&AP&AP2) Series Servo Drive
- PH3 Series Servo Motor
- P3C Series Servo Motor

servotronics@midea.com
www.servotronics.cn



Founded in Israel in 1987, Servotronix Motion Control Ltd, as a comprehensive solution provider for development, production, and sales of servomechanism, control systems, and other products, is committed to making continuous breakthrough in the field of automation and facilitating the rapid development of China's high-end manufacturing industry. It owns two brands namely Servotronix and Dorna.

Servotronix and Dorna are dedicated to designing and providing standardized and customized motion control solutions for equipment manufacturers and automation system suppliers, providing professional services to more than 1000+ customers in over 30 countries around the globe. In particular, Servotronix has been leading the direct-drive industry in the Chinese market. As an international company Servotronix has set up R&D teams in Israel, Shanghai, Jiashan, and Shunde.



Our motion control solutions cover most industries and automation equipment, such as lithium battery industry, semiconductor industry, robot industry, robotic arms industry, electronics industry, laser industry, photovoltaic industry, etc.

目录

CONTENTS

1. BD3 servo system selection list	1
PH3 series servo motor	1
P3C series servo motors	2
2. BD3E AC Servo System	3
BD3E Series Servo Naming Convention	4
BD3E-EB Series Drive Wiring Diagram General specifications for	5
BD3E-EB series drives	7
BD3E-EB Series Servo Terminal Definition	10
BD3E-EB series servo mount size	13
BD3E-AP/AP2 Series Servo Wiring Diagram	14
BD3E-AP/AP2 General Specifications	16
BD3E-AP/AP2 series servo terminal definition	18
BD3E-AP/AP2 series servo mount size	19
3. PH3E/S Series Servo Motors	20
PH3E/S Series Servo Motor Naming Rules	20
PH3E/S series servo motor product highlights	21
PH3E/S Series Servo Motor Product Map	23
PH3E/S series servo motor specifications overview	24
PH3E/S Series Servo General Technical Specifications	26
PH3E/S series servo motor structural characteristics	31
PH3E/S series servo motor interface	34
BD3+PH3 motor cable and kit package	36
4. P3C Series Servo Motors	39
P3C Series Servo Motor Naming Rules	39
P3C Series Servo Motor Specifications Overview	40
P3C Series Servo Motor Terminal Block Description	46
BD3+P3C Selection of motor cables and kit packages	47

1BD3 servo system selection and matching list

PH3 Series Servo Motor

Motor Base mm	Rated Power kW	Voltage Rating V	Torque N·m (Rated/Peak)	Current Arms (Rated/Peak)	Speed rpm (Rated/Max)	Inertia Value kg·cm² (Unbraked/Braked)	Oil Seal	Brake	20-bit Magnetic Encoder Single-turn Absolute	20-bit Magnonic Encoder Multi-turn Absolute	23-bit Optical Encoder Multi-turn Absolute	BD3E Series Drive (EB/AP/AP2)
40	0.1	220	0.32/1.12	1.30/4.25	3000/7000	0.044/0.046	×	✓	PH3E-L01A004BG	PH3E-L01A004BM	PH3S-L01A004BT	BD3E-1D62A
							×	×	PH3E-L01A004NG	PH3E-L01A004NM	PH3S-L01A004NT	
60	0.2	220	0.64/2.30	1.38/5.80	3000/7000	0.24/0.25	✓	✓	PH3E-M02A006EG	PH3E-M02A006EM	PH3S-M02A006ET	BD3E-1D62A
							✓	×	PH3E-M02A006SG	PH3E-M02A006SM	PH3S-M02A006ST	
	0.4	220	1.27/4.45	2.40/9.60	3000/7000	0.47/0.48	✓	✓	PH3E-M04A006EG	PH3E-M04A006EM	PH3S-M04A006ET	BD3E-2D82A
							✓	×	PH3E-M04A006SG	PH3E-M04A006SM	PH3S-M04A006ST	
	0.6	220	1.91/7.50	3.65/16.60	3000/7000	0.68/0.69	✓	✓	PH3E-M06A006EG	PH3E-M06A006EM	PH3S-M06A006ET	BD3E-5D52A
							✓	×	PH3E-M06A006SG	PH3E-M06A006SM	PH3S-M06A006ST	
80	0.75	220	2.39/8.37	4.42/16.90	3000/7000	1.46/1.51	✓	✓	PH3E-M08A008EG	PH3E-M08A008EM	PH3S-M08A008ET	BD3E-5D52A
							✓	×	PH3E-M08A008SG	PH3E-M08A008SM	PH3S-M08A008ST	
	1.0	220	3.18/11.13	5.74/23.00	3000/7000	2.00/2.05	✓	✓	PH3E-M10A008EG	PH3E-M10A008EM	PH3S-M10A008ET	BD3E-7D62A
							✓	×	PH3E-M10A008SG	PH3E-M10A008SM	PH3S-M10A008ST	
130	0.85	220	5.39/13.50	5.73/16.28	1500/4500	12.21/14.22	✓	✓	PH3E-G09A013EG	PH3E-G09A013EM	PH3S-G09A013ET	BD3E-7D62A
							✓	×	PH3E-G09A013SG	PH3E-G09A013SM	PH3S-G09A013ST	
		380	5.39/13.50	3.30/8.85	1500/4500	12.21/14.22	✓	✓	PH3E-G09B013EG	PH3E-G09B013EM	PH3S-G09B013ET	BD3E-3D54D
							✓	×	PH3E-G09B013SG	PH3E-G09B013SM	PH3S-G09B013ST	
	1.3	220	8.28/20.85	9.70/26.09	1500/4500	18.03/20.05	✓	✓	PH3E-G13A013EG	PH3E-G13A013EM	PH3S-G13A013ET	BD3E-0122A
							✓	×	PH3E-G13A013SG	PH3E-G13A013SM	PH3S-G13A013ST	
		380	8.28/20.85	5.15/13.35	1500/4500	18.03/20.05	✓	✓	PH3E-G13B013EG	PH3E-G13B013EM	PH3S-G13B013ET	BD3E-5D44D
							✓	×	PH3E-G13B013SG	PH3E-G13B013SM	PH3S-G13B013ST	
	1.8	220	11.5/28.75	11.60/31.35	1500/4500	23.94/25.95	✓	✓	PH3E-G18A013EG	PH3E-G18A013EM	PH3S-G18A013ET	BD3E-0122A
							✓	×	PH3E-G18A013SG	PH3E-G18A013SM	PH3S-G18A013ST	
		380	11.5/28.75	7.14/19.12	1500/4500	23.94/25.95	✓	✓	PH3E-G18B013EG	PH3E-G18B013EM	PH3S-G18B013ET	BD3E-8D44D
							✓	×	PH3E-G18B013SG	PH3E-G18B013SM	PH3S-G18B013ST	

P3C Series Servo Motor

Motor Base mm	Rated Power kW	Voltage Rating V	Torque N·m (Rated /Peak)	Current Arms (Rated /Peak)	Speed rpm (Rated/Max)	Inertia Value kg·cm² (Unbraked /Braked)	Oil Seal	23-bit Multi-turn Optical Encoder		17-bit Multi-turn Magnetic Encoder		BD3E Drive EB/AP/AP2
								Without brake	With brake	Without brake	With brake	
40	0.05	220	0.16/0.48	0.6/1.8	3000/6000	0.035/0.038	✓	P3C-LA5A104ST	P3C-LA5A104ET	P3C-LA5A104SJ	P3C-LA5A104EJ	BD3E-1D62A
40	0.05	220	0.16/0.48	0.6/1.8	3000/6000	0.035/0.038	×	P3C-LA5A104NT	P3C-LA5A104BT	P3C-LA5A104NJ	P3C-LA5A104BJ	BD3E-1D62A
40	0.1	220	0.32/0.96	1/3	3000/6000	0.05/0.053	✓	P3C-L01A104ST	P3C-L01A104ET	P3C-L01A104SJ	P3C-L01A104EJ	BD3E-1D62A
40	0.1	220	0.32/0.96	1/3	3000/6000	0.05/0.053	×	P3C-L01A104NT	P3C-L01A104BT	P3C-L01A104NJ	P3C-L01A104BJ	BD3E-1D62A
80	1	220	3.18/11.13	6.3/25	3000/6000	0.88	✓	P3C-L10A108ST	/	P3C-L10A108SJ	/	BD3E-7D62A
100	1	220	3.18/9.54	7/22	3000/6000	2.26/3	✓	P3C-L10A110ST	P3C-L10A110ET	P3C-L10A110SJ	P3C-L10A110EJ	BD3E-7D62A
100	1	380	3.18/9.54	3.5/11	3000/6000	2.26/3	✓	P3C-L10B110ST	P3C-L10B110ET	P3C-L10B110SJ	P3C-L10B110EJ	BD3E-3D54D
100	1.5	220	4.77/14.31	10/31	3000/6000	3.1/3.83	✓	P3C-L15A110ST	P3C-L15A110ET	P3C-L15A110SJ	P3C-L15A110EJ	BD3E-0122A
100	1.5	380	4.77/14.31	5/16	3000/6000	3.1/3.83	✓	P3C-L15B110ST	P3C-L15B110ET	P3C-L15B110SJ	P3C-L15B110EJ	BD3E-5D44D
100	2	220	6.37/19.11	11.6/36	3000/5000	3.93/4.66	✓	P3C-L20A110ST	P3C-L20A110ET	P3C-L20A110SJ	P3C-L20A110EJ	BD3E-0122A
100	2	380	6.37/19.11	6/18	3000/5000	3.93/4.66	✓	P3C-L20B110ST	P3C-L20B110ET	P3C-L20B110SJ	P3C-L20B110EJ	BD3E-8D44D
100	2.5	380	7.96/23.88	7.5/22	3000/5000	4.76/5.5	✓	P3C-L25B110ST	P3C-L25B110ET	P3C-L25B110SJ	P3C-L25B110EJ	BD3E-8D44D
130	2.2	380	14.3/40	10.5/29.4	1500/3000	27.1/28.33	✓	P3C-G22B113ST	P3C-G22B113ET	P3C-G22B113SJ	P3C-G22B113EJ	BD3E-0124D
130	1	220	4.77/14.31	5.8/17.4	2000/3000	5.98/7.21	✓	P3C-C10A113ST	P3C-C10A113ET	P3C-C10A113SJ	P3C-C10A113EJ	BD3E-7D62A
130	1	380	4.77/14.31	3.5/10.5	2000/3000	5.98/7.21	✓	P3C-C10B113ST	P3C-C10B113ET	P3C-C10B113SJ	P3C-C10B113EJ	BD3E-3D54D
130	1.5	220	7.16/21.48	8/24	2000/3000	8.05/9.28	✓	P3C-C15A113ST	P3C-C15A113ET	P3C-C15A113SJ	P3C-C15A113EJ	BD3E-0122A
130	1.5	380	7.16/21.48	4.7/14.1	2000/3000	8.05/9.28	✓	P3C-C15B113ST	P3C-C15B113ET	P3C-C15B113SJ	P3C-C15B113EJ	BD3E-5D44D
130	2	220	9.55/28.65	10.2/30.6	2000/3000	10.13/11.36	✓	P3C-C20A113ST	P3C-C20A113ET	P3C-C20A113SJ	P3C-C20A113EJ	BD3E-0122A
130	2	380	9.55/28.65	6.2/18.6	2000/3000	10.13/11.36	✓	P3C-C20B113ST	P3C-C20B113ET	P3C-C20B113SJ	P3C-C20B113EJ	BD3E-8D44D
130	3	380	14.3/42.9	11/33	2000/3000	13.69/14.92	✓	P3C-C30B113ST	P3C-C30B113ET	P3C-C30B113SJ	P3C-C30B113EJ	BD3E-0124D
180	2.9	380	18.6/55.8	11.9/35.7	1500/3000	63.5/69.5	✓	P3C-G29B118ST	P3C-G29B118ET	P3C-G29B118SJ	P3C-G29B118EJ	BD3E-0124D

2 BD3E AC servo

Exquisite design and ingenuity

Hidden battery compartment

The wiring is simple and the connection is stable

Scan the code with ease

One machine, one code, quickly confirm product information

Strong and weak electric separation design

The anti-interference ability is significantly improved

Simple commissioning and ready to use on power

MTP electronic nameplate

The motor is plug and play

One-click self-setting

Save 90% of commissioning time

Absolute encoder

Limits and origins can be omitted

Control panel

Six buttons, parameter debugging, system tuning, fault troubleshooting, alarm clearing, one hand

Graphical debugging wizard

Make servo commissioning simple and intuitive

Quality assurance is rock-solid

High-quality materials

Strict process control measures are implemented to improve quality, resulting in more stable and reliable equipment operation and higher production efficiency.

Active cooling design + conformal coating

Withstanding harsh application environments characterized by high temperatures, high humidity, and high levels of dust.

The product complies with the CE certification standards

The product complies with the CE certification standards

Passes rigorous testing according to IEC 61800 standards

Tolerates complex electrical environments.



BD3E Series Server Naming Convention

BD3 E - 2D8 2A EB - □□

1 2 3 4 5

E 1 Drive type

Symbol	Specification
E	Economical Model
S	Standard Model

2A 3 Nominal Input Voltage

Symbol	Specification
2A	220V
4D	380V

□□ 5 Servo drive series

Symbol	Specification
[blank]	standard type
ST	STO
BS	built-in resistors + STO

2D8 2 Nominal Value

Symbol	Specification
220V	
1D6	Continuous 1.6Arms, Maximum 5.6Arms
2D8	Continuous 2.8Arms, Maximum 9.8Arms
5D5	Continuous 5.5Arms, Maximum 16.9Arms
7D6	Continuous 7.6Arms, Maximum 23Arms
012	Continuous 11.6Arms, Maximum 32Arms
380V	
3D5	Continuous 3.5Arms, Maximum 11Arms
5D4	Continuous 5.4Arms, Maximum 14Arms
8D4	Continuous 8.4Arms, Maximum 20Arms
012	Continuous 12Arms, Maximum 29.8Arms
017	Continuous 17Arms, Maximum 42Arms
021	Continuous 21Arms, Maximum 52Arms
026	Continuous 26Arms, Maximum 64.5Arms

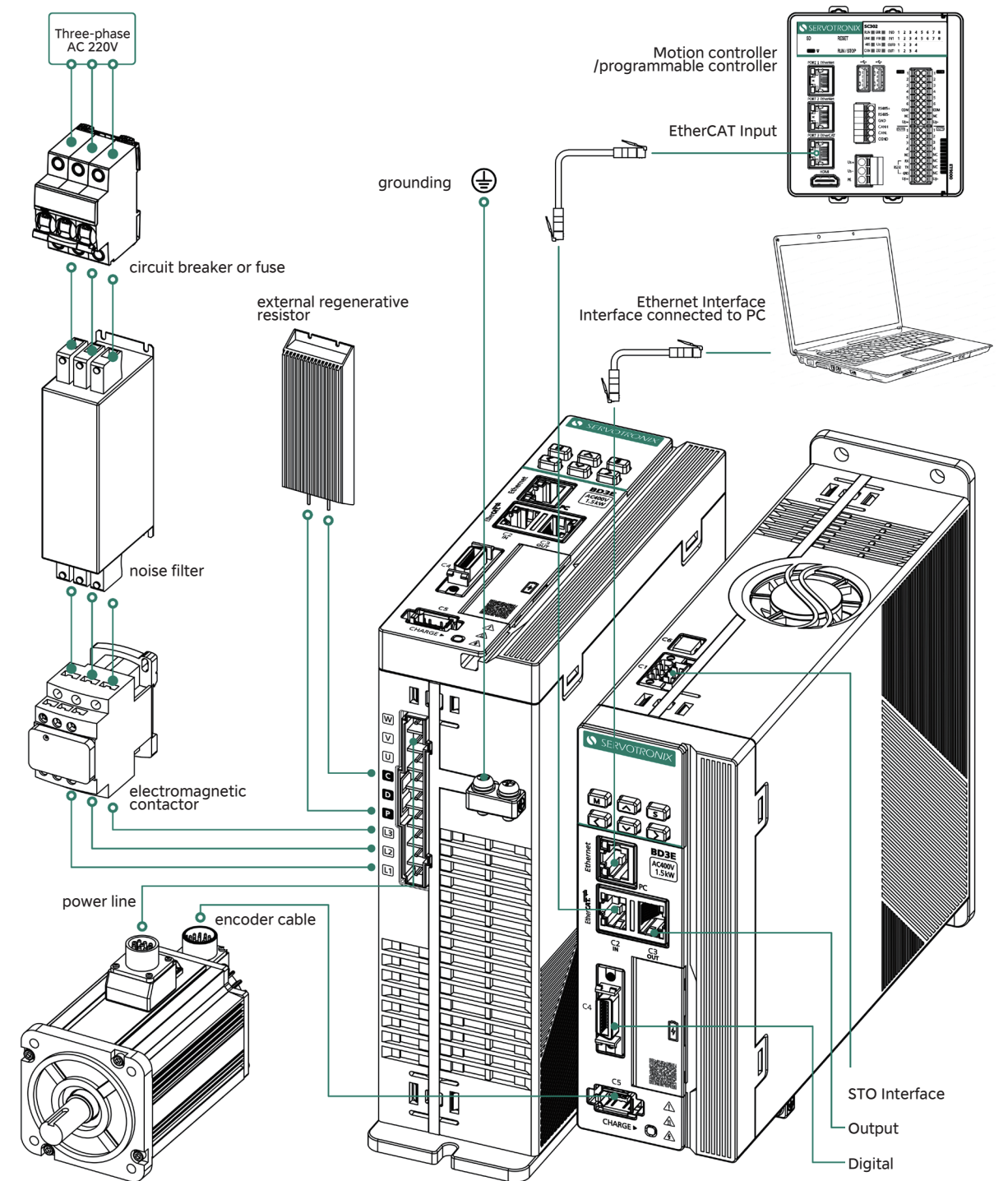
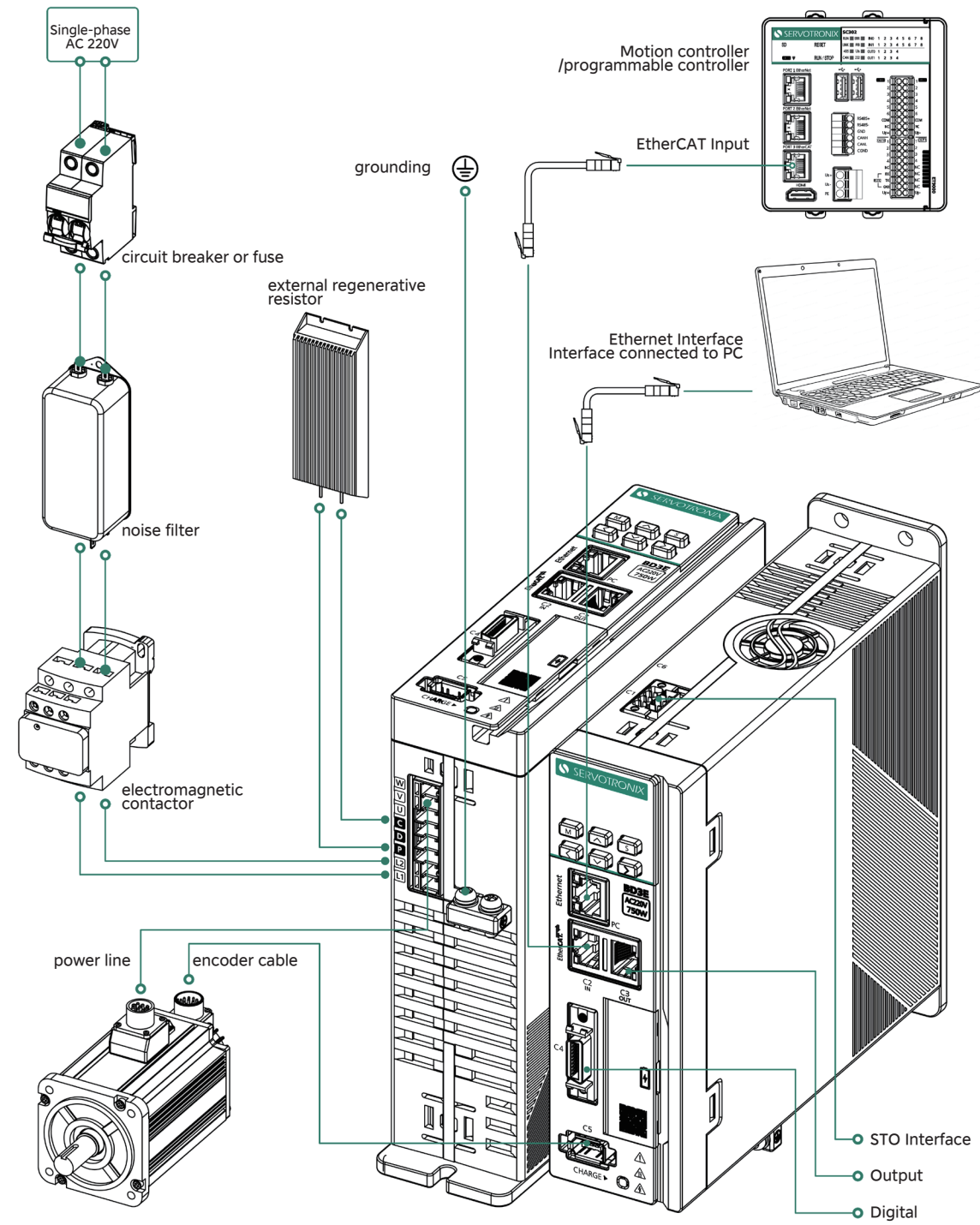
EB 4 Communication port

Symbol	Specification
EB	EtherCAT
AP	pulse
AP2	pulse with 2 channels of analog control

For product model explanation only. Not all character combinations represent available products.

BD3E-EB series

BD3E-EB Series Drive Wiring Diagram



BD3E-EB General Technical Specifications for Series Drives

characteristic		BD3E Specifications
Motor	series	PH3 series motors
	encoder	Supports up to 23-bit absolute encoders
	Motor phase	Automatic configuration of motor phase and encoder direction
Mode of operation	Control mode	Current (torque) control, speed control, position control, control mode switching
current	Control mode	DQ,PI,Feedforward
	Reference command	EtherCAT、VarCom
(torque) control	Parameter tuning method	Automatically set the parameters of the current control loop
	Performance	3.2kHz
Speed control	Filter	First-order low-pass filter, notch filter, load disturbance observer, velocity observer
	Reference command	EtherCAT、VarCom,
Position control	Performance	Update rate 125 μs (8 kHz)
	Control mode	P+ Feedforward
	Reference command	EtherCAT、VarCom
brake	method	Dynamic braking, electric motor regenerative braking.
User interaction	Operation panel	6-position buttons, LED display
GUI	UI	Windows-based ServoStudio application
	function	Setting connections, drive information, power information, motor, feedback, input/output selection/configuration, action setting/tuning, fault history/ Display, setup wizard, expert view, etc
Electronic gear ratios	range	1:1000 ~ 8000:1
Security Controls *	STO	Optional SAFE TORQUE OFF
Motor unit	location	count (user unit)
	velocity	rpm
	Acceleration/Deceleration	rpm/s
Control functions	Motor	Weak magnetic control algorithm
	Notch filter	5-way notch filter
	Feedforward functionality	Available (Speed / Torque)
	Load movement suppression control	Available (Speed / Torque)
	Friction torque compensation	Available (Speed / Torque)
	Torque saturation protection function	Available (Speed / Torque)
	Torque limit switching function	Available (Speed / Torque)
	Gain switching	Available (Speed / Torque)
	Torque filter	It can improve the high-frequency vibration suppression effect
High-speed digital input	Number of channels	2
	Signal format	Configurable optical isolation
	Voltage level	24V (IEC 61131)
	Maximum input current	12.5 mA
	Transmission delay time	1 μs

characteristic		BD3E Specifications
Normal digital input	Number of channels	5-way
	Signal format	Configurable Optically Isolated
	Voltage level	24V (IEC 61131)
	Maximum input current	6 mA
	Transmission delay time	1 ms
Normal digital output	Maximum frequency	1 kHz
	Number of channels	3
	Signal format	Configurable optical isolation
	Voltage level	24V (IEC 61131)
	Maximum output current	50mA per output (total 200mA)
Communication specification	Short-circuit protection	no
	Transmission delay time	1 ms
	Application layer protocol	EtherCATagreement
	Support Services	CoE (PDO、SDO)
	Synchronization method	DC-Distributed clock
	Physical layer	100BASE-TX
	baud rate	100Mbit/s (100BASE-TX)
	Duplex way	Full duplex
	Topology	Linear
	Transmission medium	Shielded Super Category 5 or better network cable
	Transmission distance	Less than 150M between two nodes (good environment, excellent cable)
	From the number of stations	The protocol supports up to 65535, and the actual use reaches more than 200 units.
	EtherCAT frame length	44 bytes ~ 1498 bytes
	Process data	A single Ethernet frame can be up to 1486 bytes
	Refresh time	1000 switching inputs and outputs are about 30us, and two servo axes are about 100us; Define different refresh times for different interfaces.
	Communication bit error rate	10-10 Ethernet standard
Configuration units	LED indicator	nothing
	FMMU Unit	8 pieces
	Storage synchronization snap-in	8 pieces
	Process data RAM	8KB
	Distribution clock	64 bits
	EEPROM capacity	32Kbit initialization data is written via the EtherCAT master
Control mode		Position Control: Contour Position Control (PP), Periodic Position Control (CSP)
		Speed Control: Contour Speed Control (PV), Cycle Velocity Control (CSV)
		Torque Control: Contour Torque Control (TQ), Periodic Torque Control (CST)
		Homing Mode (hm)
		The above modes are switched via EtherCAT communication commands.
Environmental specifications	Protection function	Including but not limited to: dynamic braking (hardware) low/overvoltage, overcurrent, drive and motor overheating
	compliance	CE Command: EN61800-3,EN61800-5-1
	environment	Operating temperature: 0-45°C without derating, 45-55°C with derating.
		Storage Temperature: -20 ~ 65°
		Humidity: 10 - 90% (no condensing)
		Altitude: Spacing requirements specified in accordance with IEC 61800-5-1 standard, use at an altitude of less than 1000 meters.
	working conditions	vibration: 5.88m/s2, 10Hz-60Hz
		Degree of protection: IP20
		Pollution class: IEC 60664-1 standard level 2
		Do not use in the following locations: corrosive or flammable gases, water, oil or chemicals, dust (includingiron powder) and salt

220V Mechanical and Electrical Specifications

Model	Standard Model	BD3E-1D62AEB	BD3E-2D82AEB			BD3E-5D52AEB	BD3E-7D62AEB	BD3E-0122AEB
	Functional Safety Model Model	BD3E-1D62AEB-ST	BD3E-2D82AEB-ST	BD3E-2D82AEB-BS		BD3E-5D52AEB-ST	BD3E-7D62AEB-ST	BD3E-0122AEB-ST
Maximum Applicable Motor Capacity (W)		200	400			750	1000	2000
Continuous Output Current [Arms]		1.6	2.8	2.8		5.5	7.6	11.6
Maximum Instantaneous Output Current [Arms]		5.8	9.8	9.8		16.9	23	32
Main Circuit	Current	1ph AC 200V-240V +10% ~ -10%, 50/60Hz					1/3ph AC 200V-240V +10% ~ -10%, 50/60Hz	
	Input Current [Arms]	2.3	4	4		7.9	9.6(Single-Phase Power Supply) 5.1(Three-Phase Power Supply)	12.8(Single-Phase Power Supply) 8.0(Three-Phase Power Supply)
Control Circuit Power Supply		Powered from the DC bus with a common rectifier.						
Braking Resistor	Built-in Braking Resistor Value [Ω]	No	No	40	40	25	25	
	Built-in Braking Resistor Power Rating [W]	No	No	50	50	80	80	
	Maximum Absorbable Braking Energy by Capacitor [J]	13.15	26.29	26.29	22.41	44.7	72.1	
	Minimum Allowed External Resistor Value [Ω]	50	45	40	40	25	15	
Chassis		A		B		C	D	
Outline Dimensions	W(mm)	45		50		60	80	
	H(mm)	160		160		160	160	
	D(mm)	173		173		200	200	
Fan		No	No	Yes	Yes	Yes	Yes	

380V Mechanical and Electrical Specifications

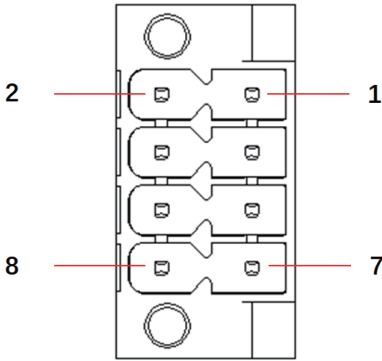
Model	Standard Model	BD3E-3D54DEB	BD3E-5D44DEB	BD3E-8D44DEB	BD3E-0124DEB
	Functional Safety Model Model	BD3E-3D54DEB-ST	BD3E-5D44DEB-ST	BD3E-8D44DEB-ST	BD3E-0124DEB-ST
Maximum Applicable Motor Capacity (W)		1000	1500	2000	3000
Continuous Output Current [Arms]		3.5	5.4	8.4	11.9
Maximum Instantaneous Output Current [Arms]		11	14	20	29.7
Main Circuit	Current	3ph AC 380V-440V +10% ~ -10%, 50/60Hz			
	Input Current [Arms]	2.4	3.6	5.6	8
Control Circuit Power Supply		Powered from the DC bus with a common rectifier.			
Braking Resistor	Built-in Braking Resistor Value [Ω]	100		50	
	Built-in Braking Resistor Power Rating [W]	60		75	
	Maximum Absorbable Braking Energy by Capacitor [J]	34.28	34.28	50.41	50.41
	Minimum Allowed External Resistor Value [Ω]	80	60	45	40
Chassis		C		D	
Outline Dimensions	W(mm)	60		75	
	H(mm)	160		160	
	D(mm)	196		200	
Fan		Yes	Yes	Yes	Yes

BD3E-EB Series Servo Terminal Definitions

Gaochuang Tmall Flagship Store



Terminal Cables: Scan to Buy



C1 Terminal Signals

Terminal Signal Definitions

The STO function blocks the PWM signals from being output to the drive's power stage via the external redundant hardware terminals STO1 and STO2, thereby preventing motor movement.

Pin	Description	Pin	Description
1	24V Power Supply	2	24V COM
3	STO1	4	STO COM
5	STO2	6	STO COM
7	NC	8	NC

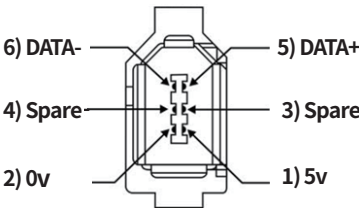
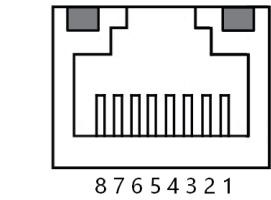
(Note) The STO 24V power supply is dedicated to the STO circuit only and must not be used for any other purpose.

PC/C2/C3 Terminal Signals

Terminal Signal Definitions

Pin	Name	Description
1	TX+	Data Transmission +
2	TX-	Data Transmission -
3	RX+	Data Reception+
4	NC	Leave Open,Do Not Connect
5	NC	Leave Open,Do Not Connect
6	RX-	Data Reception
7	NC	Leave Open,Do Not Connect
8	NC	Leave Open,Do Not Connect
Case	FG	Shielded Wire

The PC connector provides the PC communication interface for connecting to the ServoStudio2 servo tuning software via Ethernet. The C2 and C3 connectors provide the host controller communication interfaces, with the EB servo drive operating as an EtherCAT slave.



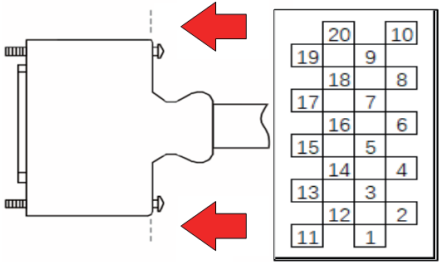
C5 Terminal Signals

For details on the C5 terminal signals, refer to the Motor Interface Description.

C4 Terminal Signals

Terminal Signal Definitions

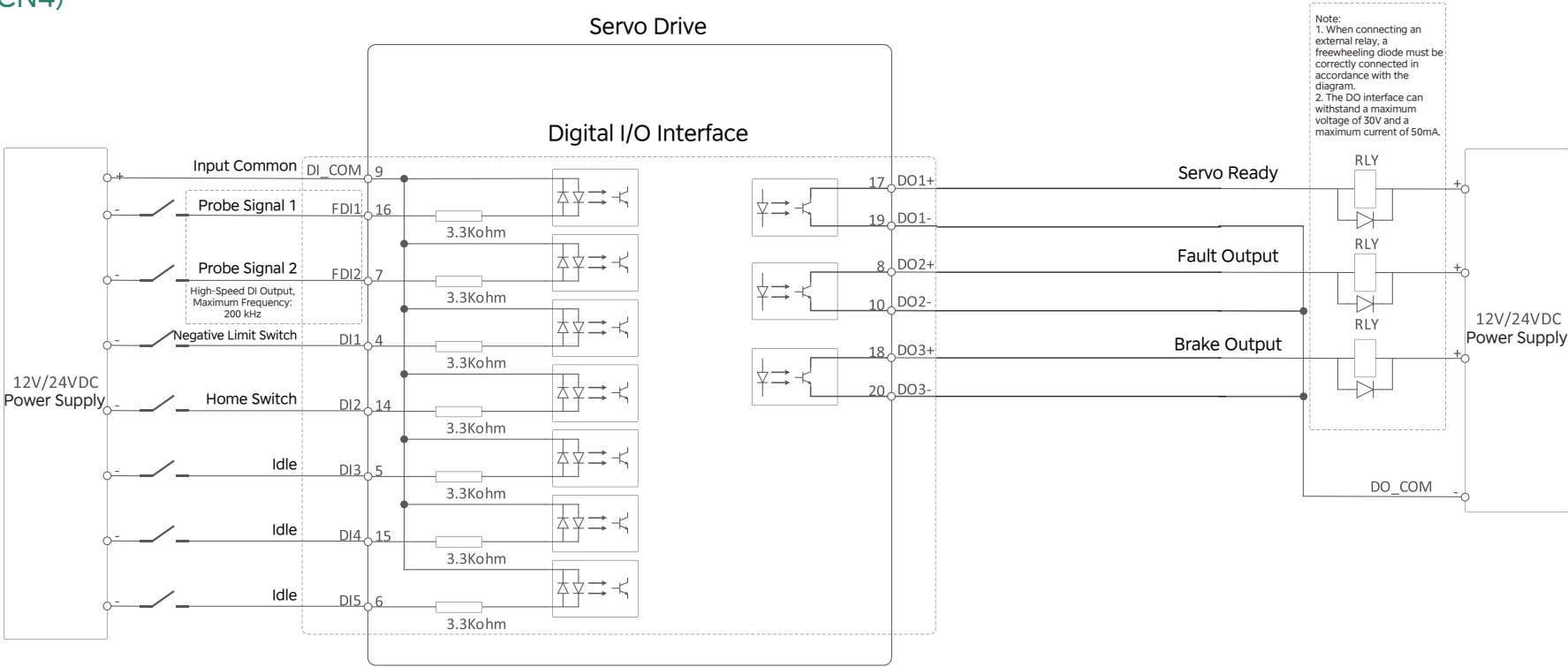
Pin	Function	Description	Pin	Function	Description
1	Internal 24V Power Supply Positive	Internal 24V Power Supply Positive	11	Internal 24V Power Supply Negative	Internal 24V Power Supply Negative
2	Reserved		12	Reserved	
3	Reserved		13	Reserved	
4	Digital Input 1	Optically Isolated Programmable Digital Input Sink/Source	14	Digital Input 2	Optically Isolated Programmable Digital Input Sink/Source
5	Digital Input 3	Optically Isolated Programmable Digital Input Sink/Source	15	Digital Input 4	Optically Isolated Programmable Digital Input Sink/Source
6	Digital Input 5	Optically Isolated Programmable Digital Input Sink/Source	16	High-Speed Digital Input 1	Optically Isolated Programmable Digital Input Sink/Source
7	High-Speed Digital Input 2	Optically Isolated Programmable Digital Input Sink/Source	17	Digital Output 1+	Optically Isolated Programmable Digital Output
8	Digital Output 2+	Optically Isolated Programmable Digital Output	18	Digital Output 3+	Optically Isolated Programmable Digital Output
9	Digital Input Common	24V or 0V (depending on Sink or Source configuration)	19	Digital Output 1-	Optically Isolated Programmable Digital Output
10	Digital Output 2-	Optically Isolated Programmable Digital Output	20	Digital Output 3-	Optically Isolated Programmable Digital Output



(Note)

1. Do not use vacant terminals.
2. Connect the shield layer of the input/output signal cable to the connector housing. Perform frame ground (FG) through the connector on the servo drive side.
3. All input/output pins can have their signals assigned via parameter settings.

I/O Interface (CN4)



(Note)

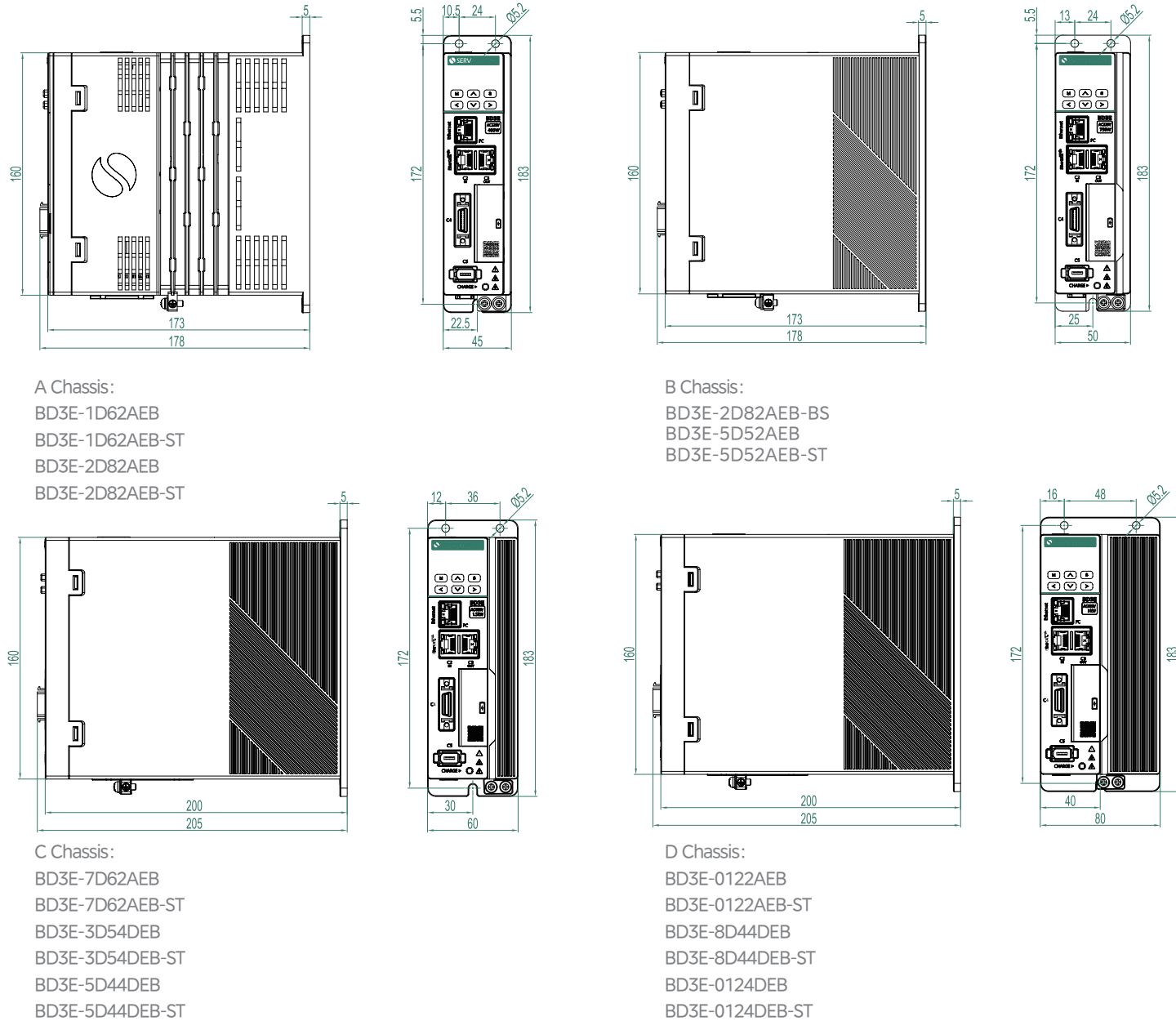
1. The brake coil is non-polarized.
2. The power supply for the brake must be prepared by the customer. Furthermore, do not use the same power supply for both the brake and the control signal power (VDC).
3. Do not apply voltages above 24V or currents above 50mA to the control signal output terminals.
4. When a control signal output is used to directly drive a relay, connect a freewheeling diode in parallel with the relay coil as shown in the diagram. Failure to install the diode or reverse installation will damage the drive.
5. It is recommended to use relays with built-in freewheeling diodes, such as the MY2N-D2_GSDC24V or MY2N-D2-DSDC12V, or to connect a fast-recovery diode (e.g., FR102, FR103) in parallel with the relay coil. The diode should have a reverse voltage rating of at least 70V and a forward current rating greater than 1A.

BD3E-EB Series Terminals

Model	Control Terminals	Product Name	Model Number	Part Number	Standard Configuration (As Shipped)	Power Terminals	Product Name	Model Number	Part Number	Standard Configuration (As Shipped)
BD3E-1D62AEB BD3E-2D82AEB BD3E-5D52AEB	C1	STO	The STO plug is supplied with the package (for ST or BK versions only)	1211500001401	Yes	P1	Power and Motor Connection Terminals	SC-T3005008SB0XT-45	11201707001675	Yes
	C2&C3	Communication Interface	RJ45+ Category 6A Cable	-	No					
	C4	Controller	MDR-20P20-BKAu-1.27	11201707000413						
	C5	Encoder	SC-06-4	12119400000273						
BD3E-7D62AEB BD3E-0122AEB BD3E-3D54DEB BD3E-5D54DEB BD3E-8D44DEB BD3E-0124DEB	C1	STO	The STO plug is supplied with the package (for ST or BK versions only)	12115000001401	Yes					
	C2&C3	Communication Interface	RJ45+ Category 6A Cable	-	No	P1	Power and Motor Connection Terminals	9EDGK-7.5-09P-13-1061Z(H)	11201707002135	Yes
	C4	Controller	MDR-20P20-BKAu-1.27	11201707000413						
	C5	Encoder	SC-06-4	12119400000273						

BD3E-EB Series Servo Mounting Dimensions

Installation Diagram: To ensure the cooling fan operates with minimal air resistance for effective heat dissipation, users must adhere to the recommended spacing distances for both single and multiple AC servo drive installations.

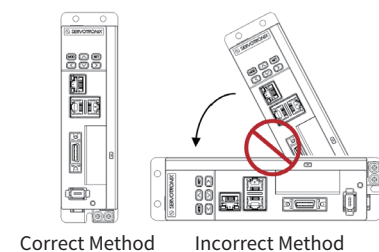


Precautions:

The unit must be installed in the specified orientation. Failure to do so may result in malfunction.

To ensure effective cooling circulation, sufficient clearance must be maintained on all sides (top, bottom, left, right) between the AC servo drive and adjacent objects or panels. Insufficient clearance may lead to malfunction.

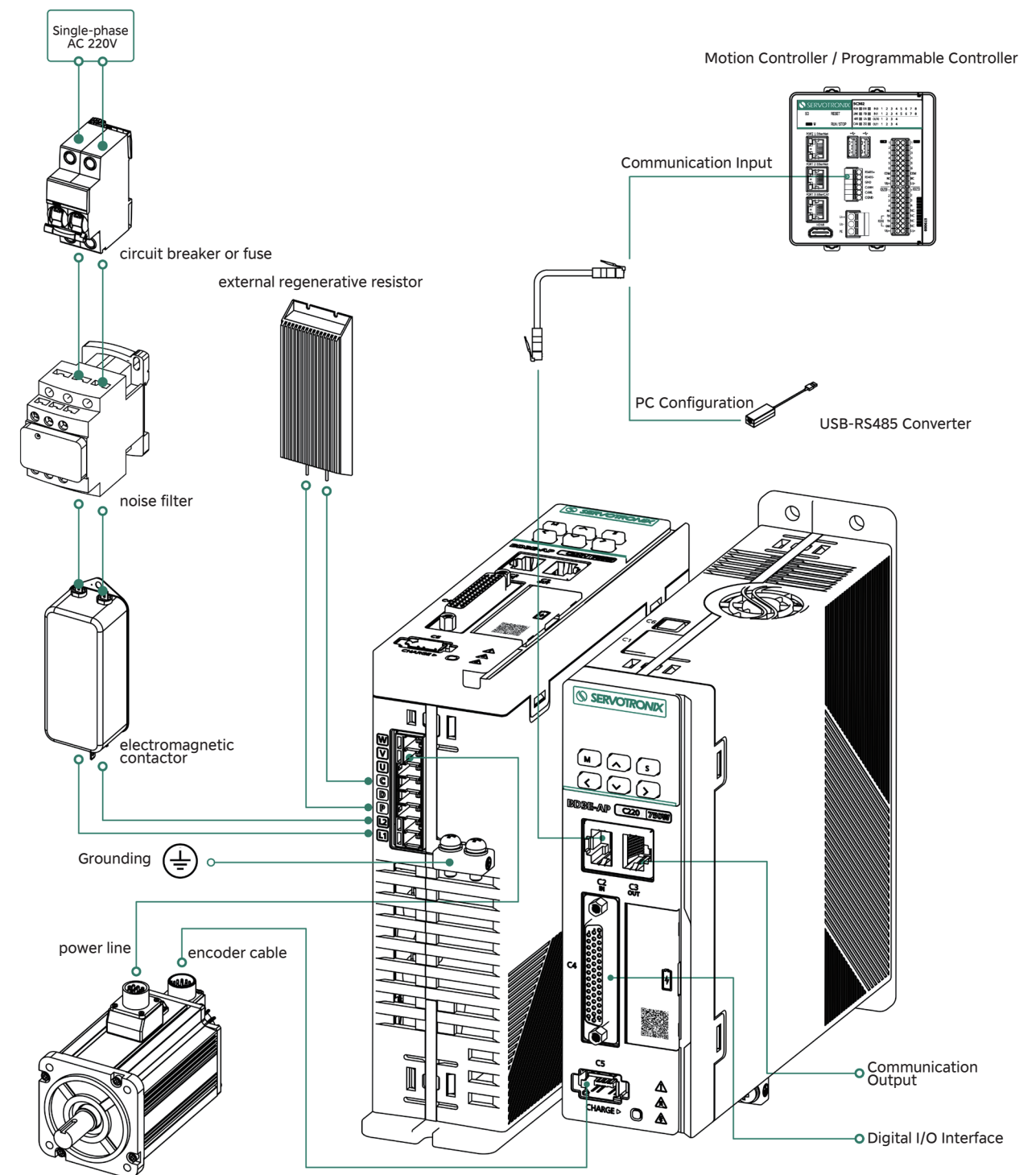
During installation, ensure that the air intake and exhaust vents are not blocked. The unit must not be mounted in a tilted position. Failure to observe these precautions will cause the unit to malfunction.



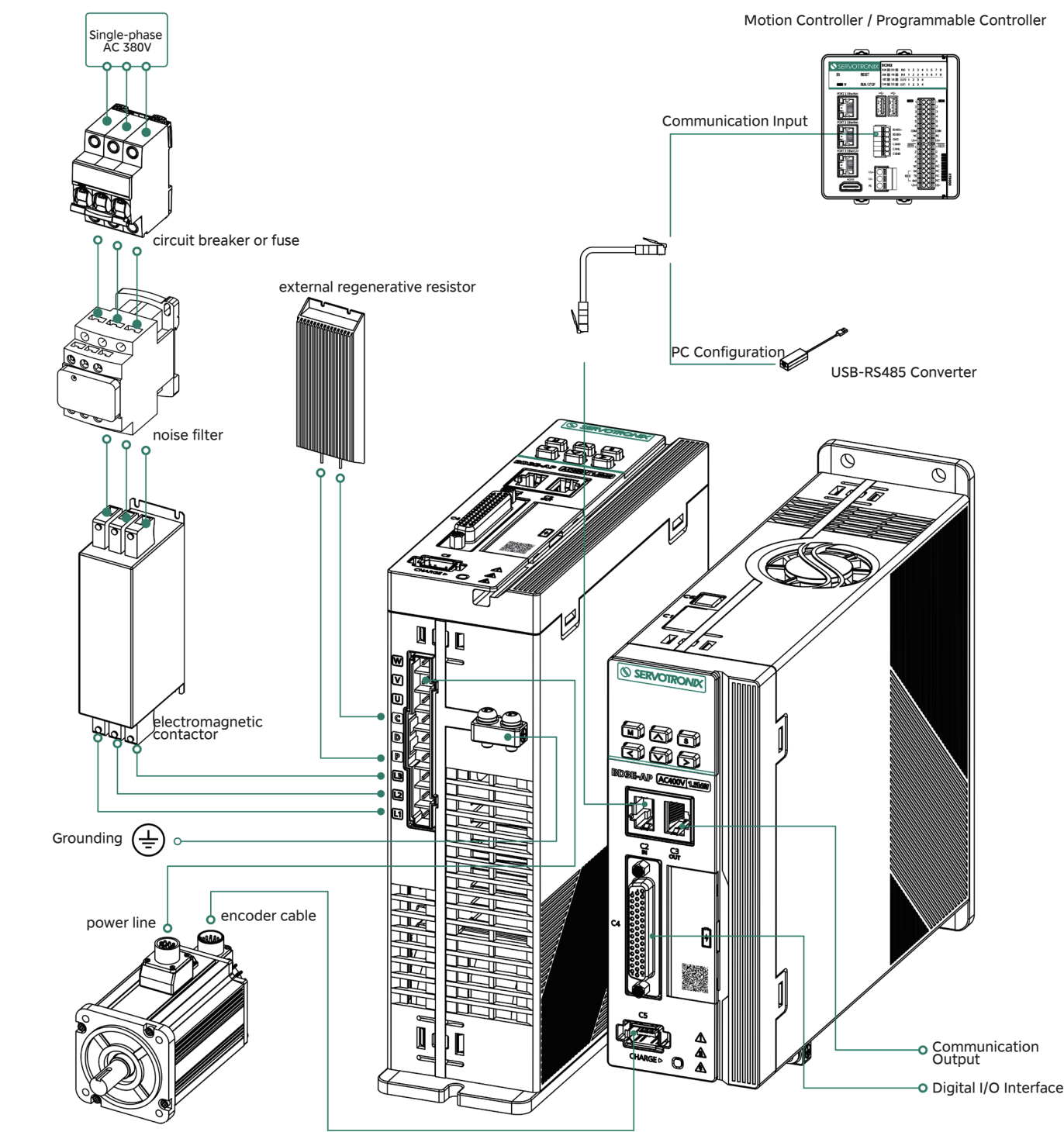
BD3E-AP/AP2 Series Servo Drives

BD3E-AP/AP2 Series Servo Wiring Diagram

BD3E-AP/AP2 Single-phase



BD3E-AP/AP2 Three-phase



BD3E-AP/AP2 General Technical Specifications

Basic Specifications			BD3E-AP
Performance	Control Method		IGBT PWM control, sine wave current drive method
	Speed Loop Frequency Response		BD3E 2.1kHz
	Within Speed Control Range		1:5000 (The lower limit of the speed control range is the condition for not stopping under rated torque load)
	Speed Fluctuation Rate	Load Fluctuation	0~100% load: ±0.5% (at rated speed)
		Voltage Fluctuation	Rated voltage ±10%: 0.5% (at rated speed)
		Temperature Fluctuation	25±25°C: ±0.5% or less (at rated speed)
	Torque Control Accuracy (Repeatability)		±2%
I/O Signals	Soft Start Time Setting		0~10s (acceleration and deceleration can be set separately)
	Analog Signal		2 points, 12bit ADC, ±10V voltage signal
	Encoder Divided Pulse Output		Phase A, Phase B: Differential output Phase Z: Differential output or open collector output, arbitrary frequency division
	Sequence Input Signals	Assignable Input Signals	7 Points Servo On Input (S-ON) Control Mode Selection Input Forward Drive Prohibit Input (POT) Reverse Drive Prohibit Input (NOT) Position Error Counter Clear Input (CLR) Alarm Reset (A-RST) Gain Switching Input (GAIN) Command Pulse Inhibit Input (INHIBIT), etc. Can assign the above signals and configure their positive/negative logic.
		Assignable Input Signals	5 Points Alarm Signal (ALM) Positioning Complete Signal (COIN) Z-phase Open-collector Signal (CZ) External Brake Release Signal (BK) Servo Ready (S-RDY) Can assign the above signals and configure their positive/negative logic.
Communication Function	485 Communication	1:N Communication	When using relays, the maximum number of stations can be set to N=31
		Axis Address Setting	Configuration via parameters
		Connected Devices	PC / Host Controller
	PC Communication	Communication Interface	RS485
Display Key Function			LED Display with 6 Keys
Dynamic Brake (DB)			Main circuit power supply OFF Servo alarm Servo OFF Overtravel (OT)
Regeneration Processing			Built-in regenerative resistor or external regenerative resistor
Overtravel (OT) Protection Function			POT, NOT input operation: deceleration stop or coasting stop
Protection Functions			Overcurrent, overvoltage, undervoltage, overload, regenerative fault
Position Control	Feedforward Compensation		0~100% (setting unit: 1%)
	Positioning Completion Width Setting		0~65535 encoder units
	Input Signal	Input Pulse Form	Differential input, open collector
		Maximum Input Pulse Frequency	Differential input: high-speed maximum 4Mpps, pulse width cannot be lower than 0.125 μs Open collector: maximum 200Kpps, pulse width cannot be lower than 2.5 μs
	Clear Signal		Clear deviation pulse open collector
Speed Control	Internally Set Position Control	Position Selection	Use DI signal combination to achieve position selection for segments 0-15 (other terminals can be set for this function)
		Soft Start Time Setting	0~10s (acceleration and deceleration can be set separately)
	Speed Selection		Selected using external IO signal input
Torque Control	Internally Set Torque Control	Torque Selection	Selected using external IO signal input
Other Functions	Vibration Damping Control		Equipped with high-frequency, mid-frequency, low-frequency three characteristic frequency resonance suppression functions
	Auto-Tuning		Equipped with HDM/PDFF gain adjustment methods
	Adaptive Notch Filter		Has 5 notch filters, 50Hz~4000Hz, 2 of which can be adaptively set



Terminal Cables: Scan to Buy

Environmental Specifications

BD3E-AP	
Protection Level	Protection Level: IP20 Pollution Degree: IEC60664-1 Level 2 Do not use in environments exposed to corrosive or flammable gases, water, oil, chemicals, dust (including iron powder), and salt
Operating Temperature	0°C to 45°C, no derating required
	45°C to 55°C, derating required
Storage Temperature	-20°C to 70°C
Humidity	10% to 90% (non-condensing)
Altitude	<1000m, according to IEC61800-5-1
Vibration	10m/s ² , 10-150Hz
Protection Functions	Including but not limited to: Power loss dynamic braking, under-voltage/over-voltage, overcurrent, drive and motor overtemperature, motor overload, drive overload, feedback loss, parameter not configured, circuit fault.

BD3E-AP/AP2 Series Drive Specifications

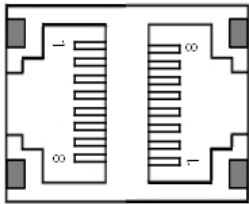
Specifications		BE3E 1D62A	BE3E 2D82A	BE3E 5D52A	BE3E 7D62A	BE3E 0122A	BE3E 3D54D	BE3E 5D44D	BE3E 8D44D	BE3E 0124D
Maximum Applicable Motor Capacity (W)		200	400	750	1000	1500	1000	1500	2000	3000
Continuous Output Current [Arms]		1.6	2.8	5.5	7.6	11.6	3.5	5.4	8.4	11.9
Instantaneous Maximum Output Current [Arms]		5.8	9.8	16.9	23	32	11	14	20	29.7
Power Circuit	Power Supply	1ph AC 200V-240V +10% ~ -10% 50/60Hz			1/3ph AC 200V-240V +10% ~ -10% 50/60Hz		3ph AC 380V-440V +10% ~ -10% 50/60Hz			
	Input Current [Arms]	2.3	4	7.9	"9.6(Single-Phase Power Supply) 5.1(Three-Phase Power Supply)"	"12.8(Single-Phase Power Supply) 8.0(Three-Phase Power Supply)"	2.4	3.6	5.6	8
Control Power Supply		DC Bus Power Sharing, Common Rectification								
Regenerative Resistor	Built-in Resistance Value [Ω]	无	无	40	25	25	100		50	
	Built-in Resistor Power Rating [W]	无	无	50	80	80	60		75	
	Maximum Absorbable Braking Energy per Cycle [J]	13.15	26.29	22.41	44.7	72.1	34.28	34.28	50.41	50.41
	Minimum Allowable External Resistance Value [Ω]	50	45	40	25	15	80	60	45	40
Chassis		A		B	C	D	C		D	
Outline Dimensions	W(mm)	45		50	60	80	60		75	
	H(mm)	160		160	160	160	160		160	
	D(mm)	173		173	200	200	200		200	
Fan		No	No	Yse	Yse	Yse	Yse	Yse	Yse	Yse

BD3E-AP/AP2 Series Servo Terminal Definitions

Communication Interface (CN2\CN3)

Connectors CN2 and CN3 are communication ports. The BD3E-AP servo drive supports RS485 communication.
CN2 is designated as RS485 IN, and CN3 as RS485 OUT.
The signal layout of CN2 and CN3 is mirrored.
When cascading multiple servo drives, standard straight-through Ethernet cables can be used.

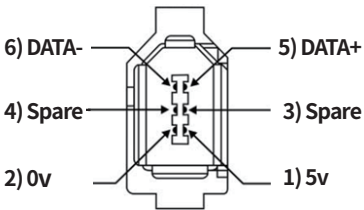
Pin	Name	Description
1	RS485+	RS485 Positive Signal
2	RS485-	RS485 Negative Signal
3	GND	Digital Ground
4	NC	Leave open, do not connect
5	NC	Leave open, do not connect
6	NC	Leave open, do not connect
7	NC	Leave open, do not connect
8	NC	Leave open, do not connect
Enclosure	FG	Shield Wire



Note: NC denotes unused terminals. Do not connect any wires.

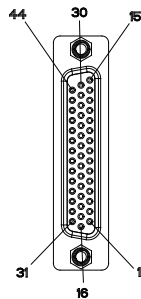
C5 Terminal Signal

For details of the C5 terminal signal, please refer to the motor interface instructions.



I/O Interface Signal Definitions

31-44			16-30			1-15		
44	AI2	Analog Input 2	30	AGND	Analog Ground	15	AI1	Analog Input 1
			29	DO5+	Digital Output 5+	14	PL	Pulse Command Power Input
43	DO5-	Digital Output 5-	28	DOOZ-	Z-phase Divided Open Collector Output -	13	DOOZ+	Z-phase Divided Open Collector Output +
42	DO1-	Digital Output 1-	27	DO2-	Digital Output 2-	12	DO3+	Digital Output 3+
41	DO1+	Digital Output 1+	26	DO3-	Digital Output 3-	11	DO4+	Digital Output 4+
40	DO2+	Digital Output 2+	25	DO4-	Digital Output 4-	10	DI3	Digital Input 3
39	DI1	Digital Input 1	24	DI4	Digital Input 4	9	DI6	Digital Input 6
38	DI2	Digital Input 2	23	DI5	Digital Input 5	8	24VGND	Internal 24V Power Ground
37	SIGN-	Sign Command Input -	22	PULS+	Pulse Command Input +	7	24V	Internal 24V Power Supply
36	SIGN+	Sign Command Input +	21	PULS-	Pulse Command Input -	6	NC	-
35	COM	Digital Input Common	20	COM	Digital Input Common	5	NC	-
34	COM	Digital Input Common	19	ZO-	Z-phase Divided Output -	4	AO-	A-phase Divided Output -
33	DI7	Digital Input 7	18	ZO+	Z-phase Divided Output +	3	AO+	A-phase Divided Output +
32	NC	-	17	BO-	B-phase Divided Output -	2	GND	Internal Digital Ground
31	NC	-	16	BO+	B-phase Divided Output +	1	NC	-

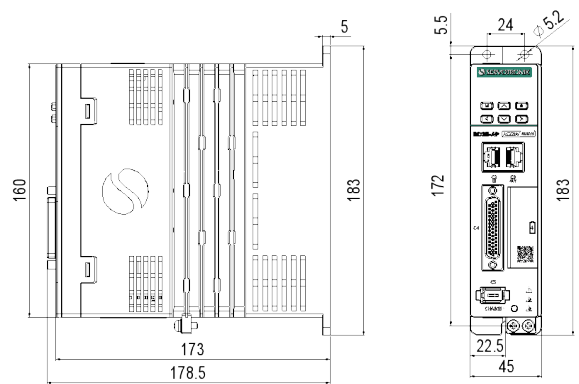


- (Note)
- Do not use vacant terminals.
 - Connect the shield layer of the input/output signal cable to the connector housing. Frame ground (FG) is established through the connector on the servo drive side.
 - All input/output pins can be assigned signals via parameter settings.

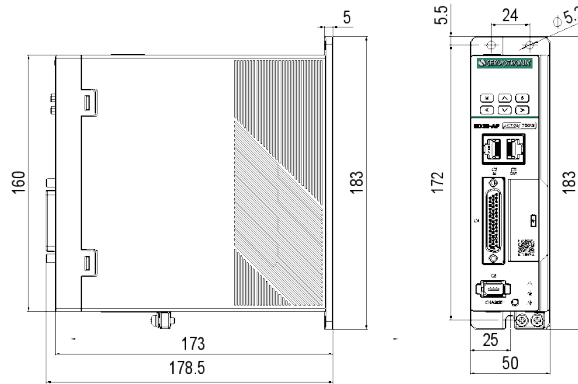
BD3E-AP/AP2 Series Terminals

Model	Control Terminal	Product Name	Specification Model	Part Number	As Shipped Configuration	Power Terminal	Product Name	Specification Model	Code	As Shipped Configuration
BD3E-1D62A BD3E-2D82A BD3E-5D52A	C2&C3	Communication Interface	RJ45 with Cat 6a Ethernet Cable		NO	P1	Power and Motor Connection Terminals	SC-T3005008SB0XT-45	11201707001675	Yes
	C4	Controller	24F78-01-05-00	12115000002541	Yes					
	C5	Encoder	SC-06-4	12119400000273	NO					
BD3E-7D62A BD3E-0122A BD3E-3D54D BD3E-5D54D BD3E-8D44D BD3E-0124D	C2&C3	Communication Interface	RJ45 with Cat 6a Ethernet Cable		NO	P1	Power and Motor Connection Terminals	9EDGK-7.5-09P-13-1061Z(H)	11201707002135	Yes
	C4	Controller	24F78-01-05-00	12115000002541	Yes					
	C5	Encoder	SC-06-4	12119400000273	NO					

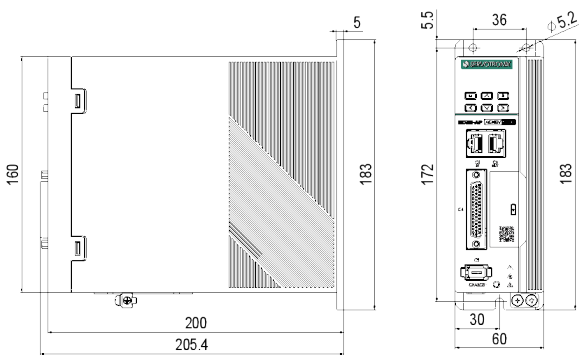
BD3E-AP/AP2 Series Servo Mounting Dimensions



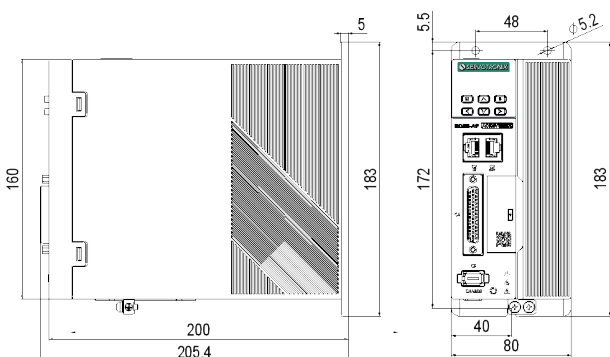
A Chassis:
BD3E-1D62AAP/AP2 BD3E-2D82AAP/AP2



B Chassis:
BD3E-5D52AAP/AP2

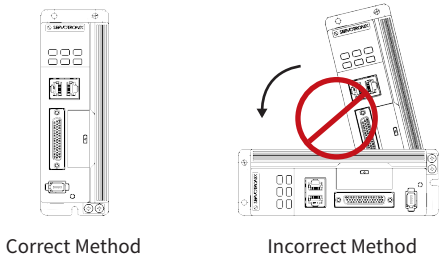


C Chassis:
BD3E-7D62AAP/AP2 BD3E-3D54DAP/AP2 BD3E-5D44DAP/AP2



D Chassis:
BD3E-8D44DAP/AP2 BD3E-0124DAP/AP2

Precautions:
The unit must be installed in the specified orientation. Failure to do so may result in malfunction.
To ensure effective cooling circulation, sufficient clearance must be maintained on all sides (top, bottom, left, right) between the AC servo drive and adjacent objects or panels. Insufficient clearance may lead to malfunction.
During installation, ensure that the air intake and exhaust vents are not blocked. The unit must not be mounted in a tilted position. Failure to observe these precautions will cause the unit to malfunction.



3 PH3E/S Series Servo Motor Product Overview

PH3E/S Series High-Performance Rotary Servo Motors represent the third-generation servo motor products developed on Googol Technology's all-new platform. Compared to the previous PH2 series, this new generation delivers comprehensive upgrades in electrical characteristics, structural integrity, control accuracy, ease of use, and manufacturability!

PH3E/S Series Servo Motor Naming Convention

PH 3 S - M 04 A 0 06 S T - ***
1 2 3 4 5 6 7 8 9 10 11 12 13

1

Generation name

Symbol	Specification
PH	PH Series

2

Generation system number

Symbol	Specification
3	Generation 3

3

性能类别

Symbol	Specification
S	Standard Type (with Optical Encoder)
E	Economy Type (with Magnetic Encoder)

4

- Hyphen - no specific meaning

5

Motor Type (by Configuration)

Symbol	Specification
L	Low Inertia, High-Speed Motor
M	Medium Inertia, High-Speed Motor
G	Medium Inertia, High-Torque Motor

6

Rated Power

Symbol	Specification	Symbol	Specification
01	0.1kW	10	1.0 kW
02	0.2 kW	09	0.85 kW
04	0.4 kW	13	1.3 kW
06	0.6 kW	18	1.8 kW
08	0.75 kW		

7

Voltage Level

Symbol	Specification
A	220V
B	380V

8

Electromagnetic Design Number

Symbol	Specification
0	Electromagnetic Design Number 0
Other	Other Electromagnetic Designs

9

Frame Size

Symbol	Specification	Symbol	Specification
04	40mm	08	80mm
06	60mm	13	130mm

10

Brake / Oil Seal / Shaft Configuration

Symbol	Specification
S	With Oil Seal; Without Brake
E	With Oil Seal; With Brake
N	Without Oil Seal; Without Brake
B	Without Oil Seal; With Brake

11

Encoder Configuration

Symbol	Specification
T	Encoder: 23-bit single-turn resolution + 16-bit multi-turn count (using 23-bit Tamagawa data protocol)
M	Magnetic Encoder: 20-bit single-turn resolution + 16-bit multi-turn count (using 23-bit Tamagawa data protocol)
G	Magnetic Encoder: 20-bit single-turn resolution (using 23-bit Tamagawa data protocol)

13

Customization Code

Symbol	Specification
blank	Standard Parts (Standard Configuration, Standard Keys, Standard Shafts)
**	For other custom codes, please refer to the custom product specification.

Note:
This naming convention is provided solely to explain the meaning of the characters in the product model number. It does not imply that all possible character combinations correspond to an existing product.

Key Features of PH3E/S Series Servo Motors

Higher Performance

□ Frame 40/60/80 Products

Peak Torque Overload Capability: **3.5 times** and above
Maximum Speed: **7000RPM**

□ Frame 130 Products

Peak Torque Overload Capability: **2.5 times** and above
Maximum Speed: **4500RPM**

High Energy Efficiency

Models rated above 550W comply with the Level 1 efficiency requirement of GB 30253.



Full certification

(additional in progress; contact sales)

The full product line is compliant with UL, CE, and UKCA certifications.

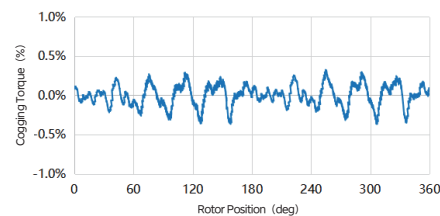


More Products

The standard product portfolio covers low-inertia motors in frame size 40 and medium-inertia motors in frame sizes 60, 80, and 130, with a power range from 0.1 kW to 1.8 kW. Compared to the previous generation (PH2), the lineup has been expanded with the addition of medium-inertia 60-frame 0.6 kW and 80-frame 1.0 kW models, offering greater configuration flexibility.

High Stability

Cogging torque is optimized to less than 1%.



Low Temperature Rise

Patented Electromagnetic Circuit Design: Typical Housing Temperature Rise under Standard Operating Conditions

less than 60k

Low Noise

With optimized magnetic circuit and mechanical design, the operating noise is significantly reduced.

Quick-Connect Design

The entire motor series incorporates a quick-connect design, eliminating the need for external "pigtail" cables and mid-air connector mating. This results in higher interface reliability, along with more convenient and flexible cabling.

High Protection



The housing of the entire product series is certified to IP67 (including the connector area, excluding the shaft through-hole).

Multiple Encoder Configuration

It is compatible with a range of encoder options and uses the Tamagawa data protocol as the default, ensuring stronger interoperability.

20-bit Magnetic Encoder Version

Repeatability: Up to 50 arcseconds.

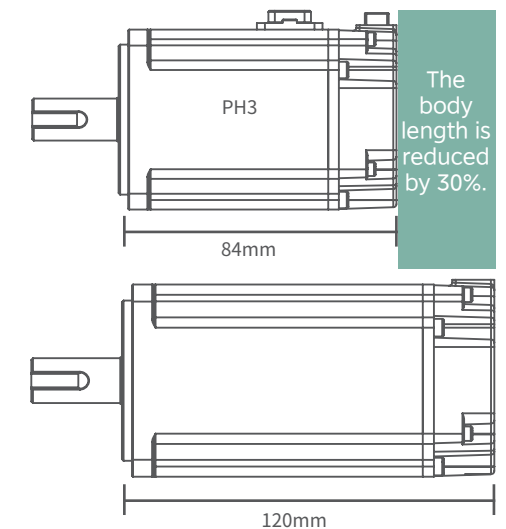
23-bit Optical Encoder Version

Repeatability: Up to 20 arcseconds.



Short Frame

Compared to the PH2, the motor dimensions are reduced by up to 30%, significantly saving installation space.



PH3E/S Series Servo Motor Product Map

PH3 □ -L	PH3 □ -M	PH3 □ -G
		
Low-Inertia High-Speed Rated 3000rpm Peak 7000rpm	Medium-Inertia High-Speed Rated 3000rpm Peak 7000rpm	Medium-Inertia High-Torque Rated 1500rpm Peak 4500rpm

Rated Power (kW)	0.1	0.2	0.4	0.6	0.75	0.85	1.0	1.3	1.8
Motor Type	40	60	60	60	80 [○]	130	80	130 [○]	130

- Motor Type Explanation:
- The □ symbol represents a Square Frame motor;
 - The numbers 40/60/80/130 indicate the Frame Size;
 - Color indicates motor type: PH3-L: Low-inertia, high-speed motor; PH3-M: Medium-inertia, high-speed motor; PH3-G: Medium-inertia, high-torque motor.
 - The superscript indicates the voltage class: [○] 220V Class; [○] 220V Class+380V Class

PH3E/S Series Servo Motors - Specification Overview

20

 20-Bit Single-Turn Absolute Magnetic Encoder

20

 20-Bit Multi-Turn Absolute Magnetic Encoder

23

 23-Bit Single-Turn Absolute Optical Encoder

Inertia Class	Specification	100W
PH3 □ -L Low-Inertia High-Speed	Model	L01A004
	Flange [mm]	40
	Rated/Peak Torque [N·m]	0.32/1.12
	Rated/Maximum Speed [rpm]	3000/7000
	Inertia (Without Brake/With Brake) [kg·cm²]	0.044/0.046
	Voltage Class [VAC]	220
	Encoder Type [bit]	20 20 23

Inertia Class	Specification	200W	400W	600W	750W	1000W
PH3□-M Medium-Inertia High-Speed	Model	M02A006	M04A006	M06A006	M08A008	M10A008
	Flange [mm]	60	60	60	80	80
	Rated/Peak Torque [N·m]	0.64/2.30	1.27/4.45	1.91/7.50	2.39/8.37	3.18/11.13
	Rated/Maximum Speed [rpm]	3000/7000	3000/7000	3000/7000	3000/7000	3000/7000
	Inertia (Without Brake/With Brake) [kg·cm²]	0.24/0.25	0.47/0.48	0.68/0.69	1.46/1.51	2.00/2.05
	Voltage Class [VAC]	220	220	220	220	220
	Encoder Type [bit]	20 20 23	20 20 23	20 20 23	20 20 23	20 20 23

Inertia Class	Specification	850W	1300W	1800W
PH3□-G Medium-Inertia High-Torque	Model	G09A013/G09B013	G13A013/G13B013	G18A013/G18B013
	Flange [mm]	130	130	130
	Rated/Peak Torque [N·m]	5.39/13.5	8.28/20.85	11.5/28.75
	Rated/Maximum Speed [rpm]	1500/4500	1500/4500	1500/4500
	Inertia (Without Brake/With Brake) [kg·cm²]	12.21/14.22	18.03/20.05	23.94/25.95
	Voltage Class [VAC]	220/380	220/380	220/380
	Encoder Type [bit]	20 20 23	20 20 23	20 20 23

Note:
The speed/torque performance data represents test results obtained when used with our BD3 series drives.

PH3E/S Series Servo Motor Catalog

Motor Type	Frame Size	Rated Power (kW)	Voltage Class (VAC)	Torque N·m (Rated/Peak)	Speed rpm (Rated/Maximum)	Inertia kg·cm² (Without Brake/With Brake)	Current Arms (Rated/Peak)	Oil Seal	Brake	20-Bit Magnetic Single-Turn Absolute	20-Bit Magnetic Multi-Turn Absolute	23-Bit Optical Multi-Turn Absolute
L Low-Inertia High-Speed Motor	40	0.1	220	0.32/1.12	3000/7000	0.044/0.046	1.30/4.25	×	✓	PH3E-L01A004BG	PH3E-L01A004BM	PH3S-L01A004BT
								×	×	PH3E-L01A004NG	PH3E-L01A004NM	PH3S-L01A004NT
M Medium-Inertia High-Speed Motor	60	0.2	220	0.64/2.30	3000/7000	0.24/0.25	1.38/5.80	✓	✓	PH3E-M02A006EG	PH3E-M02A006EM	PH3S-M02A006ET
								✓	×	PH3E-M02A006SG	PH3E-M02A006SM	PH3S-M02A006ST
		0.4	220	1.27/4.45	3000/7000	0.47/0.48	2.40/9.60	✓	✓	PH3E-M04A006EG	PH3E-M04A006EM	PH3S-M04A006ET
								✓	×	PH3E-M04A006SG	PH3E-M04A006SM	PH3S-M04A006ST
		0.6	220	1.91/7.50	3000/7000	0.68/0.69	3.65/16.60	✓	✓	PH3E-M06A006EG	PH3E-M06A006EM	PH3S-M06A006ET
								✓	×	PH3E-M06A006SG	PH3E-M06A006SM	PH3S-M06A006ST
	80	0.75	220	2.39/8.37	3000/7000	1.46/1.51	4.42/16.90	✓	✓	PH3E-M08A008EG	PH3E-M08A008EM	PH3S-M08A008ET
								✓	×	PH3E-M08A008SG	PH3E-M08A008SM	PH3S-M08A008ST
		1.0	220	3.18/11.13	3000/7000	2.00/2.05	5.74/23.00	✓	✓	PH3E-M10A008EG	PH3E-M10A008EM	PH3S-M10A008ET
								✓	×	PH3E-M10A008SG	PH3E-M10A008SM	PH3S-M10A008ST
								✓	✓	PH3E-G09A013EG	PH3E-G09A013EM	PH3S-G09A013ET
								✓	×	PH3E-G09A013SG	PH3E-G09A013SM	PH3S-G09A013ST
G Medium-Inertia High-Torque Motor	130	0.85	220	5.39/13.50	1500/4500	12.21/14.22	5.73/16.28	✓	✓	PH3E-G09B013EG	PH3E-G09B013EM	PH3S-G09B013ET
								✓	×	PH3E-G09B013SG	PH3E-G09B013SM	PH3S-G09B013ST
			380	5.39/13.50	1500/4500	12.21/14.22	3.30/8.85	✓	✓	PH3E-G09B013EG	PH3E-G09B013EM	PH3S-G09B013ET
								✓	×	PH3E-G09B013SG	PH3E-G09B013SM	PH3S-G09B013ST
		1.3	220	8.28/20.85	1500/4500	18.03/20.05	9.70/26.09	✓	✓	PH3E-G13A013EG	PH3E-G13A013EM	PH3S-G13A013ET
								✓	×	PH3E-G13A013SG	PH3E-G13A013SM	PH3S-G13A013ST
			380	8.28/20.85	1500/4500	18.03/20.05	5.15/13.35	✓	✓	PH3E-G13B013EG	PH3E-G13B013EM	PH3S-G13B013ET
								✓	×	PH3E-G13B013SG	PH3E-G13B013SM	PH3S-G13B013ST
		1.8	220	11.5/28.75	1500/4500	23.94/25.95	11.60/31.35	✓	✓	PH3E-G18A013EG	PH3E-G18A013EM	PH3S-G18A013ET
								✓	×	PH3E-G18A013SG	PH3E-G18A013SM	PH3S-G18A013ST
			380	11.5/28.75	1500/4500	23.94/25.95	7.14/19.12	✓	✓	PH3E-G18B013EG	PH3E-G18B013EM	PH3S-G18B013ET
								✓	×	PH3E-G18B013SG	PH3E-G18B013SM	PH3S-G18B013ST

Special Marking Note:
Frame 40 motors do not include oil seals as standard. Please contact our sales personnel for customization if oil seals are required.

General Technical Specifications

Product Generation			PH3E/S Series	
Voltage Class		220V Model Number		380V Model Number
Withstand Voltage Rating		1500 VAC 1 minute		1800 VAC 1 minute
Duty Cycle		S1		
Insulation Class		F		
Insulation Resistance		≥ 10MΩ @ 500 VDC		
Excitation Mode		Permanent Magnet Type		
Mounting Method		Flange Mounting		
Drive Connection Method		Direct connection to the drive via an extension cable		
Rotation Direction		When viewed from the motor shaft extension side (load side), counterclockwise (CCW) rotation is defined as the positive direction. Under this condition, the phase relationship of the motor's back EMF is: U > V > W.		
Vibration Class		V15		
Enclosure Protection Rating		IP67 (excluding the shaft through-hole, and requires the connector to be reliably mated)		
Vibration Resistance		Frequency: 10–150 Hz	Amplitude: 0.175 mm or Acceleration: 25 m/s2	Sweep Cycles: 10
Shock Resistance		Peak Acceleration: 50 m/s2 Pulse Duration: 30 ms Waveform: Half-sine Tests: 3 shocks per direction, 18 shocks total		
Environmental Conditions	Storage Environment	When storing the motor in a non-powered state, please adhere to the following environmental requirements:		
		Ambient Temperature: -10°C to +40°C (non-freezing)		
		Ambient Humidity: 20% RH to 85% RH (non-condensing)		
	Operating Environment	Ambient Temperature: -10°C to 40°C		
		Ambient Humidity: 20% RH to 85% RH (non-condensing)		
	Installation Location	• Indoor locations free from corrosive or explosive gases		
		• Well-ventilated areas with minimal dust, debris, and moisture		
		• Locations allowing easy inspection and cleaning		
		• Altitude below 1000m (for 1000m to 2000m, derating is required)		
		• Areas free from strong magnetic field generation		

Motor Electrical Specifications

PH3E/S-L Electrical Specifications

Parameter		Unit	L01A004
Rated Voltage		VAC	220
Inertia Type		/	Low Inertia
Mounting Flange		mm	40
Rated Power		W	100
Rated Torque		N·m	0.32
Maximum Torque *1		N·m	1.12
Rated Speed		r/min	3000
Maximum Speed *1		r/min	7000
Rated Current *1		Arms	1.30
Maximum Current *1		Arms	4.25
Torque Constant *1		Nm/Arms	0.31
Number of Pole Pairs		/	5
Line Voltage Constant *1		Vrms/krpm (±10%)	18.60
Electrical Time Constant		ms	0.40
Line Resistance (at 20°C) *1		Ω (±5%)	13.57
Line Inductance *1		mH (±10%)	5.43
Inductance	d-axis	mH (±10%)	2.97
	q-axis	mH (±10%)	2.46
Rotor Inertia	Without Brake	x10 ⁻⁴ kg.m ²	0.044
	With Brake	x10 ⁻⁴ kg.m ²	0.046
Mechanical Time Constant	Without Brake	ms	0.95
	With Brake	ms	0.99
Mass	Without Brake	kg	0.34
	With Brake	kg	0.51
Allowable Load	Radial Load	N	78
	Axial Load	N	54
Brake Specifications *2	Rated Voltage	VDC (±10%)	24
	Rated Current	A	0.33
	Rated Power	W (@20°C)	8.0
	Holding Torque	N·m	≥ 0.32
	Pull-in Voltage	VDC	≤ 16.8
	Pull-in Time	ms	≤ 40
	Drop-out Voltage	VDC	≥ 1
	Drop-out Time	ms	≤ 20
	Rotation Angle	°	≤ 1.5
Encoder Configuration		/	20 20 23
Test Heat Sink Specifications		mm	200*200*6

Notes:
*1: All parameter values are typical figures measured from the test prototype at an ambient temperature of 25°C. Testing was conducted using Googoltech BD3 series servo drives; performance may vary when used with other drive models.
*2: The brake is designed for static holding only and must not be used for dynamic braking applications.

PH3E/S-M Electrical Specification

Parameter		Unit	M02A006	M04A006	M06A006	M08A008	M10A008
Rated Voltage		VAC	220	220	220	220	220
Inertia Type		/	Medium Inertia	Medium Inertia	Medium Inertia	Medium Inertia	Medium Inertia
Mounting Flange		mm	60	60	60	80	80
Rated Power		W	200	400	600	750	1000
Rated Torque		N·m	0.64	1.27	1.91	2.39	3.18
Maximum Torque *1		N·m	2.30	4.45	7.50	8.37	11.13
Rated Speed		r/min	3000	3000	3000	3000	3000
Maximum Speed *1		r/min	7000	7000	7000	7000	7000
Rated Current *1		Arms	1.38	2.40	3.65	4.42	5.74
Maximum Current *1		Arms	5.80	9.60	16.60	16.90	23.00
Torque Constant *1		Nm/Arms	0.51	0.56	0.56	0.60	0.60
Number of Pole Pairs		/	5	5	5	5	5
Line Voltage Constant *1		Vrms/krpm (±10%)	30.78	33.80	33.78	36.06	36.20
Electrical Time Constant		ms	1.17	1.67	1.56	3.05	2.91
Line Resistance (at 20°C) *1		Ω (±5%)	9.03	3.08	1.87	1.15	0.79
Line Inductance *1		mH (±10%)	10.57	5.13	2.92	3.51	2.30
Inductance	d-axis	mH (±10%)	5.12	2.40	1.37	1.64	1.08
	q-axis	mH (±10%)	5.45	2.73	1.55	1.87	1.22
Rotor Inertia	Without Brake	x10 ⁻⁴ kg.m ²	0.24	0.47	0.68	1.46	2.00
	With Brake	x10 ⁻⁴ kg.m ²	0.25	0.48	0.69	1.51	2.05
Mechanical Time Constant	Without Brake	ms	1.25	0.69	0.61	0.71	0.66
	With Brake	ms	1.31	0.71	0.62	0.73	0.68
Mass	Without Brake	kg	0.71	1.02	1.30	1.98	2.38
	With Brake	kg	1.09	1.39	1.67	2.27	2.76
Allowable Load	Radial Load	N	245	245	245	393	393
	Axial Load	N	74	74	74	147	147
Brake Specifications *2	Rated Voltage	VDC (±10%)	24	24	24	24	24
	Rated Current	A	0.40	0.40	0.40	0.44	0.35
	Rated Power	W (@20°C)	9.6	9.6	9.6	10.5	8.5
	Holding Torque	N·m	≥ 1.6	≥ 1.6	≥ 2.3	≥ 3.2	≥ 3.8
	Pull-in Voltage	VDC	≤ 18	≤ 18	≤ 18.6	≤ 18.6	≤ 16.8
	Pull-in Time	ms	≤ 60	≤ 60	≤ 70	≤ 70	≤ 60
	Drop-out Voltage	VDC	≥ 1.5	≥ 1.5	≥ 0.5	≥ 0.5	≥ 0.5
	Drop-out Time	ms	≤ 20	≤ 20	≤ 20	≤ 20	≤ 40
	Rotation Angle	°	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5
Encoder Configuration*3		/	20 20 23	20 20 23	20 20 23	20 20 23	20 20 23
Test Heat Sink Specifications		mm	250*250*6	250*250*6	250*250*6	250*250*6	250*250*6

Notes:
*1: All parameter values are typical figures measured from the test prototype at an ambient temperature of 25°C. Testing was conducted using Googoltech BD3 series servo drives; performance may vary when used with other drive models.
*2: The brake is designed for static holding only and must not be used for dynamic braking applications.

PH3E/S-G Electrical Specifications

Parameter		Unit	G09A013	G09B013	G13A013	G13B013	G18A013	G18B013
Rated Voltage		VAC	220	380	220	380	220	380
Inertia Type		/	Medium Inertia	Medium Inertia	Medium Inertia	Medium Inertia	Medium Inertia	Medium Inertia
Mounting Flange		mm	130	130	130	130	130	130
Rated Power		W	850	850	1300	1300	1800	1800
Rated Torque		N·m	5.39	5.39	8.28	8.28	11.50	11.50
Maximum Torque *1		N·m	13.50	13.50	20.85	20.85	28.75	28.75
Rated Speed		r/min	1500	1500	1500	1500	1500	1500
Maximum Speed *1		r/min	4500	4500	4500	4500	4500	4500
Rated Current *1		Arms	5.73	3.30	9.70	5.15	11.60	7.14
Maximum Current *1		Arms	16.28	8.85	26.09	13.35	31.35	19.12
Torque Constant *1		Nm/Arms	0.94	1.72	0.90	1.77	1.02	1.67
Number of Pole Pairs		/	5	5	5	5	5	5
Line Voltage Constant *1		Vrms/krpm (±10%)	56.81	103.93	54.21	106.92	61.52	100.73
Electrical Time Constant		ms	7.81	7.51	8.91	9.04	9.38	9.90
Line Resistance (at 20°C) *1		Ω (±5%)	0.99	3.46	0.46	1.79	0.40	1.00
Line Inductance *1		mH (±10%)	7.73	26.00	4.10	16.19	3.75	9.90
Inductance	d-axis	mH (±10%)	3.60	12.10	1.87	7.54	1.71	4.60
	q-axis	mH (±10%)	4.13	13.90	2.23	8.65	2.04	5.30
Rotor Inertia	Without Brake	x10 ⁻⁴ kg.m ²	12.21	12.21	18.03	18.03	23.94	23.94
	With Brake	x10 ⁻⁴ kg.m ²	14.22	14.22	20.05	20.05	25.95	25.95
Mechanical Time Constant	Without Brake	ms	2.05	2.14	1.55	1.55	1.39	1.29
	With Brake	ms	2.39	2.50	1.72	1.72	1.50	1.40
Mass	Without Brake	kg	5.45	5.45	6.90	6.90	8.40	8.40
	With Brake	kg	6.90	6.90	8.40	8.40	9.80	9.80
Allowable Load	Radial Load	N	686	686	686	686	686	686
	Axial Load	N	196	196	196	196	196	196
Brake Specifications *2	Rated Voltage	VDC (±10%)	24	24	24	24	24	24
	Rated Current	A	0.96	0.96	0.96	0.96	0.96	0.96
	Rated Power	W (@20°C)	23.0	23.0	23.0	23.0	23.0	23.0
	Holding Torque	N·m	≥ 16	≥ 16	≥ 16	≥ 16	≥ 16	≥ 16
	Pull-in Voltage	VDC	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18
	Pull-in Time	ms	≤ 80	≤ 80	≤ 80	≤ 80	≤ 80	≤ 80
	Drop-out Voltage	VDC	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5	≥ 0.5
	Drop-out Time	ms	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40
	Rotation Angle	°	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5
Encoder Configuration*3		/	202023	202023	202023	202023	202023	202023
Test Heat Sink Specifications		mm	400*400*20	400*400*20	400*400*20	400*400*20	400*400*20	400*400*20

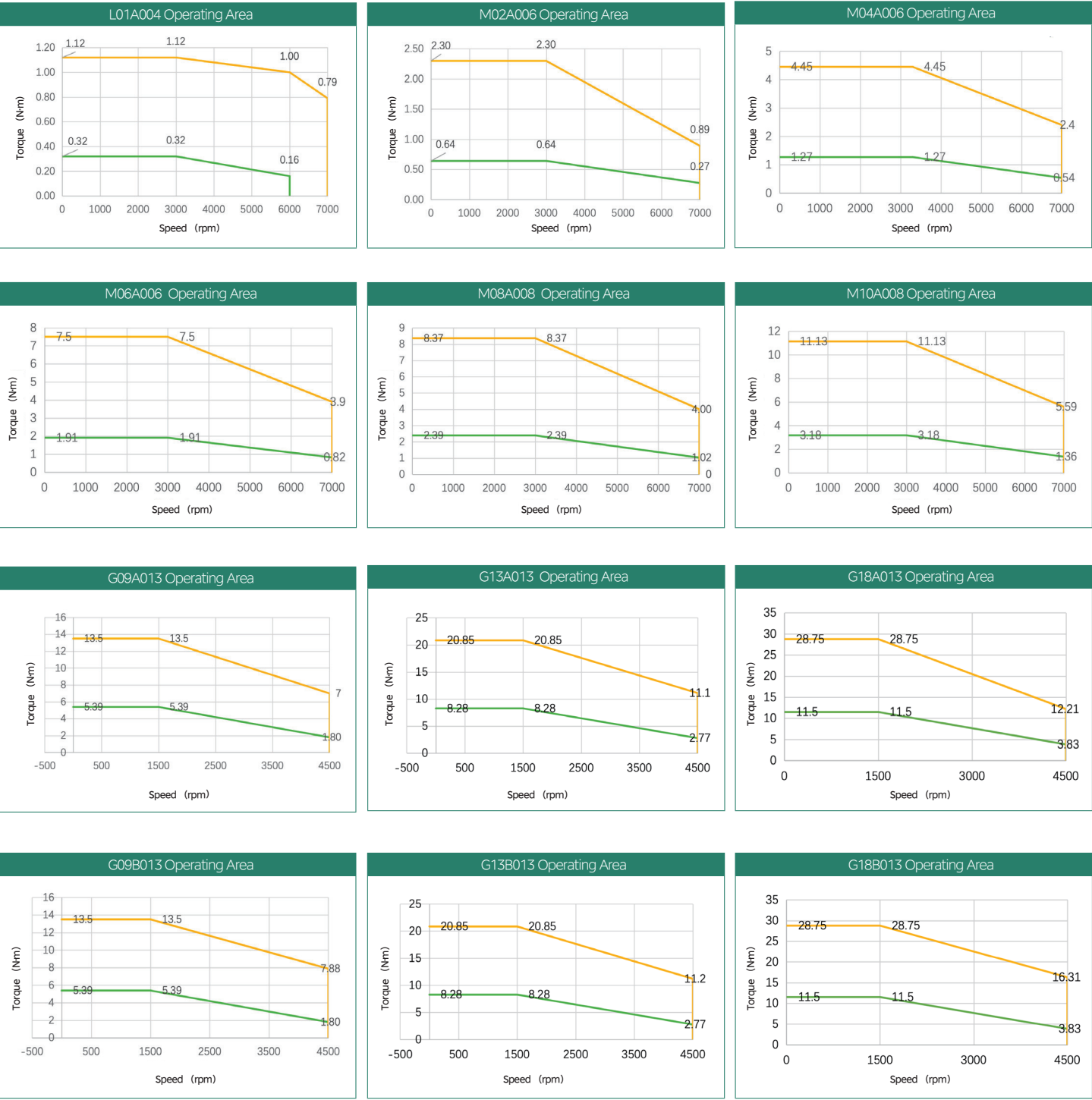
Notes:

*1: All parameter values are typical figures measured from the test prototype at an ambient temperature of 25°C. Testing was conducted using Googoltech BD3 series servo drives; performance may vary when used with other drive models.

*2: The brake is designed for static holding only and must not be used for dynamic braking applications.

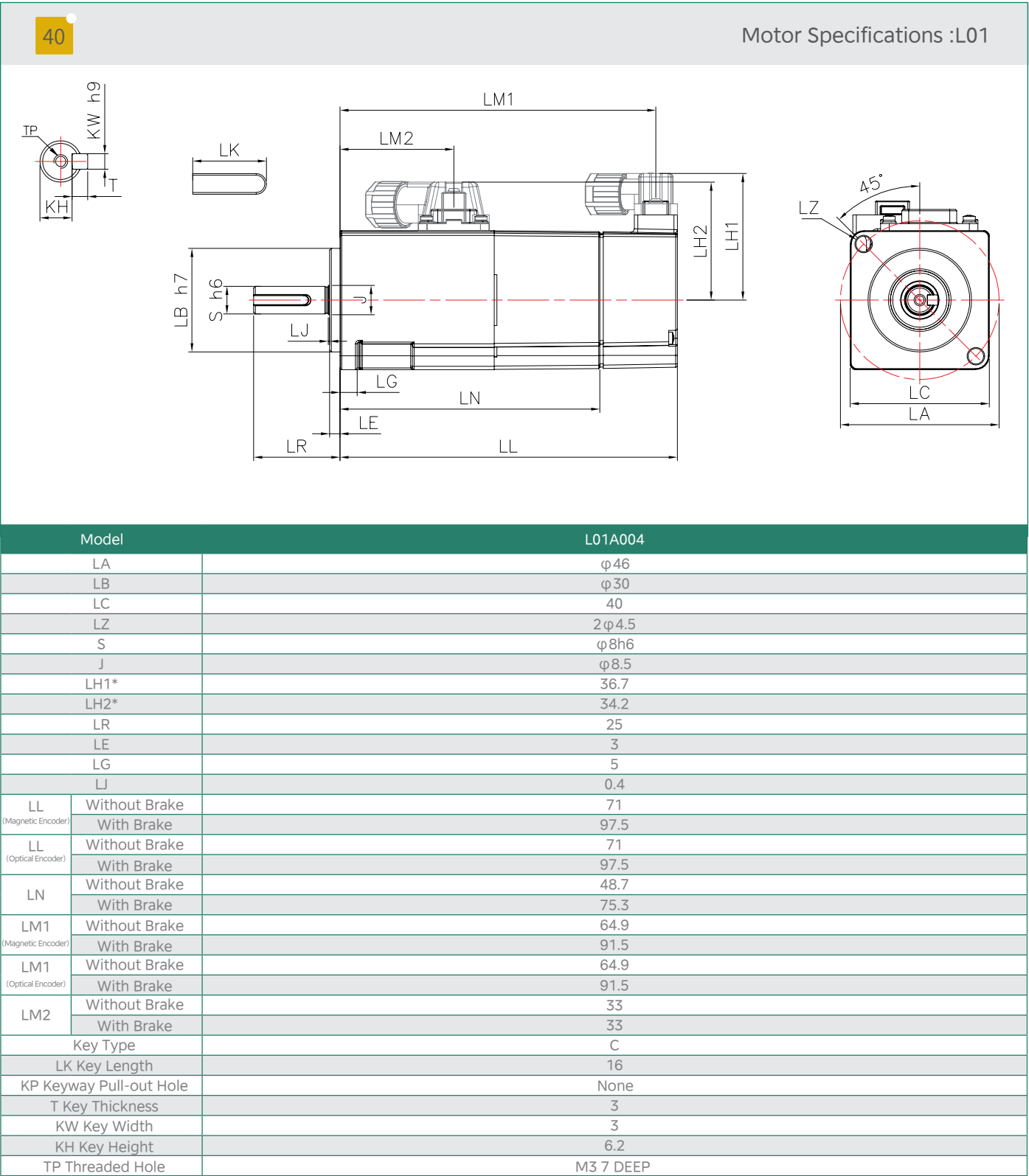
T-N Operating Region Curve

Continuous Operating Area Continuous Duty Zone



Motor Structural Characteristics

PH3E/S-L Structural Dimensions

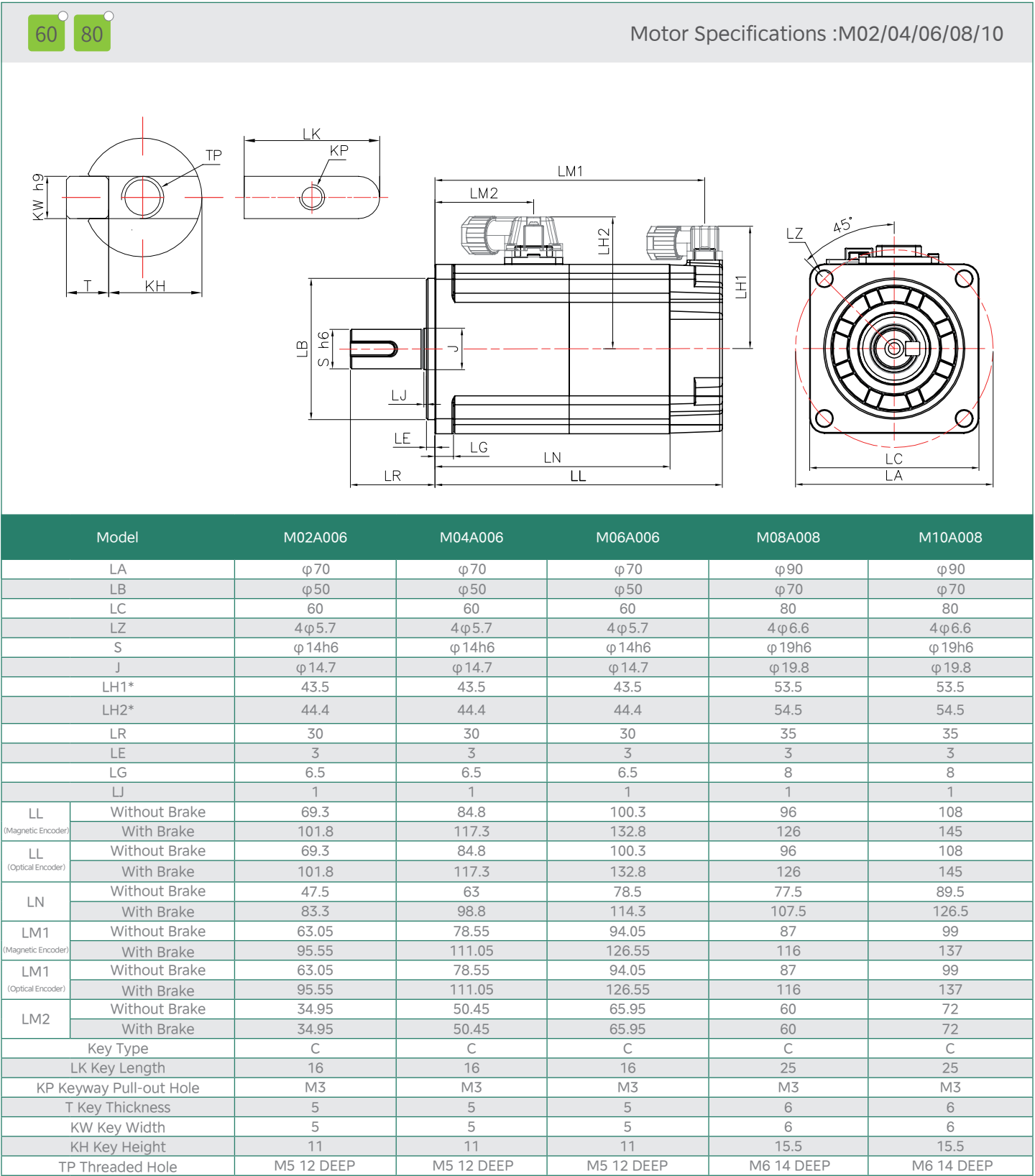


Notes:

*1. Standard unit for dimensions: mm

*2. Explanation of mark *: The motor body does not include the connector on the extension cable. LH1 and LH2 indicate the maximum overall height after installing the connector of the extension cable.

PH3E/S-M Structural Dimensions

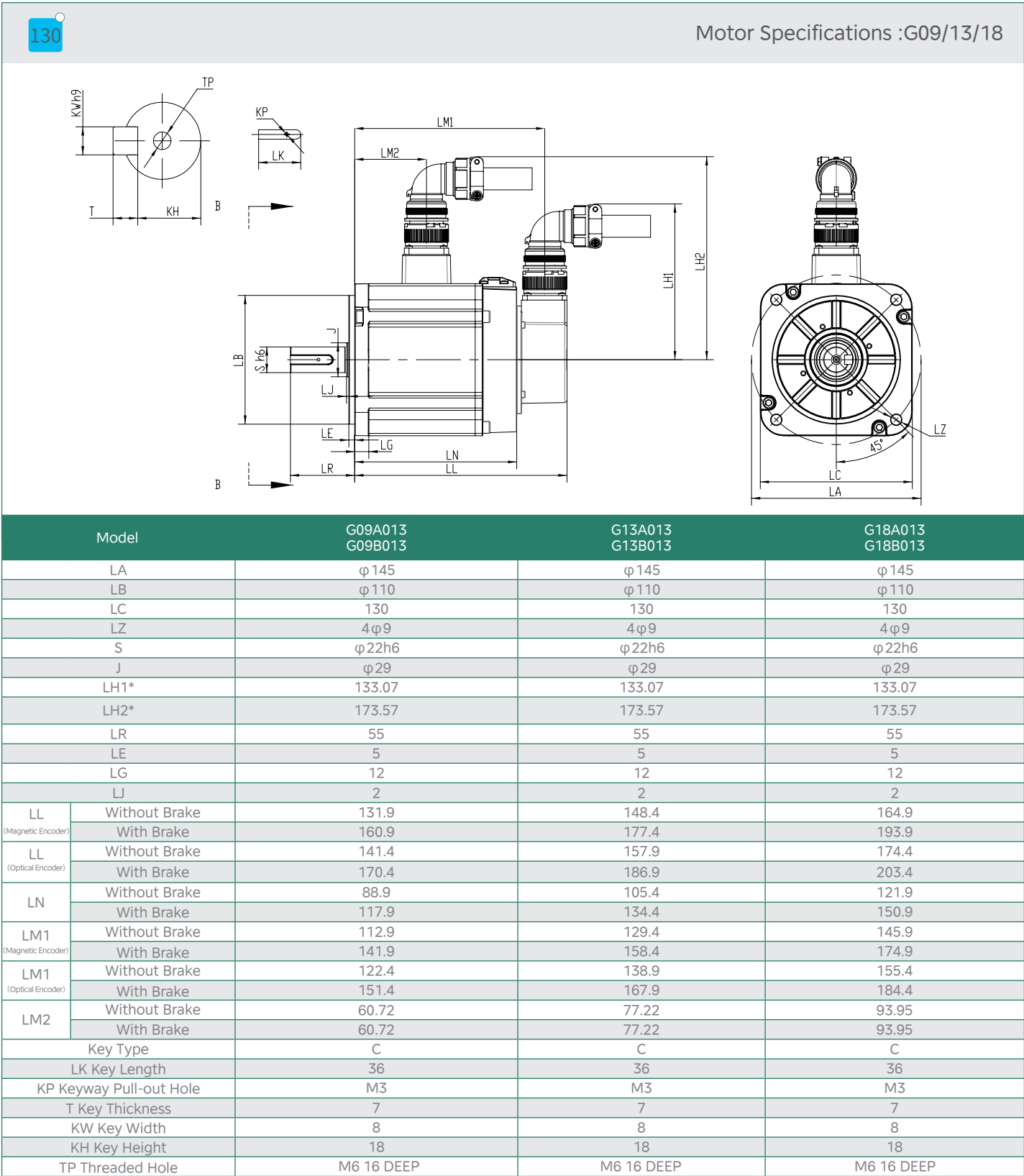


Notes:

*1. Standard unit for dimensions: mm

*2. Explanation of mark *: The motor body does not include the connector on the extension cable. LH1 and LH2 indicate the maximum overall height after installing the connector of the extension cable.

PH3E/S-G Structural Dimensions



Notes:
*1. Standard unit for dimensions: mm
*2. Explanation of mark *: The motor body does not include the connector on the extension cable. LH1 and LH2 indicate the maximum overall height after installing the connector of the extension cable.

Motor Interface

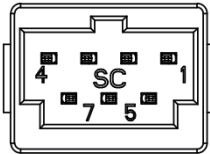
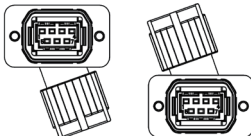
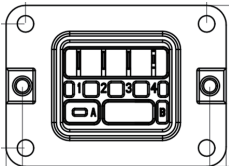
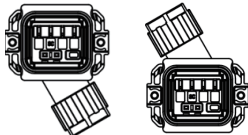
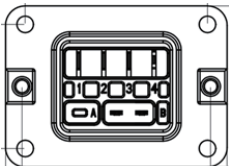
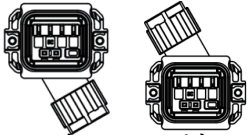
PH3E/S series motors are equipped with SUNCHU MC Series and 5015 Military-Spec IP67 rated electrical interfaces. These provide effective enhancement of the servo motor's overall protection rating, offering long interface lifespan, reliable connectivity, and flexible cable routing.

※ The connector brand specified in this manual is Sanzhu Technology (SUNCHU) **SUNCHU** 三竹机电®.

※ Connectors are critical components that ensure reliable electrical connections. It is imperative to use only the brand and model officially specified by Googoltech.

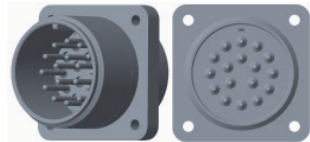
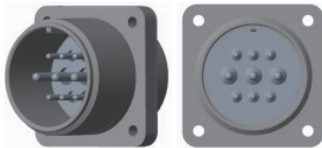
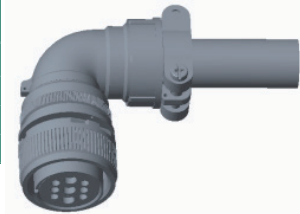
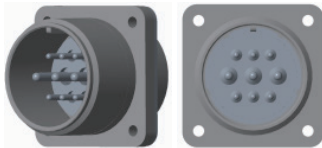
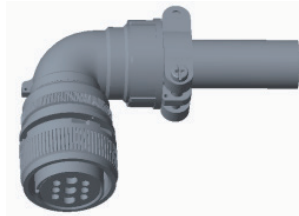
※ Googoltech shall not be liable for any malfunctions or losses resulting from the unauthorized use of connectors from other brands.

Interface Specifications for Frame 40/60/80 Motors and Extension Cables (MC Series Connector)

	Motor Connector	Extension Cable Connector																																								
Encoder Interface	Connector: Model: SC-MC7P-MDDL <table><tr><th>Pin Number</th><th>Signal</th></tr><tr><td>1</td><td>Shield</td></tr><tr><td>2</td><td>VCC</td></tr><tr><td>3</td><td>GND</td></tr><tr><td>4</td><td>Data+</td></tr><tr><td>5</td><td>Data-</td></tr><tr><td>6</td><td>Bat+</td></tr><tr><td>7</td><td>Bat-</td></tr></table> 	Pin Number	Signal	1	Shield	2	VCC	3	GND	4	Data+	5	Data-	6	Bat+	7	Bat-	Connector: Model: SC-MC7S-AB20-000-10 <table><tr><th>Pin Number</th><th>Signal</th><th>Wire Color</th></tr><tr><td>1</td><td>Shield</td><td>Shield</td></tr><tr><td>2</td><td>VCC</td><td>Red</td></tr><tr><td>3</td><td>GND</td><td>Black</td></tr><tr><td>4</td><td>Data+</td><td>Blue</td></tr><tr><td>5</td><td>Data-</td><td>Blue Black</td></tr><tr><td>6</td><td>Bat+</td><td>Green</td></tr><tr><td>7</td><td>Bat-</td><td>Green Black</td></tr></table> Pin: Model: Forward: S-FMC19012220 (*7) Reverse: S-FMC19012220 (*7)  D Direction (Forward) N Direction (Reverse)	Pin Number	Signal	Wire Color	1	Shield	Shield	2	VCC	Red	3	GND	Black	4	Data+	Blue	5	Data-	Blue Black	6	Bat+	Green	7	Bat-	Green Black
	Pin Number	Signal																																								
1	Shield																																									
2	VCC																																									
3	GND																																									
4	Data+																																									
5	Data-																																									
6	Bat+																																									
7	Bat-																																									
Pin Number	Signal	Wire Color																																								
1	Shield	Shield																																								
2	VCC	Red																																								
3	GND	Black																																								
4	Data+	Blue																																								
5	Data-	Blue Black																																								
6	Bat+	Green																																								
7	Bat-	Green Black																																								
Power Line Interface (Without Brake)	Connector: Model: SC-MC6P-AP2G-054-19 <table><tr><th>Pin Number</th><th>Signal</th></tr><tr><td>1</td><td>U</td></tr><tr><td>2</td><td>V</td></tr><tr><td>3</td><td>W</td></tr><tr><td>4</td><td>PE</td></tr></table> 	Pin Number	Signal	1	U	2	V	3	W	4	PE	Connector: Model: SC-MC6S-AP20-00 <table><tr><th>Pin Number</th><th>Signal</th><th>Wire Color</th></tr><tr><td>1</td><td>U</td><td>Red</td></tr><tr><td>2</td><td>V</td><td>White</td></tr><tr><td>3</td><td>W</td><td>Black</td></tr><tr><td>4</td><td>PE</td><td>Green Yellow</td></tr></table> Pin: Model: Forward: S-FMCK6012220 (*4) Reverse: S-FMCK6092220 (*4)  D Direction (Forward) N Direction (Reverse)	Pin Number	Signal	Wire Color	1	U	Red	2	V	White	3	W	Black	4	PE	Green Yellow															
	Pin Number	Signal																																								
1	U																																									
2	V																																									
3	W																																									
4	PE																																									
Pin Number	Signal	Wire Color																																								
1	U	Red																																								
2	V	White																																								
3	W	Black																																								
4	PE	Green Yellow																																								
Power Line Interface (With Brake)	Connector: Model: SC-MC6P-AP2G-044-19 <table><tr><th>Pin Number</th><th>Signal</th></tr><tr><td>1</td><td>U</td></tr><tr><td>2</td><td>V</td></tr><tr><td>3</td><td>W</td></tr><tr><td>4</td><td>PE</td></tr><tr><td>A</td><td>BRK+</td></tr><tr><td>B</td><td>BRK-</td></tr></table> 	Pin Number	Signal	1	U	2	V	3	W	4	PE	A	BRK+	B	BRK-	Connector: Model: SC-MC6S-AP20-00 <table><tr><th>Pin Number</th><th>Signal</th><th>Wire Color</th></tr><tr><td>1</td><td>U</td><td>Red</td></tr><tr><td>2</td><td>V</td><td>White</td></tr><tr><td>3</td><td>W</td><td>Black</td></tr><tr><td>4</td><td>PE</td><td>Green Yellow</td></tr><tr><td>A</td><td>BRK+</td><td>Blue</td></tr><tr><td>B</td><td>BRK-</td><td>Brown</td></tr></table> Pin: Model: Forward: S-FMCK6012220 (*4) S-FMC19012220 (*2) Reverse: S-FMCK6092220 (*4) S-FMC19012220 (*2)  D Direction (Forward) N Direction (Reverse)	Pin Number	Signal	Wire Color	1	U	Red	2	V	White	3	W	Black	4	PE	Green Yellow	A	BRK+	Blue	B	BRK-	Brown					
	Pin Number	Signal																																								
1	U																																									
2	V																																									
3	W																																									
4	PE																																									
A	BRK+																																									
B	BRK-																																									
Pin Number	Signal	Wire Color																																								
1	U	Red																																								
2	V	White																																								
3	W	Black																																								
4	PE	Green Yellow																																								
A	BRK+	Blue																																								
B	BRK-	Brown																																								

Notes:
1. The wire colors specified in the table are recommended. If the actual wire colors differ, the signals must be identified based on the pin number definitions.
2. In the encoder interface, Pins 6 and 7 are the external battery power supply interfaces for multi-turn encoders, and are only functional on motor models equipped with multi-turn encoders.
3. The connectors listed in this table cannot be purchased individually. If required, please select the corresponding connector kit package.
4. The brake power supply has specific polarity requirements. It is essential to wire strictly according to the designated polarity, otherwise servo system malfunctions may occur or the motor may fail to achieve its maximum performance.

□Interface Specifications for Frame 130 Motors and Extension Cables
(5015 Military-Spec Connector)

	Motor Connector	Extension Cable Connector																																								
Encoder Interface	Connector: Model: CMS3102A20-29P P/N: 12119400001081 <table><tr><th>Pin Number</th><th>Signal</th></tr><tr><td>E</td><td>SD+</td></tr><tr><td>F</td><td>SD-</td></tr><tr><td>G</td><td>GND</td></tr><tr><td>H</td><td>VCC</td></tr><tr><td>J</td><td>Shield</td></tr><tr><td>S</td><td>Bat-</td></tr><tr><td>T</td><td>Bat+</td></tr></table> 	Pin Number	Signal	E	SD+	F	SD-	G	GND	H	VCC	J	Shield	S	Bat-	T	Bat+	Connector: Model: CMS3108A20-29SI P/N: 12119400000501 <table><tr><th>Pin Number</th><th>Signal</th><th>Wire Color</th></tr><tr><td>E</td><td>SD+</td><td>Blue</td></tr><tr><td>F</td><td>SD-</td><td>Blue Black</td></tr><tr><td>G</td><td>GND</td><td>Black</td></tr><tr><td>H</td><td>VCC</td><td>Red</td></tr><tr><td>J</td><td>Shield</td><td>Shield</td></tr><tr><td>S</td><td>Bat-</td><td>Green Black</td></tr><tr><td>T</td><td>Bat+</td><td>Green</td></tr></table> 	Pin Number	Signal	Wire Color	E	SD+	Blue	F	SD-	Blue Black	G	GND	Black	H	VCC	Red	J	Shield	Shield	S	Bat-	Green Black	T	Bat+	Green
Pin Number	Signal																																									
E	SD+																																									
F	SD-																																									
G	GND																																									
H	VCC																																									
J	Shield																																									
S	Bat-																																									
T	Bat+																																									
Pin Number	Signal	Wire Color																																								
E	SD+	Blue																																								
F	SD-	Blue Black																																								
G	GND	Black																																								
H	VCC	Red																																								
J	Shield	Shield																																								
S	Bat-	Green Black																																								
T	Bat+	Green																																								
Power Line Interface (Without Brake)	Connector: Model: CMS3102A20-18P P/N: 12119400000841 <table><tr><th>Pin Number</th><th>Signal</th></tr><tr><td>E</td><td>PE</td></tr><tr><td>F</td><td>U</td></tr><tr><td>I</td><td>V</td></tr><tr><td>B</td><td>W</td></tr></table> 	Pin Number	Signal	E	PE	F	U	I	V	B	W	Connector: Model: CMS3108A20-18SI P/N: 12119400000502 <table><tr><th>Pin Number</th><th>Signal</th><th>Wire Color</th></tr><tr><td>E</td><td>PE</td><td>Green Yellow</td></tr><tr><td>F</td><td>U</td><td>Red</td></tr><tr><td>I</td><td>V</td><td>White</td></tr><tr><td>B</td><td>W</td><td>Black</td></tr></table> 	Pin Number	Signal	Wire Color	E	PE	Green Yellow	F	U	Red	I	V	White	B	W	Black															
Pin Number	Signal																																									
E	PE																																									
F	U																																									
I	V																																									
B	W																																									
Pin Number	Signal	Wire Color																																								
E	PE	Green Yellow																																								
F	U	Red																																								
I	V	White																																								
B	W	Black																																								
Power Line Interface (With Brake)	Connector: Model: CMS3102A20-18P P/N: 12119400000841 <table><tr><th>Pin Number</th><th>Signal</th></tr><tr><td>E</td><td>PE</td></tr><tr><td>F</td><td>U</td></tr><tr><td>I</td><td>V</td></tr><tr><td>B</td><td>W</td></tr><tr><td>C</td><td>BRK+</td></tr><tr><td>D</td><td>BRK-</td></tr></table> 	Pin Number	Signal	E	PE	F	U	I	V	B	W	C	BRK+	D	BRK-	Connector: Model: CMS3108A20-18SI P/N: 12119400000502 <table><tr><th>Pin Number</th><th>Signal</th><th>Wire Color</th></tr><tr><td>E</td><td>PE</td><td>Green Yellow</td></tr><tr><td>F</td><td>U</td><td>Red</td></tr><tr><td>I</td><td>V</td><td>White</td></tr><tr><td>B</td><td>W</td><td>Black</td></tr><tr><td>C</td><td>BRK+</td><td>Brown</td></tr><tr><td>D</td><td>BRK-</td><td>Blue</td></tr></table> 	Pin Number	Signal	Wire Color	E	PE	Green Yellow	F	U	Red	I	V	White	B	W	Black	C	BRK+	Brown	D	BRK-	Blue					
Pin Number	Signal																																									
E	PE																																									
F	U																																									
I	V																																									
B	W																																									
C	BRK+																																									
D	BRK-																																									
Pin Number	Signal	Wire Color																																								
E	PE	Green Yellow																																								
F	U	Red																																								
I	V	White																																								
B	W	Black																																								
C	BRK+	Brown																																								
D	BRK-	Blue																																								

- Notes:
- The wire colors listed in the table are recommended. If the actual wire colors differ, please use the pin number definitions to confirm the signals.
 - For the encoder interface, terminals S and T are the external battery power supply interfaces for multi-turn encoders. These are only functional on models equipped with multi-turn encoders.
 - The brake power supply has polarity requirements. Wiring must be performed strictly according to the specified polarity. Failure to do so may result in servo system malfunction or failure to achieve the motor's maximum performance.

Servo Cable Selection Guide

- Neither servo cables nor connector kit packages are standard accessories and must be ordered separately.
- Customers only need to select either the servo cable or the connector kit package.
- Each servo cable model has a corresponding connector kit package. Select the appropriate connector kit package based on the specific cable required for the servo system.
- The connector kit package includes connectors and accessories for both ends of the cable, but does not include conductors. Customers must prepare their own conductors for harness assembly.

Power Cables and Connector Accessories Catalog

PH3 Motor Model	Compatible Drive Type	Encoder Configuration	Length (m)	Cable Model (Standard Flexible Cable)		Connector Kit Model (Either this or the cable is required)
				Front Outlet(D Direction)	Rear Outlet(N Direction)	
L01、 M02/04/06	BD3 Series	Without Brake	3	SPC-A61011-0303-F	SPC-A63011-0303-F	Front Outlet(D Direction): CAP-A6-01-A Rear Outlet(N Direction): CAP-A6-01-B
			5	SPC-A61011-0305-F	SPC-A63011-0305-F	
			10	SPC-A61011-0310-F	SPC-A63011-0310-F	
			15	SPC-A61011-0315-F	SPC-A63011-0315-F	
			20	SPC-A61011-0320-F	SPC-A63011-0320-F	
		With Brake	3	SPC-A62021-0403-F	SPC-A64021-0403-F	Front Outlet(D Direction): CAP-A6-02-A Rear Outlet(N Direction): CAP-A6-02-B
			5	SPC-A62021-0405-F	SPC-A64021-0405-F	
			10	SPC-A62021-0410-F	SPC-A64021-0410-F	
			15	SPC-A62021-0415-F	SPC-A64021-0415-F	
			20	SPC-A62021-0420-F	SPC-A64021-0420-F	
M08/10	BD3 Series	Without Brake	3	SPC-A61031-0503-F	SPC-A63031-0503-F	Front Outlet(D Direction): CAP-A6-03-A Rear Outlet(N Direction): CAP-A6-03-B
			5	SPC-A61031-0505-F	SPC-A63031-0505-F	
			10	SPC-A61031-0510-F	SPC-A63031-0510-F	
			15	SPC-A61031-0515-F	SPC-A63031-0515-F	
			20	SPC-A61031-0520-F	SPC-A63031-0520-F	
		With Brake	3	SPC-A62041-0603-F	SPC-A64041-0603-F	Front Outlet(D Direction): CAP-A6-04-A Rear Outlet(N Direction): CAP-A6-04-B
			5	SPC-A62041-0605-F	SPC-A64041-0605-F	
			10	SPC-A62041-0610-F	SPC-A64041-0610-F	
			15	SPC-A62041-0615-F	SPC-A64041-0615-F	
			20	SPC-A62041-0620-F	SPC-A64041-0620-F	
G09/13/18	BD3 Series	Without Brake	3	CBL-PWPH220000A003		CAP-PWPH220000A0
			5	CBL-PWPH220000A005		
			10	CBL-PWPH220000A010		
			15	CBL-PWPH220000A015		
			20	CBL-PWPH220000A020		
		With Brake	3	CBL-PWPH220001A003		CAP-PWPH220001A0
			5	CBL-PWPH220001A005		
			10	CBL-PWPH220001A010		
			15	CBL-PWPH220001A015		
			20	CBL-PWPH220001A020		

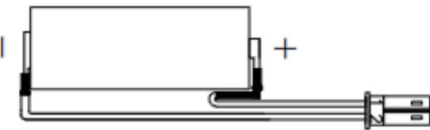
Note: The power cables designed for M08/10 models are backward compatible with those used for L01, M02/04/06 motors.

Encoder Cables and Connector Accessories Catalog

PH3 Motor Model	Compatible Drive Type	Encoder Configuration	Length (m)	Cable Model (Standard Flexible Cable)		Connector Kit Model (Either this or the cable is required)
				Front Outlet(D Direction)	Rear Outlet(N Direction)	
L01, M02/04/06 /08/10 M08/10 M08/10	BD3 Series	Single-Turn Encoder (Without Battery)	3	SFC-A71A41-0103-F	SFC-A73A41-0103-F	CAP-A7-A4-1
			5	SFC-A71A41-0105-F	SFC-A73A41-0105-F	
			10	SFC-A71A41-0110-F	SFC-A73A41-0110-F	
			15	SFC-A71A41-0115-F	SFC-A73A41-0115-F	
			20	SFC-A71A41-0120-F	SFC-A73A41-0120-F	
		Multi-Turn Encoder (With Battery)	3	SFC-A72A43-0103-F	SFC-A74A43-0103-F	CAP-A7-A4-3
			5	SFC-A72A43-0105-F	SFC-A74A43-0105-F	
			10	SFC-A72A43-0110-F	SFC-A74A43-0110-F	
			15	SFC-A72A43-0115-F	SFC-A74A43-0115-F	
			20	SFC-A72A43-0120-F	SFC-A74A43-0120-F	
G09/13/18 G09/13/18	BD3 Series	Single-Turn Encoder (Without Battery)	3	CBL-FBPH22S301A003		CAP-FBPH2S301A0
			5	CBL-FBPH22S301A005		
			10	CBL-FBPH22S301A010		
			15	CBL-FBPH22S301A015		
			20	CBL-FBPH22S301A020		
		Multi-Turn Encoder (With Battery)	3	CBL-FBPH22T203A003		CAP-FBPH2T203A0
			5	CBL-FBPH22T203A005		
			10	CBL-FBPH22T203A010		
			15	CBL-FBPH22T203A015		
			20	CBL-FBPH22T203A020		

Remarks:

- For motors equipped with multi-turn encoders, if the multi-turn function is not required, you may select the "Single-turn Encoder" configuration and the corresponding cable model. Cables with batteries or connector kits should only be selected when utilizing the encoder's multi-turn counting function.
- BD3 Series Battery Assembly: Model BT01 (3.6V, 2700mAh), Part Number 17419450001421, as shown in the figure on the right.
- The encoder cable connector kits for L01, M02/04/06, M08/10 do not distinguish between forward/rear cable exit: The connector attached to the motor includes both "Terminals" and "Housing." When users create custom cables, they can adjust the orientation of the "Housing" according to the required cable exit direction.



PH3 Interface Adapter Cables and Connector Accessories Catalog

Purpose:

1. Converts the motor interface of PH35 series L01, M02/04/06/08/10 to the AMP connector interface used by the older PH2/PM2/PM1 series for frame sizes 40/60/80. This allows compatibility with the corresponding cable harnesses of the older series, meeting application requirements across more different generations of servo drives.

2. When customers need to upgrade from the older Cirron PM1/PM2/PH2 series servo motors to the PH3 series standard frame size 60/80 motors, the PH3 motor's quick-connect interface is incompatible with the existing AMP plastic connector cables on the customer's equipment. This adapter cable converts the PH3 motor interface to the older AMP connector, enabling connection with the original cables on the equipment.

Motor Type	Length (m)	High-Flex Cable		Connector Kit
		Front Outlet(D Direction)	Rear Outlet(N Direction)	
Power Cable - Without Brake	0.3	SPC-A61D11-05A3-F	SPC-A63D11-05A3-F	Front Outlet(D Direction): CAP-A6-D1-A Rear Outlet(N Direction): CAP-A6-D1-B
Power Cable - With Brake	0.3	SPC-A62D31-06A3-F	SPC-A64D31-06A3-F	Front Outlet(D Direction): CAP-A6-D3-A Rear Outlet(N Direction): CAP-A6-D3-B
Encoder Cable - Universal for Single/Multi-Turn	0.3	SFC-A72D51-01A3-F	SFC-A74D51-01A3-F	CAP-A7-D5

Example:

1. The customer's site originally uses a PH2-M06B23035T40D motor and a CDHD series drive, with the matching power cable CBL-PWPH220000D0O*# and encoder cable CBL-FBPH2T200D0**.

2. When replacing the PH2 motor with a PH3 motor while keeping the customer's existing drive, there are two possible solutions depending on whether the customer's site replaces the cables, as detailed below:

Category	Drive	Motor	Power Cable	Encoder Cable	Remarks
Current Solution	CDHD Drive	PH2-M06B23035T40D (With Lead Wires)	CBL-PWPH220000D0**	CBL-FBPH2T200D0**	/
Alternative 1	CDHD Drive	PH3S-M04A006ST (Socket, No Lead Wires)	SPC-A61D11-05A3-F CBL-PWPH220000D0**	SFC-A72D51-01A3-F CBL-FBPH2T200D0**	By utilizing an interface conversion cable, the existing customer-site cabling remains unchanged. This cable adapts the PH3 motor interface to match the PH2's lead-out interface, enabling a direct replacement of the PH2 motor with the PH3 model.
Alternative 2	CDHD Drive	PH3S-M04A006ST (Socket, No Lead Wires)	SPC-A61011-03*-F	SFC-A72A52-0103-F	All on-site cables are replaced with PH3 standard cables to complete the replacement of the PH2 motor with the PH3 model.

Note: This example is intended solely to demonstrate the usage of the interface adapter cable. The selection of an appropriate interface adapter cable must always be based on the specific application requirements and use case.

Connector Kit Package Information

Kit Category	Compatible Drives	Applicable Motors	Kit Purpose	Cable Exit Direction	Model / Part Number	Connector Illustration
Power Line Connector Kit	BD3 Series	PH3 Series L01/M02/M04/M06	Without Brake	Front Outlet (D Direction)	CAP-A6-01-A	
				Rear Outlet (N Direction)	CAP-A6-01-B	
			Without Brake	Front Outlet (D Direction)	CAP-A6-02-A	
				Rear Outlet (N Direction)	CAP-A6-02-B	
		PH3 Series M08/M10	Without Brake	Front Outlet (D Direction)	CAP-A6-03-A	
				Rear Outlet (N Direction)	CAP-A6-03-B	
			With Brake	Front Outlet (D Direction)	CAP-A6-04-A	
				Rear Outlet (N Direction)	CAP-A6-04-B	
		PH3 Series G09/G13/G18	Without Brake	/	CAP-PWPH20000A0	
			With Brake	/	CAP-PWPH20001A0	

Kit Category	Compatible Drives	Applicable Motors	Kit Purpose	Cable Exit Direction	Model / Part Number	Connector Illustration
Encoder Cable Connector Kit	BD3 Series	PH3 Series L01/M02/M04/M06/M08/M10	Single-Turn Encoder	Front/Rear Outlet Universal	CAP-A7-A5-1	
			Multi-Turn Encoder	Front/Rear Outlet Universal	CAP-A7-A5-2	
		PH3 Series G09/G13/G18	Single-Turn Encoder	/	CAP-FBPH2S300A0	
			Multi-Turn Encoder	/	CAP-FBPH2T200A0	

Kit Category	Compatible Drives	Applicable Motors	Kit Purpose	Cable Exit Direction	Model / Part Number	Connector Illustration
Interface Conversion Cable Connector Kit	BD3 Series	PH3 Series L01/M02/M04/M06/M08/M10	For Power Line (Without Brake)	Front Outlet (D Direction)	CAP-A6-D1-A	
				Rear Outlet (N Direction)	CAP-A6-D1-B	
			For Power Line (With Brake)	Front Outlet (D Direction)	CAP-A6-D3-A	
				Rear Outlet (N Direction)	CAP-A6-D3-B	
			For Encoder Cable (Universal for Single/Multi-Turn Encoders)	Front/Rear Outlet Universal	CAP-A7-D5	

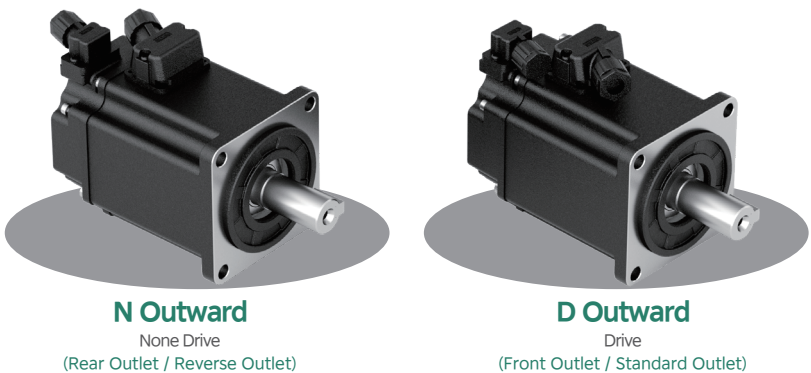
Notes:

1. The illustration of the MC connector for LO1/M02/M04/M06/M08/M10 motors shows the fully assembled configuration. The actual kit contains discrete components to facilitate installation.

2. The MC connector for LO1/M02/M04/M06/M08/M10 motors is a universal design for both front and rear cable lead-out directions. Users can adjust the orientation of the insert accordingly based on the required cable direction.

3. The appearance diagram is provided solely to illustrate the physical shape of the connector within the kit. For detailed model numbers and specifications, please refer to the connector kit specification document.

Front-Exit / Rear-Exit Cable Routing Diagram



Notes:

1. This diagram illustrates the installation of an MC connector on a terminal-type motor (Frame 40/60/80).

2. The MC connector is not a standard accessory; its depiction here is solely for demonstrating the orientation of the connector after cables with different lead-out directions are installed on the motor.

3. Users can flexibly select the lead-out direction combination for the power cable and encoder cable based on actual requirements, such as N+N, D+D, N+D, D+N, etc.

4 P3C Motor Designation

P3C Motor Designation Rules

P	3	C	-	L	01	A	1	04	S	T	-	***
1	2	3	4	5	6	7	8	9	10	11	12	13

P 1 Generation name

Symbol	Specification
P	Servotronix Servo Motor Product Designation

3 2 Generation system number

Symbol	Specification
3	Generation 3

C 3 Product Categories

Symbol	Specification
C	General-Purpose Low-Power Rotary Servo Motor

- 4 Em Dash

L 5 Motor Types (Inertia)

Symbol	Specification
L	Low Inertia, High Speed (Rated: 3000 rpm)
C	Medium Inertia, Medium Speed (2000 rpm)
G	Medium Inertia, High Torque (Rated: 1500 rpm)

01 6 Rated power

Symbol	Specification
A5	0.05kW
01	0.1kw
10	1.0kw
15	1.5kw
20	2.0kw
25	2.5kw

A 7 Rated power supply

Symbol	Specification
A	220VAC 3PhY
B	380VAC 3PhY

1 8 Design Serial number

Symbol	Specification
1	1 to 9 one-bit character,representing different electromagnetic schemes

04 9 Machine flange

Symbol	Specification
04	40mm
08	80mm
10	100mm
13	130mm
18	180mm

S 10 Brake/oil seal/shaft configuration

Symbol	Specification
S	With seal, without brake, standard keyed shaft (Seal)
E	With seal and brake, standard keyed shaft (Either)
N	Without seal and brake, standard keyed shaft (None)
B	Without seal, with brake, standard keyed shaft (Brake)

Symbol	Specification
29	2.9kw
30	3.0kw
44	4.4kw
55	5.5kw
75	7.5kw

T 11 Encoder configuration

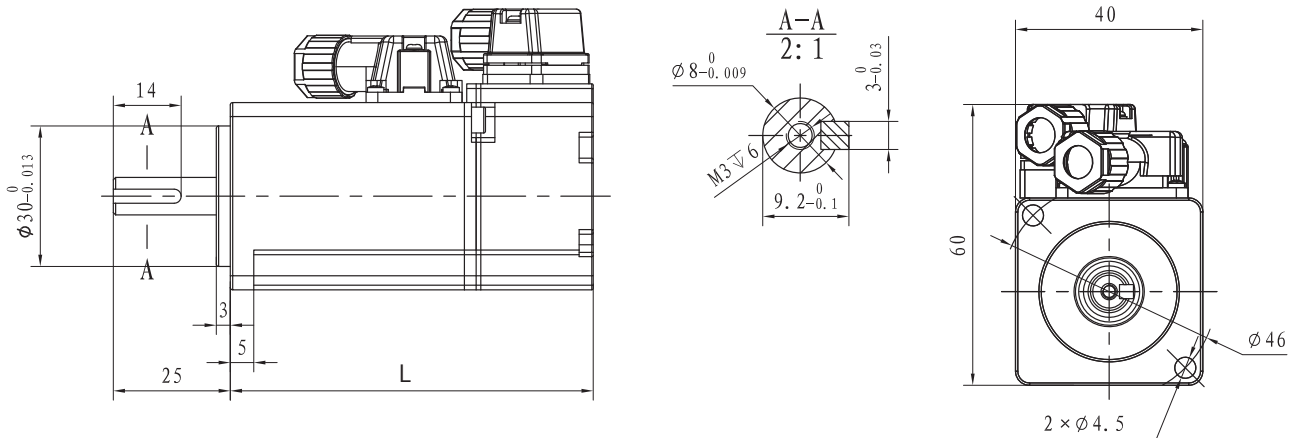
Symbol	Specification
T	Tamagawa protocol standard 23bit optical encoder (multi-turn only)
J	Tamagawa protocol standard 17bit magnetoencoder (multiple turns only)

- 12 Em Dash

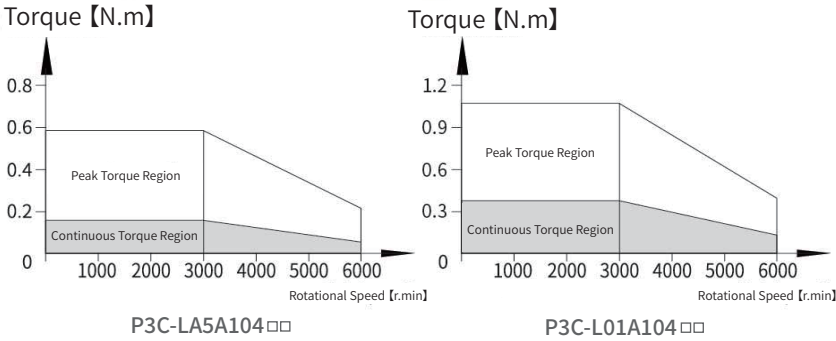
*** 13 Custom Code

Symbol	Specification
blank	Standard product (standard structure, standard key standard axis)
other	Non-electromagnetic custom custom code, see thespecification

40-Flange Low-Inertia Motors



Torque-Speed Characteristic Curve



Outline Dimension Drawing	50W	100W
L without Brake (mm)	67.5	77.5
L with Brake (mm)	100.5	110.5

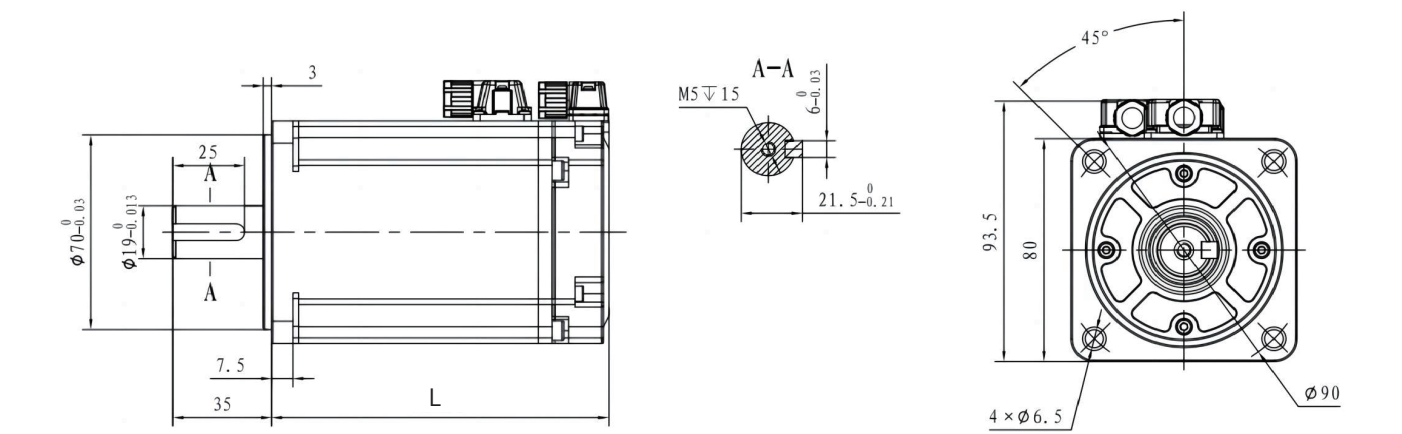
Technical Parameters

Motor Specifications	P3C-LA5A104□□	P3C-L01A104□□
Rated Power (W)	50	100
Rated Voltage (V)	220	220
Rated Current (A)	0.6	1
Rated Torque (N·m)	0.16	0.32
Rated Speed (r/min)	3000	3000
Peak Current (A)	1.8	3
Peak Torque (N·m)	0.48	0.96
Maximum Speed (r/min)	6000	6000
Back EMF (V/1000r/min)	18	19
Torque Constant (N·m/A)	0.3	0.3
Winding Resistance (Line-to-Line) (Ω)	26	14.5

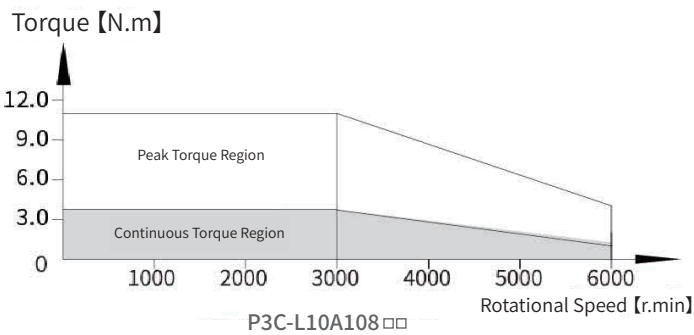
Motor Specifications	P3C-LA5A104□□	P3C-L01A104□□
Winding Inductance (Line-to-Line) (mH)	20	13.7
Electrical Time Constant (ms)	0.8	0.9
Rotor Inertia (kg·m ² ×10 ⁻⁴)	0.035(0.038)	0.05(0.053)
Weight (kg)	0.4	0.55
Number of Pole Pairs	5 Pole Pairs	
Motor Insulation Class	ClassF	
Protection Rating (IP Code)	IP65	
Operating Environment	Ambient Temperature: -20°C to 40°C Ambient Humidity: < 90% relative humidity (Non-condensing)	

Note:() are for motors with holding brakes.

80-Flange Low-Inertia Motors



Torque-Speed Characteristic Curve



Outline Dimension Drawing	1000W
L without Brake (mm)	119.4
L with Brake (mm)	156.4

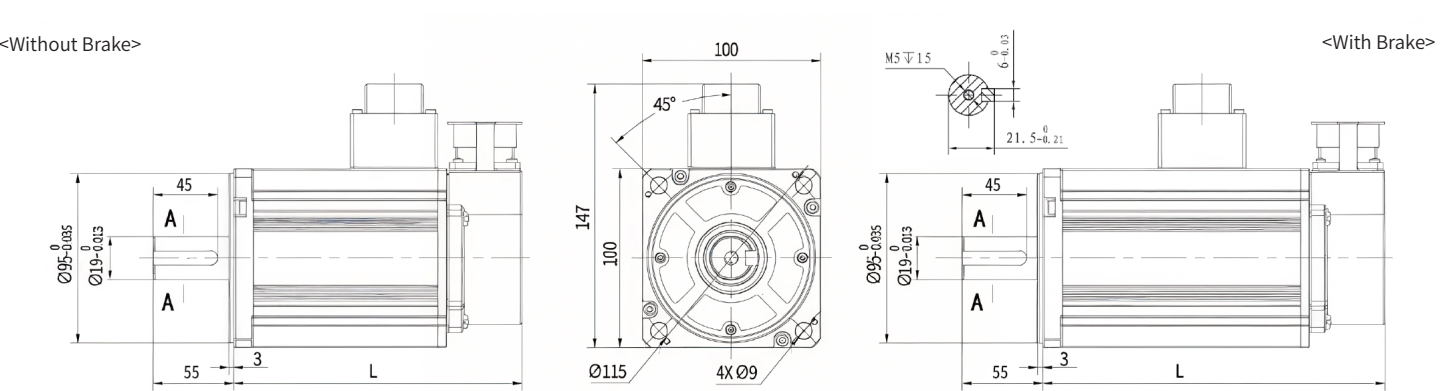
Technical Parameters

Motor Specifications	P3C-L10A108 □□
Rated Power (W)	1000
Rated Voltage (V)	220
Rated Current (A)	6.3
Rated Torque (N·m)	3.18
Rated Speed (r/min)	3000
Peak Current (A)	25
Peak Torque (N·m)	11.13
Maximum Speed (r/min)	6000
Back EMF (V/1000r/min)	33.3
Torque Constant (N·m/A)	0.50
Winding Resistance (Line-to-Line) (Ω)	0.74

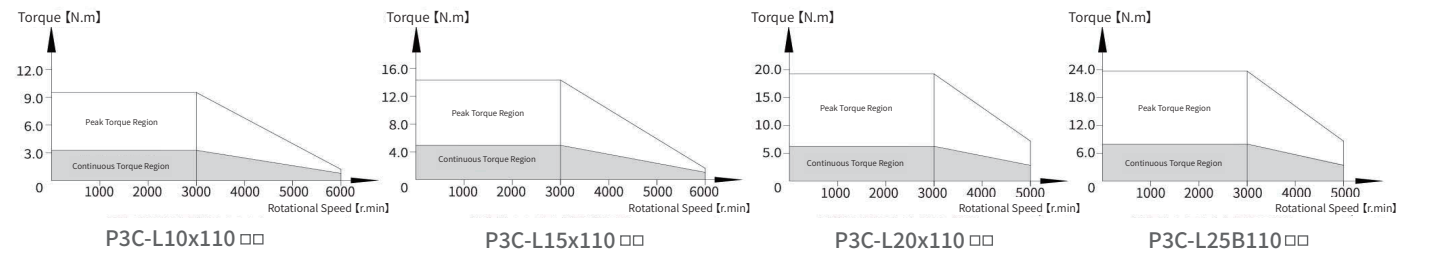
Motor Specifications	P3C-L10A108 □□
Winding Inductance (Line-to-Line) (mH)	6.7
Electrical Time Constant (ms)	9.1
Rotor Inertia (kg·m²×10⁻⁴)	0.88
Weight (kg)	2.5
Number of Pole Pairs	5 Pole Pairs
Motor Insulation Class	ClassF
Protection Rating (IP Code)	IP65
Operating Environment	Ambient Temperature: -20°C to 40°C Ambient Humidity: < 90% relative humidity (Non-condensing)

Note:() are for motors with holding brakes.

100-Flange Low-Inertia Motors



Torque-Speed Characteristic Curve



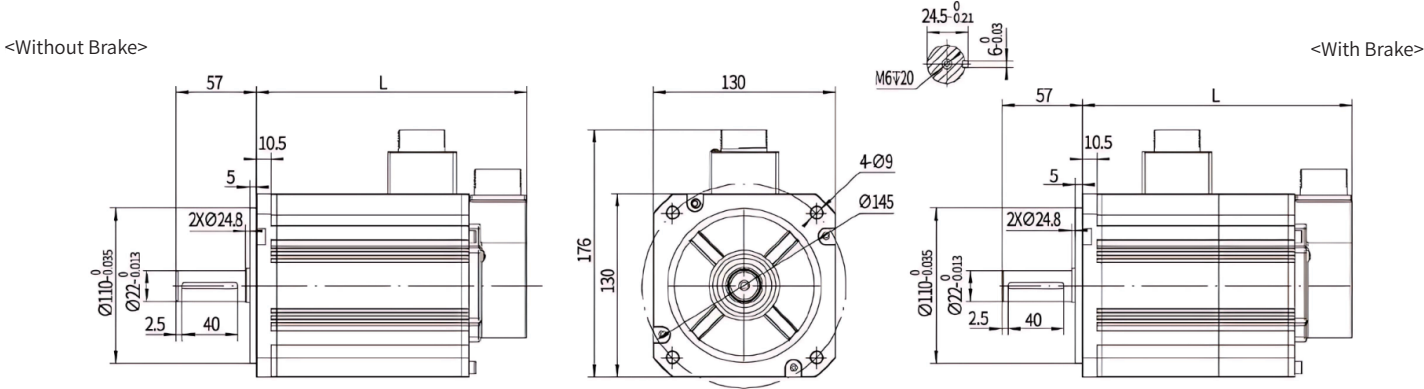
Outline Dimension Drawing	1000W	1500W	2000W	2500W
L without Brake (mm)	142	161	180	199
L with Brake (mm)	147	191	210	229

Technical Parameters

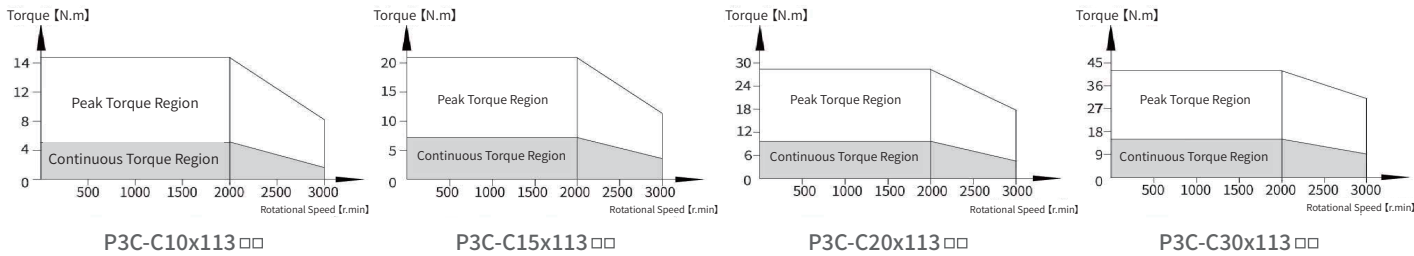
Motor Specifications	P3C-L10x110 □□	P3C-L15x110 □□	P3C-L20x110 □□	P3C-L25B110 □□
Rated Power (W)	1000	1500	2000	2500
Rated Voltage (V)	220	380	220	380
Rated Current (A)	7	3.5	10	5
Rated Torque (N·m)	3.18	3.18	4.77	4.77
Rated Speed (r/min)	3000	3000	3000	3000
Peak Current (A)	22	11	31	16
Peak Torque (N·m)	9.54	9.54	14.31	14.31
Maximum Speed (r/min)	6000	6000	6000	6000
Back EMF (V/1000r/min)	30	60	31	62
Torque Constant (N·m/A)	0.45	0.91	0.48	0.95
Winding Resistance (Line-to-Line) (Ω)	0.46	1.76	0.31	1.27
Winding Inductance (Line-to-Line) (mH)	4.6	18	3.6	13.8
Electrical Time Constant (ms)	10.0	10.2	11.6	10.9
Rotor Inertia (kg·m²×10⁻⁴)	2.26(3.0)	3.1(3.83)	3.93(4.66)	4.76(5.5)
Weight (kg)	4	5	6	7
Number of Pole Pairs	5 Pole Pairs			
Motor Insulation Class	ClassF			
Protection Rating (IP Code)	IP65			
Operating Environment	Ambient Temperature: -20°C to 40°C Ambient Humidity: < 90% relative humidity (Non-condensing)			

Note: X:A indicates a rated voltage of 220V; B indicates a rated voltage of 380V. □□ : For brake and encoder options, refer to the model designation rule.

130-Flange Medium-Inertia Motors



Torque-Speed Characteristic Curve



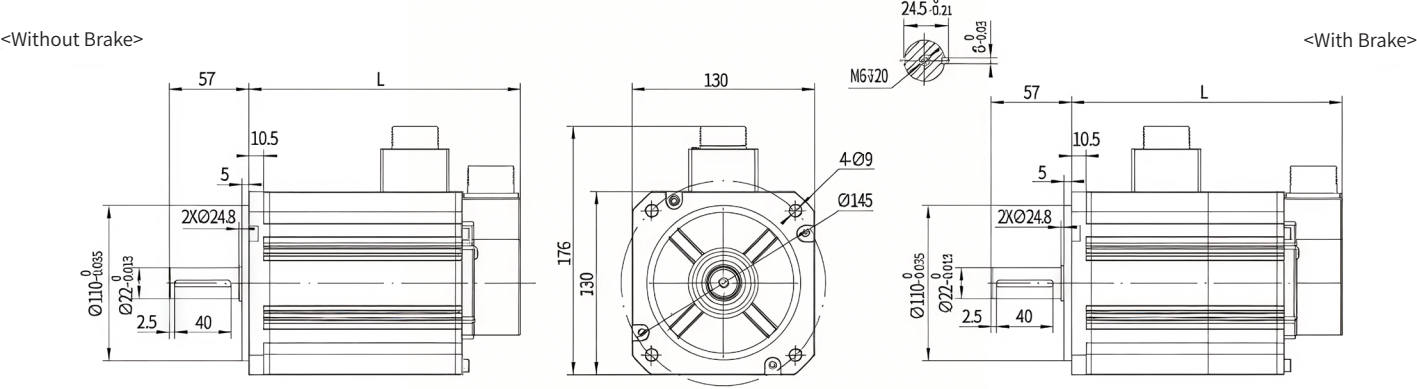
Outline Dimension Drawing	1000W	1500W	2000W	3000W
L without Brake (mm)	135	152.5	170	200
L with Brake (mm)	187	204.5	222	252

Technical Parameters

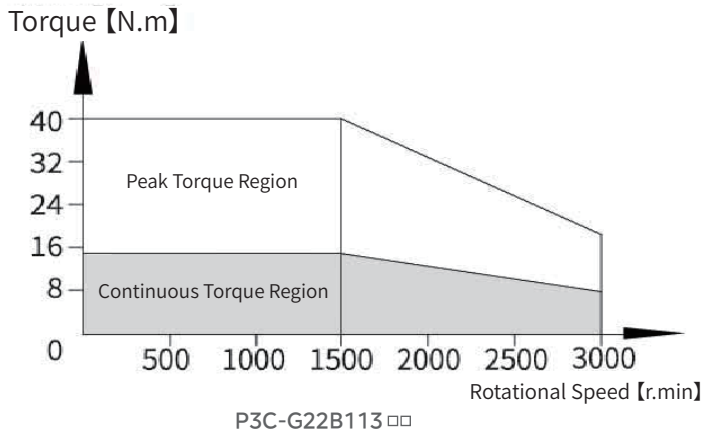
Motor Specifications	P3C-C10x113 □□		P3C-C15x113 □□		P3C-C20x113 □□		P3C-C30x113 □□
Rated Power (W)	1000		1500		2000		3000
Rated Voltage (V)	220	380	220	380	220	380	380
Rated Current (A)	5.8	3.5	8	4.7	10.2	6.2	11
Rated Torque (N·m)	4.77	4.77	7.16	7.16	9.55	9.55	14.3
Rated Speed (r/min)	2000	2000	2000	2000	2000	2000	2000
Peak Current (A)	17.4	10.5	24	14.1	30.6	18.6	33
Peak Torque (N·m)	14.31	14.31	21.48	21.48	28.65	28.65	42.9
Maximum Speed (r/min)	3000	3000	3000	3000	3000	3000	3000
Back EMF (V/1000r/min)	53	89	58	98	60	100	89
Torque Constant (N·m/A)	0.82	1.36	0.9	1.52	0.93	1.54	1.3
Winding Resistance (Line-to-Line) (Ω)	0.73	2.1	0.49	12	0.48	2.1	0.68
Winding Inductance (Line-to-Line) (mH)	9.7	28	7.3	17.8	6	26	9.5
Electrical Time Constant (ms)	13.3	13.3	14.9	14.8	12.5	12.4	14.0
Rotor Inertia (kg·m²×10⁻⁴)	5.98(7.21)		8.05(9.28)		10.13(11.36)		13.69(14.92)
Weight (kg)	5.4		7.1		8.3		10.7
Number of Pole Pairs	5 Pole Pairs						
Motor Insulation Class	ClassF						
Protection Rating (IP Code)	IP65						
Operating Environment	Ambient Temperature: -20°C to 40°C		Ambient Humidity: < 90% relative humidity (Non-condensing)				

Note: X:A indicates a rated voltage of 220V; B indicates a rated voltage of 380V. □ □ : For brake and encoder options, refer to the model designation rule.

130-Flange Medium-Inertia Motors



Torque-Speed Characteristic Curve



Outline Dimension Drawing	2200W
L without Brake (mm)	200
L with Brake (mm)	252

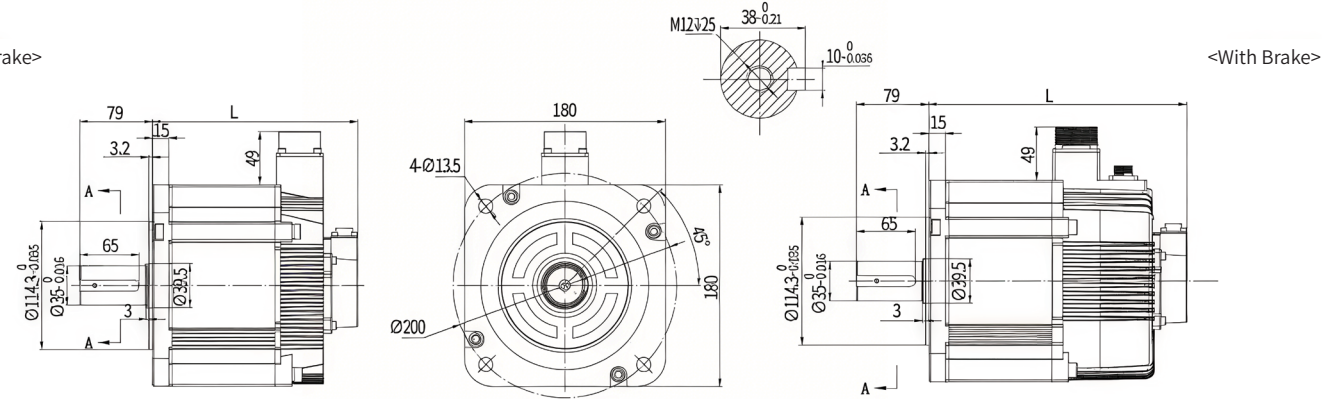
Motor Specifications	P3C-G22B113 □ □
Rated Power (W)	2200
Rated Voltage (V)	380
Rated Current (A)	10.5
Rated Torque (N·m)	14.3
Rated Speed (r/min)	1500
Peak Current (A)	29.4
Peak Torque (N·m)	40
Maximum Speed (r/min)	3000
Back EMF (V/1000r/min)	92
Torque Constant (N·m/A)	1.36
Winding Resistance (Line-to-Line) (Ω)	0.85

Motor Specifications	P3C-G22B113 □ □
Winding Inductance (Line-to-Line) (mH)	5.6
Electrical Time Constant (ms)	6.6
Rotor Inertia (kg·m²×10⁻⁴)	27.1 (28.33)
Weight (kg)	10.7
Number of Pole Pairs	5 Pole Pairs
Motor Insulation Class	ClassF
Protection Rating (IP Code)	IP65
Operating Environment	Ambient Temperature: -20°C to 40°C Ambient Humidity: < 90% relative humidity (Non-condensing)

Note:() are for motors with holding brakes.

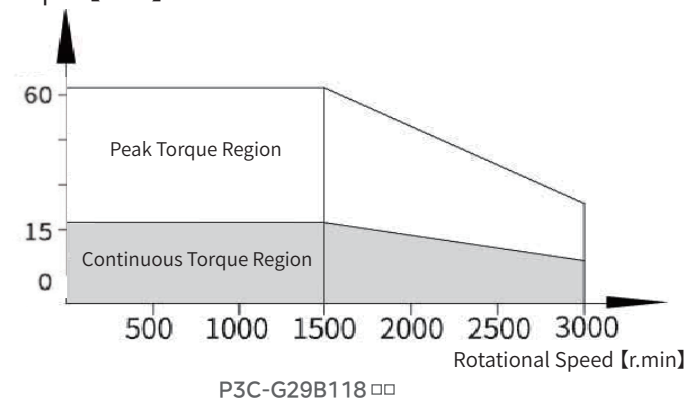
180-Flange Medium-Inertia Motors

<Without Brake>



Torque-Speed Characteristic Curve

Torque [N.m]



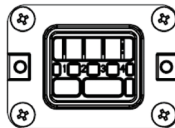
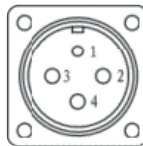
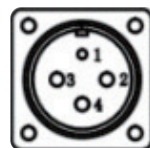
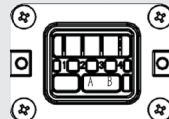
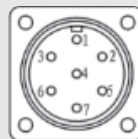
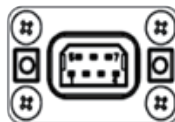
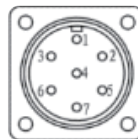
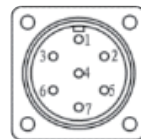
Outline Dimension Drawing	2.9kW
L without Brake (mm)	188
L with Brake (mm)	235

Motor Specifications	P3C-G29B118 □□
Rated Power (W)	2900
Rated Voltage (V)	380
Rated Current (A)	11.9
Rated Torque (N·m)	18.6
Rated Speed (r/min)	1500
Peak Current (A)	35.7
Peak Torque (N·m)	55.8
Maximum Speed (r/min)	3000
Back EMF (V/1000r/min)	100
Torque Constant (N·m/A)	1.56
Winding Resistance (Line-to-Line) (Ω)	0.37

Motor Specifications	P3C-G29B118 □□
Winding Inductance (Line-to-Line) (mH)	5.0
Electrical Time Constant (ms)	13.5
Rotor Inertia (kg.m ² ×10 ⁻⁴)	63.5 (69.5)
Weight (kg)	16.7
Number of Pole Pairs	5 Pole Pairs
Motor Insulation Class	ClassF
Protection Rating (IP Code)	IP65
Operating Environment	Ambient Temperature: -20°C to 40°C Ambient Humidity: < 90% relative humidity (Non-condensing)

Note:() are for motors with holding brakes.

Motor Connector Terminal Definitions

Classification	Configuration	Frame Sizes 40/60/80	Frame Sizes 100/130	Frame Size 180																																																
Power Connector	Without Brake	Receptacle Model: San Zhu SC-MC6P-AP2G-054  <table><tr><td>1</td><td>V</td></tr><tr><td>2</td><td>U</td></tr><tr><td>3</td><td>W</td></tr><tr><td>4</td><td>PE</td></tr></table>	1	V	2	U	3	W	4	PE	Receptacle Model: YD28J4Z  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Definition</td><td>PE</td><td>U</td><td>V</td><td>W</td></tr></table>	Pin Number	1	2	3	4	Definition	PE	U	V	W	Receptacle Model: YD32J4Z  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Definition</td><td>PE</td><td>U</td><td>V</td><td>W</td></tr></table>	Pin Number	1	2	3	4	Definition	PE	U	V	W																				
	1	V																																																		
2	U																																																			
3	W																																																			
4	PE																																																			
Pin Number	1	2	3	4																																																
Definition	PE	U	V	W																																																
Pin Number	1	2	3	4																																																
Definition	PE	U	V	W																																																
With Brake	Receptacle Model: San Zhu SC-MC6P-AP2G-044  <table><tr><td>1</td><td>V</td><td rowspan="2">A</td><td rowspan="2">Brake Terminal</td></tr><tr><td>2</td><td>U</td></tr><tr><td>3</td><td>W</td><td rowspan="2">B</td><td rowspan="2">Brake Terminal</td></tr><tr><td>4</td><td>PF</td></tr></table>	1	V	A	Brake Terminal	2	U	3	W	B	Brake Terminal	4	PF	Receptacle Model: YD28J7Z  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Definition</td><td>PE</td><td>U</td><td>V</td><td>W</td><td>Brk+</td><td>Brk-</td><td>空</td></tr></table>	Pin Number	1	2	3	4	5	6	7	Definition	PE	U	V	W	Brk+	Brk-	空	Main and brake power interfaces have dedicated power inputs. Main Power Receptacle Model: YD32J4Z  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Definition</td><td>PE</td><td>U</td><td>V</td><td>W</td></tr></table> Brake Power Receptacle Model: XS16J4Z  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Definition</td><td>Brk+</td><td>Brk-</td><td>None</td><td>None</td></tr></table>	Pin Number	1	2	3	4	Definition	PE	U	V	W	Pin Number	1	2	3	4	Definition	Brk+	Brk-	None	None	
1	V	A	Brake Terminal																																																	
2	U																																																			
3	W	B	Brake Terminal																																																	
4	PF																																																			
Pin Number	1	2	3	4	5	6	7																																													
Definition	PE	U	V	W	Brk+	Brk-	空																																													
Pin Number	1	2	3	4																																																
Definition	PE	U	V	W																																																
Pin Number	1	2	3	4																																																
Definition	Brk+	Brk-	None	None																																																
ncoder Interface	Without Brake	Receptacle Model: San Zhu SC-MC7P-A60G-18  <table><tr><td>1</td><td>DATA+</td><td>5</td><td>+5V</td></tr><tr><td>2</td><td>DATA-</td><td>6</td><td>OV</td></tr><tr><td>3</td><td>BAT+</td><td>7</td><td>FG</td></tr><tr><td>4</td><td>BAT-</td><td></td><td></td></tr></table>	1	DATA+	5	+5V	2	DATA-	6	OV	3	BAT+	7	FG	4	BAT-			Receptacle Model: YD28J7Za  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Definition</td><td>PE</td><td>E-</td><td>E+</td><td>SD-</td><td>OV</td><td>SD+</td><td>5V</td></tr></table>	Pin Number	1	2	3	4	5	6	7	Definition	PE	E-	E+	SD-	OV	SD+	5V	Receptacle Model: YD28J7Za  <table><tr><td>Pin Number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Definition</td><td>PE</td><td>E-</td><td>E+</td><td>SD-</td><td>OV</td><td>SD+</td><td>5V</td></tr></table>	Pin Number	1	2	3	4	5	6	7	Definition	PE	E-	E+	SD-	OV	SD+	5V
1	DATA+	5	+5V																																																	
2	DATA-	6	OV																																																	
3	BAT+	7	FG																																																	
4	BAT-																																																			
Pin Number	1	2	3	4	5	6	7																																													
Definition	PE	E-	E+	SD-	OV	SD+	5V																																													
Pin Number	1	2	3	4	5	6	7																																													
Definition	PE	E-	E+	SD-	OV	SD+	5V																																													

BD3+P3C Cables and Kit Selection

P3C Series Motor Category	Drive Type	Length (m)	Extension Power Cable (without Brake)			Extension Power Cable (with Brake)		
			Front Exit	Rear Exit	Connector Kit	Front Exit	Rear Exit	Connector Kit
Frame Size 40 LA5/L01	BD3 Series	3	SPC-A65011-0303-F	SPC-A67011-0303-F	Front Exit: CAP-A6-01-A Rear Exit: CAP-A6-01-B	SPC-A66021-0403-F	SPC-A68021-0403-F	Front Exit: CAP-A6-02-A Rear Exit: CAP-A6-02-B
		5	SPC-A65011-0305-F	SPC-A67011-0305-F		SPC-A66021-0405-F	SPC-A68021-0405-F	
		10	SPC-A65011-0310-F	SPC-A67011-0310-F		SPC-A66021-0410-F	SPC-A68021-0410-F	
Frame Size 60/80 L10	BD3 Series	3	SPC-A65031-0503-F	SPC-A67031-0503-F	Front Exit: CAP-A6-03-A Rear Exit: CAP-A6-03-B	SPC-A66041-0603-F	SPC-A68041-0603-F	Front Exit: CAP-A6-04-A Rear Exit: CAP-A6-04-B
		5	SPC-A65031-0505-F	SPC-A67031-0505-F		SPC-A66041-0605-F	SPC-A68041-0605-F	
		10	SPC-A65031-0510-F	SPC-A67031-0510-F		SPC-A66041-0610-F	SPC-A68041-0610-F	
Frame Size 100/130 L10/L15/C10/C15	BD3 Series	3	SPC-AG1051-0903-F		CAP-AG-05-1	SPC-AH1061-1003-F		CAP-AH-06-1
		5	SPC-AG1051-0905-F			SPC-AH1061-1005-F		
		10	SPC-AG1051-0910-F			SPC-AH1061-1010-F		
Frame Size 100/130 G22/L20/L25/ C20/C30	BD3 Series	3	SPC-AG2071-1503-F		CAP-AG-07-1	SPC-AH2081-1603-F		CAP-AH-08-1
		5	SPC-AG2071-1505-F			SPC-AH2081-1605-F		
		10	SPC-AG2071-1510-F			SPC-AH2081-1610-F		

P3C Frame 180 Model	Drive Type	Length(m)	Power Cable (Without Brake)	Power Cable Kit (Without Brake)	Brake Power Cable	Brake Cable Kit
Frame Size 180 G29	BD3 Series	3	SPC-AJ1091-1703-F	CAP-AJ-09-1	SBC-AK1131-0203-F	CAP-AK-13-1
		5	SPC-AJ1091-1705-F		SBC-AK1131-0205-F	
		10	SPC-AJ1091-1710-F		SBC-AK1131-0210-F	

Note: For Frame 180 motors, the power cable and brake power cable have separate terminals. For non-brake models, select the power cable without brake connector. For motors with brake, select the power cable without brake connector plus the brake power cable.

P3C Series Motor Category	Drive Type	Length (m)	Encoder Cable Extension (Single-Turn Absolute, Without Battery/Battery Case Assembly)			Encoder Cable Extension (Multi-Turn Absolute, With Battery/Battery Case Assembly)		
			Front Exit	Rear Exit	Connector Kit	Front Exit	Rear Exit	Connector Kit
Frame Size 40 LA5/L01	BD3 Series	3	SFC-A81A41-0103-F	SFC-A83A41-0103-F	CAP-A8-A4-1	SFC-A82A43-0103-F	SFC-A84A43-0103-F	CAP-A8-A4-3
		5	SFC-A81A41-0105-F	SFC-A83A41-0105-F		SFC-A82A43-0105-F	SFC-A84A43-0105-F	
		10	SFC-A81A41-0110-F	SFC-A83A41-0110-F		SFC-A82A43-0110-F	SFC-A84A43-0110-F	
Frame Size 60/80 L10	BD3 Series	3	SFC-A91A41-0103-F	SFC-A93A41-0103-F	CAP-A9-A4-1	SFC-A92A43-0103-F	SFC-A94A43-0103-F	CAP-A9-A4-3
		5	SFC-A91A41-0105-F	SFC-A93A41-0105-F		SFC-A92A43-0105-F	SFC-A94A43-0105-F	
		10	SFC-A91A41-0110-F	SFC-A93A41-0110-F		SFC-A92A43-0110-F	SFC-A94A43-0110-F	
Frame Size 100/130 L10/L15/C10/C15	BD3 Series	3	SFC-AH3A41-0103-F		CAP-AH-A4-1	SFC-AH4A43-0103-F		CAP-AH-A4-3
		5	SFC-AH3A41-0105-F			SFC-AH4A43-0105-F		
		10	SFC-AH3A41-0110-F			SFC-AH4A43-0110-F		



WeChatOfficial Account



Channels



Official Website

Our company is committed to continuous product improvement. Therefore, product specifications are subject to change without notice.

Servotronics Motion Technology (Shenzhen) Co., Ltd.

Address: Unit 13B01, Tower B, Kelou Building, No. 99 Baoshen Road, Songpingshan Community, Xili Street, Nanshan District, Shenzhen, Guangdong, China

Tel: 400-111-8669

Fax: +86 0755 86626665

Email: servotronics@midea.com

Website: www.servotronics.cn