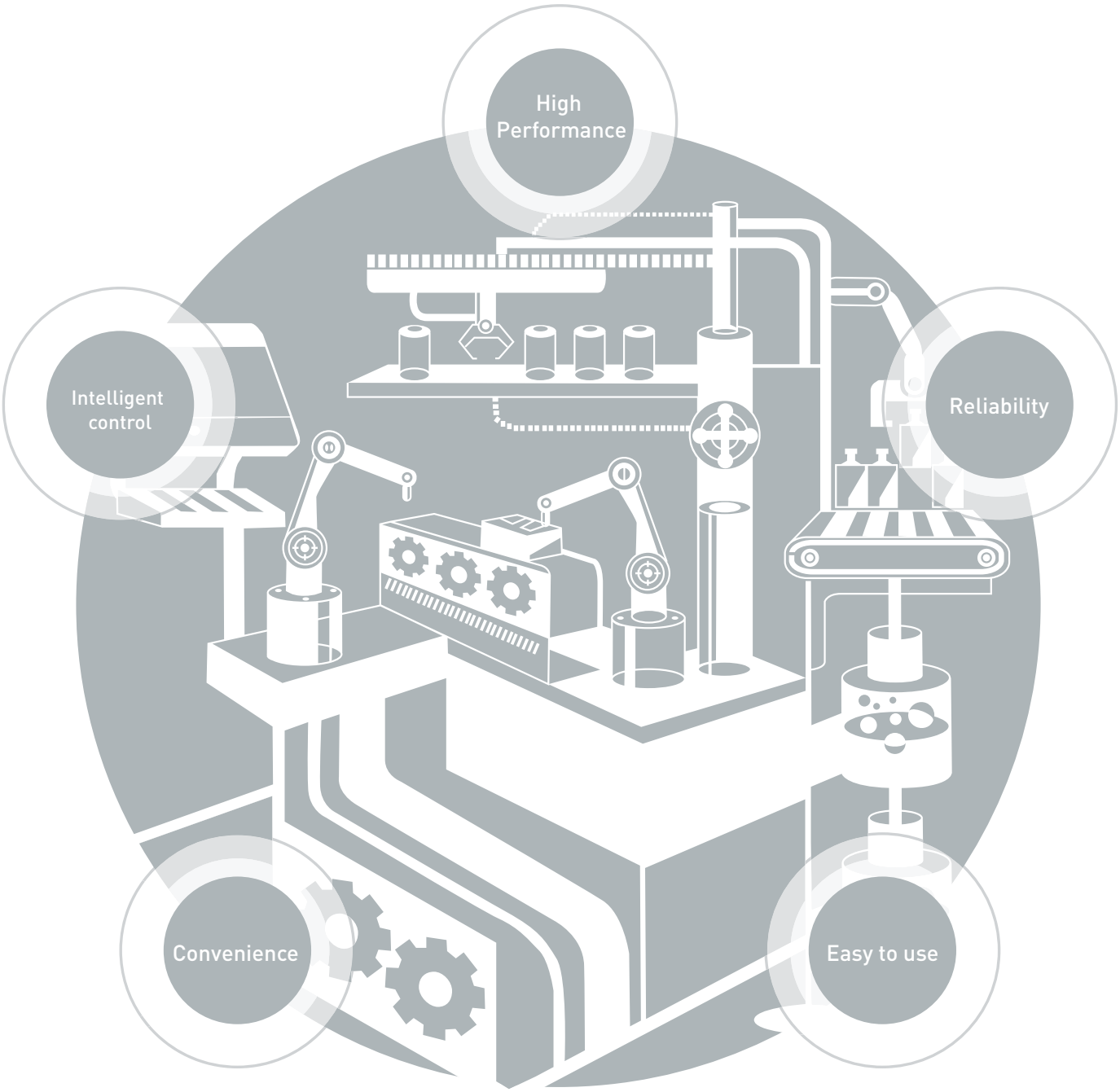
Top 100
Global
Innovator
for 10 years

Xmotion

Servo System


High Performance
Intelligent control
Reliability
Convenience
Easy to use

Xmotion
Servo System

With more features and power than
you ever imagined, the Xmotion Servo System
is your optimal solution.

Xmotion Series

The LS Xmotion Servo System realizes your optimal solution through user-oriented features such as high-performance vector, precision, and speed control; and a diverse product line that offers the best drives suiting your extensive field applications.

Features

It's Slim

145.2mm

Minimized Width to 38mm
Increase equipment utilization through Zero Stack application, light weight, and miniaturization

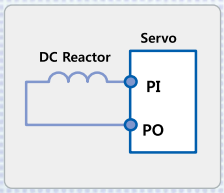
Reliability

Improved Main Capacitor Quality

- Long-life type capacitor applied (2.5x improvement)

Convenient DC Reactor Installable

- Power connection to DC-link
- Easier wiring and smaller size compared to 3-phase AC reactor
- Connection for DC input (PI, N)



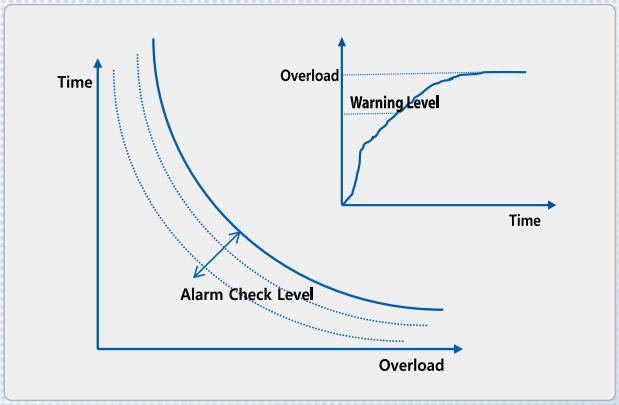
Stable Turn-off Function Based on Detection of Control Power Turn-off

Upgraded Protection Function(I)

- Triple protection functions for power module
  : IPM fault, CL detecting, over current detecting with S/W
- Main power mis-wiring detecting function : Selectable between 3-phase or single phase, alarm and warning available
- Overheat protection with thermal sensor in the drive and motor
- Alarm code grouping and exclusive output contacts (AL00, AL01, AL02)
- Warning function (digital output, warning output)
  : Mis-wiring of power, low voltage for encoder battery, over speed command, over torque command, over load, mis-matched motor and drive

Upgraded Protection Function(II)

- Supports accumulated overload detection for regenerative transistors
  : Protect algorithm is provided with embedded resistor characteristic
  : Protection by capacity (P0-11) and resistance (P0-10)
  : Supports derating factor for radiant heat
- Continuous overload capacity configurable according to operating conditions
  : Protect with separated overload table at stall & operation
  : Overload check level customizable (P0-12)
  : Warning signal output level customizable (P0-13)

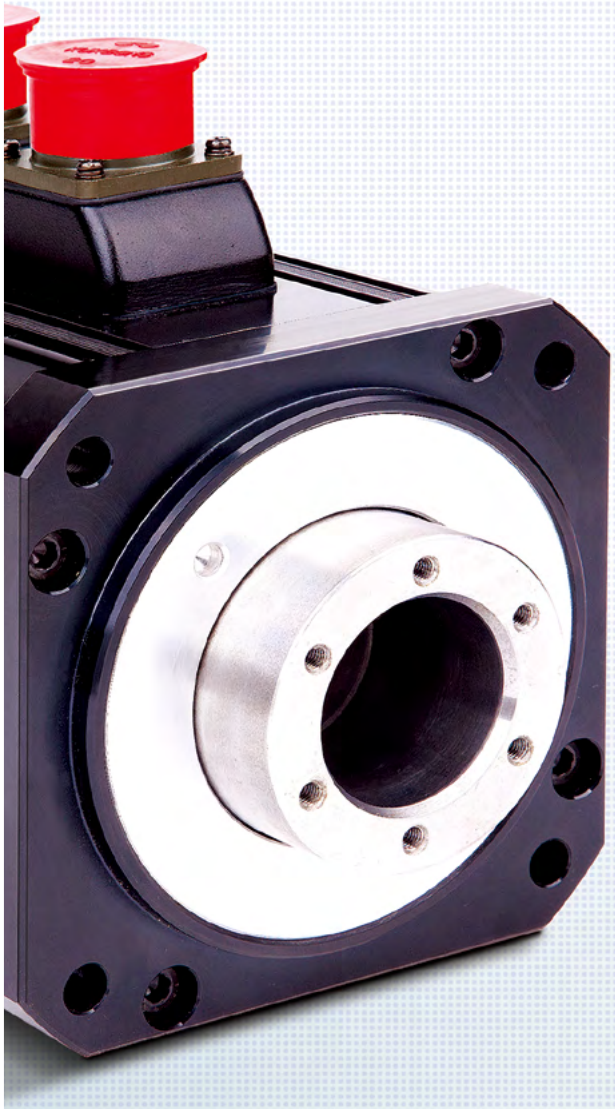


CE, RoHS, UL Certificated

lead-free

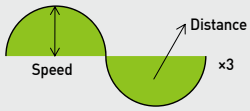
Easy to USE

Complete with user-oriented manipulability and specifications optimized for the global environment, our products will become your reliable partner.



Easy Gain Tuning With Automatic Inertia Estimating Function

- Quick & Accurate Inertia Estimating
- Off-Line Tuning
- Parameter for Estimation (Speed &Distance)



Encoder With Bi-directional High Speed Serial Communication

- Auto-recognition of motors and encoders
- BiSS protocol
- Reduced wires(7 wires) for easy wiring, noise resistant

BiSS INTERFACE

Sufficient Input/Output Contacts and Various Functions

- iX7M:Digital input contacts : 3 (each axis) , 1 (common) / Output contacts : 2 (each axis) , 1 (common)
- iX7NH: Digital input contacts: 6, output contacts: 3 / Analog input contacts: 1 and output contacts: 2
- L7NH: Digital input contacts: 8, output contacts: 4 / Analog input contacts: 1 and output contacts: 2
- L7S: Digital input contacts: 10, output contacts: 8 / Analog input contacts: 2 and output contacts: 2
- L7C: Digital input contacts: 10, output contacts: 5 / Analog input contacts: 2 and output contacts: 0
- L7P: Digital input contacts: 16, output contacts: 8 / Analog input contacts: 2 and output contacts: 2
- PEGASUS: Digital input contacts: 4, output contacts: 2 / Analog input contacts: 1 and output contacts: 1
- Flexible assignment of input/output signals by parameters and contact setting based on the input/output contact type (N.O / N.C contacts)

Drive Node Address Configurable Through Rotary Switch [iX7NH, L7NH, L7P, PEGASUS]

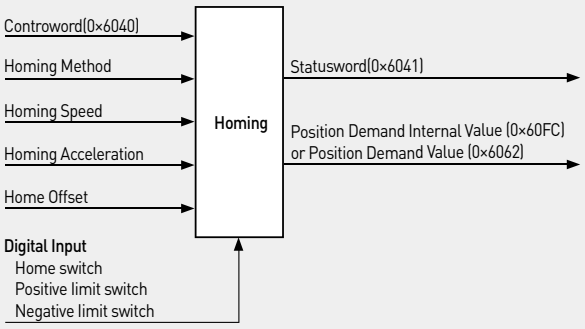
- Rotary switch enables easy configuration of drive node addresses
- iX7M : 0~99, iX7NH : 0~99, L7NH : 0~99, L7P : 0~31, PEGASUS : 0~15

Screw-type Power Connection

• Expanded to 1kW - 3.5kW (400V) for improved wiring convenience

Various Homing Functions [iX7M iX7NH, L7NH, L7P, PEGASUS]

• Homing function provided with each drives
• You can specify the speed, acceleration, offset, and homing method.

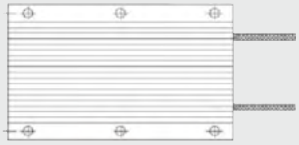


Easy Firmware Upgrade [iX7M, iX7NH, L7NH, L7P, PEGASUS]

• USB OTG enables firmware download using USB flash drives
• Useful where space is limited or environmentally unfavorable

Built-in Regenerative Braking Resistance in the Drive

• Drive installed inside to improve user convenience
• Provides connection for external installation
• Enhanced protection algorithm



The Xmotion Servo is the ultimate servo system, complete with high speed, incredible performance and convenience.

High Performance

Serial Encoder of High Resolution (16 bit - 21 bit)

- Stability improved during precision position control and low-speed operation

Stable Low-speed Properties Based on Precise Speed Measurement

- Stable speed measurement at low speed

Calculation Speed Improved [iX7M, iX7NH, L7NH, L7P, PEGASUS]

- FPU (Floating Point Unit) for reliable precision calculation
- Maximum16kHz switching frequency for precision current control
- 32 bit operation for increased synchronous command processing rate (MIPS)

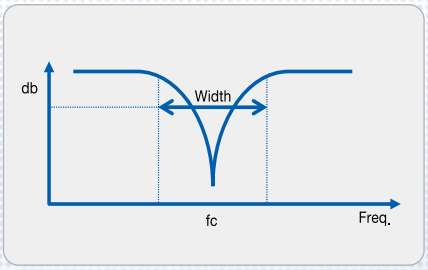
Dedicated PC Program

- L7S : LIVE-I.C.E
  iX7M, iX7NH, L7NH, L7NHF, L7C, L7P, PEGASUS, PH0X : Drive CM
- PC program for shortens equipment tuning time and debugging
- Supports monitoring for speed, torque, current feedback, position values, positional error values and alarm occurrence time

Intelligent Control

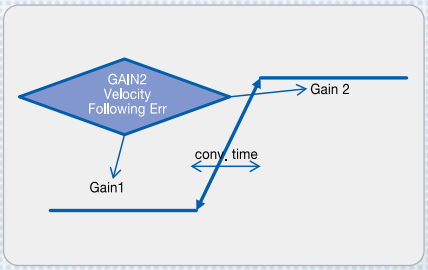
Notch Filter for Resonance Suppression

- 4-step notch filter
- 2-step vibration suppression filter at the load position
- FFT function for real-time frequency analysis



Various Gain Switching Modes for Improved Control Performance

- P/PI auto-switching function to reduce overshooting during acceleration/deceleration
- Various Gain1↔Gain2 switching modes



Various Dynamic Brake Control Modes

- Configurable operation mode at stop and after stop

Convenience

Our products provide differentiated customer experiences through powerful features such as backup, network diagnosis and monitoring.

High Performance

- High speed, real-time communication and synchronization mechanism

Cost Effective

- Standard Ethernet cabling and connectors, reduced cost of implementation for masters and slaves

Easy to Use

- Supports versatile topology for easy diagnostics

L7 Drive With Built-in EtherCAT Interface

- 100BASE-TX(100Mbps) Ethernet based real-time communication
- Supports CiA402(IEC61800-7) drive profile
- Supports connection with various masters and slaves
- Max. 100m between nodes
- Precise synchronization mechanism (1us)
- Freely adjustable PDO mapping
- Four status indication LEDs (L/A0, L/A1, RUN, ERR)
- Standard RJ45 connector and cabling(CAT5)
- Supports fifteen homing modes
- Support Full-closed control (L7NHF)

Various Operation Modes

- iX7NH, L7NH and PEGASUS: Uses EtherCAT communication to support Cyclic & Profile (P/S/T) modes, EOE, COE, and FOE

Safe Torque Off Function

- Torque-off forced by hardware signals without drive CPU and FPGA (ASIC) involvement; international standards adopted

High Speed Position Capture Function

- Touch probe function (PROBE1, PROBE2)

Supports Adjustment in Tandem with XGT Series

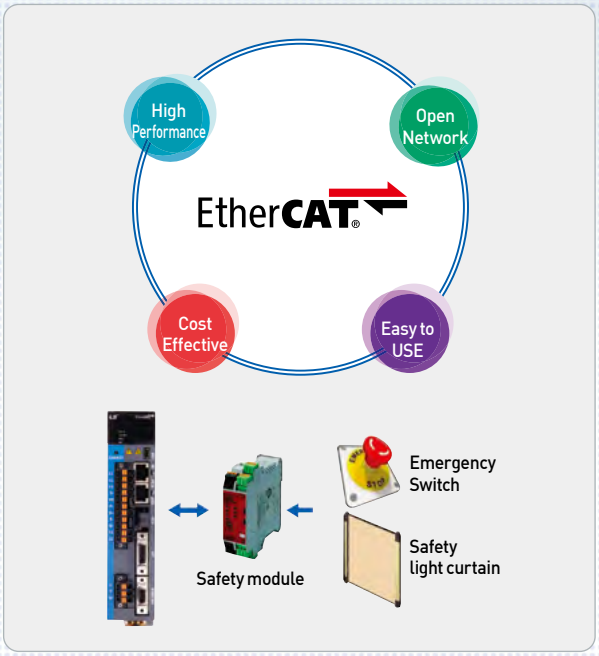
- Inertia detection, position/speed gain manual adjustment, gain switching setup, etc.

EtherCAT Drive Compatibility

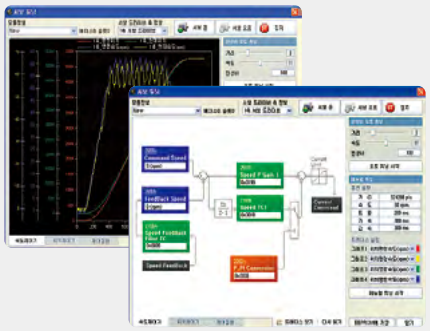
- In-house test using CTT(Conformance Test Tool)

Open Network

- International standard network with over 1600 members

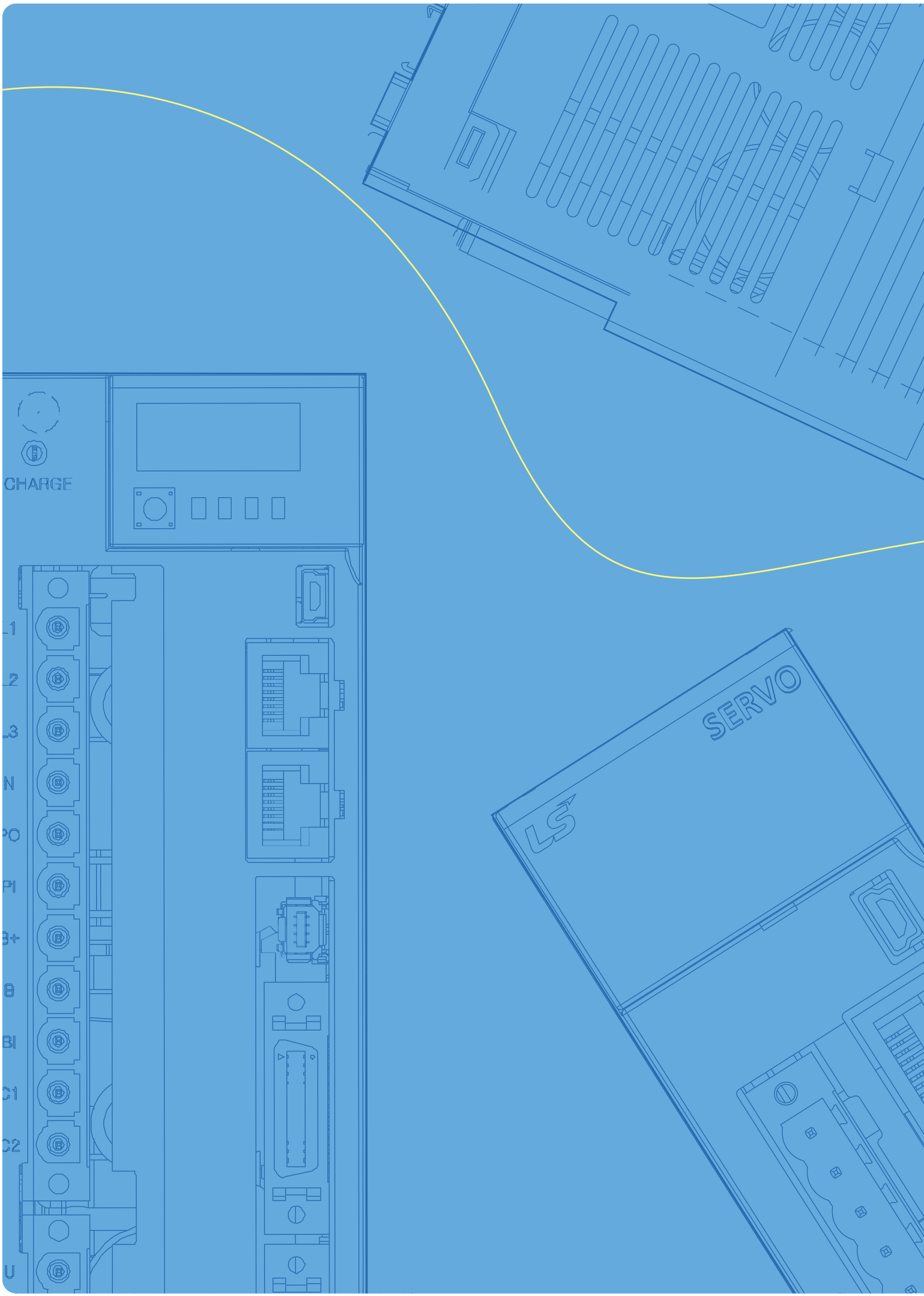


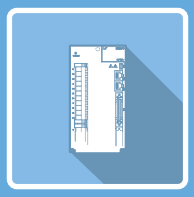
LS ELECTRIC XGT PLC + PN8B



Gain Tuning Tools and Software Package Provided

- Automatic inertia tuning and PI gains
- Gain conversion setting
- Manual fine gain tuning tool
- Adjustment, saving and initialization of parameters
- Alarm history


CHARGE
SERVO
LS



Servo Drive

Contents

iX7M Series

Servo Drive Designation

iX7M — A — □ □ □ □ B AA

Input Voltage	Capacity 1	Capacity 2	Capacity 3	Capacity 4	Encoder Type	Options
A : 200VAC	Capacities				B : BiSS	Exclusive Option Code
	2 : 200W					
	4 : 400W					
	8 : 750W					
	A : 1kW					
	X: No Axis					

Capacity Designation

1. Capacities are marked on descending order
2. Number of digits indicate number of axes

Example)

iX7M-A-222XB ⇨ 3-axis, 200W -200W -200W
iX7M-A-4444B ⇨ 4-axis, 400W -400W-400W-400W
iX7M-A-AAXXB ⇨ 2-axis, 1KW-1KW

Parts Identification

High-Performance Multi Purpose Servo Drive iX7M

One Servo Drive Controls Up To Four Axes

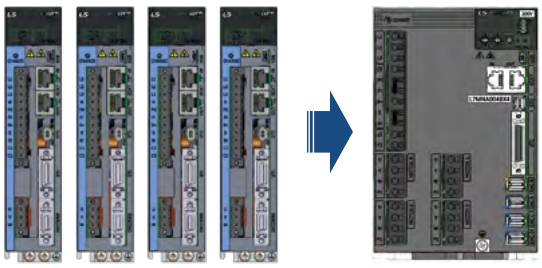
- High space efficiency and low price
- Three platforms (2-, 3- and 4-axis) provided
- Applicable to various areas, such as robot, CNC machining, 3D printing and automotive manufacturing

Minimized Installation Space & Maximized User Convenience

- Up to 40% reduced space compared to single-axis configuration
- Minimized cable wiring reduces installation space

High Precision, High Response Control Solution

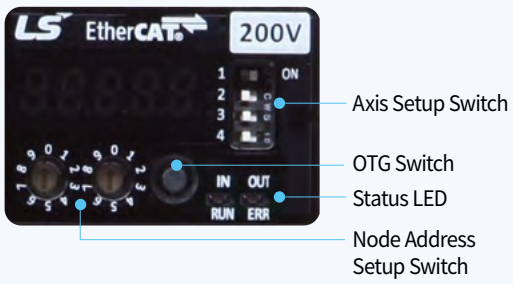
- EtherCAT-based communication supports up to 125μs communication cycle
- Encoder supports 23-bit resolution

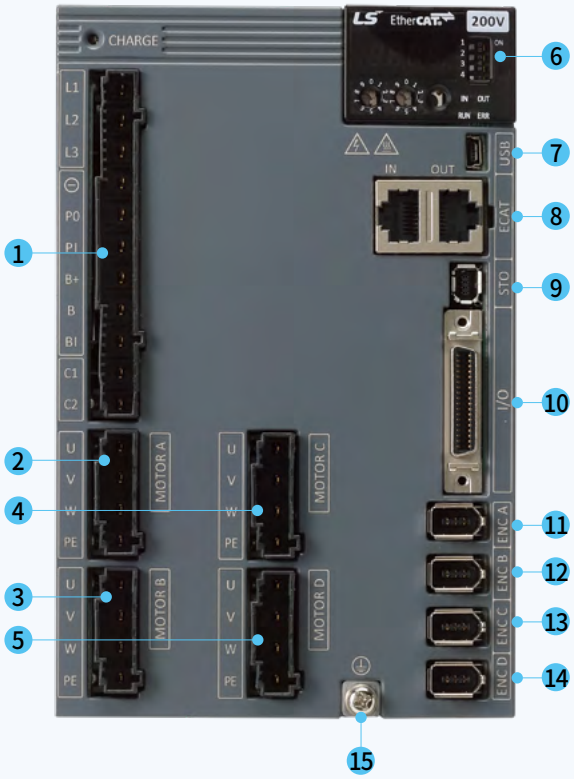


L7NHA Drive
182mm

Multi Axes Drive
110mm

[Up to 40% reduced space]
[Compared to our L7NHA 4-axis model]





1. Main Power / Control Power
2. Motor Power (1 Axis)
3. Motor Power (2 Axis)
4. Motor Power (3 Axis)
5. Motor Power (4 Axis)
6. Fixed-type Window
7. USB
8. EtherCAT
9. STO
10. I/O
11. Motor Encoder (1 Axis)
12. Motor Encoder (2 Axis)
13. Motor Encoder (3 Axis)
14. Motor Encoder (4 Axis)
15. Ground Terminal (PE)

Product Features

Enhanced Auto-Tuning

- ONE parameter tuning
- Vibration control
- FRF and adaptive filter (frequency detection and resonance removal)

Enhanced Connectivity

- Supports Modbus TCP
- Supports FoE
- Real-time motion library included

Enhanced Diagnosis

- Collects various predictive maintenance data
- Monitors encoder temperature
- Alarm tracing
  - Date, time and tracing data for up to 4 channels saved for alarms

New Features

- Encoder decimation output
- Diverse USB OTG features
  - Backup/restoration of drive parameters and alarm history backup

Enhanced User Convenience

- Clamp-type power connector and motor connectors for easy wiring
  - 4P motor connectors enable easy 4P wiring
- Supports PC software for status monitoring, parameter edit and OS update

Multi-Axis EtherCAT Servo Drive Product Line

Drive	Frame	Size (W×D×H)	Capacity				Specifications		
			1Axis	2Axis	3Axis	4Axis	Rated Current [Arms, Per Axis]	Max. Current [Arms, Per Axis]	Overload Rate [%]
4-Axis Drive	Frame-1	110×198×174	400W	400W	400W	400W	3	10.5	350
			200W	200W	200W	200W	1.7	5.95	350
3-Axis Drive	Frame-2	90×198×174	400W	400W	400W	-	3	10.5	350
			200W	200W	200W	-	1.7	5.95	350
2-Axis Drive (Medium Capacity)			1kW	1kW	-	-	6.75	23.62	350
			750W	750W	-	-	5.2	18.2	350
2-Axis Drive (Small Capacity)	Frame-3	70×198×174	400W	400W	-	-	3	10.5	350
			200W	200W	-	-	1.7	5.95	350

※ Please inquire if linear motors are used.

Product Specifications

iX7M Drive

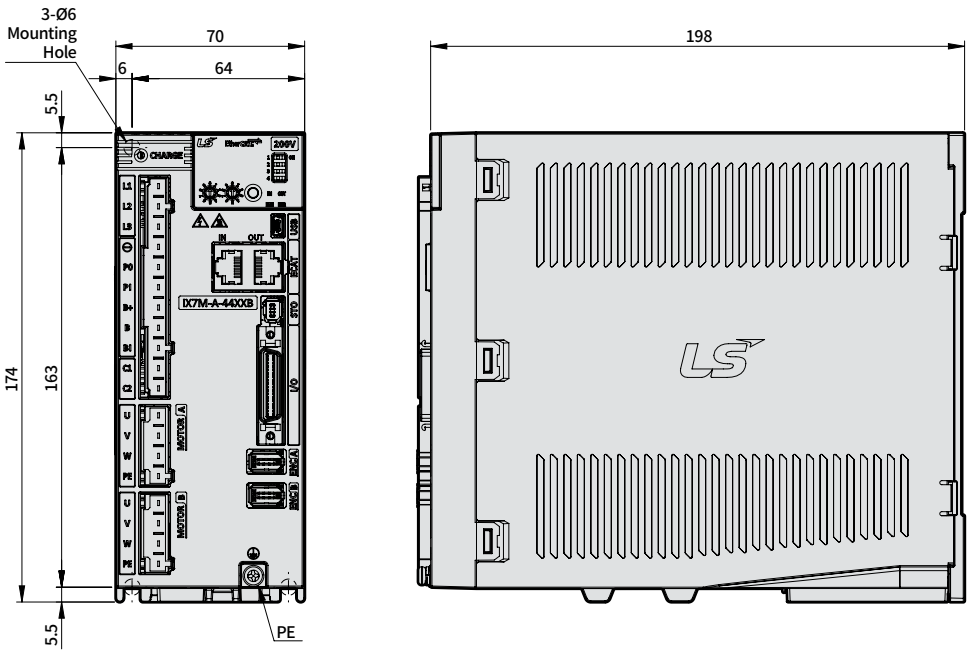
Item \ Part Number		iX7M-A-22XXB iX7M-A-222XB iX7M-A-2222B	iX7M-A-44XXB iX7M-A-444XB iX7M-A-4444B	iX7M-A-88XXB	iX7M-A-AAXXB
Input Power	Main Power	3-Phase AC200 ~ 240[V], (-15 ~ +10[%]), 50 ~ 60[Hz]			
	Control Power	1-Phase AC200 ~ 240[V], (-15 ~ +10[%]), 50 ~ 60[Hz]			
Rated Current [A], Per Axis		1.7	3	5.2	6.75
Max. Current [A], Per Axis		5.95	10.5	18.2	23.63
Encoder Type		BiSS-C(Absolute, Incremental)			
Control Performance	Speed Control Range	Max. 1 : 5,000			
	Speed Variation Ratio	±0.01[%] or less (Load variation 0~100[%]), ±0.1[%] or less (temperature: 25±10[°C])			
	Torque Control Repetition Accuracy	±1[%] or less			
EtherCAT Communication	Communication Standard	FoE (firmware download) EoE (parameter setting by UDP, tuning, secondary function, parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CiA 402 Drive profile)			
	Physical Layer	100BASE-TX(IEEE802.3)			
	Connector	RJ45 x 2			
	Communication Distance	Distance between nodes 100[m] or less			
	DC (Distributed Clock)	Synchronization by DC(Distributed Clock) mode. Minimum DC cycle: 125[μs]			
	LED Display	Link Act IN, Link Act OUT, RUN, ERR			
	CiA402 Drive Profile	Profile Position Mode Profile Velocity Mode Profile Torque Mode Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode Cyclic Synchronous Torque Mode Homing Mode			
Digital Input / Output	Digital Input	Input voltage range: DC 12[V] ~ DC 24[V] 3 input channels per axis (allocable) / 1 shared input channel (EMG fixed for all axes) Inputs of total 15 functions are selectively allocable (*POT, *NOT, *HOME, STOP, PCON, GAIN2, P_CL, N_CL, PROBE1, PROBE2, EMG, A_RST, SV_ON, LVSF1, LVSF2) Note) *: Fundamentally allocated signals			
	Digital Output	Service rating: DC 24[V] ±10%, 40[mA] 2 output channels per axis (allocable) / 2 shared output channel (allocable) Outputs of total 11 functions are selectively allocable (*BRAKE, **ALARM, **READY, ZSPD, INPOS1, TLMT, VLMT, INPOS2, INSPD, WARN, TGON) Note) *: Fundamentally allocated signals, **: Default allocated signals for shared and per-axis output			
Encoder Decimation Output		Differential Line Driver 3 channels AO, /AO, BO, /BO, ZO, /ZO up to 6.5 [Mpps] on 4x interpolation on 2-axis models. Not supported on 2- or 3-axis models.			
Safety Features		2 input channels(STO1 and STO2), 1 output channel(EDM)			
USB Communication	Function	Firmware download, tuning, test drive, monitoring and parameter duplication			
	Communication Standard	Complies with USB 2.0 Full Speed and OTG 2.0 standards			
	Accessible Device	PC or USB Storage device			
Integrated Features	Dynamic Braking	Standard built-in brake (activated when the servo alarm goes off or when the servo is off)			
	Regenerative Braking	Built-in by default, external installation available			
	Display Function	7-segment display (5 digits)			
	Self-Setting Function	Drive node address setting is possible using rotary switch			
	Additional Function	Gain tuning, alarm history, jog operation, home searching			
	Protection Function	Overcurrent, overload, overheat, overvoltage, insufficient voltage, overspeed, abnormal state of encoder, regenerative braking error, DC fan error, position following error, current detecting error			
Operation Environment	Operating Temperature / Storage Temperature	0 ~ +50[°C] / -20~ +65[°C]			
	Operating Humidity / Storage Humidity	Under 90[%]RH (noncondensing)			
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid.			

External Dimensions

*Unit [mm]

iX7M-A-22XXB / iX7M-A-44XXB

[Weight: 1.9kg (With Cooling Fan)]

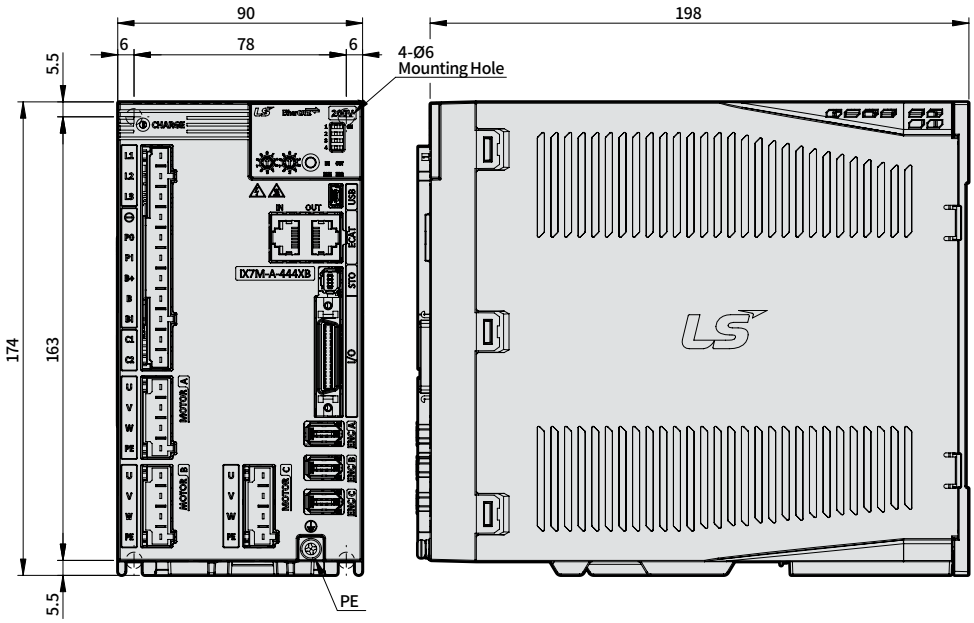


*Unit [mm]

iX7M-A-88XXB / iX7M-A-AAXXB

iX7M-A-222XB/ iX7M-A-444XB

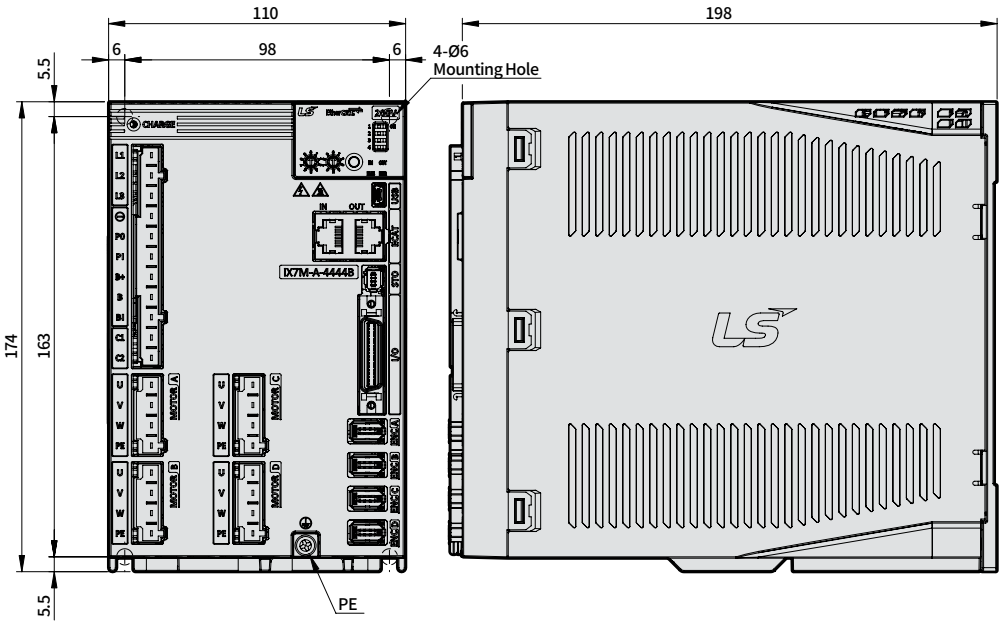
[Weight: 2.4kg (With Cooling Fan)]



iX7M-A-2222B/ iX7M-A-4444B

[Weight: 2.8kg (With Cooling Fan)]

*Unit [mm]



iX7NH Series

Servo Drive Designation

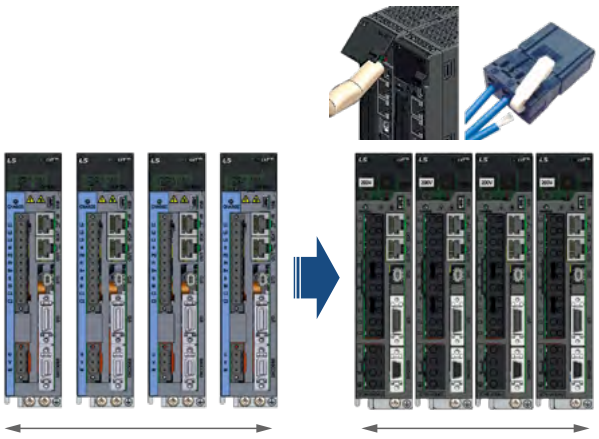
iX7	NH	A	004	U	AA
	Communication	Input Power Supply	Capacity	Encoder Type	Option
	Network Type	A : 200VAC	001 : 100W	U : Universal	Exclusive Option Code
			002 : 200W		
			004 : 400W		
			008 : 750W		
			010 : 1.0kW		
			020 : 2.0kW		
			035 : 3.5kW		

Parts Identification

Next Generation EtherCAT Network Command Type iX7NH

Compact & Convenience

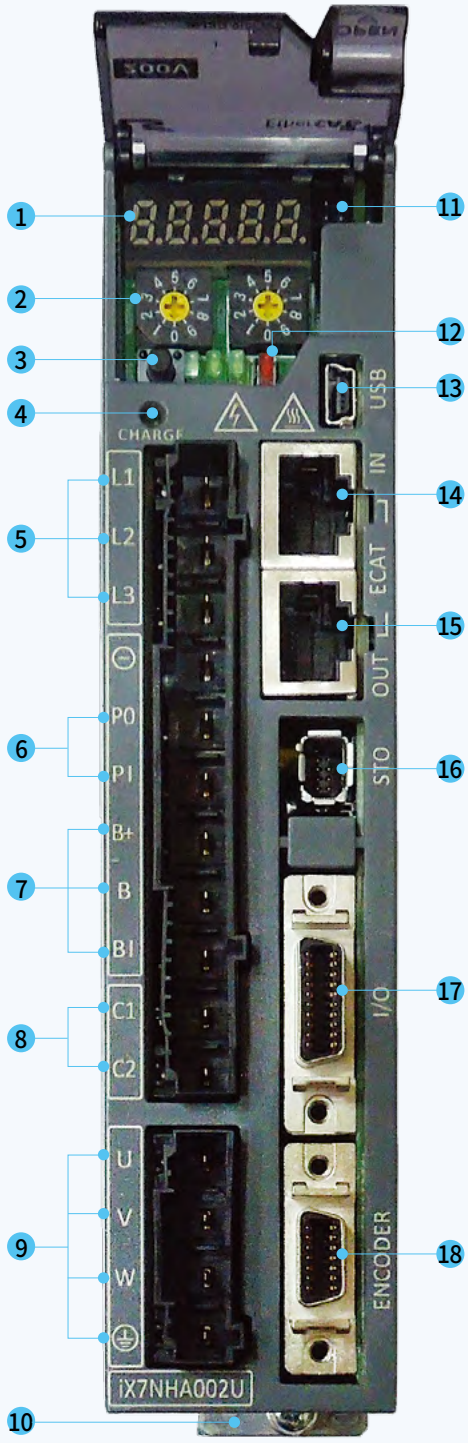
- Zero-stack installation space achieved through highly efficient heat dissipation
  - 100W ~ 1kW Drive
- Minimized drive depth for 100W and 200W drives through development and application of smaller heat sinks
  - 172.5mm → 145.2mm ; volume reduced by 16%
- Easy-to-open parameter display cover
- Spring clamp connector applied for easier wiring



L7NH Series, when operating temperature/ load is high
182mm

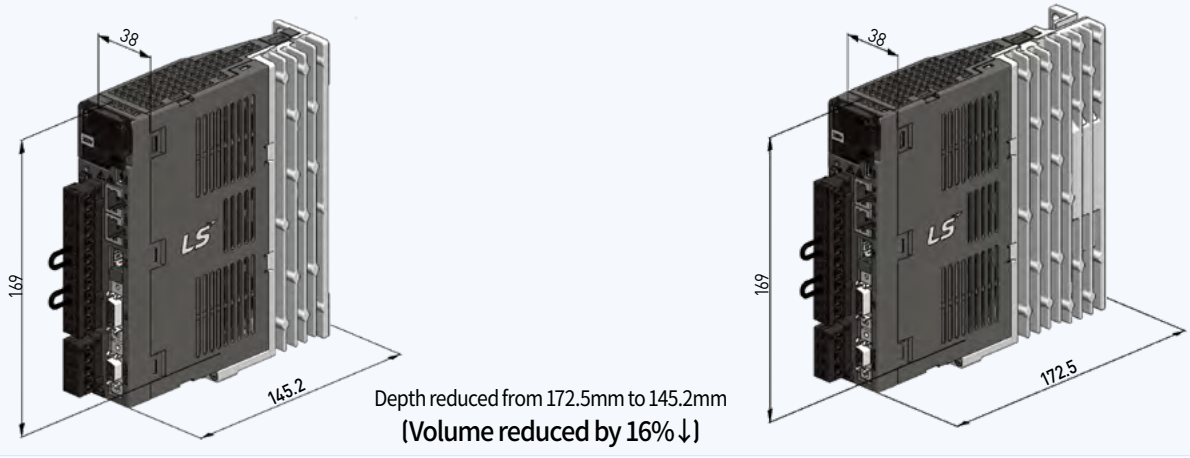
When ambient temperature is between 0°C and 45°C
155mm

[Small-capacity Model Shown]



1. Display
2. Node address configuration switch
3. OTG switch
4. Charge indicator
5. Main power connector (L1, L2, L3)
6. DC Reactor connector (P0, P1)
7. Regenerative resistance connector (B+, B, BI)
   - Short-circuit B and BI terminals when using standard type
   - Use B+ and B terminals when using external resistor
8. Control power connector (C1, C2)
9. Servo motor connecting terminal (U,V,W)
10. Ground terminal
11. Connector for analog monitor
12. State LED
13. USB Connector(USB)
14. EtherCAT communication port(IN)
15. EtherCAT communication port(OUT)
16. Safety connector(STO)
17. Input/Output signal connector(I/O)
18. Encoder connector(ENCODER)

Minimized drive depth for 100W and 200W drives through development and application of smaller heat sinks



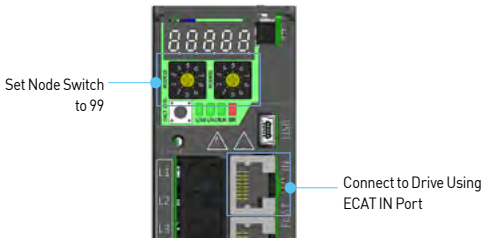
Depth reduced from 172.5mm to 145.2mm
(Volume reduced by 16%↓)

Enhanced Encoder Support & Improved Control Functionalities

- More types of encoders supported on top of high resolution encoder
  - BiSS, Quadrature, Tamagawa, Panasonic, EnDat 2.2, SSI, Nikon and Sinusoidal (Optional)
- Supports temperature monitoring through encoders
- Enhanced disconnection check function of quadrature encode
  - Disconnection check circuit added
  - No dummy wiring needed
- Improved control cycle
  - Position: 125 μs - Speed: 62.5 μs
  - Current: 31.25 μs
- Enhanced alarm trace function
  - Capable of saving up to 4 maximum channels such as alarm code & alarm occurrence time/date
- Enhanced USB OTG(On-The-Go) function
  - Drive parameter backup on USB thumb drives (Drive → USB flash drive)
  - Drive parameter restoration from USB thumb drives (Drive ← USB flash drive)
  - Drive alarm history backup (Drive → USB flash drive)
  - Firmware update (Drive ← USB flash drive)
  - Added buttons for user convenience

When Using USB OTG

When Using Modbus TCP



Faster Communication Provided in More Diverse Methods

- Fieldbus Supported: EtherCAT & Modbus TCP
- Min. Communication Cycle Time: 0.125ms
- Advanced EtherCAT functionality
  - Minimum communication cycle time improved to 0.125 ms from 0.250 ms
  - FoE function supported
- Built-in web server function
  - With web server embedded in servo drive, no drive CM (Configuration software) is needed other than web browser environment
  - Enhanced remote commissioning function through Ethernet connection

Drive Product Features

iX7NHA Drive

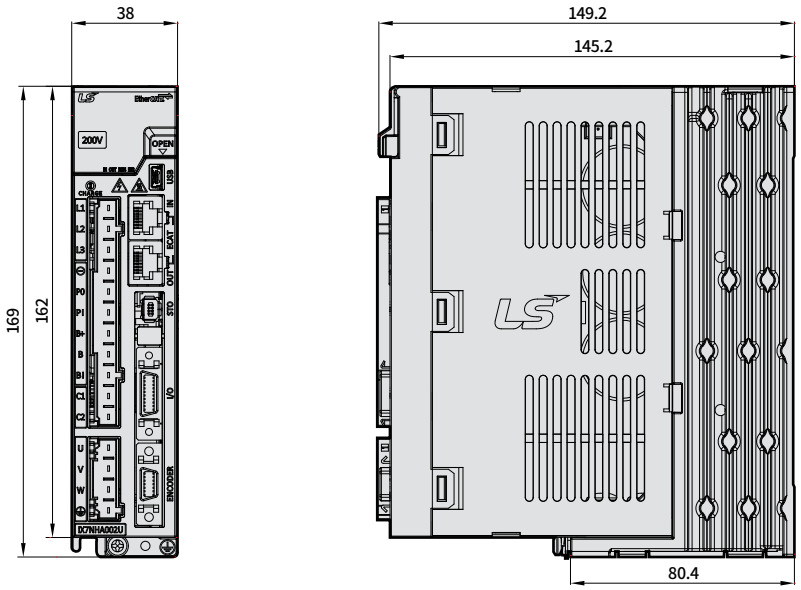
Item \ Part Number		iX7NHA001U	iX7NHA002U	iX7NHA004U	iX7NHA008U	iX7NHA010U	iX7NHA020U	iX7NHA035U
Input Power	Main Power	1-Phase AC100 ~ 120[V], 1-Phase AC200 ~ 240[V], 3-Phase AC200 ~ 240[V], (-15 ~ +10[%]), 50 ~ 60[Hz]			1-Phase AC200 ~ 240[V], 3-Phase AC200 ~ 240[V], (-15 ~ +10[%]), 50 ~ 60[Hz]	3-Phase AC200 ~ 240[V], (-15 ~ +10[%]), 50 ~ 60[Hz]		
	Control Power	1-Phase AC100 ~ 120[V] 1-Phase AC200 ~ 240[V] (-15 ~ +10[10%]), 50 ~ 60[Hz]			1-Phase AC200 ~ 240[V] (-15 ~ +10[10%]), 50 ~ 60[Hz]			
Rated Current [A]		1.4	1.7	3.0	5.2	6.75	13.5	16.0
Peak Current [A]		4.9	5.95	10.5	18.2	20.25	40.5	48.0
Encoder Type		Quadrature (Incremental) , BiSS-B, BiSS-C(Absolute, Incremental) Tamagawa Serial(Absolute, Incremental), EnDat 2.2, Sinusoidal, Analog Hall, SSI, Nikon, Panasonic						
Control Performance	Speed Control Range	Max. 1 : 5000						
	Speed Variation Ratio	±0.01[%] or less (Load variation 0~100[%]), ±0.1[%] or less (temperature: 25±10[°C])						
	Torque Control Repetition Accuracy	±1[%] or less						
EtherCAT Specification	Communication Standard	FoE (Firmware download) EoE (Parameter setting by UDP, Tuning, Secondary function, Parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CiA 402 Drive profile)						
	Physical Layer	100BASE-TX(IEEE802.3)						
	Connector	RJ45 x 2						
	Communication Distance	Distance between nodes 100[m] or less						
	DC (Distributed Clock)	Synchronization by DC(Distributed Clock) mode. Minimum DC cycle: 125[us]						
	LED Display	Link Act IN, Link Act OUT, RUN, ERR						
	CiA 402 Drive Profile	Profile Position Mode, Profile Velocity Mode, Profile Torque Mode, Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode, Homing Mode						
Digital Input, Digital Output	Digital Input	Input Voltage range: DC 12[V] ~ DC 24[V] / Total 6 input channels (allocable) Inputs of total 15 functions are selectively allocable (*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, P_CL, N_CL, PROBE1, PROBE2, EMG, A_RST, SV_ON, LVSF1, LVSF2) Note) *: Fundamentally allocated signals						
	Digital Output	Service rating: DC 24[V] ±10%, 120[mA] total 3 channels (allocable) Total 11 outputs are selectively allocable (*BRAKE, *ALARM, *READY, ZSPD, INPOS, TLMT, VLMT, INPOS2, INSPD, WARN, TGON) Note)* Automatically allocated signals						
Encoder Decimation Output		Differential Line Driver 3 channels A0, /A0, B0, /B0, Z0, /Z0 up to 6.5 [Mpps] on 4x interpolation						
Analog Input & Output	Analog Input	Input voltage range: -10 ~ +10[V], Function: analog torque limit (1 channel, unallocable)						
	Analog Output	Total 2 channels (Allocable): able to selectively allocate total 25 types of output						
Safety Function		2 Input Channels(STO1 and STO2), 1 Output Channel(EDM)						
USB Communication	Function	Firmware download, tuning, test drive, monitoring, parameter duplication						
	Communication Standard	Complies with USB 2.0 Full Speed and OTG 2.0 standards						
	Accessible Device	PC or USB Storage device						
Embedded Function	Dynamic Braking	Standard built-in brake (Activated when the servo alarm goes off or when the servo is off).						
	Regenerative Braking	Built-in by default (100W & 200W excluded)						
	Display Function	7-segment display (5 digits)						
	Self-setting Function	Drive node address setting is possible using rotary switch						
	Additional Function	Gain tuning, alarm history, jog operation, home searching						
	Protection Function	Overcurrent, overload, overheat, overvoltage, insufficient voltage, overspeed, abnormal state of encoder, position following error, current detecting error						
Operation Environment	Operating Temperature / Storage Temperature	0 ~ +50[°C] / -20 ~ +65[°C]						
	Operating Humidity / Storage Humidity	Under 80[%]RH / Under 90[%]RH (noncondensing)						
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid.						

External Dimensions

*Unit [mm]

iX7NHA001U / iX7NHA002U

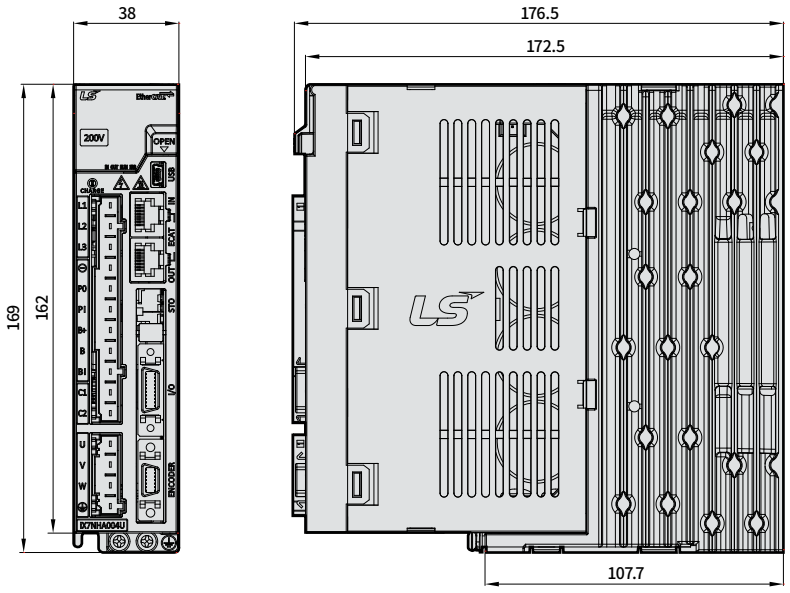
[Weight : 0.8kg]



*Unit [mm]

iX7NHA004U

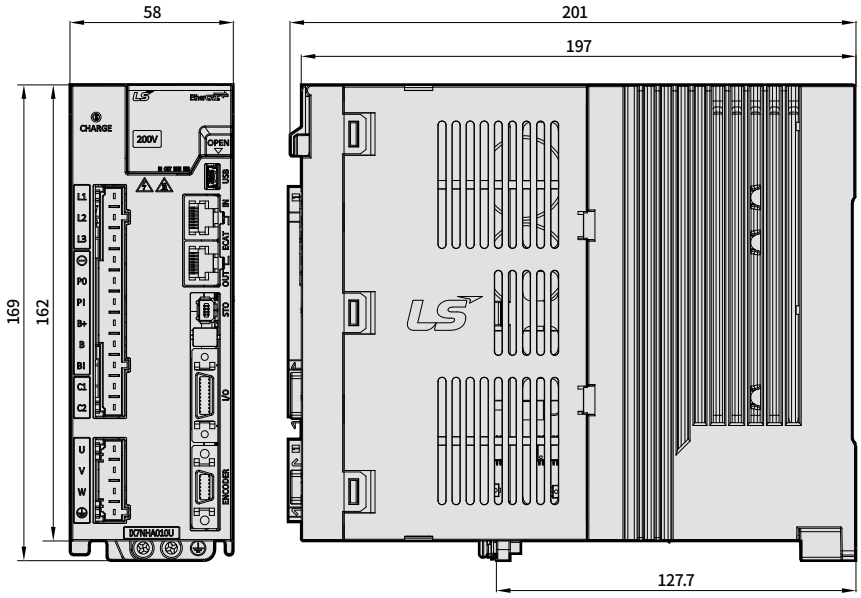
[Weight : 1.0kg]



iX7NHA008U / iX7NHA010U

[Weight : 1.6kg
(Fan-Cooling included)]

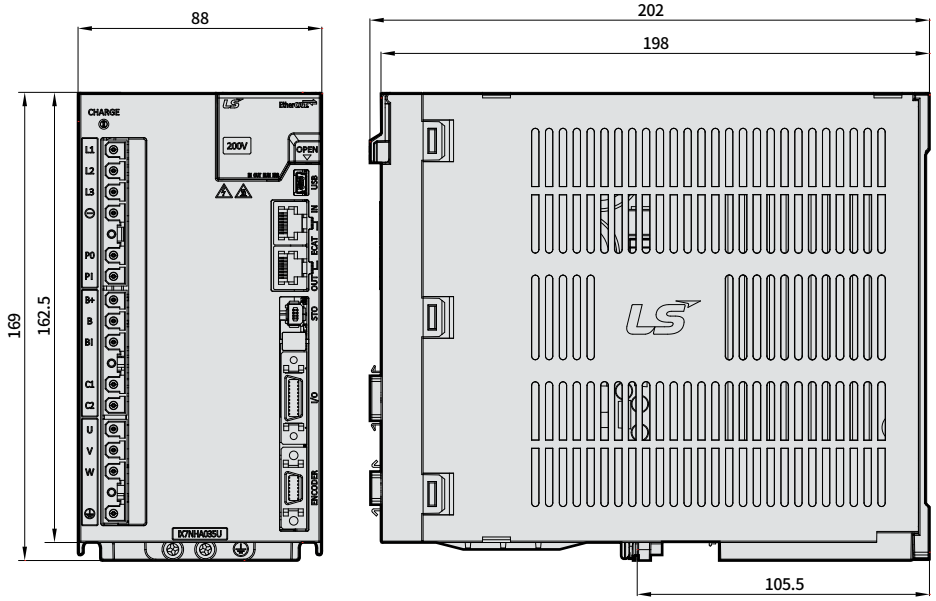
*Unit [mm]



iX7NHA020U / iX7NHA035U

[Weight : 2.4kg
(Fan-Cooling included)]

*Unit [mm]



L7NH Series

Servo Drive Designation

L7	NH	A	004	U	AA
	Communication	Input Power Supply	Capacity	Encoder Type	Option
	Network Type	A : 200VAC	001 : 100W	U : Universal	Exclusive Option Code
		B : 400VAC	002 : 200W		
			004 : 400W		
			008 : 750W		
			010 : 1.0kW		
			020 : 2.0kW		
			035 : 3.5kW		
			050 : 5.0kW		
			075 : 7.5kW		
			150 : 15kW		

Parts Identification

EtherCAT Communication Type L7NH

Real-time Control Through EtherCAT

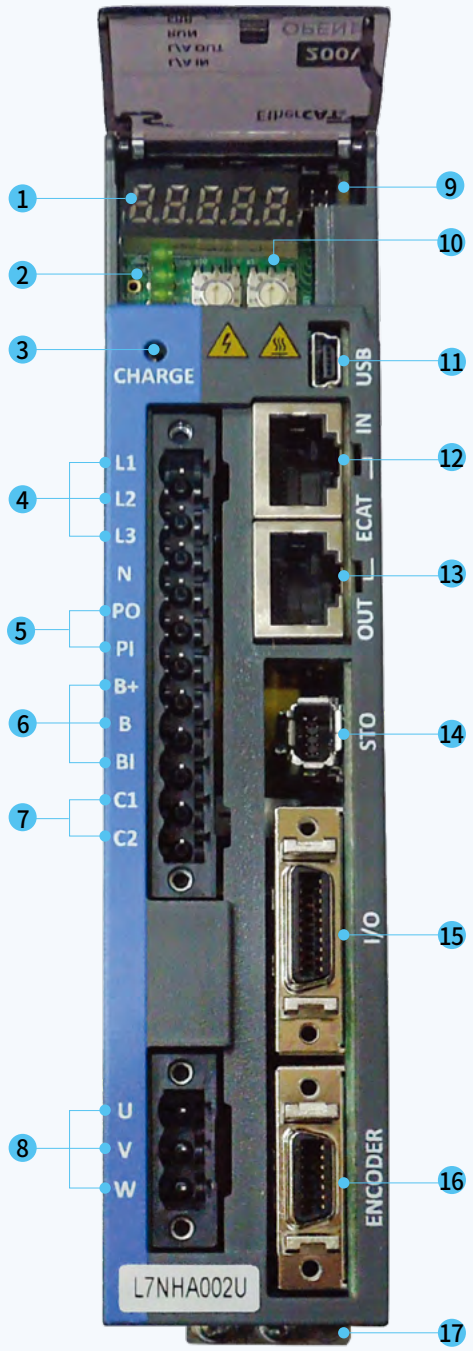
- High speed, Real-time capability and Synchronization mechanism
- Improved EtherCAT communication speed (min. 250μs, DC support)
- Supports CoE, EoE and FoE
- Improved frequency response(≈1kHz)

Compatible with Various Motors and Encoders

- Operates with rotary, DD and linear motors (3rd-party motors supported)
- Quadrature, BiSS-C, Tamagawa serial abs, EnDat 2.2, Panasonic serial abs, Sinusoidal

Improved Control Performance

- Improved control bandwidth
- 4-step notch filter provided
- Vibration control by Real-time FET
- Real-time gain tuning function



1. Display
2. State LED
3. Charge indicator
4. Main power connector (L1, L2, L3)
5. DC Reactor connector (PO, PI)
   - Short-circuit when not in use
6. Regenerative resistance connector (B+, B, BI)
   - Short-circuit B and BI terminals when using standard type
   - Use B+ and B terminals when using external resistor
7. Control power connector (C1, C2)
8. Servo motor connecting terminal (U,V,W)
9. Connector for analog monitor
10. Node address setting switch
11. USB connector (USB)
12. EtherCAT Communication port(IN)
13. EtherCAT Communication port(OUT)
14. Safety connector(STO)
15. Control signal connector (I/O)
16. Encoder connector(ENCODER)
17. Ground terminal

L7NHA Drive

Item \ Type Name		L7NHA001U	L7NHA002U	L7NHA004U	L7NHA008U	L7NHA010U	L7NHA020U	L7NHA035U	L7NHA050U	L7NHA075U	L7NHA150U
Input Power	Main Power Supply	3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]									
	Control Power Supply	Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]									
Rated Current[A]		1.4	1.7	3.0	5.2	6.8	13.5	16.7	32.0	39.4	76.0
Peak Current[A]		4.2	5.1	9.0	15.6	20.3	40.5	50.1	90.9	98.5	190.0
Encoder Type		Quadrature(Incremental), BiSS-B, BiSS-C(Absolute, Incremental) Tamagawa Serial(Absolute, Incremental), EnDat 2.2 Sinusoidal, Analog Hall									
Control Performance	Speed Control Range	Maximum 1: 5000									
	Frequency Response	Maximum 1[kHz] or above(When the 19-bit Serial Encoder is applied)									
	Speed Variation Ratio	±0.01[%] or lower(When the load changes between 0 and 100%) ±0.1[%] or less(Temperature of 25°C[±10]									
	Torque Control Repetition Accuracy	Within ±1%									
EtherCAT Communication Specifications	Communication Standard	FoE (Firmware download) EoE (Parameter setting by UDP, Tuning, Secondary function, Parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)									
	Physical Layer	100BASE-TX(IEEE802.3)									
	Connector	RJ45 x 2									
	Communication distance	Within connection between nodes 100[m]									
	DC(Distributed Clock)	Synchronization through DC mode, minimum DC cycle 250[μs]									
	LED Display	LinkAct IN, LinkAct OUT, RUN, ERR									
	Cia402 Drive Profile	Profile Position Mode, Profile Velocity Mode, Profile Torque Mode Cyclic Synchronous Position Mode, Cyclic Synchronous Velocity Mode Cyclic Synchronous Torque Mode, Homing Mode									
Digital Input, Output	Digital Input	Input Voltage range : DC 12[V] ~ DC 24[V] Total 8 input channels (allocable) Total 12 functions (below) can be used selectively for assignment. (*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST)									
	Digital Output	Service rating: DC 24[V] ±10%, 120[mA] Total 4 input channels (allocable) Total 11 functions (below) can be used selectively for assignment. (*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, VLMT±, INSPD±, WARN±, TGON±, INPOS±)									
Safety Function		2 Input Channels (STO1, STO2), 1 Output Channel (EDM±)									
USB Communication	Function	Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy									
	Communication Standard	Complies with USB 2.0 Full Speed standard									
	Connect	PC or USB storing medium									
Internal Function	Dynamic Braking	Standard built-in brake (Activated when the servo alarm goes off or when the servo is off).									
	Regenerative Braking	Default built-in(excluding 15kW), external installation possible									
	Display Function	7-segment display (5 digits)									
	Self-setting Function	Drive node address customizable with rotary switch									
	Additional Function	Gain adjustment, alarm history, JOG operation, home search									
	Protection Function	Overcurrent, overload, excessive current restriction, overheat, overvoltage, undervoltage, overspeed, encoder problem, location sensor problem, current sensor problem									
Operation Environment	Operating Temperature / Storage Temperature	0 ~ +50[°C] / -20~ +70[°C]									
	Operating Humidity / Storage Humidity	Below 80[%]RH / Below 90[%]RH(Noncondensing)									
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.									

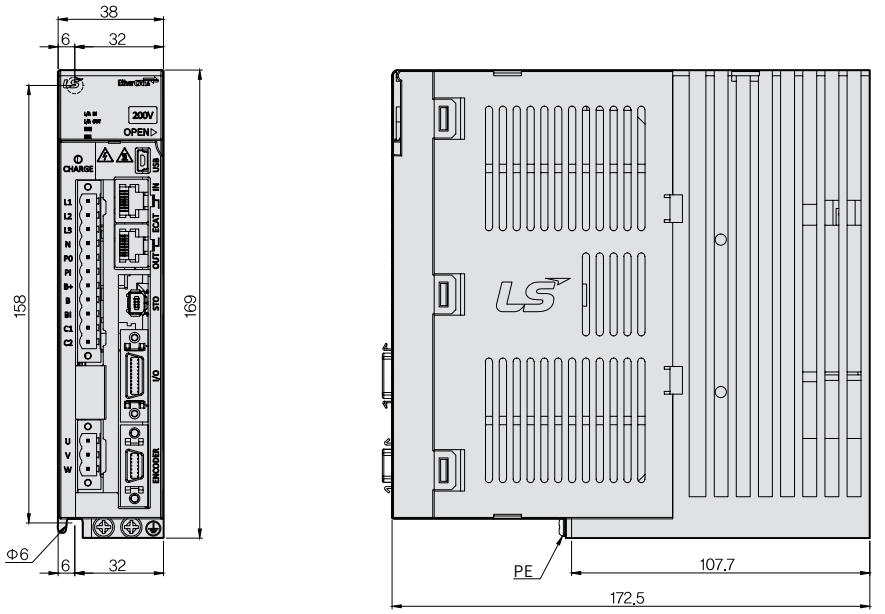
L7NHB Drive

Item \ Type Name		L7NHB010U	L7NHB020U	L7NHB035U	L7NHB050U	L7NHB075U	L7NHB150U
Input Power	Main Power Supply	3 Phase AC 380 ~ 480[V](-15 ~ 10[%]), 50 ~ 60[Hz]					
	Control Power Supply	Single Phase AC 380 ~ 480[V](-15 ~ 10[%]), 50 ~ 60[Hz]					
Rated Current[A]		3.7	8.0	10.1	17.5	22.8	39.0
Peak Current[A]		11.1	24.0	30.3	47.3	57.0	97.5
Encoder Type		Quadrature(incremental), BiSS-B, BiSS-C(absolute, incremental), Tamagawa Serial(absolute, incremental), Panasonic Serial(absolute), EnDat 2.2, Sinusoidal, Analog Hall					
Control Performance	Speed Control Range	Maximum 1: 5000					
	Frequency Response	Maximum 1[kHz] or above(When the 19-bit Serial Encoder is applied)					
	Speed Variation Ratio	±0.01[%] or lower(When the load changes between 0 and 100%) ±0.1[%] or less(Temperature of 25°C[±10]					
	Torque Control Repetition Accuracy	Within ±1%					
EtherCAT Communication Specifications	Communication Standard	FoE (Firmware download) EoE (parameter setting through UDP, tuning, auxiliary functions, parameter copy), Tuning, Secondary function, Parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)					
	Physical Layer	100BASE-TX(IEEE802.3)					
	Connector	RJ45 x 2					
	Communication distance	Within connection between nodes 100[m]					
	DC(Distributed Clock)	Synchronization through DC mode, minimum DC cycle 250[μs]					
	LED Display	LinkAct IN, LinkAct OUT, RUN, ERR					
	Cia402 Drive Profile	Profile Position Mode, Profile Velocity Mode Profile Torque Mode, Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode, Homing Mode					
Digital Input, Output	Digital Input	Input Voltage range : DC 12[V] ~ DC 24[V] Total 8 input channels (allocable) Total 12 functions (below) can be used selectively for assignment. (*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST)					
	Digital Output	Service rating: DC 24[V] ±10%, 120[mA] Total 4 input channels (allocable) Total 11 functions (below) can be used selectively for assignment. (*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, VLMT±, INSPD±, WARN±, TGON±, INPOS±)					
Safety Function		2 Input Channels (STO1, STO2), 1 Output Channel (EDM±)					
USB Communication	Function	Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy					
	Communication Standard	Complies with USB 2.0 Full Speed standard					
	Connect	PC or USB storing medium					
Internal Function	Dynamic Braking	Standard built-in brake (activated when the servo alarm goes off or when the servo is off).					
	Regenerative Braking	Default built-in(excluding 15kW), external installation possible					
	Display Function	7-segment display (5 digits)					
	Self-setting Function	Drive node address customizable with rotary switch					
	Additional Function	Gain adjustment, alarm history, JOG operation, home search					
	Protection Function	Overcurrent, overload, excessive current restriction, overheat, overvoltage, undervoltage, overspeed, encoder problem, location sensor problem, current sensor problem					
Operation Environment	Operating Temperature / Storage Temperature	0 ~ +50[°C] / -20~ +70[°C]					
	Operating Humidity / Storage Humidity	Below 80[%]RH / Below 90[%]RH(Noncondensing)					
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.					

External Dimensions

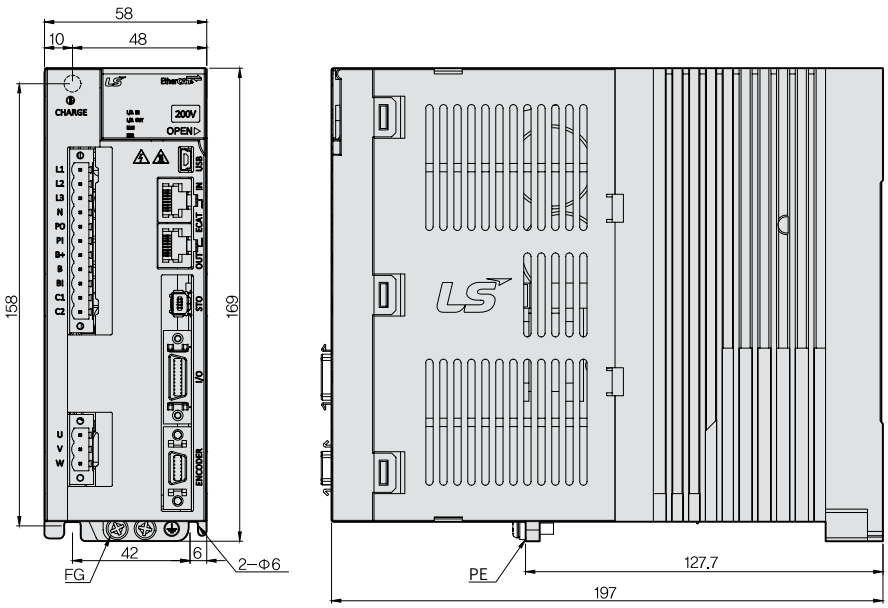
*Unit [mm]

L7NHA001U ~ L7NHA004U
[Weight: 1.0kg]



*Unit [mm]

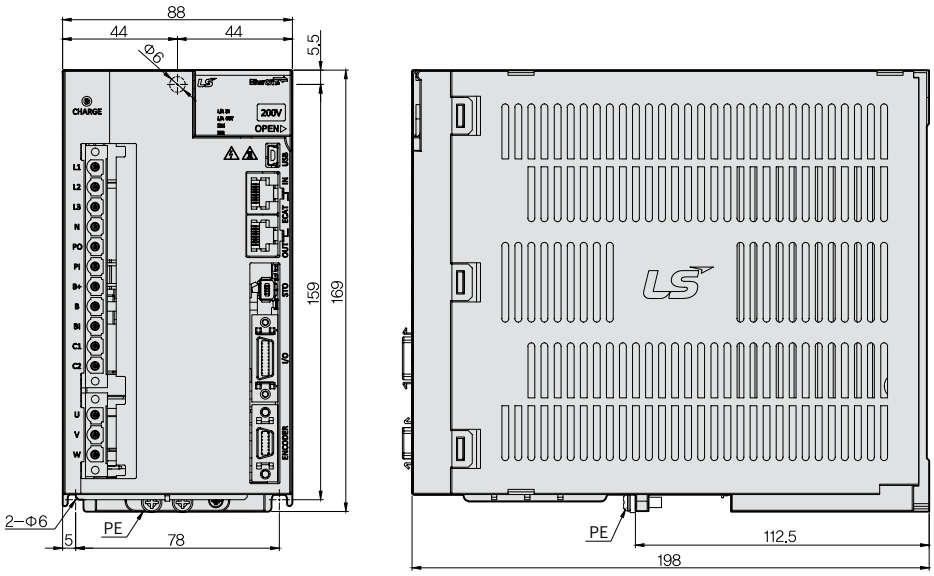
L7NHA008U / L7NHA010U
[Weight: 1.5kg
(Fan-Cooling included)]



*Unit [mm]

L7NHA020U / L7NHA035U

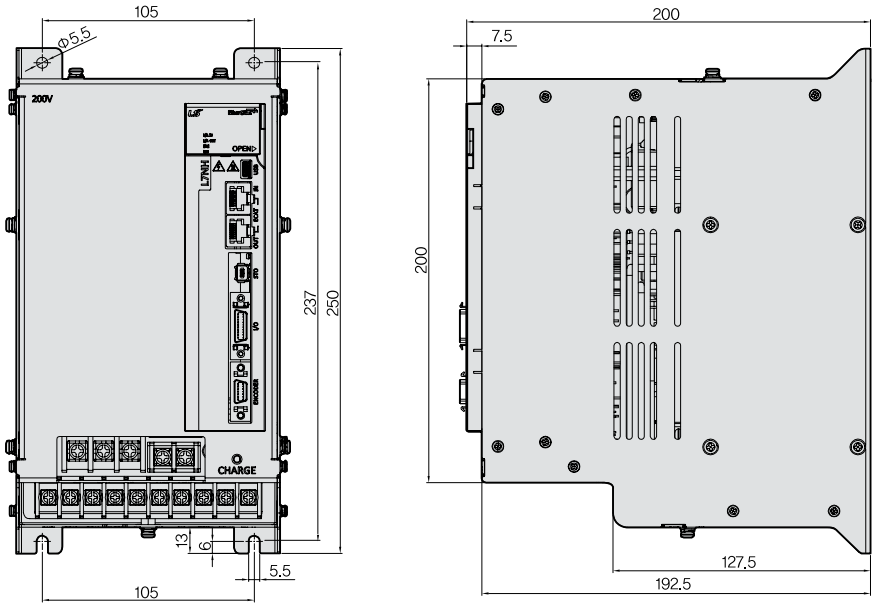
[Weight: 2.5kg
(Fan-Cooling included)]



*Unit [mm]

L7NHA050U

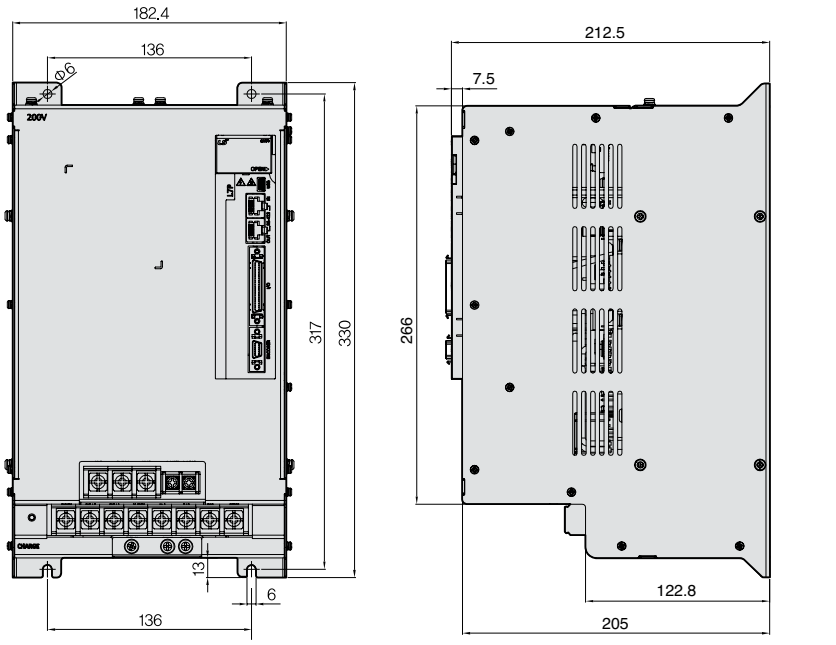
[Weight: 5.5kg
(Fan-Cooling included)]



External Dimensions

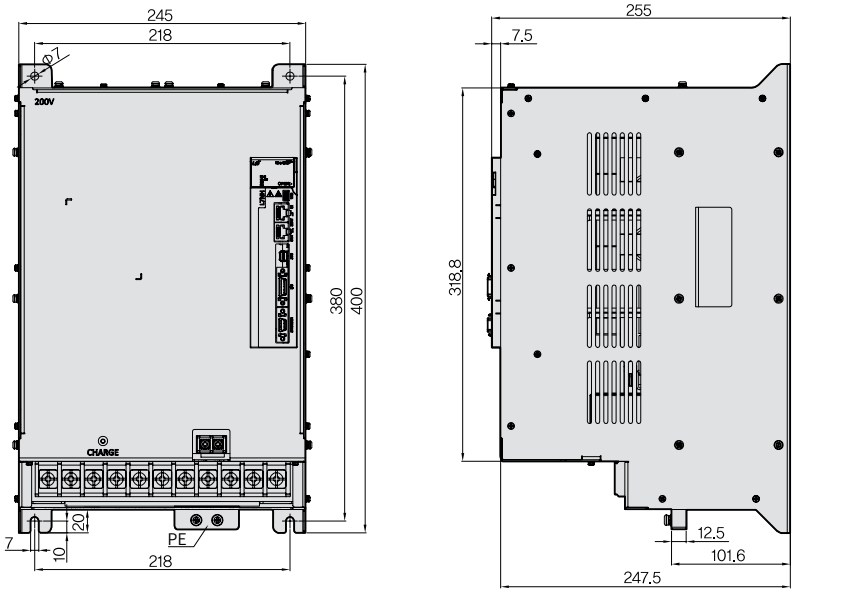
*Unit [mm]

L7NHA075U
[Weight: 8.5kg
(Fan-Cooling included)]



*Unit [mm]

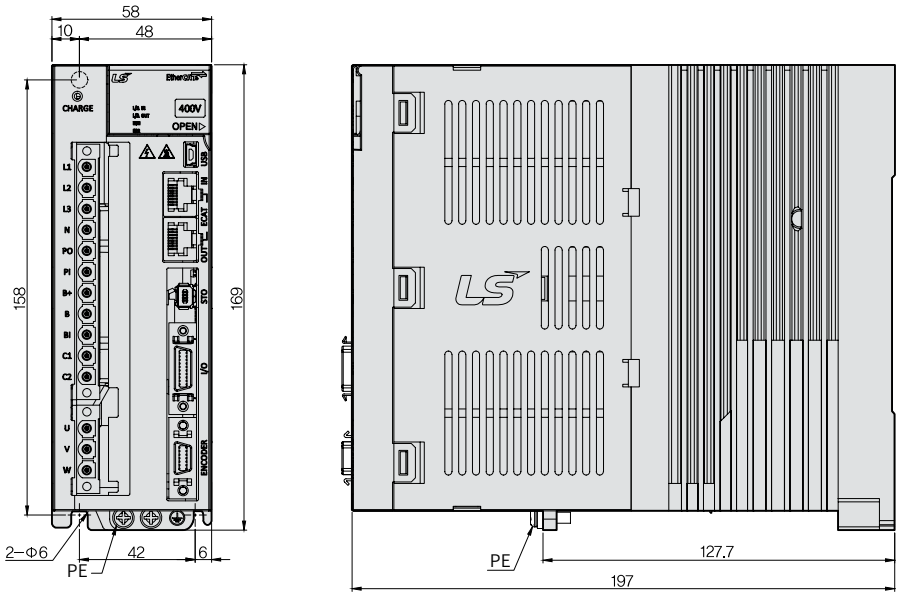
L7NHA150U
[Weight: 16.2kg
(Fan-Cooling included)]



*Unit [mm]

L7NHB010U

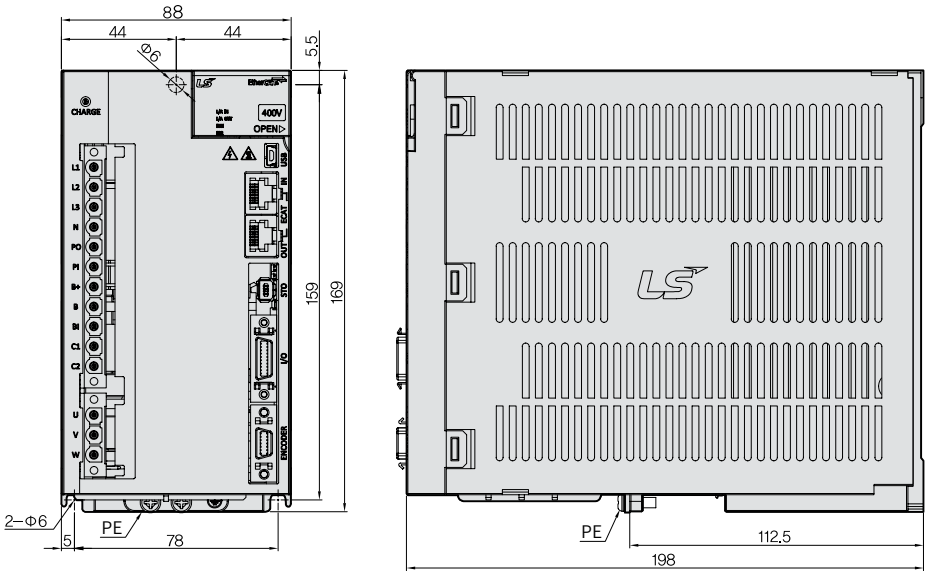
[Weight: 1.5kg
(Fan-Cooling included)]



*Unit [mm]

L7NHB020U / L7NHB035U

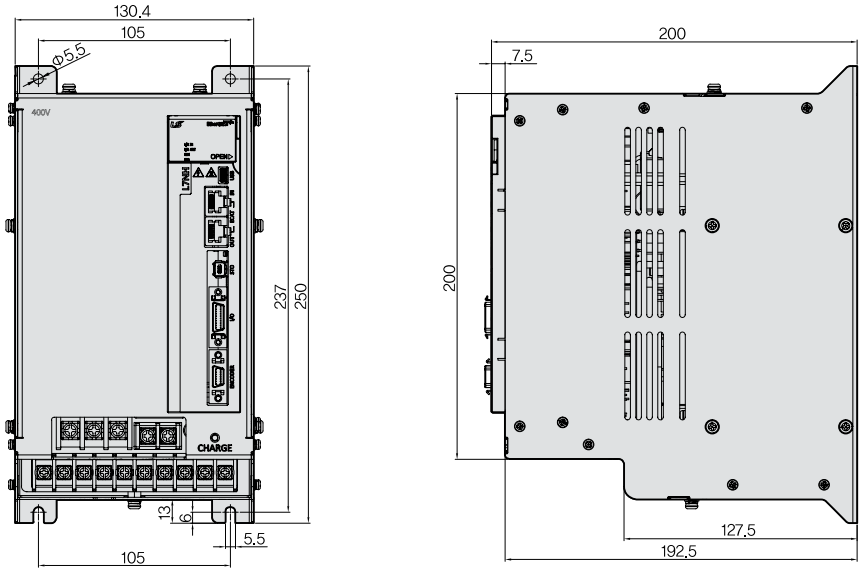
[Weight: 2.5kg
(Fan-Cooling included)]



External Dimensions

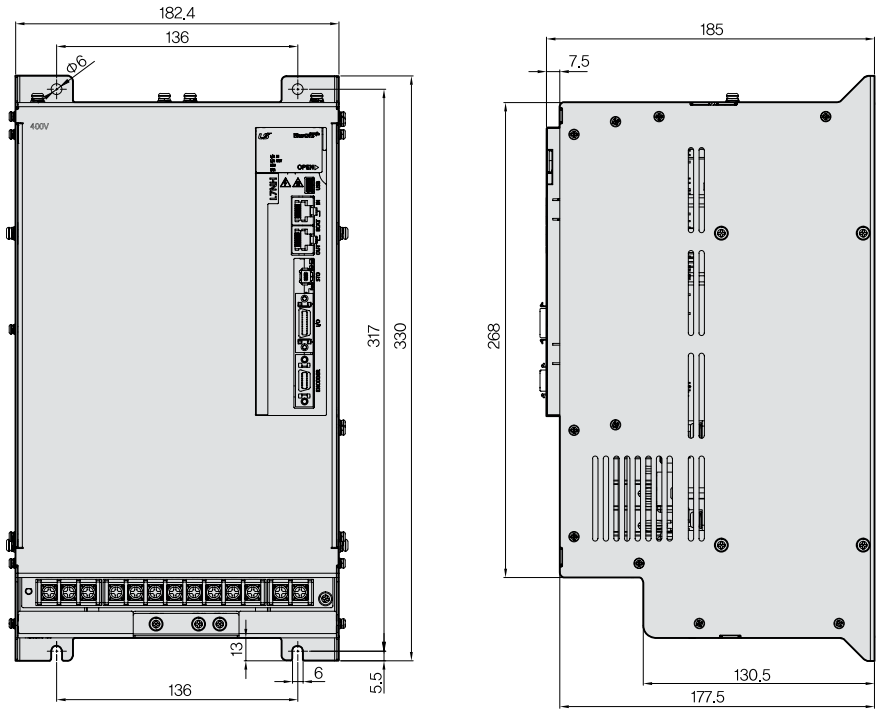
*Unit [mm]

L7NHB050U
[Weight: 5.5kg
(Fan-Cooling included)]



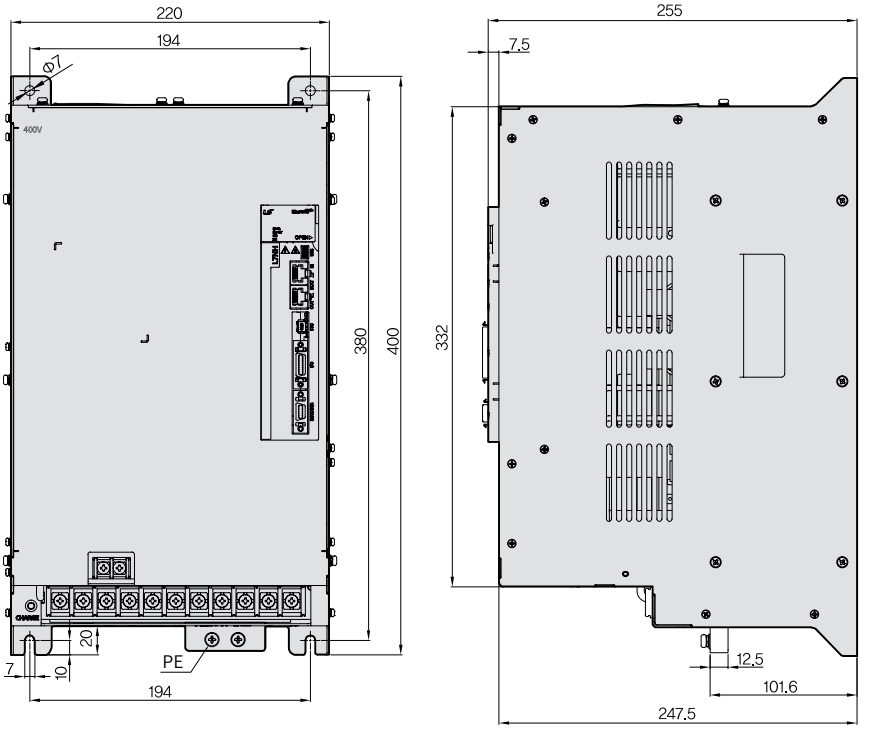
*Unit [mm]

L7NHB075U
[Weight: 8.5kg
(Fan-Cooling included)]



*Unit [mm]

L7NHB150U
[Weight: 15.5kg
(Fan-Cooling included)]



L7NHF Series

Servo Drive Designation

L7	NHF	A	010	U	AA
	Communication	Input Power Supply	Capacity	Encoder Type	Option
	EtherCAT Type+ Full-Closed Type	A : 200VAC	004 : 400W 010 : 1.0kW 035 : 3.5kW 050 : 5.0kW 075 : 7.5kW	U : Universal	Exclusive Option Code

Parts Identification

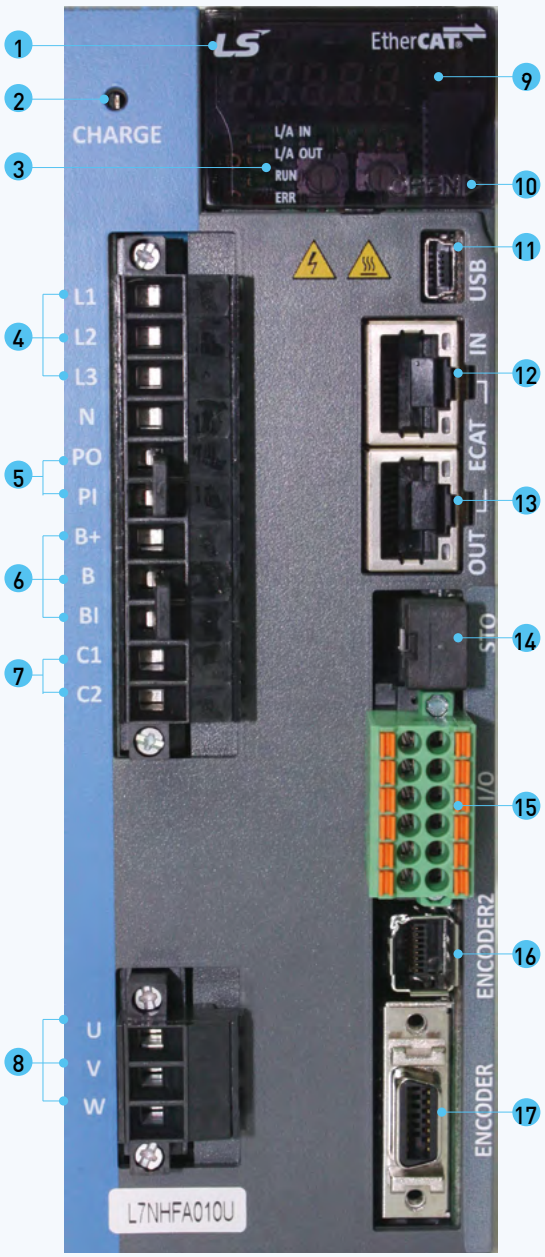
All-in-One EtherCAT, Full-Closed System Control L7NHF

Real-time Control Through EtherCAT

- High speed, Real-time capability and synchronization mechanism
- Supports CoE, EoE and FoE
- Improved speed response(≒1kHz) frequency
- Improved communication speed through 16-bit bus
  - Improved chip communication speed
  - Improved EtherCAT communication speed

Fully-closed Loop Control

- Switch among Semi-closed loop control, Fully-closed loop control and dual feedback control
- Fully-closed loop control provides quick response with internal and external encoder position values
- Fully-closed loop control ensures high-precision control during machine operation



1. Display
2. Charge Indicator
3. Status LED
4. Main power connector (L1, L2, L3)
5. DC Reactor connector (PO, PI)
6. Regenerative resistance connector (B+, B, BI)
7. Control power connector (C1, C2)
8. Servo motor connecting terminal (U,V,W)
9. Connector for analog monitor
10. Switch for node address setting
11. USB Connector
12. EtherCAT communication port (ECAT IN)
13. EtherCAT communication port (ECATOUT)
14. Safety connector(STO)
15. Input / output signal connector (I/O)
16. Encoder2 connector(ENCODER2)
17. Encoder connector(ENCODER)

Xmotion Drive Product Features

L7NHFA Drive

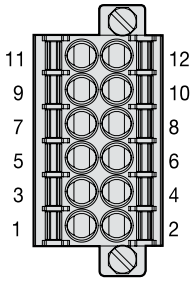
Item \ Type Name		L7NHFA004U	L7NHFA010U	L7NHFA035U	L7NHFA050U	L7NHFA075U
Input Power	Main Power Supply	3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]				
	Control Power Supply	Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]				
Rated Current[A]		3.0	6.8	16.7	32	39.4
Peak Current[A]		9.0	20.3	50.1	90.9	98.5
1st Encoder Encoder A		Quadrature (Incremental), BiSS-B, BiSS-C (Absolute, Incremental) Tamagawa Serial (Absolute, Incremental), EnDat 2.2, Sinusoidal, Analog Hall				
2nd Encoder Encoder B		Quadrature (Incremental), SSI Sinusoidal, Analog Hall (Analog to BiSS converter)				
Control Performance	Speed Control Range	Maximum 1: 5000				
	Frequency Response	Maximum 1[kHz] or above(When the 19-bit Serial Encoder is applied)				
	Speed Variation Ratio	±0.01[%] or lower(When the load changes between 0 and 100%) ±0.1[%] or less(Temperature of 25°C[±10]				
	Torque Control Repetition Accuracy	Within ±1%				
	Input Frequency	4[Mpps], Lind Drive				
	Input Pulse Method	Symbol+Pulse series,CW+CCW,PhaseA/B				
Communication Specifications	Communication Standard	FoE (Firmware download) EoE (parameter setting through UDP, tuning, auxiliary functions, parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)				
	Physical Layer	100BASE-TX (IEEE802.3)				
	Connector	RJ45 x 2				
	Communication distance	Within connection between nodes 100[m]				
	DC(Distributed Clock)	Synchronization through DC mode, minimum DC cycle 250[us]				
	LED Display	LinkAct IN, LinkAct OUT, RUN, ERR				
	Cia402 Drive Profile	Profile Position Mode, Profile Velocity Mode. Profile Torque Mode, Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode, Homing Mode				
Digital Input, Output	Digital Input	Input Voltage range : DC12[V] ~ DC 24[V] Total 6 input channels(allocable) Total 15 functions (below) can be used selectively for assignment. (*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST, SV_ON, LVSF, LVSF2) * Default signal				
	Digital Output	Total 3 input channels (Allocable) Total 11 functions (below) can be used selectively for assignment. (*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, VLMT±, INSPD±, WARN±, TGON±, INPOS2±) * Default signal				
	Analog Output	Total 2 channels (Allocable) Total 25 output can be used selectively for assignment.				
Safety Function		2 Inpu t Channels (STO1, STO2))				
USB Communication	Function	Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy				
	Communication Standard	Complies with USB 2.0 Full Speed standard				
	Connect	PC or USB storing medium				
Internal Function	Dynamic Braking	Standard built-in brake (activated when the servo alarm goes off or when the servo is off).				
	Regenerative Braking	Default built-in(excluding 15kW), external installation possible				
	Display Function	7-segment display (5 digits)				
	Self-setting Function	Drive node address customizable with rotary switch				
	Additional Function	Gain adjustment, alarm history, JOG operation, home search				
	Protection Function	Overcurrent, overload, excessive current restriction, overheat, overvoltage, undervoltage, overspeed, encoder problem, location sensor problem, current sensor problem				
Operation Environment	Operating Temperature / Storage Temperature	0 ~ 50[°C] ~ -20 ~ 65[°C]				
	Operating Humidity / Storage Humidity	Below 80[%]RH / Below 90[%]RH(Noncondensing)				
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.				

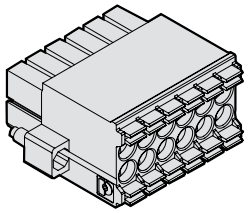
L7NHF Series I/O & Encoder2 PIN MAP

I/O Connector

PIN No.	Signal	PIN No.	Signal
1	DICOM	7	DI6
2	FG	8	DI5
3	D2	9	DO2
4	DI1	10	DO1
5	DI4	11	DOCOM
6	DI5	12	DO3

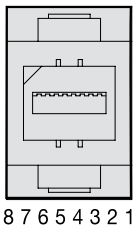
DFMC 1.5 / 6-STF-3.5 (PHOENIX)

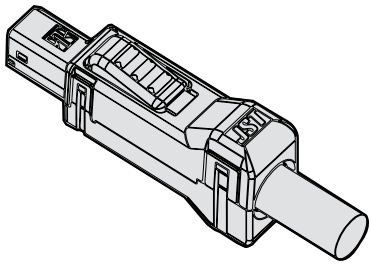




Encoder2 Connector

MUF-PK8K-X (JST)



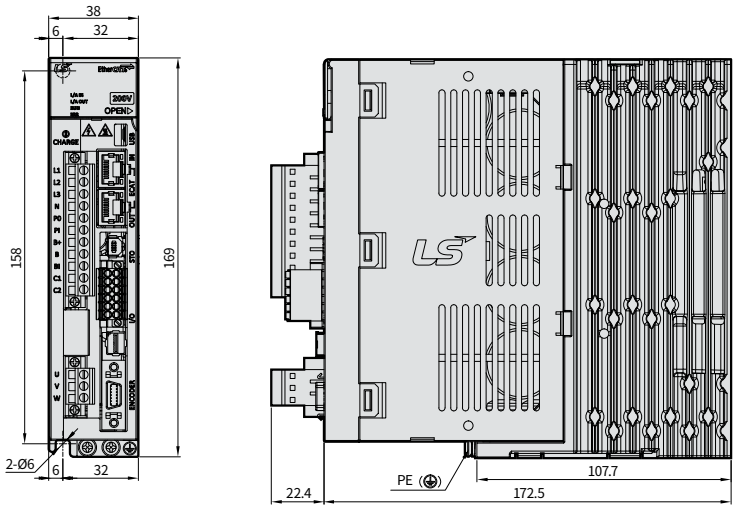


PIN No.	Signal(Quadrature)	Signal(SSI)	PIN No.	Signal(Quadrature)	Signal(SSI)
1	5V	5V	5	B	CLK
2	GND	GND	6	/B	/CLK
3	A	DATA	7	Z	Z
4	/A	/DATA	8	/Z	/Z

External Dimensions

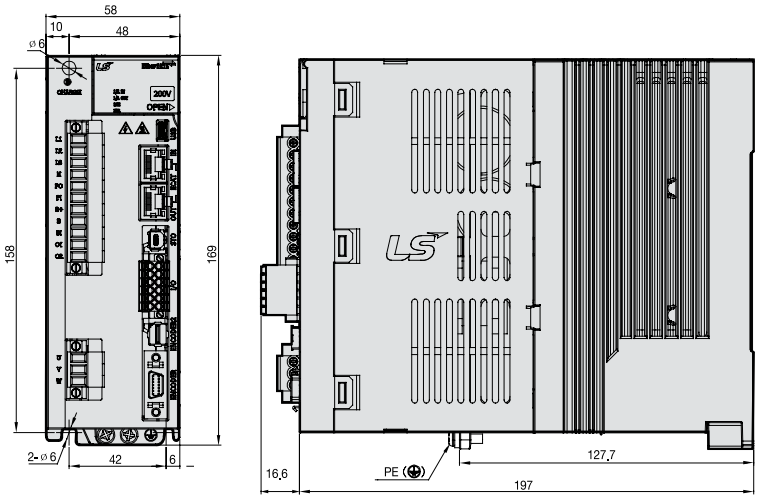
*Unit [mm]

L7NHFA004U
[Weight: 1.0kg]



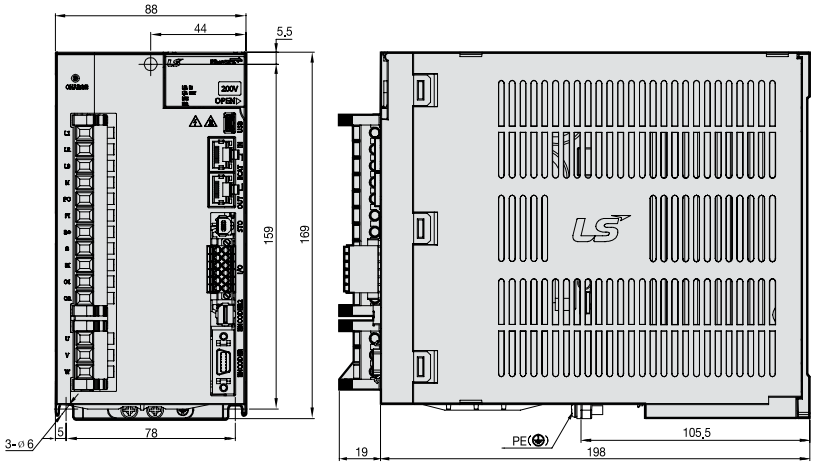
*Unit [mm]

L7NHFA010U
[Weight: 1.5kg
(Fan-Cooling included)]



*Unit [mm]

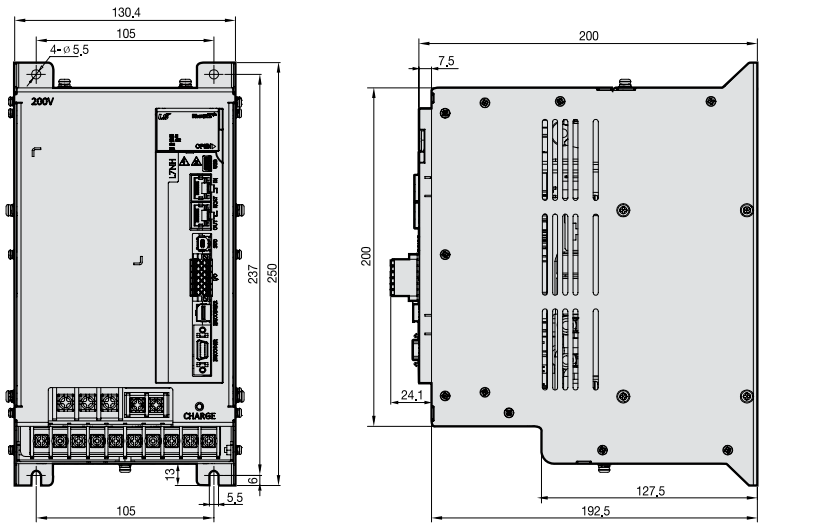
L7NHFA035U
[Weight: 2.5kg
(Fan-Cooling included)]



*Unit [mm]

L7NHFA050U

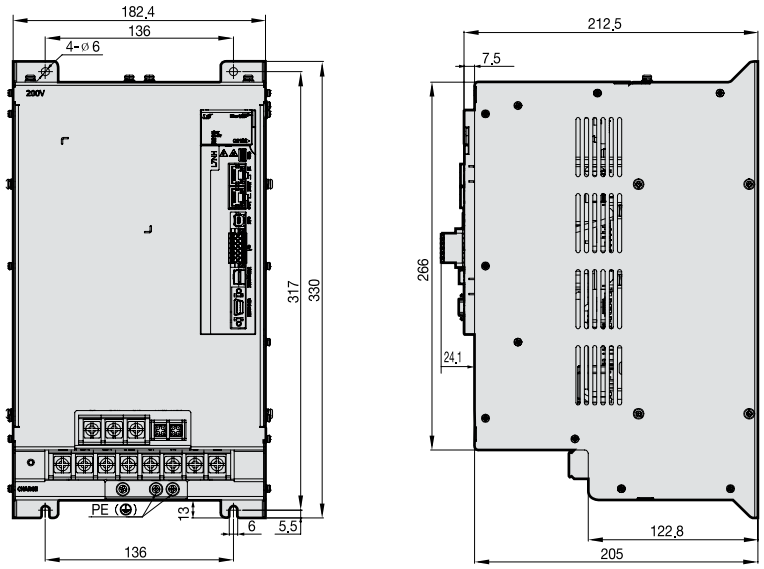
[Weight: 1.5kg
(Fan-Cooling included)]



*Unit [mm]

L7NHFA075U

[Weight: 2.5kg
(Fan-Cooling included)]



L7S Series

Servo Drive Designation

L7	S	A	004	B	AA
	Communication	Input Power Supply	Capacity (A: 200VAC)	Encoder Type	Option
	Standard I/O Type	A : 200VAC	001 : 100W	A : Incremental	Exclusive Option Code
		B : 400VAC	002 : 200W	B : Serial	
			004 : 400W		
			008 : 750W		
			010 : 1.0kW		
			020: 20kW		
			035 : 3.5kW		
			050 : 5.0kW		
			075 : 7.5kW		
			150 : 15kW		

Capacity (B: 400VAC)
010 : 1.0kW
020: 20kW
035 : 3.5kW
050 : 5.0kW
075 : 7.5kW
150 : 15kW

Parts Identification

Standard Pulse and Analog Command Type L7S

Easy to USE

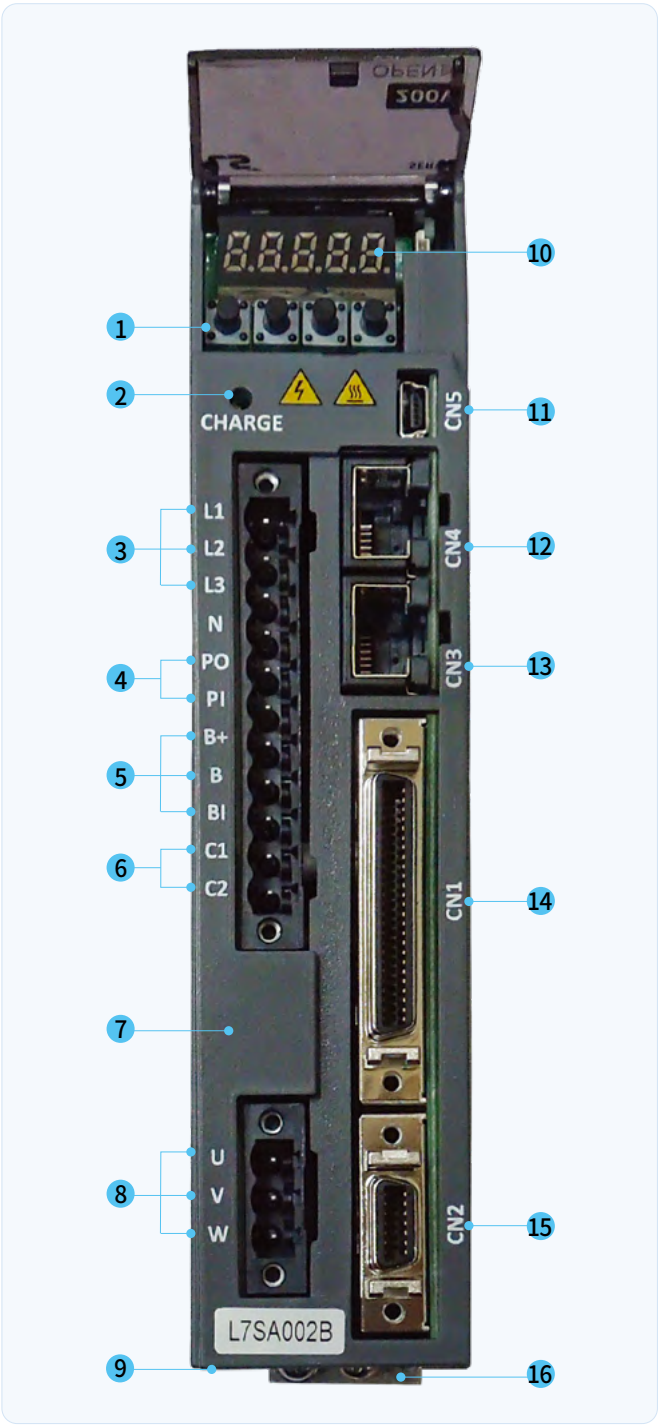
- Easy gain tuning with automatic inertia estimating function
- Easy setting Built-in panel operator
- Many I/O contacts and various functions (Digital input: 10 contacts, Digital output: 8 contacts / Analog input, output: 2 contacts)

Reliability for Protection Function

- CE, RoHS Certificated
- Drive Protection Function and Warn Function

High Response for Precise Control

- High-resolution serial type Serial type Encoder (19Bit, BiSS)
- Improved speed response frequency (≈1kHz)



1. Operation keys (Mode, Up, Down, Set)
2. Charge indicator
3. Main power connector (L1, L2, L3)
4. DC Reactor connector(PO, PI)
   - Short-circuit when not in use
5. Regenerative resistance connector (B+, B, BI)
   - Short-circuit B and BI terminals when using standard type
   - Use B+ and B terminals when using external resistor
6. Control power connector (C1, C2)
7. Front cover
8. Motor power cable connector (U, V, W)
9. Heat sink
10. Display
11. CN5: USB Connector
12. CN4: RS-422 communication connector
13. CN3: RS-422 communication connector
14. CN1: Control signal connector
15. CN2: Encoder signal connector
16. Ground

L7SA Drive

Item \ Type Name			L7SA001□	L7SA002□	L7SA004□	L7SA008□	L7SA010□	L7SA020□	L7SA035□	L7SA050□	L7SA075B	L7SA150B
Input Power	Main Power Supply		3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]									
	Control Power Supply		Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]									
Rated Current[A]			1.4	1.7	3.0	5.2	6.8	13.5	16.7	32.0	39.4	76.0
Peak Current[A]			4.2	5.1	9.0	15.6	20.3	40.5	50.1	96.0	98.5	190.0
Encoder Type			Quad. type incremental line drive 2,000~10,000[P/R], Serial 18bit 100W (for M8 only), 19Bit, 20Bit (for DD motor only)									
Control Performance	Speed Control	Speed Control Range	Maximum 1: 5000									
		Frequency Response	Maximum 1 [kHz] or above (when using 19bit serial encoder)									
		Speed Command	DC -10 [V]~+10 [V] (Reverse rotation in case of negative voltage)									
		Accel/Decel Time	Straight or S-curve acceleration/deceleration (0-10,000 [ms], possible to be set by one [ms] unit)									
		Speed Variation Ratio	±0.01[%] or lower (when load changes between 0 and 100%), ±0.1[%] or lower									
	Position Control	Input Frequency	1[Mpps], Line driver / 200[kpps], Open Collector									
		Input Pulse Type	Symbol + Pulse series, CW+CCW, A/B Phase									
		Electric Gear Ratio	Four digital gear ratios can be set, selected and tuned.									
	Torque Control	Torque Command	DC-10~+10 [V] (Reverse direction torque in case of negative voltage)									
		Speed Limit	DC 0~10 [V], internal speed command within ±1[%]									
		Repetition accuracy	Within ±1[%]									
Input/Output Signal	Analog Input	Input Range	DC -10 ~ +10[V]									
		Resolution	12[bit]									
	Analog Output	Output Range	DC -10 ~ +10[V]									
		Resolution	12[bit]									
	Digital Input		Total 10 Input channels(Assignment available) SVON, SPD1, SPD2, SPD3, ALMRST, DIR, CCWLIM, CWLIM, EMG, STOP, EGEAR1, EGEAR2, PCON, GAIN2, P_CLR, T_LMT, MODE, ABS_RQ, ZCLAMP Above 19 functions can be used selectively for assignment. Signal can be set as positive logic or negative logic									
	Digital Output		Total 5 Channels(Assignment available), 3 Channels(Set as alarm code) ALARM, READY, ZSPD, BRAKE, INPOS, TLMT, VLMT, INSPD, WARN Above 9 outputs can be used selectively for assignment. Signal can be set as positive logic or negative logic									
Communication	RS-422		Accessible to PC software and the RS422 server									
	USB		Status monitoring, JOG operation, parameter upload/download are available with PC Software									
Encoder			Serial BiSS encoder and quadrature encoder supported									
Encoder Output Type			Random pre-scale output through FPGA (Maximum 6.4 Mpps)									
Built-in functions	Dynamic Braking		Standard built-in (Activated when the servo alarm goes off or when the servo is off)									
	Regenerative Braking		Default built-in(excluding 15kW), external installation possible									
	Display		7-segment display (5 digits)									
	Self-setting Function		Loader (SET, MODE, UP, and [DOWN] keys)									
	Additional Function		Auto gain tuning, phase Z detection, manual JOG operation, program JOG operation, automatic analog input calibration									
	Protective Function		Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem									
Operation Environment	Operating Temperature / Storage Temperature		0 ~ +50[°C] / -20 ~ +70[°C]									
	Operating Humidity / Storage Humidity		Below 80[%]RH / Below 90[%]RH(Noncondensing)									
	Environment		Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.									

* L7SA075 and L7SA150 do not support Incremental type

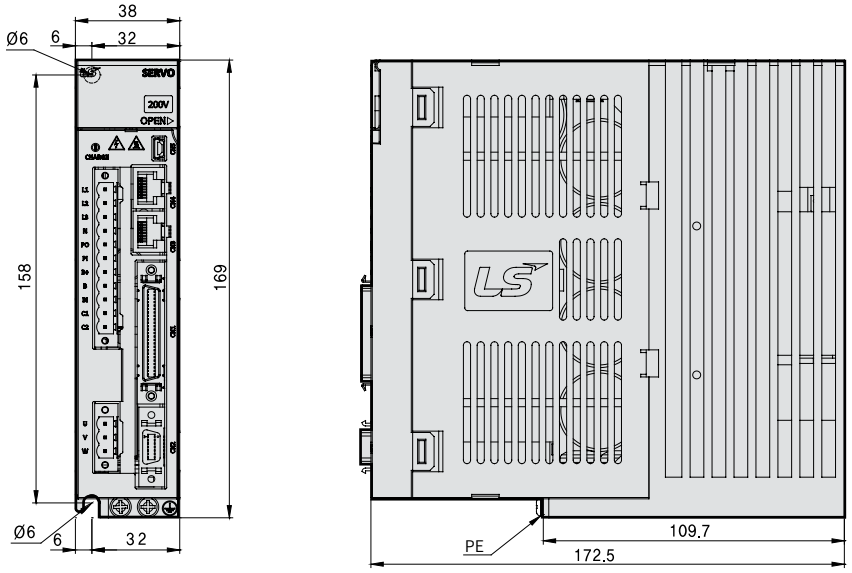
L7SB Drive

Item \ Type Name			L7SB010B	L7SB020B	L7SB035B	L7SB050B	L7SB075B	L7SB150B
Input Power	Main Power Supply		3 Phase AC380 ~ 480[V](-15 ~ +10[%]), 50 ~ 60[Hz]					
	Control Power Supply		Single Phase AC380 ~ 480[V](-15 ~ +10[%]), 50 ~ 60[Hz]					
Rated Current[A]			3.7	8.0	10.1	17.5	22.8	39.0
Peak Current[A]			11.1	24.0	30.3	52.5	57.0	97.5
Encoder Type			19Bit					
Control Performance	Speed Control	Speed Control Range	Maximum 1: 5000					
		Frequency Response	Maximum 1 [kHz] or above (when using 19bit serial encoder)					
		Speed Command	DC -10 [V]~+10 [V] (Reverse rotation in case of negative voltage)					
		Accel/Decel Time	Straight or S-curve acceleration/deceleration (0-10,000 [ms], possible to be set by one [ms] unit)					
		Speed Variation Ratio	±0.01 [%] or lower [When load changes between 0 and 100%], ±0.1[%] or lower [Temperature 25 ±10°C]					
	Position Control	Input Frequency	1[Mpps], Line driver / 200[kpps], Open collector					
		Input Pulse Type	Symbol + pulse series, CW+CCW, A/B phase					
		Electric Gear Ratio	Four digital gear ratios can be set, selected and tuned.					
	Torque Control	Torque Command	DC-10~+10 [V] (Reverse direction torque in case of negative voltage)					
		Speed Limit	DC 0~10 [V], internal speed command within ±1[%]					
		Repetition accuracy	Within ±1[%]					
Input/Output Signal	Analog Input	Input Range	DC -10 ~ +10[V]					
		Resolution	12[bit]					
	Analog Output	Output Range	DC -10 ~ +10[V]					
		Resolution	12[bit]					
	Digital Input		A total of 10 input channels (Allocable) SVON, SPD1, SPD2, SPD3, ALMRST, DIR, CCWLIM, CWLIM, EMG, STOP, EGEAR1, EGEAR2, PCON, GAIN2, P_CLR, T_LMT, MODE, ABS_RQ, ZCLAMP You can selectively allocate a total of 19 functions. You can set the positive/negative logic of the selected signal.					
	Digital Output		A total of 5 channels (Allocable), 3 channels (Fixed with alarm codes) ALARM, READY, ZSPD, BRAKE, INPOS, TLMT, VLMT, INSPD, WARN You can selectively allocate a total of nine kinds of output. You can set the positive/negative logic of the selected signal.					
Communication	RS-422		Accessible to PC software and the RS422 server					
	USB		Status monitoring through PC software, JOG operation, and parameter uploading/downloading are possible.					
Encoder			Serial BiSS encoder and quadrature encoder supported					
Encoder Output Type			Random pre-scale output through FPGA (Maximum 6.4 Mpps)					
Built-in functions	Dynamic Braking		Standard built-in (Activated when the servo alarm goes off or when the servo is off)					
	Regenerative Braking		Default built-in (excluding 15kW), external installation possible					
	Display		7-segment display (5 digits)					
	Self-setting Function		Loader (SET, MODE, UP, and [DOWN] keys)					
	Additional Function		Auto gain tuning, phase Z detection, manual JOG operation, program JOG operation, automatic analog input calibration					
	Protective Function		Overcurrent, overload, overvoltage, voltage lack, main power input error, control power input error, overspeed, motor cable, heating error (power module overheat, drive temperature error), encoder error, excessive regeneration, sensor error, communication error					
OperationEnvironment	Operating Temperature / Storage Temperature		0 ~ +50[°C] / -20 ~ +70[°C]					
	Operating Humidity / Storage Humidity		Below 80[%]RH / Below 90[%]RH(Noncondensing)					
	Environment		Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.					

External Dimensions

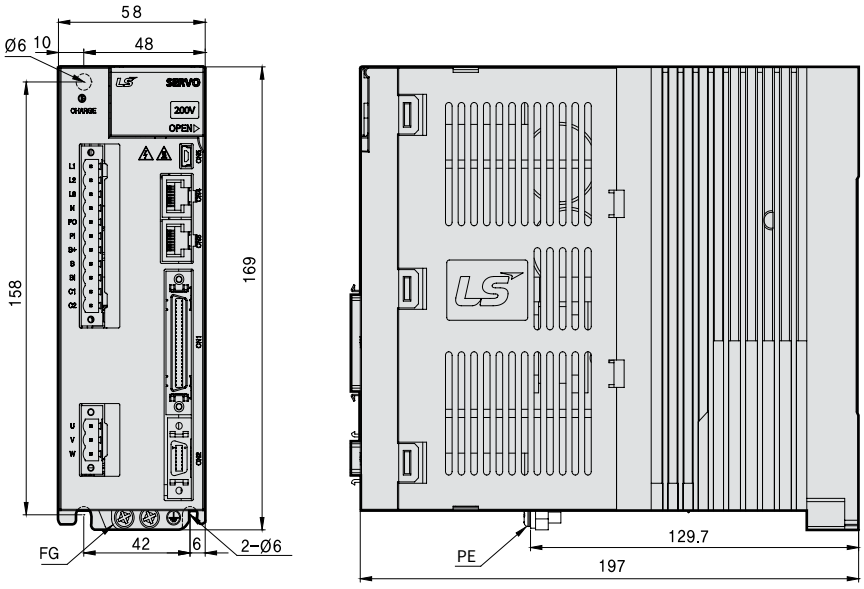
*Unit [mm]

L7SA001□~L7SA004□
[Weight: 1.0kg]



*Unit [mm]

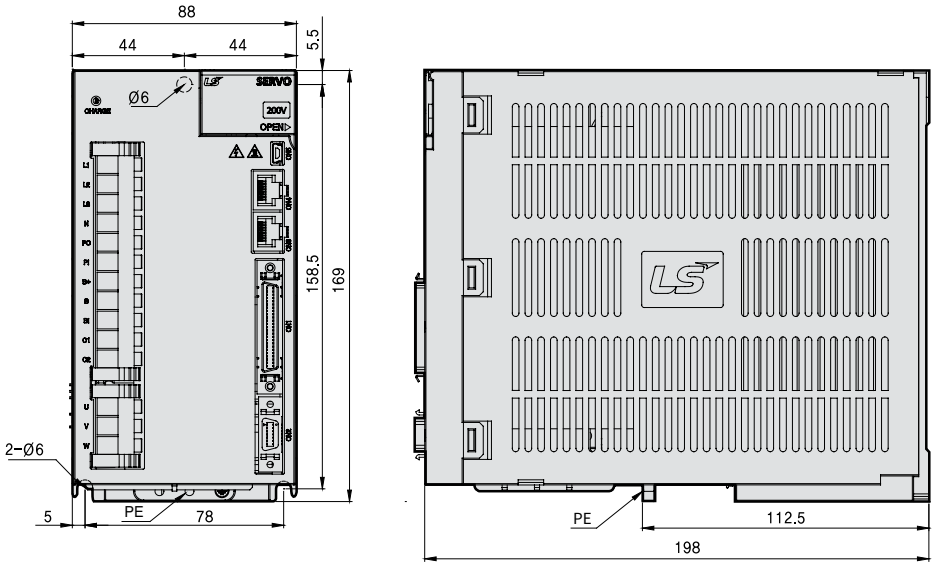
L7SA008□~L7SA010□
[Weight: 1.5kg
(Fan-Cooling included)]



*Unit [mm]

L7SA020□~L7SA035□

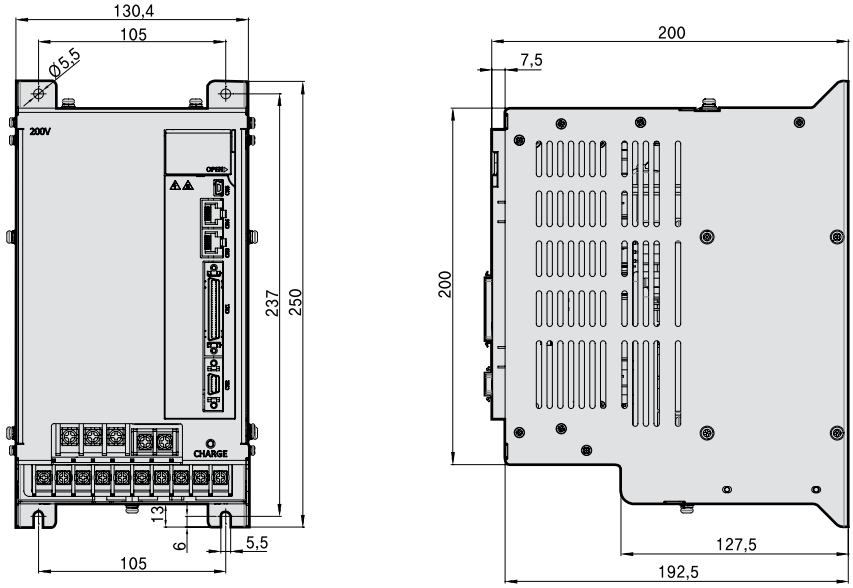
[Weight: 2.5kg
(Fan-Cooling included)]



*Unit [mm]

L7SA050□

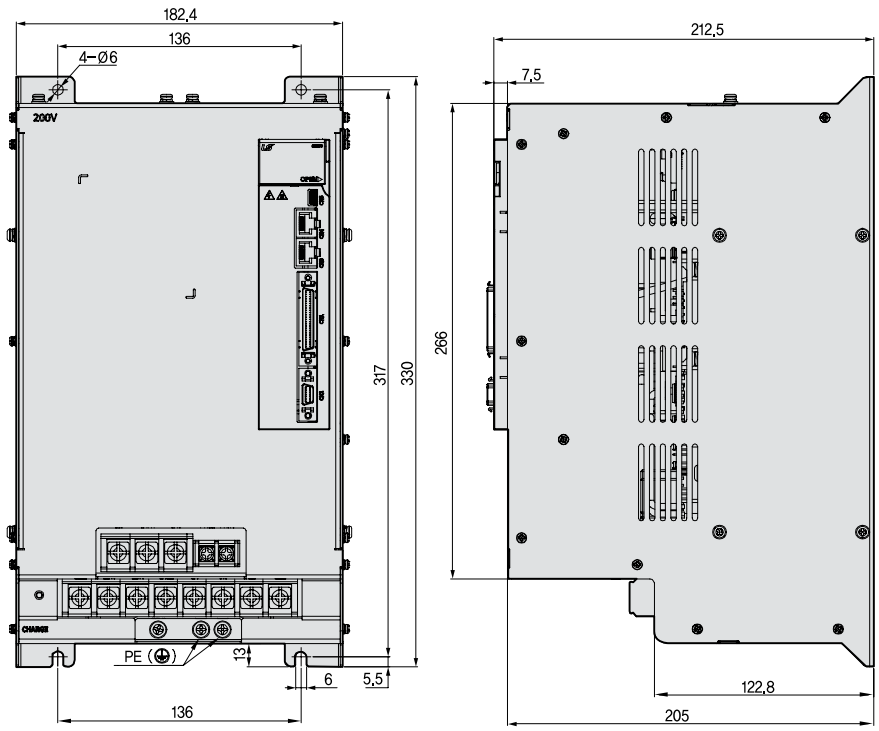
[Weight: 5.5kg
(Fan-Cooling included)]



External Dimensions

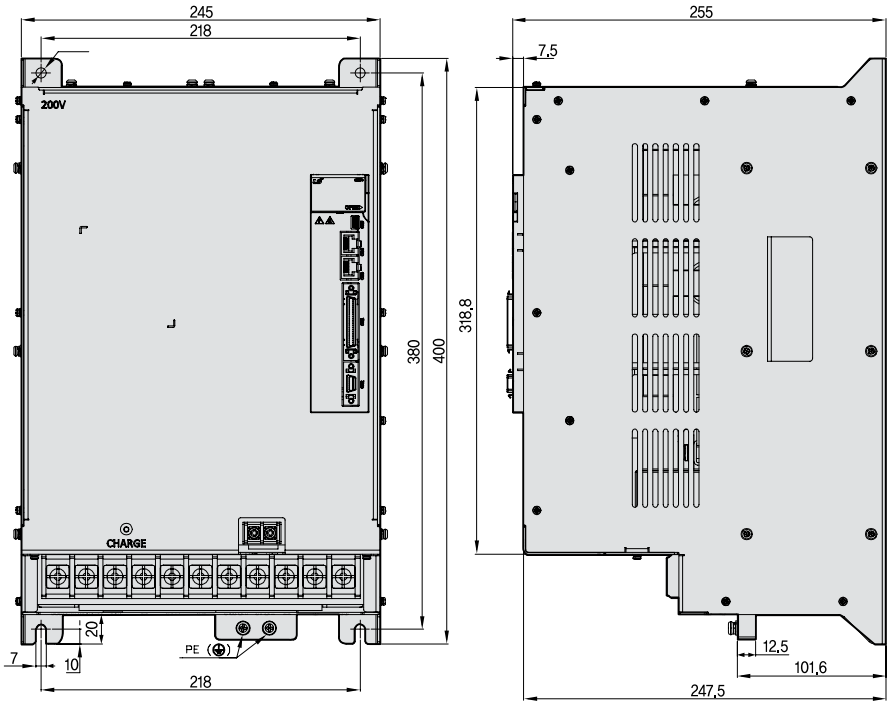
*Unit [mm]

L7SA075B
[Weight: 8.5kg
(Fan-Cooling included)]



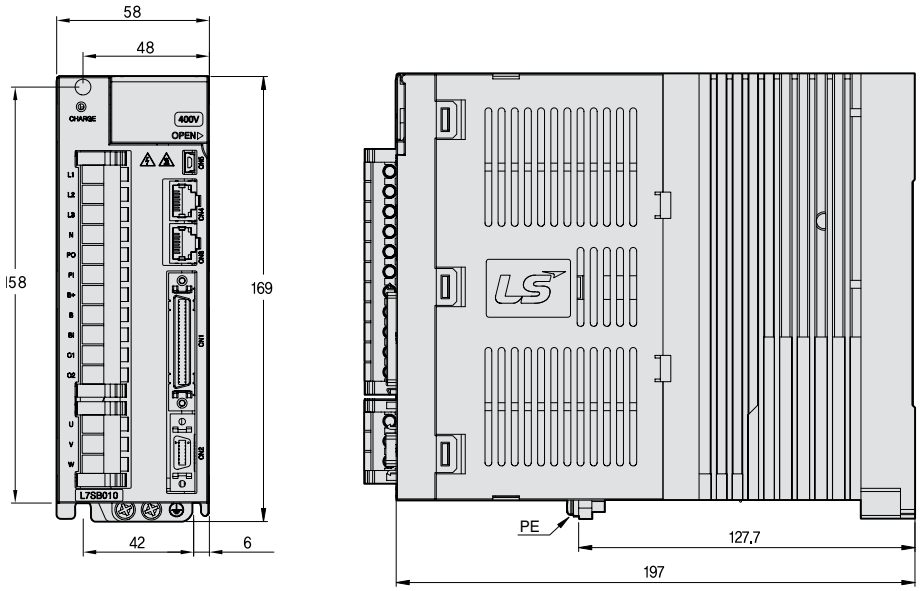
*Unit [mm]

L7SA150B
[Weight: 16.2kg
(Fan-Cooling included)]



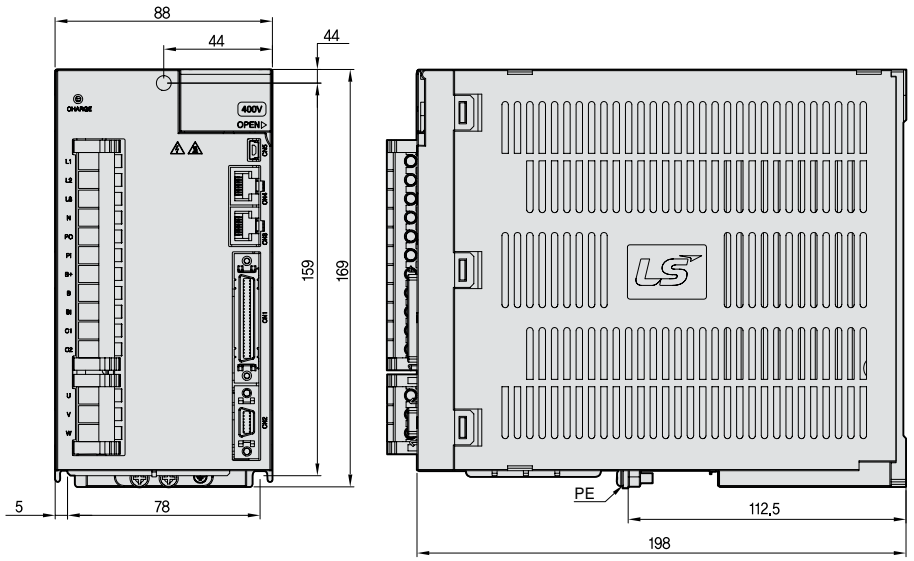
*Unit [mm]

L7SB010B
[Weight: 1.5kg
(Fan-Cooling included)]



*Unit [mm]

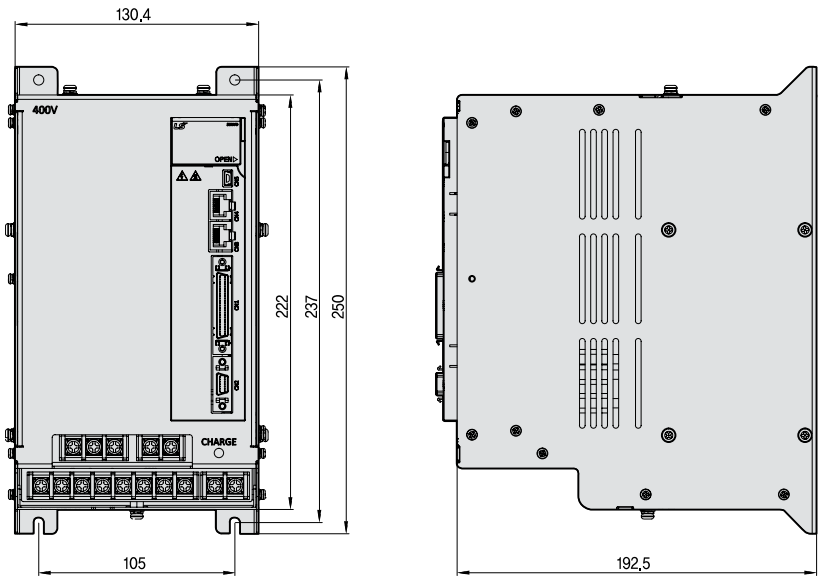
L7SB020B / L7SB035B
[Weight: 2.5kg
(Fan-Cooling included)]



External Dimensions

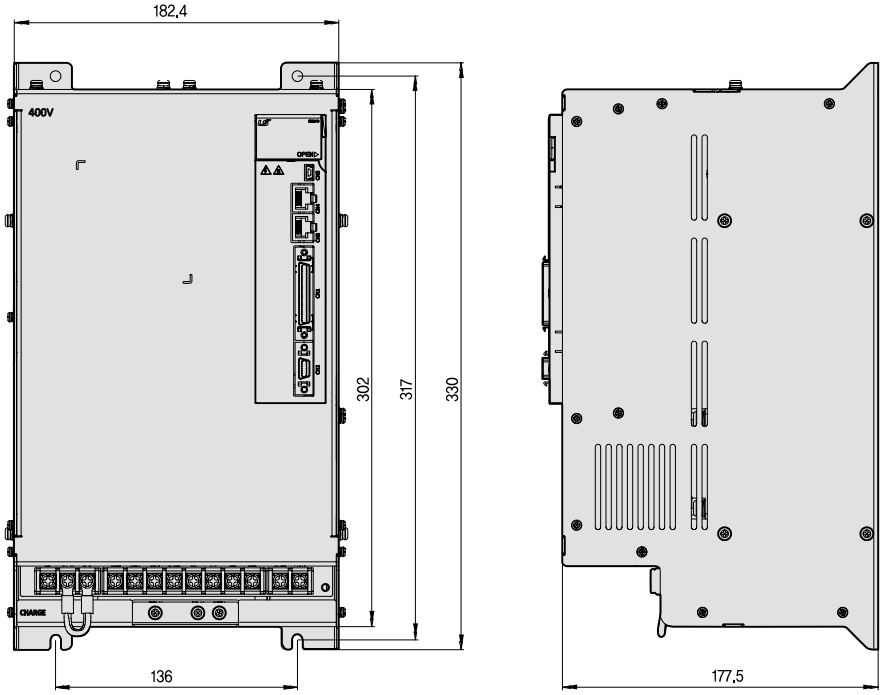
*Unit [mm]

L7SB050B
[Weight: 5.5kg
(Fan-Cooling included)]



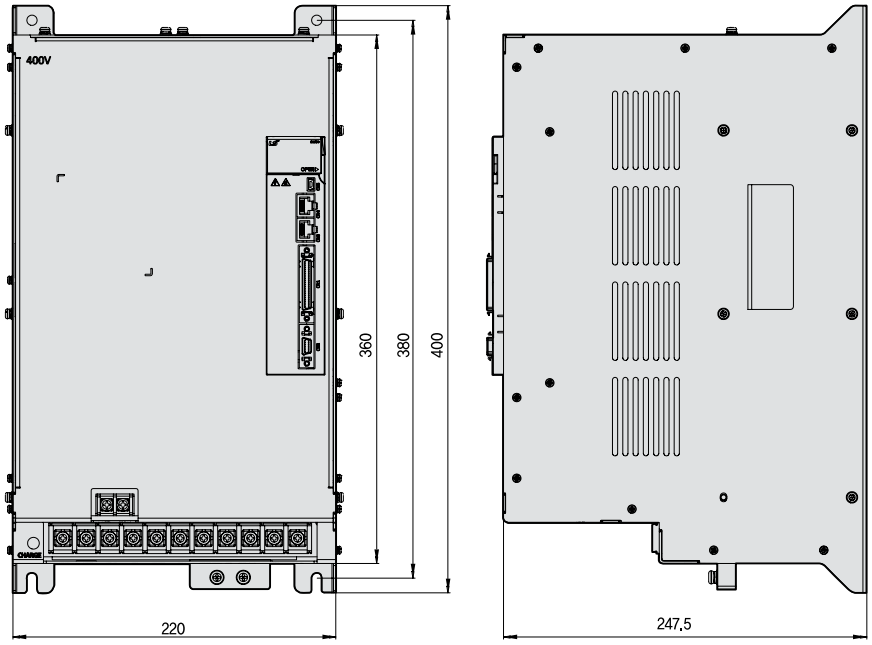
*Unit [mm]

L7SB075B
[Weight: 8.5kg
(Fan-Cooling included)]



*Unit [mm]

L7SB150B
[Weight: 15.5kg
(Fan-Cooling included)]



L7C Series

Servo Drive Designation

L7	C	A	010	U	AA
	Communication	Input Power Supply	Capacity	Encoder Type	Option
	Economical I/O Type	A : 200VAC	001 : 100W	U : Universal	Exclusive Option Code
			002 : 200W		
			004 : 400W		
			008 : 750W		
			010 : 1.0kW		

Parts Identification

Economical Pulse and Analog Command Type L7C

Control Power/Main Power Unification

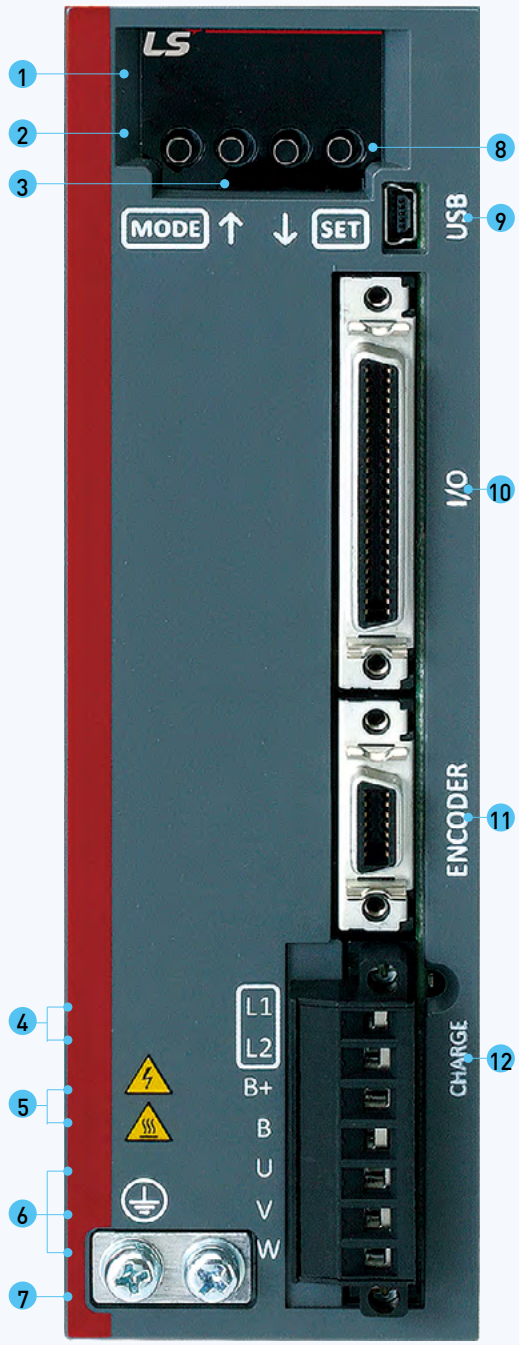
- Unified power supply with integrated control and power board
- Diverse product line supporting single-phase AC220, with capacities ranging from 0.1 to 1kW

Optimal Systems with Affordable Cost

- No FPGA used by the optimized MCU operation

Maintains L7S compatibility and specifications

- Compatibility with existing L7S I/O pin map
- Maintain current control cycle (10kHz), speed/position control cycle (5kHz)
- Added operation mode (indexing mode) and improved memory (1MB)



1. Display
2. Mode switch
3. Operation switch(Up/down)
4. Main power terminal (L1, L2)
5. Regenerative resistance terminal (B+, B)
   - Mount external resistors to ports B+ and B
6. Servo motor power connectors (U, V, W)
7. Ground
8. Set-up switch
9. USB connector
10. Control signal connector(I/O)
11. Encoder connector(ENCODER)
12. Charge indicator

L7C Drive

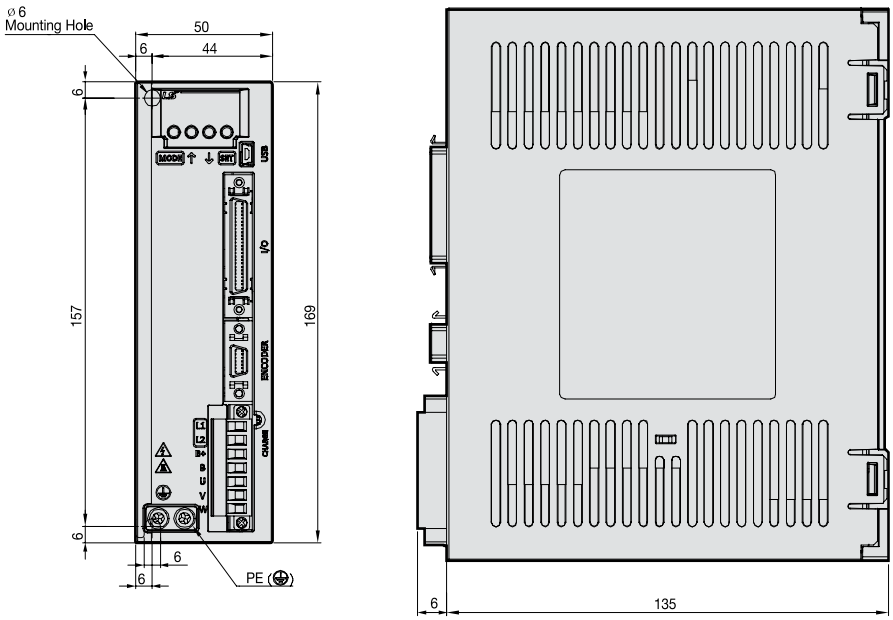
Item \ Type Name		L7CA001U	L7CA002U	L7CA004U	L7CA008U	L7CA010U
Input Power		Single phase AC200 ~ 230[V] (-15~+10%), 50~60[Hz]				
Rated Current[A]		1.4	1.7	3.0	5.2	6.75
Peak Current[A]		4.2	5.1	9.0	15.6	20.25
Encoder Type		Quadrature (Incremental), Biss-B, Biss-C (Absolute, Incremental)				
Control Performance	Speed Control Range	Maximum 1:5000				
	Frequency Response	Maximum 1[KHz] or above (When using 19Bit Serial Encoder)				
	Speed Variation Ratio	±0.01 [%] or lower [when load changes between 0 and 100%] ±0.1[%] or lower [Temperature 25 ±10°C]				
	Accel/Decel Time	Straight or S-curve acceleration/deceleration (0-10,000[ms], possible to be set by 0-1,000[ms] unit)				
	Input frequency	1[Mpps], line driver / 200[kpps], open collector				
	Input Pulse Type	Symbol + Pulse series, CW+CCW, A/B Phase				
Communication Specifications	Standards	ANSI/TIA/EIA-422 standard specifications				
	Protocol	MODBUS-RTU				
	Synchro Method	Asynchronous				
	Power Consumption	100mA or less				
	Transmission Speed	9,600 / 19,200 / 38,400 / 57,600bps				
	Distance	Maximum 200[m]				
	Terminating Resistance	External connection (CN1 7Pin, 28Pin connection), Built-in 120Ω				
Digital Input, Output	Digital Input	Input voltage range : DC12V ~ DC24V Total 10 input channels (allocable) Total 34 input functions allocable (*SV_ON, *SPD/LVSF1, *SPD2/LVSF2, *SPD3, *A-RST, *JDIR, *POT, *NOT, *EMG, *STOP, START, REGT, HOME, HSTART, ISEL0, ISEL1, ISEL2, ISEL3, ISEL4, ISEL5, PCON, GAIN2, P_CL, N_CL, MODE, PAUSE, ABSRQ, JSTART, PCLR, AOVR, INHIBIT, EGEAR1, EGEAR2, ABS_RESET) * Basic allocation signal				
	Digital Output	Service rating : DC24V ±10%, 120mA 5 of 8 input channels are allocable, 3 channels are fixed with AL00, AL01, AL02 Total 19 output functions allocable (*ALARM, *READY, *ZSPD, *BRAKE, *INPOS1, ORG, EOS, TGON, TLMT, VLMT, INSPD, WARN, INPOS2, IOUT0, IOUT1, IOUT2, IOUT3, IOUT4, IOUT5) * Basic allocation signal				
Analog Output		2 Channels Analog speed input (Command/Overide) ±10V Analog torque input (Command/Limit) ±10V				
USB Communication	Connect	PC				
	Communication Standard	Complies with USB 2.0 Full Speed standard				
	Specification	PC, complies with USB 2.0 Full Speed standard				
Internal Function	Dynamic Braking	Standard built-in brake (Activated when the servo alarm goes off or when the servo is off),				
	Regenerative Braking	External installation possible (optional)				
	Display Function	7-segment display (5 digits)				
	Additional Function	Gain tuning, alarm history, JOG operation, origin search				
	Protection Function	Excessive current/voltage/overload/overheating/speed, excessive current limit, low voltage, encoder/position following/current sensing failure				
Operation Environment	Operating Temperature / Storage Temperature	0~50°C / -20 ~ 65°C				
	Operating Humidity / Storage Humidity	Below80[%]RH / Below 90[%]RH(Noncondensing)				
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.				

External Dimensions

*Unit [mm]

L7CA001U / L7CA002U / L7CA004U

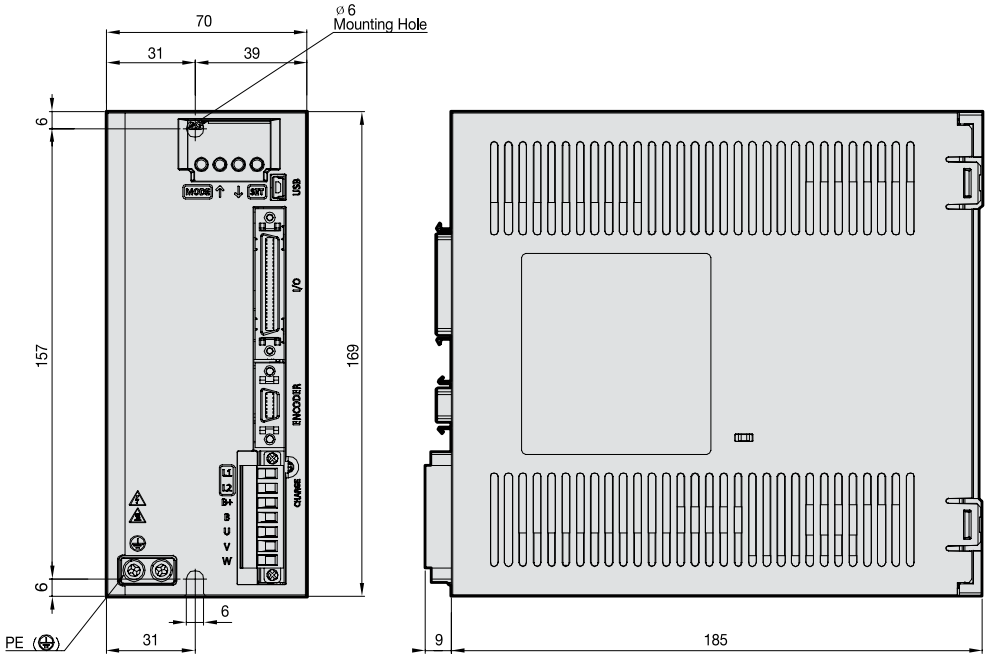
[Weight: 1.0kg]



*Unit [mm]

L7CA008U / L7CA010U

[Weight: 1.5kg]



L7P Series

Servo Drive Designation

L7	P	A	004		U	AA
	Communication	Input Power Supply	Capacity (A: 200VAC)	Capacity (B: 400VAC)	Encoder Type	Option
	Standard I/O & Index Type	A : 200VAC	001 : 100W	010 : 1.0kW	U : Universal	Exclusive Option Code
		B : 400VAC	002 : 200W	020: 20kW		
			004 : 400W	035 : 3.5kW		
			008 : 750W	050 : 5.0kW		
			010 : 1.0kW	075 : 7.5kW		
			020: 20kW	150 : 15kW		
			035 : 3.5kW			
			050 : 5.0kW			
			075 : 7.5kW			
			150 : 15kW			

Parts Identification

Standard Pulse and Indexer Type L7P

Provides Program Function with Built-in Single Axis Position Determination Module

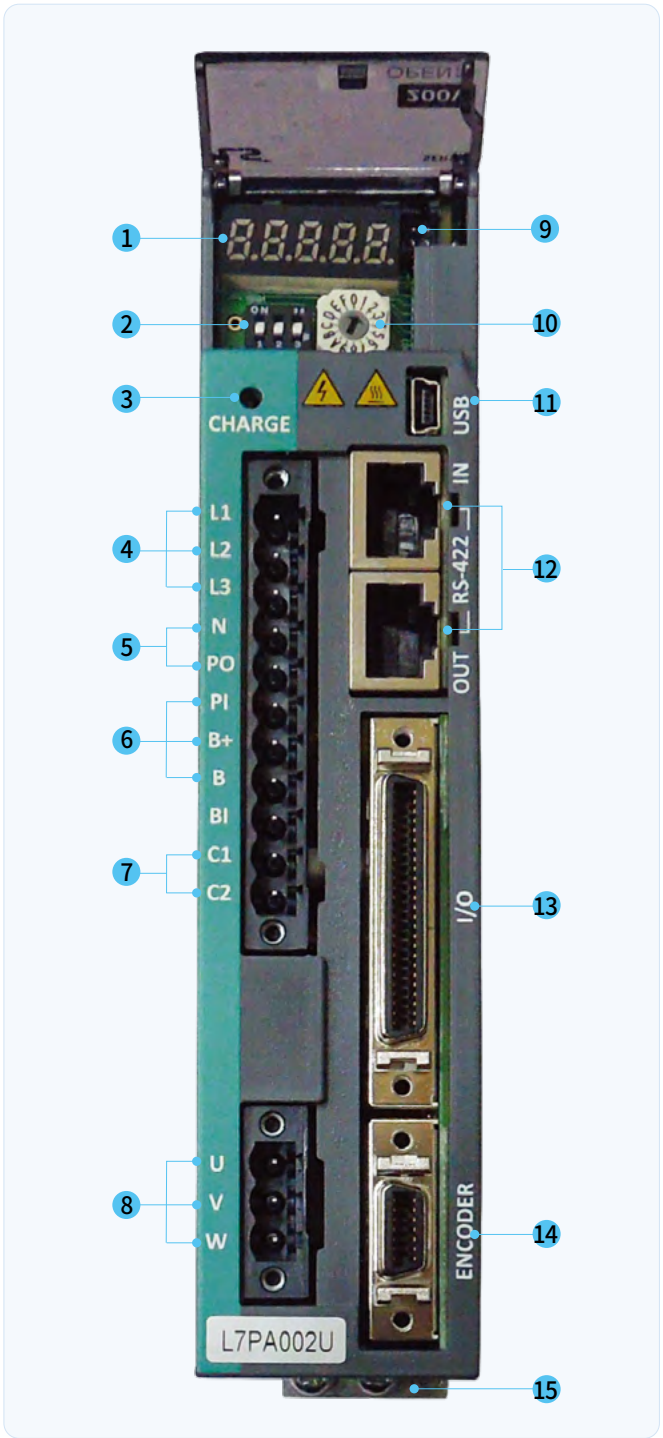
- Supports position control mode through pulse input
- Provides position control through I/O or HMI without position control module
- Drive operable by itself
- Modbus RTU protocol (RS-422)

Compatible with Various Motors and Encoders

- Operates with rotary, DD and linear motors (Supporting 3rd party motor)
- Quadrature, BiSS-C, Tamagawa serial abs, Endat 2.2, Panasonic serial abs, Sinusoidal

Improved Control Performance

- Improved control bandwidth
- 4-step notch filter provided
- Vibration control by Real-time FET
- Real-time gain tuning function



1. Display
2. Terminating resistance switch
3. Charge indicator
4. Main power connector (L1, L2, L3)
5. DC reactor connector (PO, PO), short-circuit when not in use
6. Regenerative resistor connector (B+, B, BI)
   - Short-circuit B and BI terminals when using standard type
   - Use B+ and B terminals when using external resistor
7. Control power connector (C1, C2)
8. Servo motor power connector(U, V, W)
9. Connector for analogue monitor
10. Node address switch
11. USB connector(USB)
12. RS-422 communication connector(CN3,CN4)
13. Control signal connector(I/O)
14. Encoder connector(ENCODER)
15. Ground

L7PA Drive

Item \ Type Name		L7PA001U	L7PA002U	L7PA004U	L7PA008U	L7PA010U	L7PA020U	L7PA035U	L7PA050U	L7PA075U	L7PA150U
Input Power	Main Power Supply	3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]									
	Control Power Supply	Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]									
Rated Current[A]		1.4	1.7	3.0	5.2	6.8	13.5	16.7	32.0	39.4	76.0
Peak Current[A]		4.2	5.1	9.0	15.6	20.3	40.5	50.1	90.9	98.5	190.0
Encoder Type		Quadrature(Incremental), BiSS-B, BiSS-C(Absolute, Incremental), Tamagawa Serial(Absolute, Incremental), Panasonic Serial(Absolute), EnDat 2.2, Sinusoidal, Analog Hall									
Control Performance	Speed Control Range	Maximum 1: 5000									
	Frequency Response	Maximum 1 [kHz] or above (When using 19bit Serial Encoder)									
	Speed Variation Ratio	±0.01 [%] or lower [when load changes between 0 and 100%] ±0.1[%] or lower[Temperature25 ±10°C]									
	Accel/Decel Time	Straight or S-curve acceleration/deceleration (0~10,000[ms], 0~1,000[ms] Unit configurable)									
	Input Frequency	1[Mpps], line drive / 200[kpps], Open collector									
	Input Pulse Type	Symbol + Pulse series, CW+CCW, A/B Phase									
RS422 Communication Specifications	Communication Specifications	ANSI/TIA/EIA-422 Standard specifications									
	Communication Protocol	MODBUS-RTU									
	Connector	RJ45 x 2									
	Synchro Method	Asynchronous									
	Transmission Speed	9600 /19200/38400/57600 [bps], Can be configured at [0x3002]									
	Transmission Distance	Maximum 200 [m]									
	Power Consumption	100[mA] or less									
	Terminating Resistance	Dip S/W(On/Off), Built-In 120Ω									
Digital Input, Output	Digital Input	Input voltage range: DC 12[V] ~ DC 24[V], total 16 input channel (allocable), 33 function inputs can be selectively allocated (*SV_ON, *POT, *NOT, *A-RST, *START, *STOP, *REGT, *EMG, *HOME, *HSTART, *ISEL0, *ISEL1, *ISEL2, *ISEL3, *ISEL4, *ISEL5, PCON, GAIN2, P_CL, N_CL, PROBE1, PROBE2, PAUSE, ABSRQ, JSTART, JDIR, PCLR, SPD1/ LVSF1, SPD2/ LVSF2, SPD3, AOVR, INHIBIT, MODE)									
	Digital Output	Use rating: DC 24[V] ±10%, 120[mA], total 8 input channel (allocable) 19 function inputs can be selectively allocated (*ALARM±, *READY±, *BRAKE±, *INPOS1±, *ORG±, *EOS±, *TGON±, *TLMT±, VLMT±, INSPD±,ZSPD±, WARN±, INPOS2±, IOUT0±, IOUT1±, IOUT2±, IOUT3±, IOUT4±, IOUT5±)									
Analog Input / Output	Analog Input	Total 2 channels (allocable) analog speed override input(-10[V] ~ +10[V]) analog torque command input(-10[V] ~ +10[V])									
	Analog Output	Total 2 channels 15 function inputs can be selectively allocated									
USB Communication	Functions	Firmware download, parameter setting, tuning, auxiliary function,parameter copy									
	Communication Specifications	Complies with USB 2.0 Full speed specifications									
	Connection Device	PC or USB storage media									
Built-in Functions	Dynamic Braking	Standard built-in(activated by servo alarm or servo OFF)									
	Regenerative Braking	Default built-in(Excluding 15kW), external installation possible									
	Display	7-segment display (5 digits)									
	Self-setting Function	Drive node address can be set using rotary switch									
	Additional Function	Gain tuning, alarm history, JOG operation, origin search									
	Protective Function	Excessive current, overload, excessive current limit, overheating, excessive voltage, low voltage, excessive speed, encoder failure, position following failure, current sensing failure									
Operation Environment	Operating Temperature / Storage Temperature	0 ~ +50[°C] / -20~ +70[°C]									
	Operating Humidity / Storage Humidity	Below80[%]RH / Below 90[%]RH(Noncondensing)									
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.									

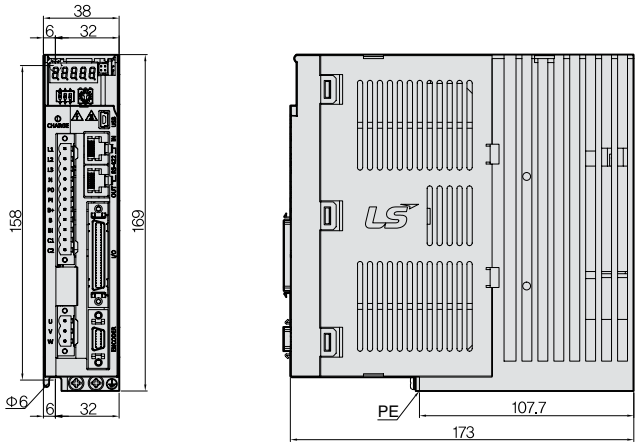
L7PB Drive

Item \ Type Name		L7PB010U	L7PB020U	L7PB035U	L7PB050U	L7PB075U	L7PB150U
Input Power	Main Power Supply	3 Phase AC380 ~ 480[V](-15 ~ +10[%]), 50 ~ 60[Hz]					
	Control Power Supply	Single Phase AC380 ~ 480[V](-15 ~ +10[%]), 50 ~ 60[Hz]					
Rated Current[A]		3.7	8.0	10.1	17.5	22.8	39.0
Peak Current[A]		11.1	24.0	30.3	47.3	57.0	97.5
Encoder Type		Quadrature(Incremental), BiSS-B, BiSS-C(Absolute, Incremental), Tamagawa Serial(Absolute, Incremental), Panasonic Serial(Absolute), EnDat 2.2, Sinusoidal, Analog Hall					
Control Performance	Speed Control Range	Maximum 1: 5000					
	Frequency Response	Maximum 1 [kHz] or above (When using 19bit Serial Encoder)					
	Speed Variation Ratio	±0.01 [%] or lower [when load changes between 0 and 100%] ±0.1[%]orlower[temperature25 ±10°C]					
	Accel/Decel Time	Straight or S-curve acceleration/deceleration (0~10,000[ms], 0~1,000[ms] Unit configurable)					
	Input Frequency	1[Mpps], line drive / 200[kpps], Open collector					
	Input Pulse Type	Symbol + Pulse Series, CW+CCW, A/B Phase					
RS422 Communication Specifications	Communication Specifications	ANSI/TIA/EIA-422 Standard specifications					
	Communication Protocol	MODBUS-RTU					
	Connector	RJ45 x 2					
	Synchro Method	Asynchronous					
	Transmission Speed	9600 /19200/38400/57600 [bps], Can be configured at [0x3002]					
	Transmission Distance	Maximum 200 [m]					
	Power Consumption	100[mA]					
	Terminating Resistance	Dip S/W(On/Off), Built-In 120Ω					
Digital Input, Output	Digital Input	Input voltage range: DC 12[V] ~ DC 24[V], total 16 input channel (allocable), 30 function inputs can be selectively allocated (*SV_ON, *POT, *NOT, *A-RST, *START, *STOP, *REGT, *EMG, *HOME, *HSTART, *ISEL0, *ISEL1, *ISEL2, *ISEL3, *ISEL4, *ISEL5, PCON, GAIN2, P_CL, N_CL, PAUSE, ABSRQ, JSTART, JDIR, PCLR, SPD1/LVSF1, SPD2/ LVSF2, SPD3, AOVR, MODE)					
	Digital Output	Use rating: DC 24[V] ±10%, 120[mA], total 8 input channel (allocable) 19 function inputs can be selectively allocated (*ALARM±, *READY±, *BRAKE±, *INPOS1±, *ORG±, *EOS±, *TGON±, *TLMT±, VLMT±, INSPD±,ZSPD±, WARN±, INPOS2±, IOUT0±, IOUT1±, IOUT2± IOUT3±, IOUT4±, IOUT5±)					
Analog Input / output	Analog Input	Total 2 channels Analog speed override input (command / override) -10[V] ~ +10[V], Analog torque command input (command / limit) -10[V] ~ +10[V]					
	Analog Output	Total 2 channels (allocable) 15 function inputs can be selectively allocated					
USB Communication	Functions	Firmware download, parameter setting, tuning, auxiliary function, parameter copy					
	Communication Specifications	Complies with USB 2.0 Full speed specifications					
	Connection Device	PC or USB storage media					
Built-in Functions	Dynamic Braking	Standard built-in(Activated by servo alarm or servo OFF)					
	Regenerative Braking	Default built-in(Excluding 15kW), external installation possible					
	Display	7-segment display (5 digits)					
	Self-setting Function	Drive node address can be set using rotary switch					
	Additional Function	Gain tuning, alarm history, JOG operation, origin search					
	Protective Function	Excessive current, overload, excessive current limit, overheating, excessive voltage, low voltage, excessive speed, encoder failure, position following failure, current sensing failure					
Operation Environment	Operating Temperature / Storage Temperature	0 ~ +50[°C] / -20~ +70[°C]					
	Operating Humidity / Storage Humidity	Below80[%]RH / Below 90[%]RH(Noncondensing)					
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.					

External Dimensions

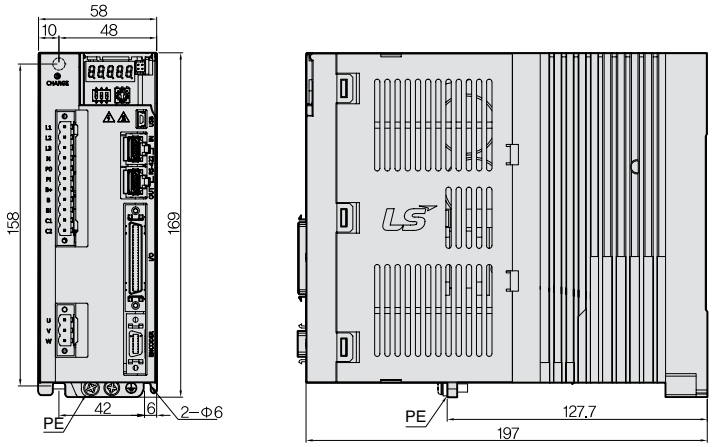
*Unit [mm]

L7PA001U ~ L7PA004U
[Weight: 1.0kg]



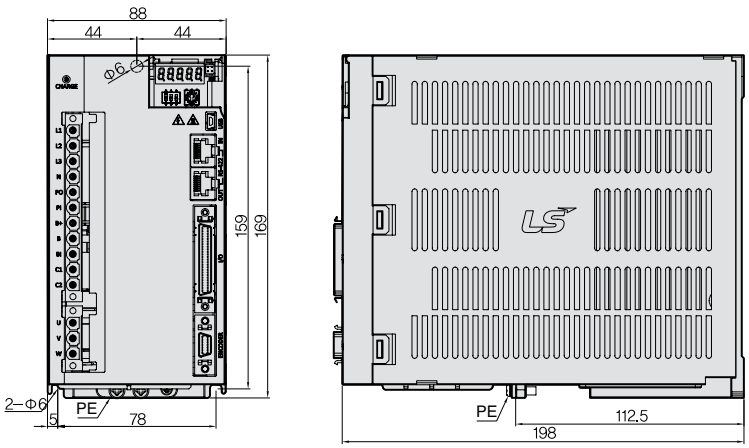
*Unit [mm]

L7PA008U / L7PA010U
[Weight: 1.5kg
(Fan-Cooling included)]



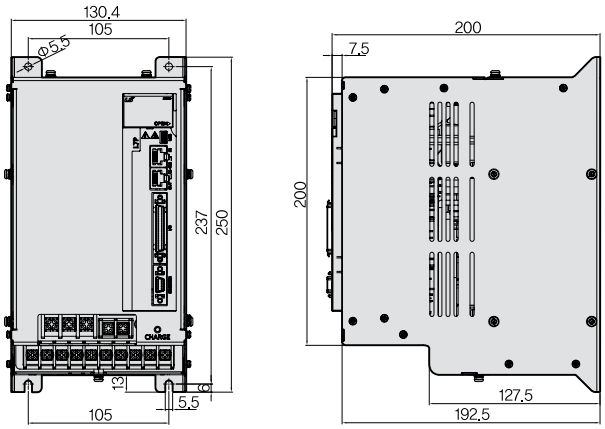
*Unit [mm]

L7PA020U / L7PA035U
[Weight: 2.5kg
(Fan-Cooling included)]



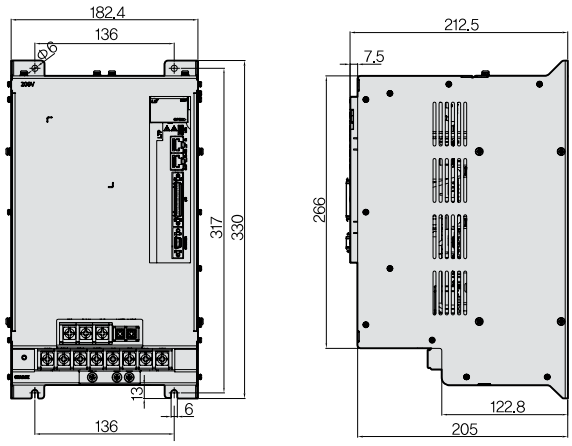
*Unit [mm]

L7PA050U
[Weight: 5.5kg
(Fan-Cooling included)]



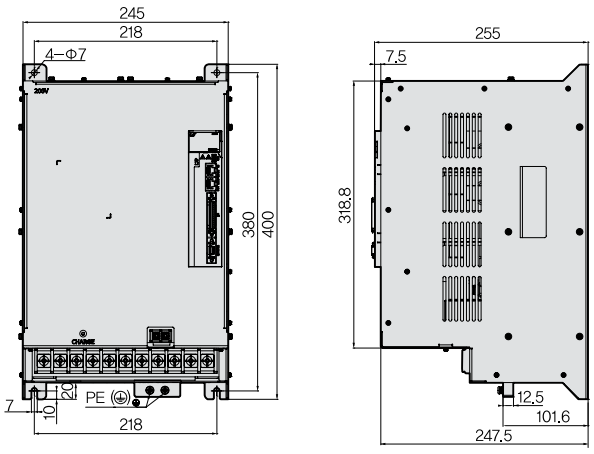
*Unit [mm]

L7PA075U
[Weight: 8.5kg
(Fan-Cooling included)]



*Unit [mm]

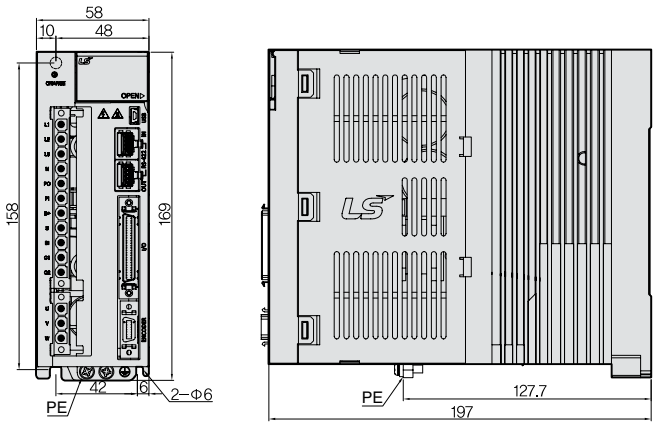
L7PA150U
[Weight: 16.2kg
(Fan-Cooling included)]



External Dimensions

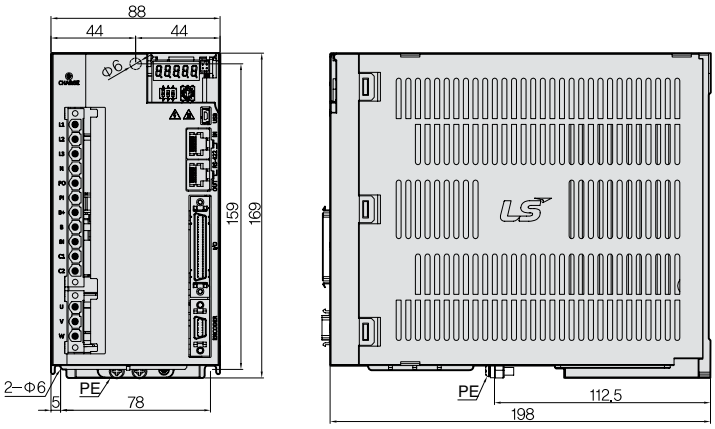
*Unit [mm]

L7PB010U
[Weight: 1.5kg
(Fan-Cooling included)]



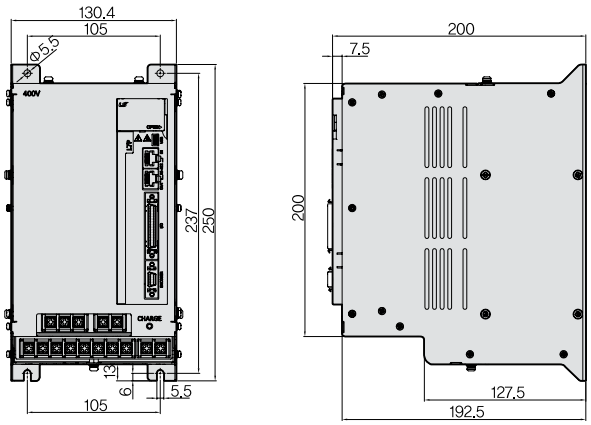
*Unit [mm]

L7PB020U / L7PB035U
[Weight: 2.5kg
(Fan-Cooling included)]



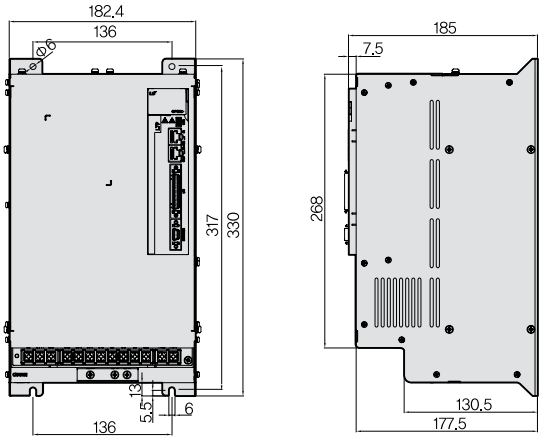
*Unit [mm]

L7PB050U
[Weight: 5.5kg
(Fan-Cooling included)]



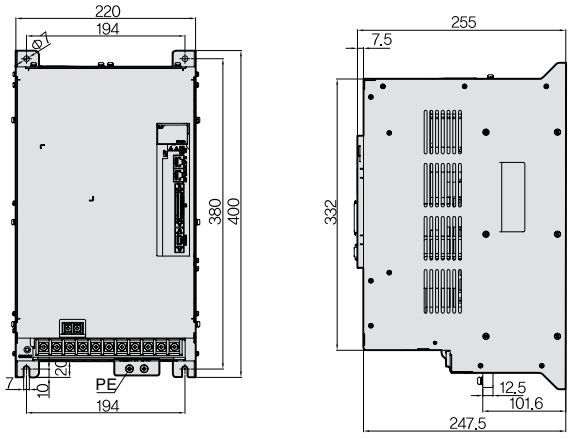
*Unit [mm]

L7PB075U
[Weight: 8.5kg
(Fan-Cooling included)]

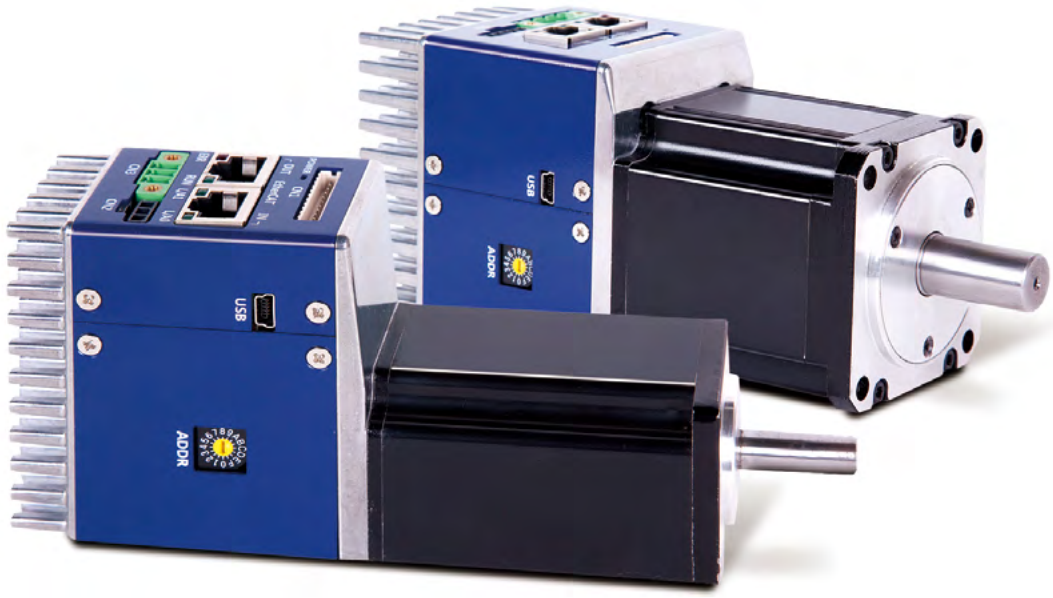


*Unit [mm]

L7PB150U
[Weight: 15.5kg
(Fan-Cooling included)]



PEGA Series



Servo Drive Designation

PEGA	–	A	R5	A	–	A	N	–	M	A
Servo Drive		Flange Size	Motor Capacity	Rated Speed		Drive Voltage	Communication		Encoder Type	Resolution
PEGASUS Series		A : 40 Flange B : 60 Flange	R5 : 50[W] 01 : 100[W] 02 : 200[W] 03 : 300[W]	A : 3000[rpm]		A : 48VDC	N : EtherCAT		M : Magnetic Encoder	A : 12Bit

Parts Identification

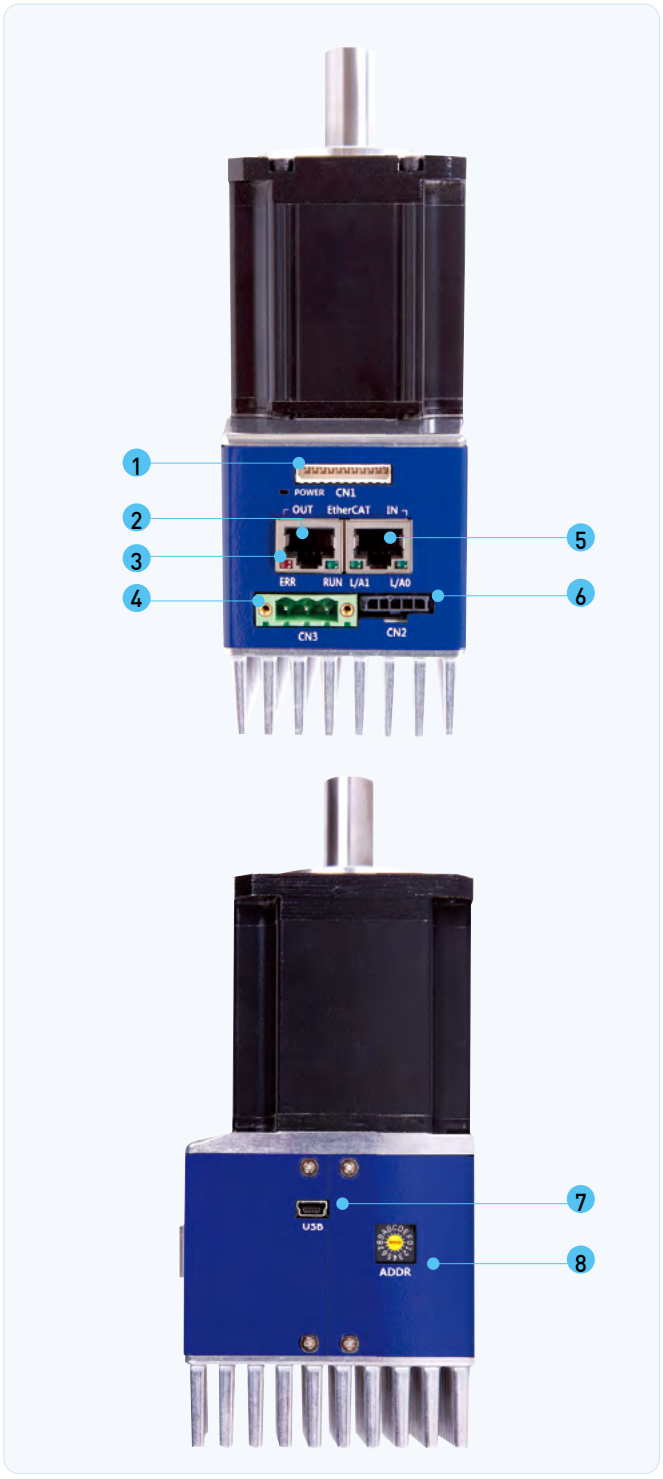
Integrated Drive-Motor EtherCAT Type PEGA

Enhanced Efficiency Through Integration of Motor and Drive

- Cost effective from installation by integrated system of motor, encoder cable and drive
- Highly efficient space usage when installed at limited and small space
- High effectiveness for application of multi axis because there is no limitation for space of installation

Real-time Control Through EtherCAT

- High speed, Real-time capability and synchronization mechanism
- Improved EtherCAT communication speed (min. 250μs, supports DC)
- Supports CoE, EoE and FoE



1. Input / Output signal connector (CN1)
   - This connector is for sequence input / Output signals
2. EtherCAT Communication output port (OUT)
3. Status LED
   - It indicates the current state of EtherCAT Communication
4. Power connector (CN3)
5. EtherCAT Communication input port (IN)
6. Safety connector (CN2)
   - This connector connects safety devices
7. USB Connector (CN5, Mini B type)
   - This connector is to communicate with a PC
8. Node address setting switch
   - This switch is to set the node address of the drive
   - You can set the node addresses from 0 to 15

Xmotion Drive Product Features

Rated Values of Servo Drive

Rated	□40 50W (AR5A)	□40 100W (A01A)	□60 100W (B01A)	□60 200W (B02A)	□60 300W (B03A)
Continuous Output Current [Arms]	1.8	2.4	3.6	5.0	6.8
Maximum Output Current [Arms]	3.5	3.8	7.2	10.0	13.6
Input Voltage	DC 48V ~ DC 60V				

Basic Specifications

Category			Details
Use Conditions	Control Method		PWM controlled sine wave current driving method
	Operating Temperature/Storage Temperature		0~+40[°C] / -20~ +60[°C]
	Operating Humidity/Storage Humidity		Below 80% RH / Below 90% RH (no freeze or condensation)
	Vibration-/Impact-resistance		TBD
	Degree of Protection/Degree of Pollution		TBD
	Altitude		1000m or lower
	Other		To be free from elecreostatic noise, strong electric current, or radiation.
Performance	Speed Variation	Load Variation	At 0 to 100% load: ± 3% (at rated speed)
		Voltage Variation	Rated voltage ±10%: 0% (at rated speed)
		Temperature Variation	25°C: ±0.1% or less (at rated speed)
Input/ Output Signal	Input Signal		Input voltage range: DC 12 V - DC 30 V The 4-channel input signal can be assigned to 12 functions: POT, NOT, HOME, STOP, PCON, GAIN2, PCL, NCL, PROBE1, PROB2, EMG, and ARST.
	Output Signal		Rated voltage and current: DC 24 V ±10%, 120[mA] The 2-channel output signal can be assigned to 11 functions: BRAKE, ALARM, RDY, ZSPD, INPOS1, TLMT, VLMT, INSPD, WARN, TGON, and INPOS2.
Analog Monitor			Number of channels: 1, Output voltage range: ±4V, Angular resolution: 12 bits, Stabilization time: 15 us
USB Communica-tion	Connecting Device		PC or USB storage medium
	Communication Standard		Conforms to the USB 2.0 Full Speed Standard.
	Function		Firmware download, parameter setting, adjustment, auxiliary functions, and parameter copy function.
Dynamic Brake (Three-phase Short-circuit)			Activates when servo alarm, servo OFF, or Emergency stop (POT, NOT and EMG) is input.
Protection Functions			Overcurrent, overload, current limit, overheat, overvoltage, undervoltage, overspeed, encoder error, position follow error, etc.
Auxiliary Functions			Gain adjustment, alarm history, JOG drive, programmed JOG drive, etc.
Safety Functions	Input		STO1, STO2
	Compatible Standard		TBD

EtherCAT Communication Specification

Category		Details
Communicati on Standard	FoE	Firmware download
	EoE	Parameter setting, adjustment, auxiliary functions, and parameter copy through UDP.
	CoE	IEC 61158 Type12, IEC 61800-7 CiA 402 drive profile
Physical Layer		100BASE-TX(IEEE802.3)
Connector		RJ45 x 2
Distance		Within 100 m between nodes
DC (Distributed Clock)		Sync by DC mode
LED Display		• L/A0(Link/Act IN) • L/A1(Link/Act OUT) • RUN • ERR
Cia402 Drive Profile		Supports CSP, CSV, CST, PP, PV, PT, and HM Modes.

Internal Encoder Specification

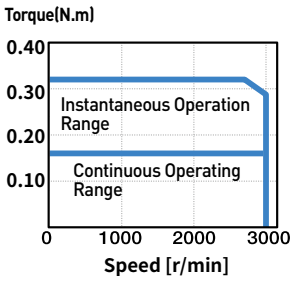
Category	Details
Encoder Type	Magnetic Encoder (12bit)(Singleturn Absolute)

Internal Motor Specification

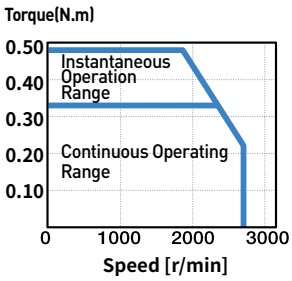
Model		□40 50W (AR5A)	□40 100W (A01A)	□60 100W (B01A)	□60 200W (B02A)	□60 300W (B03A)
Rated Torque	[N·m]	0.16	0.32	0.32	0.64	1.27
	[kgf·cm]	1.62	3.25	3.25	6.50	9.74
Max. Torque	[N·m]	0.32	0.48	0.64	1.27	1.91
	[kgf·cm]	3.24	4.88	6.50	13.0	19.48
Rated Speed	[r/min]	3000	2400	3000	3000	3000
Max Speed	[r/min]	3000	3000	3000	3000	3000
Inertia	[kg·m^{2}X10^{-4}]	0.0240	0.0450	0.1140	0.1820	0.3210
	[gf·cm·s^2]	0.0245	0.0459	0.1163	0.1857	0.3276

Speed-Torque Characteristics

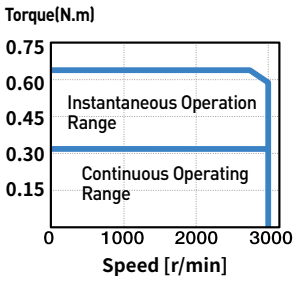
PEGA-AR5A-A



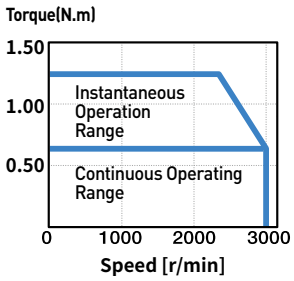
PEGA-A01A-A



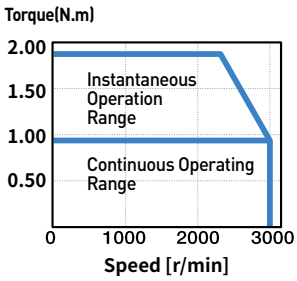
PEGA-B01A-A



PEGA-B02A-A



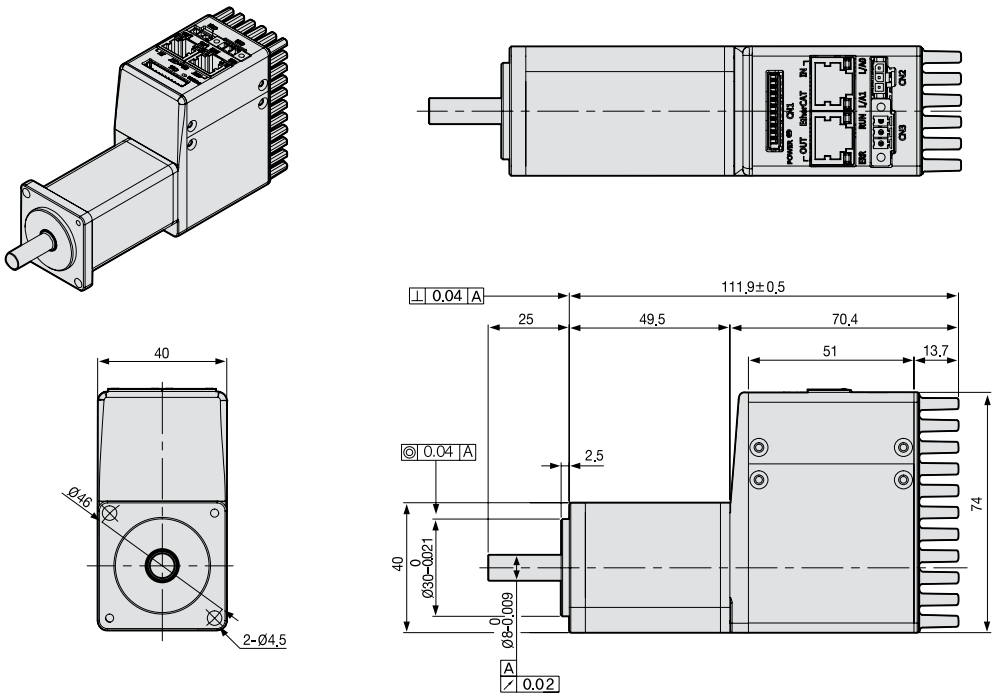
PEGA-B03A-A



External Dimensions

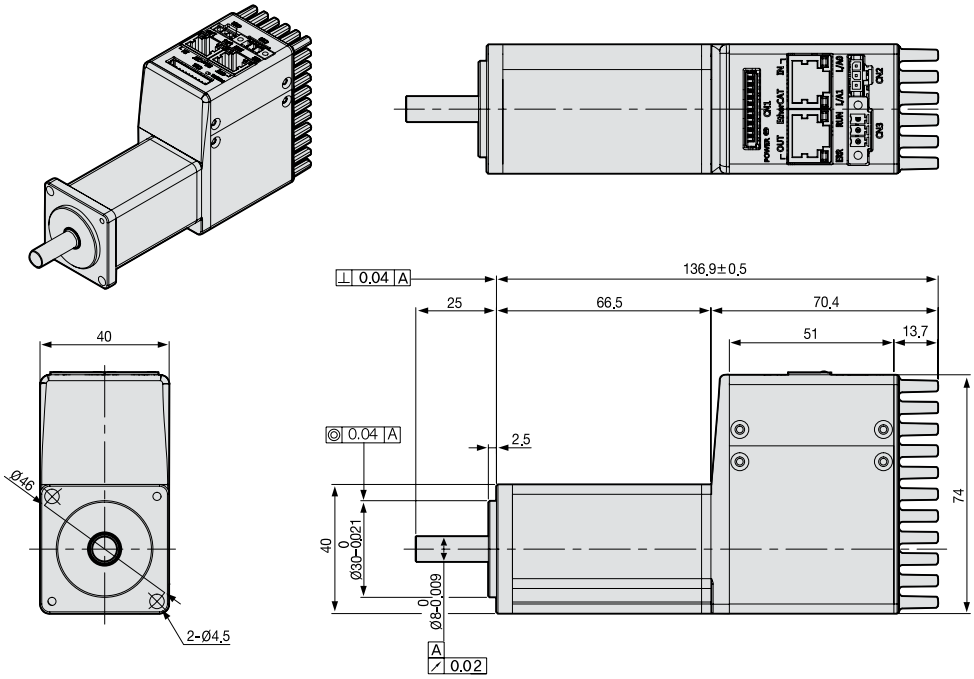
*Unit [mm]

PEGA-AR5A
[Weight: 0.51kg]



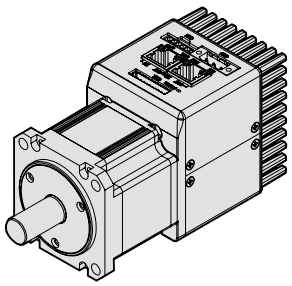
*Unit [mm]

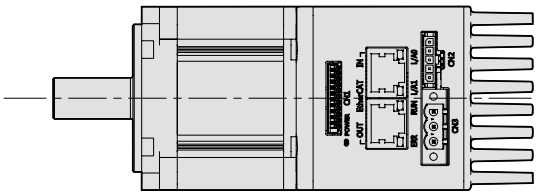
PEGA-A01A
[Weight: 0.63kg]

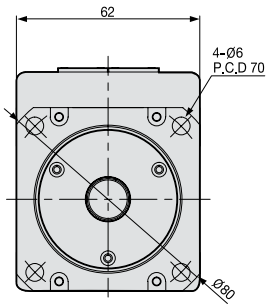


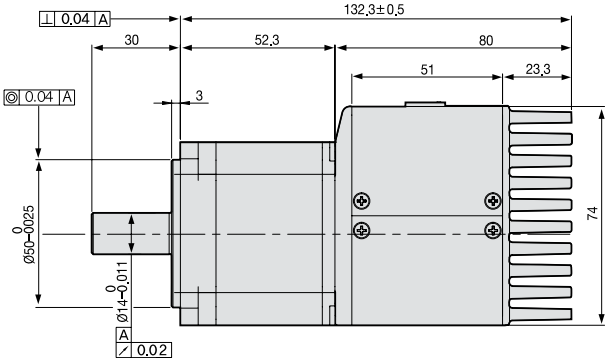
*Unit [mm]

PEGA-B01A
[Weight: 1.07kg]



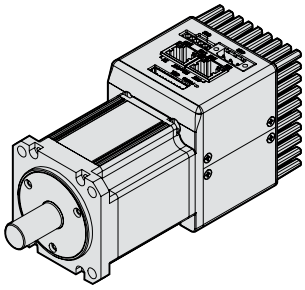


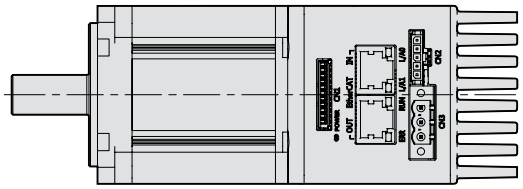


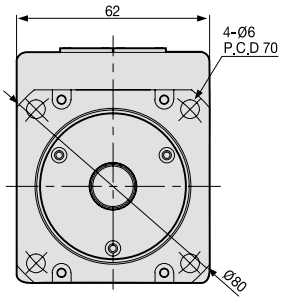


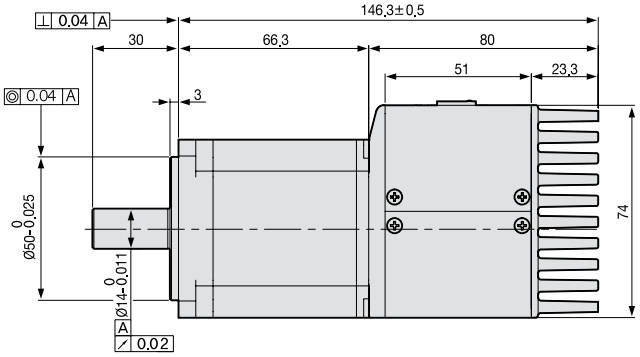
*Unit [mm]

PEGA-B02A
[Weight: 1.30kg]







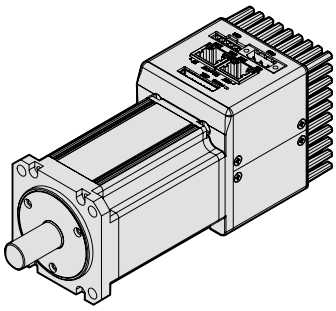


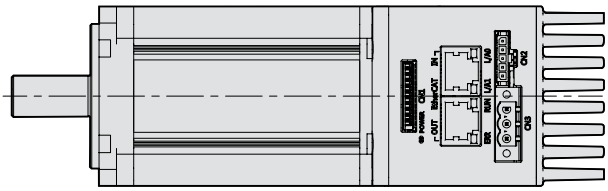
External Dimensions

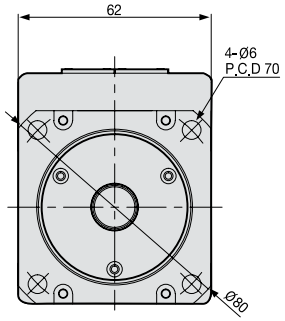
*Unit [mm]

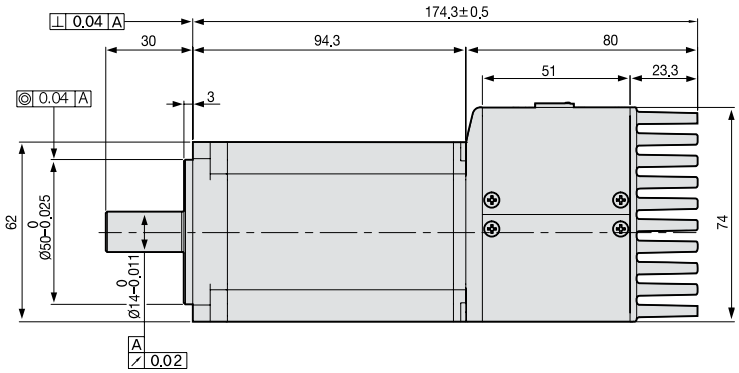
PEGA-B03A

[Weight: 1.79kg]



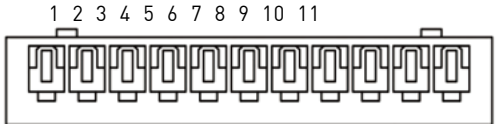






Accessory Kit

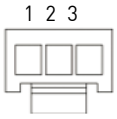
CN1 : I/O Connector



51004-1100(MOLEX)

Pin No.	Direction	Name	Signals	Descriptions
1	VCC	+24	+24V INPUT	+24V Vcc Input
2	Input	POT	Positive Over-Traverl	Limit Sensor Input
3	Input	NOT	Negative Over Traverl	
4	Input	HOME	Home Sensor	Home Sensor Input for Homing
5	Input	STOP	Stop Input	Stop Command Input
6	Output	BRAKE+	BRAKE	Output Brake Control Signal
7	Output	BRAKE-		
8	Output	ALARM+	Alarm Output	Servo Alarm Output
9	Output	ALARM-		
10	Output	MONITOR1	Analog Monitor	Analog Monitor Output(0V~5V)
11	GND	AGND	AGND(0V)	Analog Signal Graound

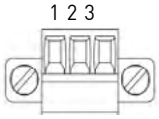
CN2 : Safe Torque Off Connector



43645-3(MOLEX)

Pin No.	Name	Descriptions
1	HWBB1	Safe Torque Off(STO) input signals
2	HWBB2	
3	COMMON	DC 24V GND

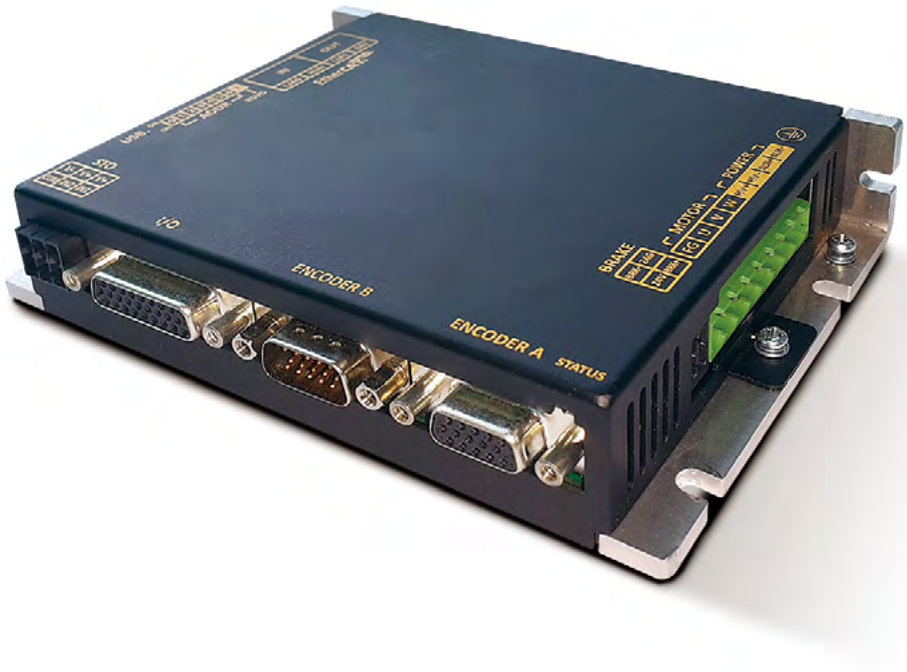
CN3 : Power Connector



MC_1.5-3-STF-3.5
(PHOENIX CONTACT)

Pin No.	Name	Descriptions
1	FG	Frame Ground
2	N(DC 0V)	DC 0V GND
3	VCC(DC 48V)	DC 48V input

PHOX Series



Servo Drive Designation

PHOX	–	03	–	080	N	S	–	AA
Model Name		Output Cunent		Maximum Power Input	Communication	Encoder Type		Option
PHOENIX Series		03 : 3A 06 : 6A		080 : 80VAC	N : EtherCAT	S : SIN/COS R : Resolver		Exclusive Option Code

Note1] Additional selection option, on selecting the dual encoder

Parts Identification

Low Voltage DC Drive Type PHOX

Real-time Control Through EtherCAT

- High speed, Real-time capability and synchronization mechanism
- Supports CoE, EoE and FoE
- Improved frequency response(≈1kHz)
- Improved communication speed by applying 16bit-bus
  - Improved chip communication speed
  - Improved EtherCAT communication speed

Variable Switching Frequency

- 16/32/48kHz

Fully-closed Loop Control

- Switch among Semi-closed loop control, Fully-closed loop control and dual feedback control
- Fully-closed loop control provides quick response with internal and external encoder position values
- Fully-closed loop control ensures high-precision control during machine operation

Progamming Function Including Single-axis Position Module

- Positioning control mode with pulse inputs
- Provides position control through I/O or HMI without position control module
- Supports indexing mode

1. EtherCAT Out
2. EtherCAT In
3. Switch for node address setting
4. Mini B USB
5. STO Connector
6. IO Connector
7. Encoder B connector
8. Encoder A connector
9. Status LED
10. Brake connector
11. Motor power connector
12. Master power connector(HV+,HV-)
13. Auxiliary power connector(AUX+,AUX-)
14. Ground

PHOX Series

Item \ Type Name		PHOX-03	PHOX-06
Input Power	Main Power Supply	DC 24~80[V] Note1)	
	Control Power Supply	DC 24~80[V] Note1)	
Rated Current[A]		3	6
Peak Current[A]		9[A] > 1[sec]	18[A] > 1[sec]
1st Encoder Encoder A		*Quadrature(Max. 10Mpps after X 4) - With and without halls, Differential *Serial Encoder(absolute, incremental) - BiSS(B,C), Endat2.2, Tamagawa Serial, SSI	
2nd Encoder Note2) Encoder B		*Quadrature(Max. 10Mpps after X 4) - Without halls, Differential *Serial Encoder(absolute, incremental) - BiSS(B,C), Endat2.2, Tamagawa Serial, SSI *Analog Encoder - Sinusoidal(1Vpp), Analog hall(Sin/Cos) - Resolver(Optional)	
Control Performance	Speed Control Range	Maximum 1: 5000	
	Frequency Response	Maximum 1 [kHz] or above (When using 19bit Serial Encoder)	
	Speed Variation Ratio	±0.01 [%] or lower [when load changes between 0 and 100%] ±0.1[%] or lower[temperature25 ±10°C]	
	Accel / Decel Time	Within ±1%	
	Input Frequency	4[Mpps], line drive	
	Input Pulse Method	Symbol+Pulse series, CW+CCW, PhaseA/B	
EtherCAT Communication Specifications	Communication Standard	FoE (Firmware download) EoE (Parameter setting by UDP, Tuning, Secondary function, Parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)	
	Physical Layer	100BASE-TX(IEEE802.3)	
	Connector	RJ45 x 2	
	Communication distance	Within connection between nodes 100[m]	
	DC(Distributed Clock)	Synchronization by DC mode, minimum DC cycle: 250[μs]	
	LED Display	LinkAct IN, LinkAct OUT, RUN, ERR	
	Cia402 Drive Profile	Profile Position Mode, Profile Velocity Mode, Profile Torque Mode, Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode, Homing Mode	
Digital Input, Output	Digital Input	Total 4 input channels(Allocable) Total 33 functions can be used selectively for assignment (*POT, *NOT, *HOME , * STOP, PCON, GAIN2, P_CL, N_CL, PROBE1P, ROBE2, EMG, A_RST, SV_ON, START, PAUSE, REGT, HSTART, ISEL0~5, ABS_RQ, JSTART, JDIR, PCLR, AOVR, INHIB ,SPD1, SPD2, SPD3, MODE)	
	Digital Output	Total 4 input channels(Allocable) Total 33 functions can be used selectively for assignment (*BRAKE, *ALARM, *READY, *ZSPD, INPOS1, INPOS2, TLMT, VLMT, INSPD, WARN, TGON, ORG, EOS, IOUT0, IOUT1, IOUT2 IOUT3, IOUT4, IOUT5)	
Analog Input / Output	Analog Input	Input voltage range: ±10[V] differential Single channel, torque limit value adjustable through analog voltage	
	Analog Output	Total 2 channels(allocable) Total 15 outputs can be used selectively for assignment	
Safety Function		2 input channels(STO1, STO2)	
Encoder Output Type		A0(+/-), B0(+/-), Z0(+/-) (Line drive output max. 6.4Mpps)	
USB Communication	Function	Firmware download, parameter setting, tuning, auxiliary function, parameter copy	
	Communication Standard	Complies with USB 2.0 Full speed specifications	
	Connect	PC or USB storage media	
Internal Function	Self-setting Function	Drive node address can be set using dip switch	
	Additional Function	Gain tuning, alarm history, JOG operation, origin search	
	Protective Function	Overcurrent, overload, excessive current limit, overheat, overvoltage, undervoltage, overspeed, encoder error, position following error, current sensing error	
Operation Environment	Operating Temperature / Storage Temperature	0 ~ 50[°C] / -20 ~ 65 °C	
	Operating Humidity / Storage Humidity	Below 80[%]RH / Below 90[%]RH(Noncondensing)	
	Environment	Keep indoors. Avoid corrosive / flammable gas or liquid, and electrically conductive dust.	

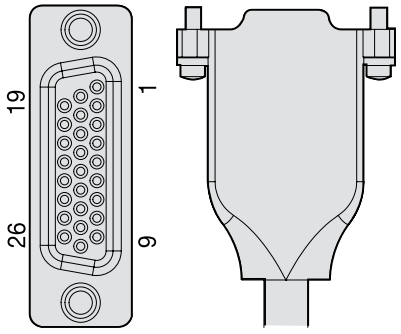
Note1) It is possible to drive with a voltage of less than 48 [V] of DC input power. However, the actual speed may be slower than the command speed and the specifications of the low voltage motor [based on DC 48 [V]] cannot be guaranteed. We recommend using DC 48[V] as the input power if possible.

Note2) Available when full-closed function is applied

PHOX Series I/O and Encoder PIN Map

I/O Connector

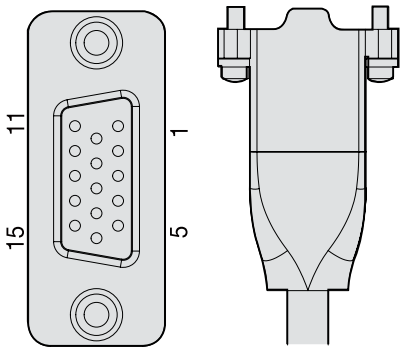
10090769-P264ALF



PIN No.	Signal	PIN No.	Signal	PIN No.	Signal	PIN No.	Signal
1	PF+	8	AMON1	15	DO1	22	/BO
2	PF-	9	AMON2	16	DO2	23	ZO
3	PR+	10	DICOM	17	DO3	24	/ZO
4	PR-	11	DI1	18	18 DO4	25	DOCOM
5	AGND	12	DI2	19	AO	26	AGND
6	AI+	13	DI3	20	/AO		
7	AI+	14	DI4	21	BO		

Encoder A Connector

10090769-P154ALF

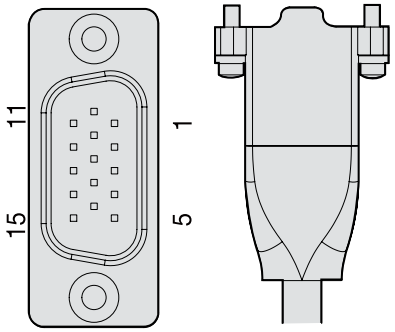


PIN No.	Encoder				
	Quad	BISS	SSI	ENDAT	TAMAGAWA
1	Z+	-	-	-	-
2	Z-	-	-	-	-
3	GND	GND	GND	GND	GND
4	-	-	-	-	-
5	5V	5V	5V	5V	5V
6	GND	GND	GND	GND	GND
7	A-	SL-	DATA-	RC-/DV-	TXD-/RXD-
8	A+	SL+	DATA+	RC+/DV+	TXD-/RXD+
9	HALL U	-	-	-	-
10	*MOT	*MOT	*MOT	*MOT	*MOT
11	B-	MA-	CLK-	CLK-	-
12	B+	MA+	CLK+	CLK+	-
13	HALL V	-	-	-	-
14	HALL W	-	-	-	-
15	-	-	-	-	-

PHOX Series I/O and Encoder PIN Map

Encoder B Connector (Full Closed)

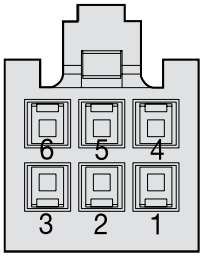
10090770-S154ALF



PIN No.	Encoder						
	Quad	BISS	SSI	ENDAT	TAMAGAWA	SIN/COS	RESOLVER
1	Z+	-	-	-	-	-	-
2	Z-	-	-	-	-	-	-
3	GND	GND	GND	GND	GND	GND	GND
4	-	-	-	-	-	SIN+	SIN+
5	5V	5V	5V	5V	5V	5V	5V
6	-	-	-	-	-	REF-	EXT-
7	A-	SL-	DATA-	RC-/DV-	TXD-/RXD-	-	-
8	A+	SL+	DATA+	RC+/DV+	TXD+/RXD+	-	-
9	-	-	-	-	-	SIN-	SIN-
10	*MOT	*MOT	*MOT	*MOT	*MOT	*MOT	*MOT
11	B-	MA-	CLK-	CLK-	-	-	-
12	B+	MA+	CLK+	CLK+	-	-	-
13	-	-	-	-	-	REF+	EXT+
14	-	-	-	-	-	COS-	COS-
15	-	-	-	-	-	COS+	COS+

STO Connector

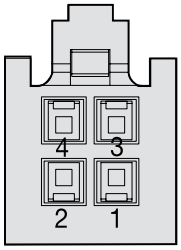
IPD1-03-D-K



PIN No.	Signal	Description
1	COM	Common(24 GND)
2	STO2	Cuts off current(torque) applied to motor when signal is off
3	STO1	Cuts off current(torque) applied to motor when signal is off
4	V-	DC -12V(bypass)
5	V+	DC -12V(bypass)
6	V+	DC -12V(bypass)

BRAKE Connector

IPD1-02-D-K

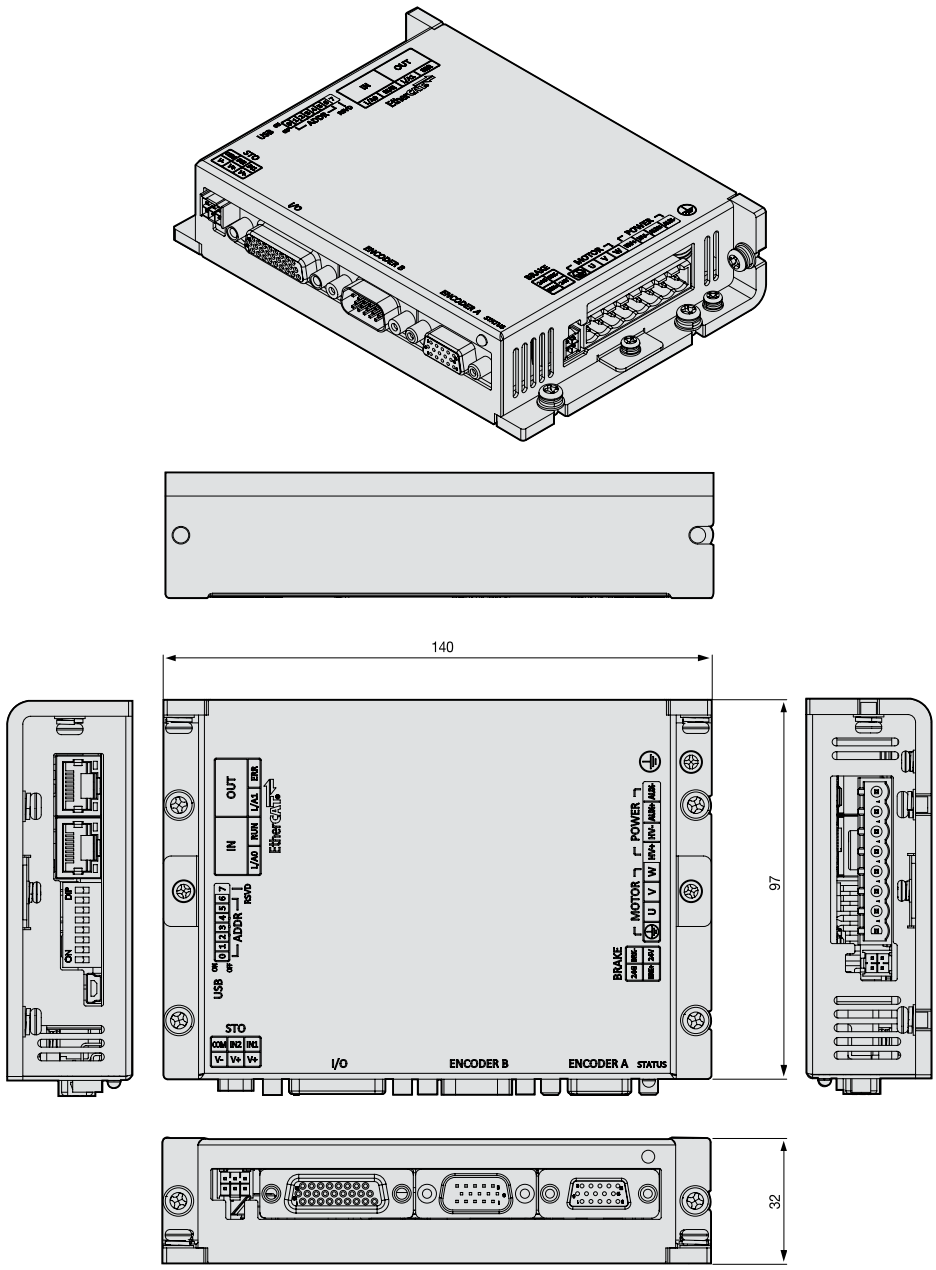


PIN No.	Signal	Description
1	24V	Brake 24V Input
2	BRK+	Brake 24V Output
3	BRK-	Brake (1A)
4	24G	24V Return

External Dimensions

*Unit [mm]

PHOX-03 / PHOX-06
[Weight: 0.43kg]



Drive Combination Table

iX7M

Rated Speed (rpm)	Maximum Speed (rpm)	Flange	Motor	iX7 Drive	Encoder Cable		iX7 Power Cable	iX7 Power + Brake	Brake
					Serial	Absolute			
3,000	6,500	□40	EAR5A	iX7M-A-22□□B	APCS-E□□□RM-□b	APCS-E□□□RM1-□	APCS-P□□□EX1-□	'APCS-P□□□EBX1-□	-
		□40	EA01A	iX7M-A-22□□B					
	6,000	□40	EA015A	iX7M-A-22□□B					
	6,500	□60	EB01A	iX7M-A-22□□B			APCS-P□□□EX-□	'APCS-P□□□EBX-□	
		□60	EB02A	iX7M-A-22□□B					
		□60	EB04A	iX7M-A-44□□B					
	6000	□80	EC04A	iX7M-A-44□□B					
		□80	EC06A	iX7M-A-88□□B					
		□80	EC08A	iX7M-A-88□□B					
	5,500	□80	EC10A	iX7M-A-AA□□B					
3,000	5,000	□40	FALR5A	iX7M-A-22□□B	APCS-E□□□EM-□	APCS-E□□□EM1-□	APCS-P□□□LSX-□	-	APCSB□□□QS-□
		□40	FAL01A	iX7M-A-22□□B					
		□40	FAL015A	iX7M-A-44□□B					
		□60	FBL01A	iX7M-A-22□□B					
		□60	FBL02A	iX7M-A-22□□B					
		□60	FBL04A	iX7M-A-44□□B					
		□80	FCL04A	iX7M-A-44□□B					
		□80	FCL06A	iX7M-A-88□□B					
		□80	FCL08A	iX7M-A-88□□B					
		□80	FCL10A	iX7M-A-AA□□B					
200	500	135Φ	DB03D	iX7M-A-22□□B	APCS-E□□□ZM	-	APCSPN□□□YSX	-	-
			DB06D	iX7M-A-22□□B					
			DB09D	iX7M-A-44□□B					
		175Φ	DC06D	iX7M-A-22□□B					
			DC12D	iX7M-A-44□□B					
	400		DC18D	iX7M-A-88□□B					
	500	230Φ	DD12D	iX7M-A-44□□B					
	400		DD22D	iX7M-A-88□□B					
			DD34D	iX7M-A-AA□□B					
	300	290Φ	DE40D	iX7M-A-AA□□B					
200	500	135Φ	DFB03D	iX7M-A-22□□B	APCS-E□□□ZM1	-	APCSPN□□□YSX1	-	-
		175Φ	DFC06D	iX7M-A-22□□B					
		230Φ	DFD12D	iX7M-A-44□□B					

iX7NHA

Rated Speed (rpm)	Maximum Speed (rpm)	Flange	Motor	iX7 Drive	Encoder Cable		iX7 Power Cable	iX7 Power + Brake	Brake
					Serial	Absolute			
3,000	5,000	□40	FALR5A	iX7NHA001U	APCS-E□□□ES-□	APCS-E□□□ES-□1	APCS-P□□□LSX	-	APCS-B□□□QS-□
		□40	FAL01A	iX7NHA001U					
		□40	FAL015A	iX7NHA004U					
		□60	FBL01A	iX7NHA001U					
		□60	FBL02A	iX7NHA002U					
		□60	FBL04A	iX7NHA004U					
		□80	FCL04A	iX7NHA004U					
		□80	FCL06A	iX7NHA008U					
		□80	FCL08A	iX7NHA008U					
		□80	FCL10A	iX7NHA010U					
		□130	FE09A	iX7NHA010U	APCS-E□□□□DS	APCS-E□□□□DS1	APCS-P□□HSX1	APCS-P□□NBX1	-
		□130	FE15A	iX7NHA020U					
		□130	FE22A	iX7NHA020U			APCS-P□□HSX	APCS-P□□NBX	
		□130	FE30A	iX7NHA035U					
2,000	3,000	□130	FE06D	iX7NHA008U	APCS-E□□□□DS	APCS-E□□□□DS1	APCS-P□□HSX1	APCS-P□□NBX1	-
		□130	FE11D	iX7NHA010U					
		□130	FE16D	iX7NHA020U			APCS-P□□HSX	APCS-P□□NBX	
		□130	FE22D	iX7NHA020U					
1,500	3,000	□130	FE05G	iX7NHA008U			APCS-P□□HSX1	APCS-P□□NBX1	-
		□130	FE09G	iX7NHA010U					
		□130	FE13G	iX7NHA020U			APCS-P□□HSX	APCS-P□□NBX	
		□130	FE17G	iX7NHA020U					
1,000	2,000	□130	FE03M	iX7NHA004U			APCS-P□□HSX1	APCS-P□□NBX1	-
		□130	FE06M	iX7NHA008U					
		□130	FE09M	iX7NHA010U					
		□130	FE12M	iX7NHA020U			APCS-P□□HSX	APCS-P□□NBX	

iX7NHA DD Motor

Rated Speed (rpm)	Maximum Speed (rpm)	External Diameter Of Motor(Φ)	Motor	Drive	Encoder Cable		iX7 Power Cable	iX7 Power + Brake Cable	Brake
					Serial	Absolute			
200	500	135Φ	DB03D	iX7NHA001U	APCS-E□□□ZS	-	APCS-P□□□YSX	-	-
			DB06D	iX7NHA002U					
			DB09D	iX7NHA004U					
		175Φ	DC06D	iX7NHA002U					
			DC12D	iX7NHA004U					
	400		DC18D	iX7NHA008U					
	500	230Φ	DD12D	iX7NHA004U					
	400		DD22D	iX7NHA008U					
			DD34D	iX7NHA010U					
	300	290Φ	DE40D	iX7NHA010U					
			DE60D	iX7NHA020U					
150	250	360Φ	DFA1G	iX7NHA020U			APCS-P□□□ZSX		
			DFA6G	iX7NHA035U					
50	100	380Φ	DGC3S	iX7NHA020U					
200	500	135Φ	DFB03D	iX7NHA001U	APCS-E□□□ZS1	-	APCS-P□□□YSX1	-	-
		175Φ	DFC06D	iX7NHA002U					
		230Φ	DFD12D	iX7NHA004U					

Drive Combination Table

L7NHA

Rated Speed (rpm)	Maximum Speed (rpm)	Flange	Motor	Drive	Encoder Cable		Power	Power + Brake	Brake
					Serial	Absolute			
3,000	5,000	□40	FALR5A	L7NHA001U	APCS-E□□□ES-□	APCS-E□□□ES-□1	APCS-P□□□LS-□	-	APCS-B□□□QS-□
		□40	FAL01A	L7NHA001U					
		□40	FAL015A	L7NHA004U					
		□60	FBL01A	L7NHA001U					
		□60	FBL02A	L7NHA002U					
		□60	FBL04A	L7NHA004U					
		□80	FCL04A	L7NHA004U					
		□80	FCL06A	L7NHA008U					
		□80	FCL08A	L7NHA008U					
		□80	FCL10A	L7NHA010U					
		□130	FE09A	L7NHA010U	APCS-E□□□□DS	APCS-E□□□□DS1	APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FE15A	L7NHA020U					
		□130	FE22A	L7NHA020U			APCS-P□□□HS	APCS-P□□□NB	
		□130	FE30A	L7NHA035U					
		□180	FF30A	L7NHA035U			APCS-P□□□IS	APCS-P□□□PB	
		□180	FF50A	L7NHA050U			APCS-P□□□JS	APCS-P□□□LB	
2,000	3,000	□80	FCL03D	L7NHA004U	APCS-E□□□ES-□	APCS-E□□□ES-□1	APCS-P□□□LS-□	-	APCS-B□□□QS-□
		□80	FCL05D	L7NHA008U					
		□80	FCL06D	L7NHA008U					
		□80	FCL07D	L7NHA008U					
		□130	FE06D	L7NHA008U	APCS-E□□□□DS	APCS-E□□□□DS1	APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FE11D	L7NHA010U					
		□130	FE16D	L7NHA020U			APCS-P□□□HS	APCS-P□□□NB	
		□130	FE22D	L7NHA020U					
		□180	FF22D	L7NHA020U			APCS-P□□□IS1	APCS-P□□□PB1	
		□180	FF35D	L7NHA035U			APCS-P□□□IS	APCS-P□□□PB	
		□180	FF55D	L7NHA050U			APCS-P□□□JS	APCS-P□□□LB	
	2,500	□180	FF75D	L7NHA075U			APCS-P□□□JS2	APCS-P□□□LB2	
	3,000	□220	FG22D	L7NHA020U			APCS-P□□□IS1	-	APCS-P□□□SB
		□220	FG35D	L7NHA035U			APCS-P□□□IS		
		□220	FG55D	L7NHA050U			APCS-P□□□JS		
	2,500	□220	FG75D	L7NHA075U			APCS-P□□□JS2		
		□220	FG110D	L7NHA150U			APCS-P□□□0S		
1,500	3,000	□130	FE05G	L7NHA008U			APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FE09G	L7NHA010U					
		□130	FE13G	L7NHA020U			APCS-P□□□HS	APCS-P□□□NB	
		□130	FE17G	L7NHA020U					
		□180	FF20G	L7NHA020U			APCS-P□□□IS1	APCS-P□□□PB1	
	2,700	□180	FF30G	L7NHA035U			APCS-P□□□IS	APCS-P□□□PB	
	3,000	□180	FF44G	L7NHA050U			APCS-P□□□JS	APCS-P□□□LB	
	2,500	□180	FF60G	L7NHA075U			APCS-P□□□JS2	APCS-P□□□LB2	
	2,000	□180	FF75G	L7NHA075U			APCS-P□□□MS	-	
	3,000	□220	FG20G	L7NHA020U			APCS-P□□□IS1		APCS-P□□□SB
	2,700	□220	FG30G	L7NHA035U			APCS-P□□□IS		
	3,000	□220	FG44G	L7NHA050U			APCS-P□□□JS		
	2,500	□220	FG60G	L7NHA075U			APCS-P□□□JS2		
		□220	FG85G	L7NHA150U			APCS-P□□□0S		
		□220	FG110G	L7NHA150U					
		□220	FG150G	L7NHA150U			APCS-P□□□VS		
1,000	2,000	□130	FE03M	L7NHA004U			APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FE06M	L7NHA008U					
		□130	FE09M	L7NHA010U					
		□130	FE12M	L7NHA020U			APCS-P□□□HS	APCS-P□□□NB	
		□180	FF12M	L7NHA020U			APCS-P□□□IS1	APCS-P□□□PB1	
		□180	FF20M	L7NHA020U			APCS-P□□□IS	APCS-P□□□PB	
	1,700	□180	FF30M	L7NHA035U					
	2,000	□180	FF44M	L7NHA050U			APCS-P□□□JS	APCS-P□□□LB	
		□220	FG12M	L7NHA020U			APCS-P□□□IS1	-	APCS-P□□□SB
		□220	FG20M	L7NHA020U			APCS-P□□□IS		
	1,700	□220	FG30M	L7NHA035U					
	2,000	□220	FG44M	L7NHA050U			APCS-P□□□JS		
			FG60M	L7NHA075U			APCS-P□□□MS		

L7NHA DD Motor

Rated Speed (rpm)	Maximum Speed (rpm)	External Diameter Of Motor(Φ)	Motor	Drive	Encoder Cable		Power	Power + Brake	Brake
					Serial	Absolute			
200	500	135Φ	DB03D	L7NHA001U	APCS-E□□□ZS	-	APCS-PN□□□YS	-	-
			DB06D	L7NHA002U					
			DB09D	L7NHA004U					
		175Φ	DC06D	L7NHA002U					
			DC12D	L7NHA004U					
	400		DC18D	L7NHA008U					
	500	230Φ	DD12D	L7NHA004U					
	400		DD22D	L7NHA008U					
			DD34D	L7NHA010U					
	300	290Φ	DE40D	L7NHA010U					
			DE60D	L7NHA020U					
150	250	360Φ	DFA1G	L7NHA020U			APCS-PN□□□ZS		
			DFA6G	L7NHA035U					
50	100	380Φ	DGC3S	L7NHA020U					
200	500	135Φ	DFB03D	L7NHA001U	APCS-E□□□ZS1	-	APCS-PN□□□YS1	-	-
		175Φ	DFC06D	L7NHA002U					
		230Φ	DFD12D	L7NHA004U					

Drive Combination Table

L7NHB

Rated Speed (rpm)	Maximum Speed (rpm)	Flange	Motor	Drive	Encoder Cable		Power	Power + Brake	Brake
					Serial	Absolute			
3,000	5,000	□130	FEP09A	L7NHB010U	APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FEP15A	L7NHB020U					
		□130	FEP22A	L7NHB035U					
		□130	FEP30A	L7NHB035U					
		□180	FFP30A	L7NHB035U			APCS-P□□□IS1	APCS-P□□□PB1	
		□180	FFP50A	L7NHB050U			APCS-P□□□JS1	APCS-P□□□LB1	
2,000	3,000	□130	FEP06D	L7NHB010U			APCS-P□□□HS1	APCS-P□□□NB1	
		□130	FEP11D	L7NHB010U					
		□130	FEP16D	L7NHB020U					
		□130	FEP22D	L7NHB020U					
		□180	FFP22D	L7NHB020U			APCS-P□□□IS1	APCS-P□□□PB1	
		□180	FFP35D	L7NHB035U					
		□180	FFP55D	L7NHB050U			APCS-P□□□JS1	APCS-P□□□LB1	
	2,500	□180	FFP75D	L7NHB075U					
	3,000	□220	FGP22D	L7NHB020U			APCS-P□□□IS1	-	APCS-P□□□SB
	2,700	□220	FGP35D	L7NHB035U					
	3,000	□220	FGP55D	L7NHB050U			APCS-P□□□JS1		
	2,500	□220	FGP75D	L7NHB075U					
		□220	FGP110D	L7NHB150U			APCS-P□□□MS1		
1,500	3,000	□130	FEP05G	L7NHB010U			APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FEP09G	L7NHB010U					
		□130	FEP13G	L7NHB020U					
		□130	FEP17G	L7NHB020U					
		□180	FFP20G	L7NHB020U			APCS-P□□□IS1	APCS-P□□□PB1	
	2,700	□180	FFP30G	L7NHB035U					
	3,000	□180	FFP44G	L7NHB050U			APCS-P□□□JS1	APCS-P□□□LB1	
	2,500	□180	FFP60G	L7NHB075U					
	2,200	□180	FFP75G	L7NHB075U			APCS-P□□□MS1	-	APCS-P□□□SB
	3,000	□220	FGP20G	L7NHB020U			APCS-P□□□IS1		
	2,700	□220	FGP30G	L7NHB035U					
	3,000	□220	FGP44G	L7NHB050U			APCS-P□□□JS1		
	2,500	□220	FGP60G	L7NHB075U					
		□220	FGP85G	L7NHB150U			APCS-P□□□MS1		
	2,000	□220	FGP110G	L7NHB150U					
		□220	FGP150G	L7NHB150U			APCS-P□□□MS		
1,000	2,000	□130	FEP03M	L7NHB010U			APCS-P□□□HS1	APCS-P□□□NB1	-
		□130	FEP06M	L7NHB010U					
		□130	FEP09M	L7NHB010U					
		□130	FEP12M	L7NHB020U					
		□180	FFP12M	L7NHB020U			APCS-P□□□IS1	APCS-P□□□PB1	
		□180	FFP20M	L7NHB020U					
	1,700	□180	FFP30M	L7NHB035U					
	2,000	□180	FFP44M	L7NHB050U			APCS-P□□□JS1	APCS-P□□□LB1	
		□220	FGP12M	L7NHB020U			APCS-P□□□IS1	-	APCS-P□□□SB
		□220	FGP20M	L7NHB020U					
		□220	FGP30M	L7NHB050U					
		□220	FGP44M	L7NHB050U			APCS-P□□□JS1		
		□220	FGP60M	L7NHB150U			APCS-P□□□MS1		

L7CA

Rated Speed (rpm)	Maximum Speed (rpm)	Flange	Motor	Drive	Encoder Cable		Power	Power + Brake	Brake
					Serial	Absolute			
3,000	5,000	□40	FALR5A	L7CA001U	APCS-E □□□ES	APCS-E □□□ES1	APCS-P□□□LSC	-	APCS-B□□□QS
		□40	FAL01A	L7CA001U					
		□40	FAL015A	L7CA002U					
		□60	FBL01A	L7CA001U					
		□60	FBL02A	L7CA002U					
		□60	FBL04A	L7CA004U					
		□80	FCL04A	L7CA004U					
		□80	FCL06A	L7CA008U					
		□80	FCL08A	L7CA008U					
		□80	FCL10A	L7CA010U					
2,000	2,500	□80	FCL03D	L7CA004U					
		□80	FCL05D	L7CA008U					
		□80	FCL06D	L7CA008U					
		□80	FCL07D	L7CA008U					

Servo Motor

Contents

Motor Designation (E Series)

Servo Motor Designation

APM - E B 04 A M3 K 2

Model Name

APM : Servo Motor

Model Type

E : E Series

Flange Size

A : Flange Size : 40mm
B : Flange Size : 60mm
C : Flange Size : 80mm
E : Flange Size : 130mm
F : Flange Size : 180mm

Motor Capacity

R5 : 50W	12 : 1.2kW
01 : 100W	15 : 1.5kW
015 : 150W	16 : 1.6kW
02 : 200W	20 : 2kW
03 : 300W	22 : 2.2kW
04 : 400W	30 : 2.9kW, 3.0kW
06 : 600W	44 : 4.4kW
08 : 750W	50 : 4.7kW
09 : 900W	60 : 6kW
10 : 1kW	75 : 7.5kW
11 : 1.1kW	

Rated Rotation Speed

A : 3,000 rpm
D : 2,000 rpm
G : 1,500 rpm
M : 1,000 rpm

Encoder Type

M3 : 23Bit S-Turn Absolute BiSS-C (16Bit M-Turn Absolute BiSS-C)
L (Battery-less) : 20Bit S-Turn Absolute BiSS-C (16Bit M-Turn Absolute BiSS-C)

Shaft Type

K: Rounded key on one side (standard)
N : Straight

Option

None: No options
1 : Oil Seal
2 : Brake
3 : Oil Seal and Brake

Motor Specifications

Item	Unit	EAR5A			EA01A			EA015A		
Applicable Drive		iX7NHA001U	L7□A001□	L7CA001U	iX7NHA001U	L7□A001□	L7CA001U	iX7NHA002U	L7□A002□	L7CA002U
Flange Size(□)		□40								
Rated Output	[kW]	0.05			0.1			0.15		
Rated Torque	[N·m]	0.16			0.32			0.48		
	[kgf·cm]	1.62			3.25			4.87		
Max. Instantaneous Torque	[N·m]	0.56	0.48		1.11	0.96		1.67	1.43	
	[kgf·cm]	5.68	4.87		11.37	9.74		17.05	14.62	
Rated Current	[A]	1.17			1.10			1.21		
Max.Current	[A]	4.09	3.51		3.85	3.3		4.25	3.64	
Rated Speed	[r/min]	3,000								
Max. Speed	[r/min]	6,500	5,000		6,500	5,000		6,000	5,000	
Inertia Moment	[kg·m^{2}X10^{-4}]	0.038			0.071			0.123		
	[gf·cm·s^2]	0.039			0.072			0.125		
Allowable Load Inertia Ratio Note2, 3]		Motor Inertia × 30								
Rated Power Rate	[kW/s]	6.68			14.31			18.61		
Speed/Position Detector	Standard	Serial Multi-Turn Absolute Built-in Type (23Bit)								
	Option	Batteryless : Serial Multi-Turn Absolute Built-in Type(20Bit) Note 6)								
Specifications & Features	Protection	Fully closed, self cooling IP67 Note 1)								
	Rated Time	Continuous								
	Ambient Temp	Operating: 0 ~ 40[°C] Storage : -10 ~ 60[°C]								
	Ambient Humidity	Operating: Below 80[%]RH / Storage: Below 90[%]RH (noncondensing)								
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.								
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)								
Weight	[kg]	0.26(0.44)			0.37(0.55)			0.55		

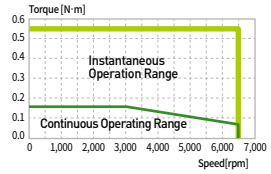
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Product may not qualify marked IP rating if reducers are attached or cables are bent beyond designated specifications. Use our standard cables for IP rating qualification.
Note2] Load inertia ratio should be reduced for faster response.
Note3] The allowable load inertia ratio applies when servo motor is operated at a constant speed.
Note4] EA Series products should be connected to power first, and then connected to the encoder.
Note5] Please inquire for EA015A products.
Note6] Batteryless encoders should not be operated near strong magnetic fields.

Speed-Torque Characteristics

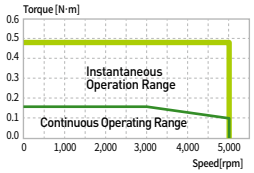
■ 3-Phase AC200V

■ 3-Phase AC230V (L7C 1-Phase)

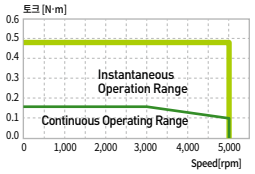
APM-EAR5A (iX7NH)



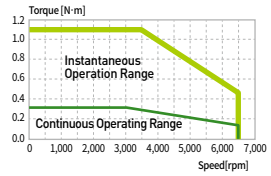
APM-EAR5A (L7 Series)



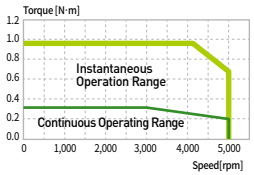
APM-EAR5A (L7C)



APM-EA01A (iX7NH)



APM-EA01A (L7 Series)



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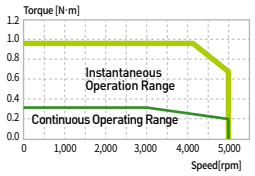
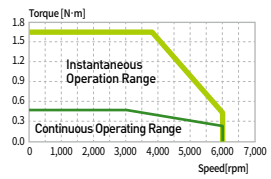
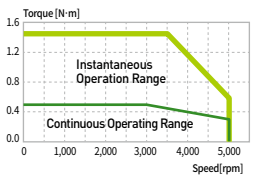


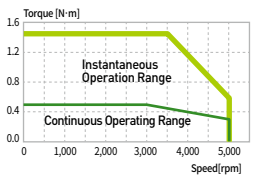
APM-EA015A (iX7NH)



APM-EA015A (L7 Series)



APM-EA015A (L7C)



※ □40 Products have same operation range regardless of input voltage (200/230V)

Servo Motor Specifications & Torque Characteristics (200V)

Motor Specifications

Item	Unit	EB01A			EB02A			EB04A		
Applicable Drive		iX7NHA001U	L7□A001□	L7CA001U	iX7NHA002U	L7□A002□	L7CA002U	iX7NHA004U	L7□A004□	L7CA004U
Flange Size(□)		□60								
Rated Output	[kW]	0.1			0.2			0.4		
Rated Torque	[N·m]	0.32			0.64			1.27		
	[kgf·cm]	3.25			6.50			12.99		
Max. Instantaneous Torque	[N·m]	1.11	0.96		2.23	1.91		4.46	3.82	
	[kgf·cm]	11.37	9.74		22.74	19.49		45.47	38.98	
Rated Current	[A]	1.15			1.37			2.65		
Max.Current	[A]	4.01	3.44		4.78	4.10		9.27	7.95	
Rated Speed	[r/min]	3,000								
Max. Speed	[r/min]	6,500	5,000		6,500	5,000		6,500	5,000	
Inertia Moment	[kg·m^{2}X10^{-4}]	0.172			0.309			0.584		
	[gf·cm·s^2]	0.176			0.315			0.596		
Allowable Load Inertia Ratio Note2, 3]		Motor Inertia × 20						Motor Inertia × 15		
Rated Power Rate	[kW/s]	5.89			13.10			27.78		
Speed/Position Detector	Standard	Serial Multi-Turn Absolute Built-in Type (23Bit)								
	Option	Batteryless : Serial Multi-Turn Absolute Built-in Type(20Bit) Note 4)								
Specifications & Features	Protection	Fully closed, self cooling IP67 Note 1)								
	Rated Time	Continuous								
	Ambient Temp	Operating: 0 ~ 40[°C] Storage : -10 ~ 60[°C]								
	Ambient Humidity	Operating: Below 80[%]RH / Storage: Below 90[%]RH (noncondensing)								
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.								
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)								
Weight	[kg]	0.59(0.95)			0.76(1.12)			1.10(1.46)		

Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Product may not qualify marked IP rating if reducers are attached or cables are bent beyond designated specifications. Use our standard cables for IP rating qualification.

Note2) Load inertia ratio should be reduced for faster response.
Note3) The allowable load inertia ratio applies when servo motor is operated at a constant speed.
Note4) Batteryless encoders should not be operated near strong magnetic fields.

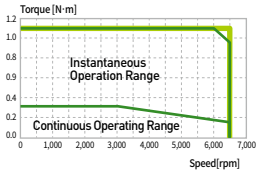
Speed-Torque Characteristics

■ 3-Phase AC200V

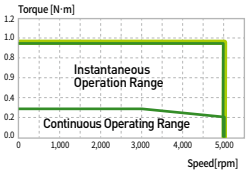
■ 3-Phase AC230V

(L7C 1-Phase)

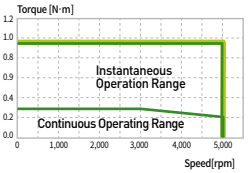
APM-EB01A (iX7NH)



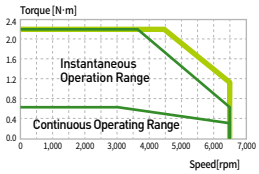
APM-EB01A (L7 Series)



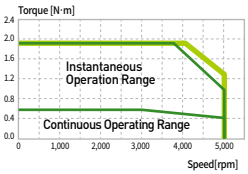
APM-EB01A (L7C)



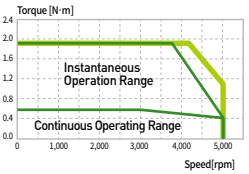
APM-EB02A (iX7NH)



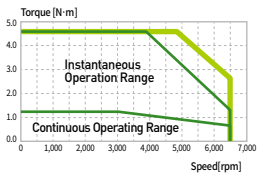
APM-EB02A (L7 Series)



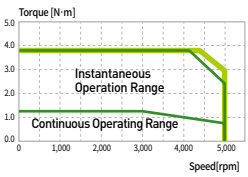
APM-EB02A (L7C)



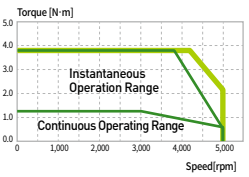
APM-EB04A (iX7NH)



APM-EB04A (L7 Series)



APM-EB04A (L7C)



Motor Specifications

Item	Unit	EC04A			EC06A			EC08A			EC10A		
Applicable Drive		iX7NHA004U	L7□A004□	L7CA004U	iX7NHA008U	L7□A008□	L7CA008U	iX7NHA008U	L7□A008□	L7CA008U	iX7NHA010U	L7□A010□	L7CA010U
Flange Size(□)		□80											
Rated Output	[kW]	0.4			0.6			0.75			1		
Rated Torque	[N·m]	1.27			1.91			2.39			3.18		
	[kgf·cm]	12.99			19.49			24.36			32.48		
Max. Instantaneous Torque	[N·m]	4.46	3.82		6.68	5.73		8.36	7.16		9.55		
	[kgf·cm]	45.47	38.98		68.21	58.47		85.26	73.08		97.44		
Rated Current	[A]	2.52			4.29			4.63			5.30		
Max.Current	[A]	8.82	7.56		15.01	12.87		16.21	13.90		15.91		
Rated Speed	[r/min]	3,000											
Max. Speed	[r/min]	6,000	5,000		6,000	5,000		6,000	5,000		5,500	5,000	4,500
Inertia Moment	[kg·m^{2}X10^{-4}]	0.861			1.410			1.567			2.352		
	[gf·cm·s^2]	0.879			1.439			1.599			2.400		
Allowable Load Inertia Ratio Note2, 3]		Motor Inertia × 15									Motor Inertia × 10		
Rated Power Rate	[kW/s]	18.82			25.86			36.36			43.08		
Speed/Position Detector	Standard	Serial Multi-Turn Absolute Built-in Type(23Bit)											
	Option	Batteryless : Serial Multi-Turn Absolute Built-in Type(20Bit) Note 4)											
Specifications & Features	Protection	Fully closed, self cooling IP67 Note 1)											
	Rated Time	Continuous											
	Ambient Temp	Operating: 0 ~ 40[°C] Storage : -10 ~ 60[°C]											
	Ambient Humidity	Operating: Below 80[%]RH / Storage: Below 90[%]RH (noncondensing)											
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.											
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)											
Weight	[kg]	1.41(2.08)			1.86(2.53)			2.00(2.67)			2.69(3.36)		

Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Product may not qualify marked IP rating if reducers are attached or cables are bent beyond designated specifications. Use our standard cables for IP rating qualification.

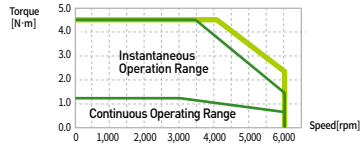
Note2] Load inertia ratio should be reduced for faster response.
Note3] The allowable load inertia ratio applies when servo motor is operated at a constant speed.
Note4] Batteryless encoders should not be operated near strong magnetic fields.

Speed-Torque Characteristics

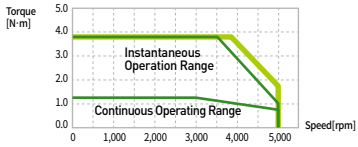
■ 3-Phase AC200V
■ 3-Phase AC230V

(L7C 1-Phase)

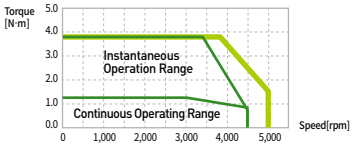
APM-EC04A (iX7NH)



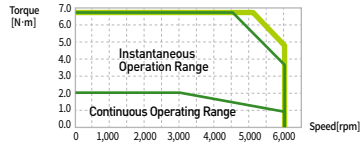
APM-EC04A (L7 Series)



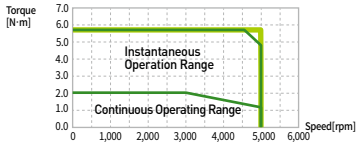
APM-EC04A (L7C)



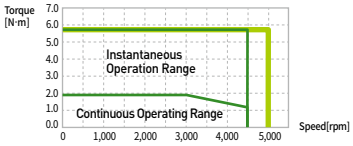
APM-EC06A (iX7NH)



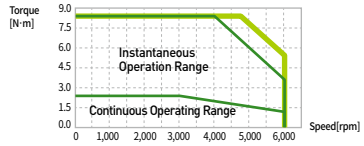
APM-EC06A (L7 Series)



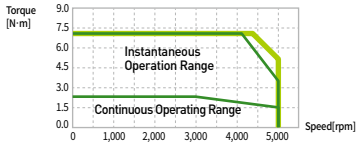
APM-EC06A (L7C)



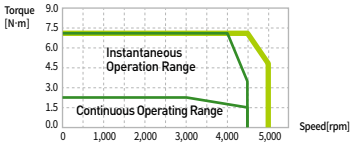
APM-EC08A (iX7NH)



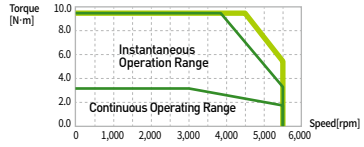
APM-EC08A(L7 Series)



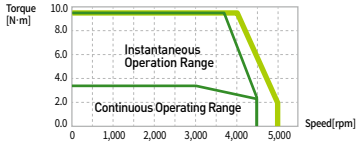
APM-EC08A (L7C)



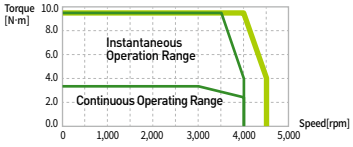
APM-EC10A (iX7NH)



APM-EC10A (L7 Series)



APM-EC10A (L7C)



Servo Motor Specifications & Torque Characteristics (200V)

Motor Specifications

Item	Unit	EE09A		EE15A		EE22A		EE30A		EF30A	EF50A
Applicable Drive		iX7NHA010	L7□A010	iX7NHA020	L7□A020	iX7NHA020	L7□A020	iX7NHA035	L7□A035	L7□A035	L7□A050
Flange Size(□)		□130								□180	
Rated Output	[kW]	0.9		1.5		2.2		3		3	4.7
Rated Torque	[N·m]	2.86		4.77		7		9.55		9.55	14.96
	[kgf·cm]	29.2		48.7		71.4		97.4		97.44	152.66
Max. Instanta-neous Torque	[N·m]	8.59		14.32		21.01		28.65		28.65	44.88
	[kgf·cm]	87.7		146.1		214.3		292.2		292.33	457.98
Rated Current	[A]	6.17		10.96		12.08		14.29		15.31	24.6
Max.Current	[A]	18.51		32.88		36.24		42.87		45.93	73.8
Rated Speed	[r/min]	3,000									
Max. Speed	[r/min]	6,000	5,000	6,000	5,000	6,000	5,000	5,500	4,300	5,000	5,000
Inertia Moment	[kg·m^{2}X10^{-4}]	4.55		8.4		12.28		16.15		28.44	39.82
	[gf·cm·s^2]	4.643		8.571		12.531		16.48		29.02	40.633
Allowable Load Inertia Ratio Note2, 3]		Motor Inertia × 10								Motor Inertia × 5	
Rated Power Rate	[kW/s]	18.04		27.14		39.93		56.46		32.06	56.21
Speed/Position Detector	Standard	Serial Multi-Turn Absolute Built-in Type (23Bit)									
	Option	Batteryless : Serial Multi-Turn Absolute Built-in Type(20Bit) Note 4)									
Specifications & Features	Protection	Fully closed, self cooling IP65 Note 1)									
	Rated Time	Continuous									
	Ambient Temp	Operating: 0 ~ 40[°C] Storage : -10 ~ 60[°C]									
	Ambient Humidity	Operating: Below 80[%]RH / Storage: Below 90[%]RH (noncondensing)									
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.									
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)									
Weight	[kg]	4.7		6.2		7.8		9.4		12.1	15.1

Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Product may not qualify marked IP rating if reducers are attached or cables are bent beyond designated specifications. Use our standard cables for IP rating qualification.

Note2) Load inertia ratio should be reduced for faster response.
Note3) The allowable load inertia ratio applies when servo motor is operated at a constant speed.
Note4) Batteryless encoders should not be operated near strong magnetic fields.

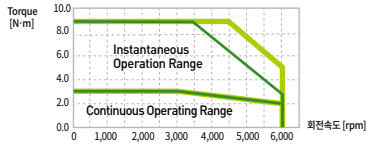
Speed-Torque Characteristics

■ 3-Phase AC200V

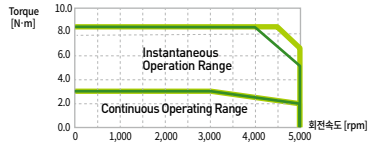
■ 3-Phase AC230V

(L7C 1-Phase)

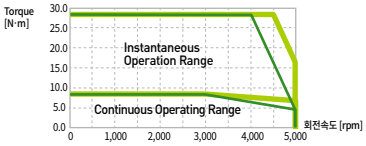
APM-EE09A (iX7NH)



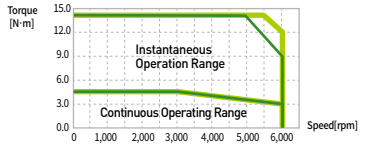
APM-EE09A (L7NH, L7P Series)



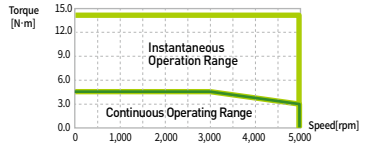
APM-EF30A (L7 Series)



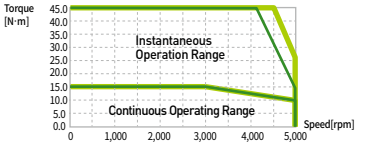
APM-EE15A (iX7NH)



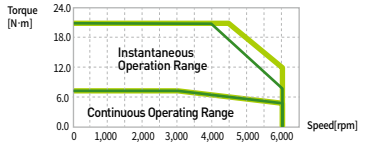
APM-EE15A (L7NH, L7P Series)



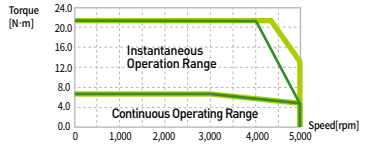
APM-EF50A (L7 Series)



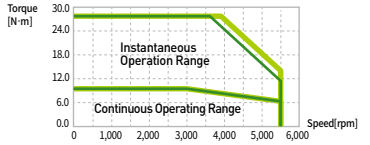
APM-EE22A (iX7NH)



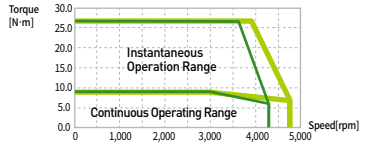
APM-EE22A (L7NH, L7P Series)



APM-EE30A (iX7NH)



APM-EE30A (L7NH, L7P Series)



Motor Specifications

Item	Unit	EE06D	EE11D	EE16D	EE22D	EF20G	EF30G	EF44G	EF60G	EF75G
Applicable Drive		L7□A008	L7□A010	L7□A020		L7□A020	L7□A035	L7□A050	L7□A075	L7□A075
Flange Size(□)		□130				□180				
Rated Output	[kW]	0.6	1.1	1.6	2.2	1.8	2.9	4.4	6	7.5
Rated Torque	[N·m]	2.86	5.25	7.64	10.5	11.46	18.46	28.01	38.2	47.75
	[kgf·cm]	29.23	53.59	77.95	107.19	116.93	188.39	285.83	389.77	487.21
Max. Instantaneous Torque	[N·m]	8.59	15.76	22.92	31.51	34.38	55.39	84.03	95.49	143.24
	[kgf·cm]	87.7	160.78	233.86	321.56	350.79	565.16	857.49	974.42	1461.63
Rated Current	[A]	4.29	5.73	8.86	10.94	11.21	15.05	28.66	34	30.45
Max.Current	[A]	12.87	17.19	26.58	32.82	33.63	45.15	85.98	85	91.35
Rated Speed	[r/min]	2,000				1,500				
Max. Speed	[r/min]	3,000	3,000	3,000	3,000	3,000	2,500	3,000	2,500	2,000
Inertia Moment	[kg·m^{2}X10^{-4}]	4.55	8.4	12.28	16.15	28.44	39.82	63.37	91.99	106.65
	[gf·cm·s^2]	4.643	8.571	12.531	16.48	29.02	40.633	64.663	93.867	108.827
Allowable Load Inertia Ratio Note2, 3]		Motor Inertia × 10				Motor Inertia × 5				
Rated Power Rate	[kW/s]	18.04	32.84	47.53	68.32	46.17	85.6	123.82	158.61	213.76
Speed/Position Detector	Standard	Serial Multi-Turn Absolute Built-in Type (23Bit)								
	Option	Batteryless : Serial Multi-Turn Absolute Built-in Type(20Bit) Note 4)								
Specifications & Features	Protection	Fully closed, self cooling IP65 Note 1)								
	Rated Time	Continuous								
	Ambient Temp	Operating: 0 ~ 40[°C] Storage : -10 ~ 60[°C]								
	Ambient Humidity	Operating: Below 80[%]RH / Storage: Below 90[%]RH (noncondensing)								
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.								
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)								
Weight	[kg]	4.7	6.2	7.8	9.4	12.1	15.1	20.8	27.7	32

Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Product may not qualify marked IP rating if reducers are attached or cables are bent beyond designated specifications. Use our standard cables for IP rating qualification.

Note2] Load inertia ratio should be reduced for faster response.
Note3] The allowable load inertia ratio applies when servo motor is operated at a constant speed.
Note4] Batteryless encoders should not be operated near strong magnetic fields.

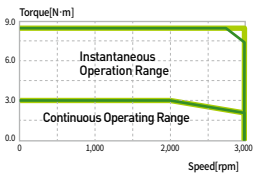
Speed-Torque Characteristics

■ 3-Phase AC200V

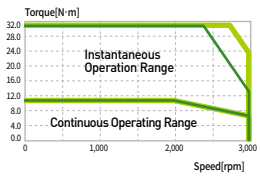
■ 3-Phase AC230V

(L7C 1-Phase)

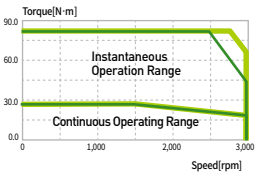
APM-EE06D



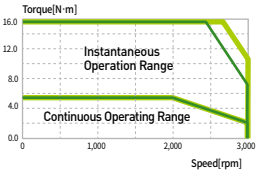
APM-EE22D



APM-EF44G



APM-EE11D



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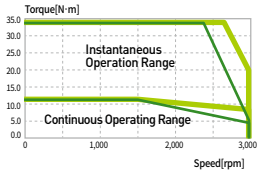

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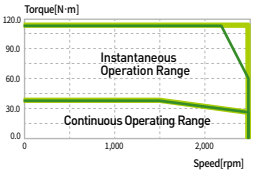
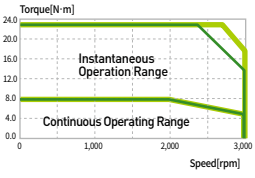
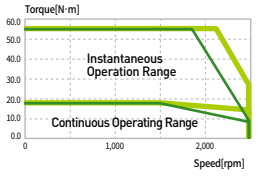


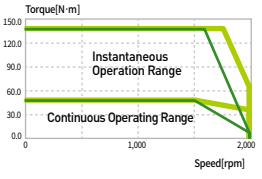
APM-EE16D



APM-EF30G



APM-EF75G



Servo Motor Specifications & Torque Characteristics (200V)

Motor Specifications

항목	단위	EE03M	EE06M	EE09M	EE12M	EF12M	EF20M	EF30M	EF44M
Applicable Drive		L7□A004	L7□A008	L7□A010	L7□A020			L7□A035	L7□A050
Flange Size(□)		□130				□180			
Rated Output	[kW]	0.3	0.6	0.9	1.2	1.2	2	3	4.4
Rated Torque	[N·m]	2.86	5.73	8.59	11.46	11.46	19.1	28.65	42.02
	[kgf·cm]	29.23	58.47	87.7	116.93	116.93	194.88	292.33	428.74
Max. Instanta-neous Torque	[N·m]	8.59	17.19	25.78	34.38	34.38	57.3	85.94	126.05
	[kgf·cm]	87.7	175.4	263.09	350.79	350.79	584.65	876.98	1286.23
Rated Current	[A]	2.71	4.22	5.73	10.07	11.24	13.46	15.53	29.77
Max.Current	[A]	8.13	12.66	17.19	30.21	33.72	40.38	46.59	89.31
Rated Speed	[r/min]	1,000							
Max. Speed	[r/min]	2,000	2,000	2,000	2,000	2,000	2,000	1,500	2,000
Inertia Moment	[kg·m^{2}X10^{-4}]	4.55	8.4	12.28	16.15	28.44	39.82	63.37	91.99
	[gf·cm·s^2]	4.643	8.571	12.531	16.48	29.02	40.633	64.663	93.867
Allowable Load Inertia Ratio Note2, 3]		Motor Inertia × 10				Motor Inertia × 5			
Rated Power Rate	[kW/s]	18.04	39.08	60.15	81.31	46.17	91.6	129.51	191.91
Speed/Position Detector	Standard	Serial Multi-Turn Absolute Built-in Type (23Bit)							
	Option	Batteryless : Serial Multi-Turn Absolute Built-in Type(20Bit) Note 4)							
Specifications & Features	Protection	Fully closed, self cooling IP65 Note 1)							
	Rated Time	Continuous							
	Ambient Temp	Operating: 0 ~ 40[°C] Storage : -10 ~ 60[°C]							
	Ambient Humidity	Operating: Below 80[%]RH / Storage: Below 90[%]RH (noncondensing)							
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.							
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)							
Weight	[kg]	4.7	6.2	7.8	9.4	12.1	15.1	20.8	27.7

Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Product may not qualify marked IP rating if reducers are attached or cables are bent beyond designated specifications. Use our standard cables for IP rating qualification.

Note2) Load inertia ratio should be reduced for faster response.
Note3) The allowable load inertia ratio applies when servo motor is operated at a constant speed.
Note4) Batteryless encoders should not be operated near strong magnetic fields.

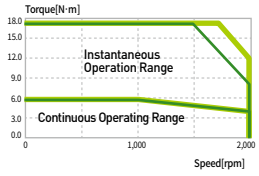
Speed-Torque Characteristics

■ 3-Phase AC200V

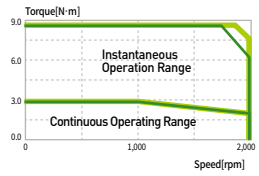
■ 3-Phase AC230V

(L7C 1-Phase)

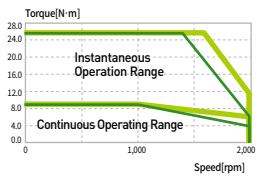
APM-EE03M



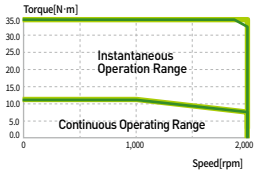
APM-EE06M



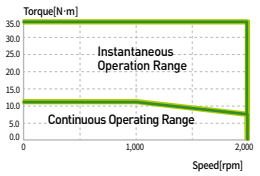
APM-EE09M



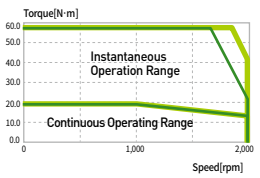
APM-EE12M



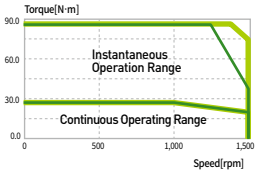
APM-EF12M



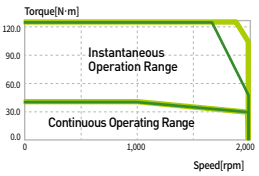
APM-EF20M



APM-EF30M

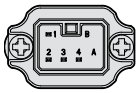


APM-EF44M



External Dimensions of Servo Motors

EA Series



SC-MC6P-AK2G-05

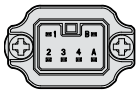
Plug Specifications

Power (Non Brake)

Pin No.	Signal
1	FG
2	U
3	V
4	W

(Power Connector Pin Table)

Power (Brake)

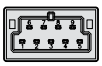


SC-MC6P-AK2G-04

Pin No.	Signal
1	FG
2	U
3	V
4	W
A	BK+
B	BK-

(Power Connector Pin Table)

Encoder

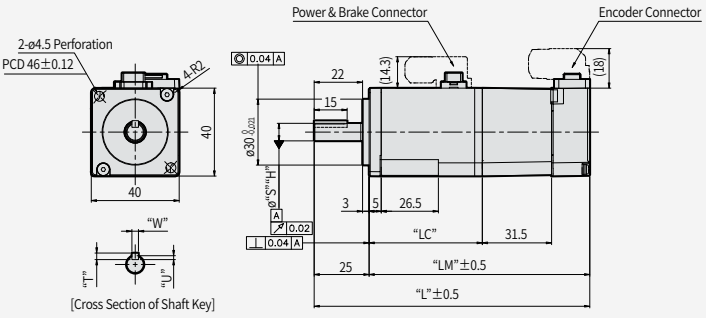


RECEPTACLE : JN13CD09PN1
PIN : JN-24S-C1B-B1-10000

Pin No.	Signal
1	SHIELD
2	$\overline{SLO}$
3	SLO
4	$\overline{MA}$
5	MA
6	GND_B
7	VDD_B
8	OV
9	+5V

(Encoder Connector Pin Table)

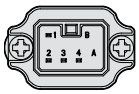
Note) Avoid excessive shock to motor when connecting keys; the shock may damage encoders or bearings.



Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
EAR5A	80.1(111.4)	55.1(86.4)	37.7(37.5)	8	0 -0.009	3	3	1.8	0.26(0.44)
EA01A	94.1(125.4)	69.1(100.4)	51.7(51.5)	8	0 -0.009	3	3	1.8	0.37(0.55)
EA015A	116.1	91.1	73.7	8	0 -0.009	3	3	1.8	0.55

Note) ( )Dimensions in parantheses are for servo motors with integrated maintenance brakes.

EA Series (Batteryless)



GAMC3095

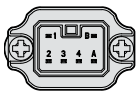
Plug Specifications

Power (Non Brake)

Pin No.	Signal
1	FG
2	U
3	V
4	W

(Power Connector Pin Table)

Power (Brake)

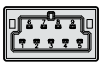


GAMC3079

Pin No.	Signal
1	FG
2	U
3	V
4	W
A	BK+
B	BK-

(Power Connector Pin Table)

Encoder

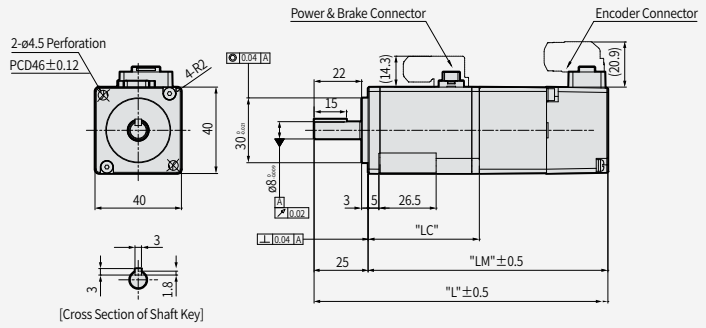


RECEPTACLE : JN13CD09PN1
PIN : JN-24S-C1B-B1-10000

Pin No.	Signal
1	SHIELD
2	$\overline{SLO}$
3	SLO
4	$\overline{MA}$
5	MA
6	-
7	-
8	OV
9	+5V

(Encoder Connector Pin Table)

Note) Avoid excessive shock to motor when connecting keys; the shock may damage encoders or bearings.



Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
EAR5A	91.9(122.0)	66.9(97.0)	38.5(37.5)	8	0 -0.009	3	3	1.8	0.31(0.49)
EA01A	105.9(136.0)	80.9(111.0)	52.5(51.5)	8	0 -0.009	3	3	1.8	0.42(0.60)

Note) ( )Dimensions in parantheses are for servo motors with integrated maintenance brakes.
Batteryless encoders should not be operated near strong magnetic fields.

EB Series

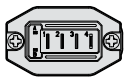
Plug Specifications

SC-MC6P-AJ2G-05

Power (Non Brake)

Pin No.	Signal
1	U
2	V
3	W
4	FG

(Power Connector Pin Table)

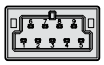


SC-MC6P-AJ2G-04

Power (Brake)

Pin No.	Signal
1	U
2	V
3	W
4	FG
A	BK+
B	BK-

(Power Connector Pin Table)



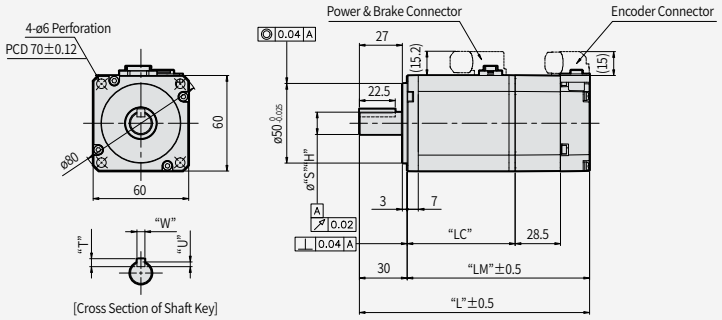
RECEPTACLE : JN13CD09PN1
PIN : JN-24S-C1B-B1-10000

Encoder

Pin No.	Signal
1	SHIELD
2	$\overline{SLO}$
3	SLO
4	$\overline{MA}$
5	MA
6	GND_B
7	VDD_B
8	OV
9	+5V

(Encoder Connector Pin Table)

Note) Avoid excessive shock to motor when connecting keys; the shock may damage encoders or bearings.
Batteryless encoders have no signals for pins 6 and 7.



Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
EB01A	89.2(117.5)	59.2(87.5)	41.0(40.8)	14	0 -0.018	5	5	3	0.59(0.95)
EB02A	98.2(126.5)	68.2(96.5)	50.0(49.8)	14	0 -0.018	5	5	3	0.76(1.12)
EB04A	116.2(144.5)	86.2(114.5)	68.0(67.8)	14	0 -0.018	5	5	3	1.10(1.46)

Note) ( )Dimensions in parantheses are for servo motors with integrated maintenance brakes.
For non-brake models with batteryless encoders, the dimensions L and LM increase by 11.8[mm].
For brake models with batteryless encoders, the dimensions L and LM increase by 12.0[mm].
For all models with batteryless encoders, the weight increases by 0.06[kg].
Batteryless encoders should not be operated near strong magnetic fields.

EC Series

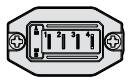
Plug Specifications

SC-MC6P-AJ2G-05

Power (Non Brake)

Pin No.	Signal
1	U
2	V
3	W
4	FG

(Power Connector Pin Table)

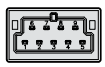


SC-MC6P-AJ2G-04

Power (Brake)

Pin No.	Signal
1	U
2	V
3	W
4	FG
A	BK+
B	BK-

(Power Connector Pin Table)



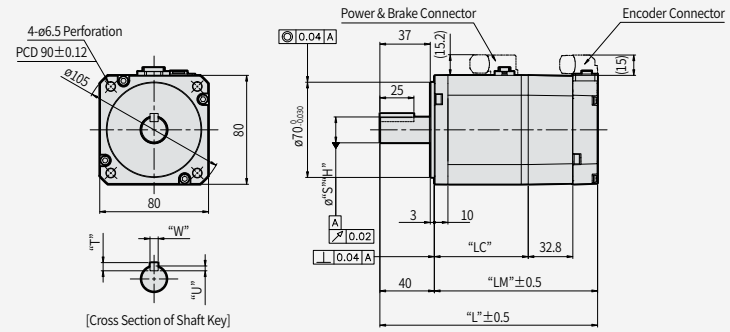
RECEPTACLE : JN13CD09PN1
PIN : JN-24S-C1B-B1-10000

Encoder

Pin No.	Signal
1	SHIELD
2	$\overline{SLO}$
3	SLO
4	$\overline{MA}$
5	MA
6	GND_B
7	VDD_B
8	OV
9	+5V

(Encoder Connector Pin Table)

Note) Avoid excessive shock to motor when connecting keys; the shock may damage encoders or bearings.
Batteryless encoders have no signals for pins 6 and 7.



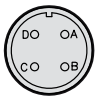
Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
EC04A	115.2(148.0)	75.2(108.0)	57.0(57.0)	14	0 -0.018	5	5	3	1.41(2.08)
EC06A	127.2(160.0)	87.2(120.0)	69.0(69.0)	19	0 -0.021	6	6	3.5	1.86(2.53)
EC08A	131.2(164.0)	91.2(124.0)	73.0(73.0)	19	0 -0.021	6	6	3.5	2.00(2.67)
EC10A	151.2(184.0)	111.2(144.0)	93.0(93.0)	19	0 -0.021	6	6	3.5	2.69(3.36)

Note) ( )Dimensions in parantheses are for servo motors with integrated maintenance brakes.
For non-brake models with batteryless encoders, the dimensions L and LM increase by 11.8[mm].
For brake models with batteryless encoders, the dimensions L and LM increase by 12.0[mm].
For all models with batteryless encoders, the weight increases by 0.06[kg].
Batteryless encoders should not be operated near strong magnetic fields.

External Dimensions of Servo Motors

EE Series

Plug Specifications



Specifications:
MS3102A20-4P(Standard)

Power (Non Brake)

Pin No.	Signal
A	U
B	V
C	W
D	접지선

Specifications:
MS3102A20-15P
(Brake-attached type)

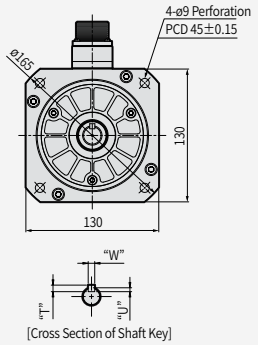
Pin No.	Signal	Pin No.	Signal
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

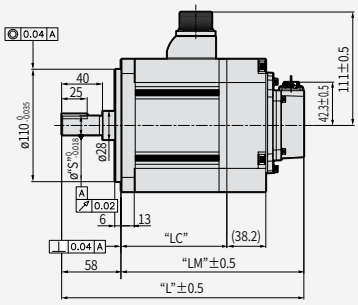
SC-CMV1-R10PTG-4

Encoder

Pin No.	Signal
1	+5V
2	OV
3	-
4	VDD_B
5	GND_B
6	MA
7	$\overline{MA}$
8	SLO
9	$\overline{SLO}$
10	SHIELD

(Multi Turn Encoder Connector Pin Table)





Model	External Dimensions(mm)				Key Dimensions			Weight (kg)
	L	LM	LC	S	T	W	U	
EE09A, EE06D, EE03M	181(219)	123(161)	85.8(85.6)	19	5	5	3	4.7(6.3)
EE15A, EE11D, EE06M	199(237)	141l(179)	103.8(103.6)	19	5	5	3	6.2(7.8)
EE22A, EE16D, EE09M	217(255)	159(197)	121.8(121.6)	22	6	6	3.5	7.8(9.4)
EE30A, EE22D, EE12M	235(273)	177(215)	139.8(139.6)	24	7	8	4	9.4(11)

Note) Avoid excessive shock to motor when connecting keys; the shock may damage encoders or bearings.
Batteryless encoders have no signals for pins 6 and 7.

Note) For both non-brake and brake models with batteryless encoders, the dimensions L and LM increase by 11.2[mm].
Note) For all models with batteryless encoders, the weight increases by 0.06[kg].
Note) Batteryless encoders should not be operated near strong magnetic fields.

EF Series

Plug Specifications

Specifications:
MS3102A22-22P(Standard)

Power (Non Brake)

Pin No.	Signal
A	U
B	V
C	W
D	Grounding Wire

Specifications:
MS3102A24-10P
(Brake-attached type)

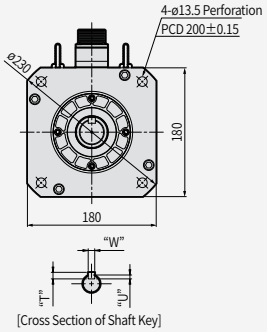
Pin No.	Signal	Pin No.	Signal
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

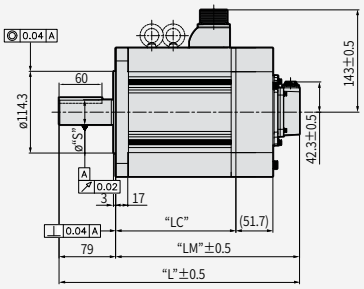
SC-CMV1-R10PTG-4

Encoder

Pin No.	Signal
1	+5V
2	OV
3	-
4	VDD_B
5	GND_B
6	MA
7	$\overline{MA}$
8	SLO
9	$\overline{SLO}$
10	SHIELD

(Multi Turn Encoder Connector Pin Table)





Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	LR	S	T	W	U	
EF30A, EF20G, EF12M	231.7(283.1)	152.7(204.1)	155.5(115.2)	79	35 $^{0}_{-0.01}$	8	10	5	12.1(19.3)
EF50A, EF30G, EF20M	248.7(300.1)	169.7(221.1)	132.5(132.2)	79	35 $^{0}_{-0.01}$	8	10	5	15.1(22.3)
EF44G, EF30M	284.7(336.1)	205.7(257.1)	168.5(168.2)	79	35 $^{0}_{-0.01}$	8	10	5	20.8(28)
EF60G, EF44M	326.7(378.1)	247.7(299.1)	210.5(210.2)	79	42 $^{0}_{-0.016}$	8	12	5	27.7(34.9)
EF75G	381.7	268.7	231.5	113	42 $^{0}_{-0.016}$	8	12	5	32

Note) Avoid excessive shock to motor when connecting keys; the shock may damage encoders or bearings.
Batteryless encoders have no signals for pins 6 and 7.

Note) For both non-brake and brake models with batteryless encoders, the dimensions L and LM increase by 11.2[mm].
Note) For all models with batteryless encoders, the weight increases by 0.06[kg].
Note) Batteryless encoders should not be operated near strong magnetic fields.

Brake and Heat Sink Specifications

Brake Specifications

Motor Series	EA	EB	EC	EF	FF
Use	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance
Input Voltage [V]	DC 24V	DC 24V	DC 24V	DC 24V	DC 24V
Static Friction Torque [N•m]	0.32	1.47	3.23	10.4	40
Capacity [W]	4.5	6.6	7.3	19.4	25
Rated Current [A]	0.17	0.27	0.3	29.6	23
Braking System	Spring brake	Spring brake	Spring brake	0.81	1.04
Insulation Level	F	F	F	F	F

Note) 1. Electronic brakes should only be used to maintain static state, and never to stop moving motors.
2. The specifications of electronic brakes are measured at 20°C.
3. These specifications are subject to change. Please check the voltage specifications on your motors.

Heat Sink Specifications

Classification	Standard(mm) Servo Motor	Material
EA Series (□40)	250×250×6	Aluminum
EB Series (□60)	250×250×6	
EC Series (□80)	250×250×12	
EE Series (□130)	350×350×20	
EF Series (□180)	550×550×30	
EF Series (5kW or more) (□180)	650×650×36	

※ The dimensions above are measured with attached heat sinks.

Motor Designation (F Series)

Servo Motor Designation

APM(C) – F BL P 04 A M K 1

Model Name
APM : Servo motor (Made in Korea)
APMC : Servo motor (Made in China)

Model Shaft
F : Flat shaft

Flange Size
AL : 40 Flange
BL : 60 Flange
CL : 80 Flange
E : 130 Flange
F : 180 Flange
G : 220 Flange

Input Power Supply
None: 200VAC
P : 400VAC

Motor Capacity
R5 : 50[W]
01 : 100[W]
015 : 150[W]
02 : 200[W]
03 : 300[W]
04 : 400[W]
07 : 650[W]
08 : 750[W]
10 : 1.0[kW]
20 : 2.0[kW]
35 : 3.5[kW]
50 : 5.0[kW]
75 : 7.5[kW]
110 : 11[kW]
150 : 15[kW]

Rated Speed
A : 3000[rpm]
D : 2000[rpm]
G : 1500[rpm]
M : 1000[rpm]

Encoder Type
M : 19bit S-tum abs (16bit M-turn abs)
M8 : 18bit S-tum abs [FAL type] (16bit M-turn abs)
Y : 17bit S-turn abs (Magnetic)

Shape of Shaft End
N : Straight
K : One side round key (Standard)

Oil Seal, Brake Type
None: None
1 : Oil seal attached
2 : Brake attached
3 : Oil seal, Brake attached

Note1) In case of 40, 60, 80 flange product, you can apply 200V drive only.

Note2) If you apply nonstandard encoder, please contact our office.

Note3) Refer to brake operating voltage

Motor Specifications [Rated 3000r/min]

Servo Motor (APMC-□□□□)		FALR5A	FAL01A	FAL015A	FBL01A	FBL02A	FBL04A	FCL04A	FCL06A	FCL08A	FCL10A	FCL03D	FCL05D	FCL06D	FCL07D
Applicable Drive		L7□A001		L7□A002	L7□A001	L7□A002	L7□A004		L7□A008		L7□A010	L7□A004	L7□A008		
Flange Size(□)		□40			□60			□80							
Rated Output	[kW]	0.05	0.1	0.15	0.1	0.2	0.4	0.4	0.6	0.75	1	0.3	0.45	0.55	0.65
Rated Torque	[N·m]	0.16	0.32	0.48	0.32	0.64	1.27	1.27	1.91	2.39	3.18	1.43	2.15	2.63	3.1
	[kgf·cm]	1.62	3.25	4.87	3.25	6.49	12.99	12.99	19.49	24.36	32.48	14.62	21.92	26.8	31.67
Max. Instantaneous Torque	[N·m]	0.48	0.96	1.43	0.96	1.91	3.82	3.82	5.73	7.16	9.55	4.3	6.45	7.88	9.31
	[kgf·cm]	4.87	9.74	14.62	9.74	19.48	38.96	38.98	58.47	73.08	97.44	43.85	65.77	80.39	95.01
Rated Current	[A]	0.95	1.25	1.60	0.95	1.45	2.6	2.58	3.81	5.02	5.83	2.5	3.05	3.06	3.83
Max.Current	[A]	2.85	3.75	4.80	2.85	4.35	7.8	7.75	11.42	15.07	17.5	7.51	9.16	9.18	11.5
Rated Speed	[r/min]	3000										2000			
Max. Speed	[r/min]	5000										3000			
Inertia Moment	[kg·m²X10⁻⁴]	0.023	0.042	0.063	0.091	0.147	0.248	0.53	0.897	1.264	1.632	0.53	0.897	1.264	1.63
	[gf·cm·s²]	0.024	0.043	0.065	0.093	0.15	0.253	0.541	0.915	1.29	1.665	0.541	0.915	1.29	1.66
Allowable Load Inertia Ratio		30timesofmotorinertia		20 times of motor inertia				15 times of motor inertia							
Rated Power Rate	[kW/s]	10.55	23.78	36.19	11.09	27.6	27.07	30.6	40.66	45.09	62.08	38.73	51.47	54.56	59.03
Speed/Position Detector	Standard	Serial Multi-Turn Built-in Type(18bit)			Serial Multi-Turn Built-in Type(19bit)										
	Option	×													
Specifications & Features	Protection	Fully closed·Self cooling IP67 Note1]													
	Rated Time	Continuous													
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]													
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)													
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.													
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)													
Weight	[kg]	0.31	0.45	0.61	0.56	0.74	1.06	1.52	2.14	2.68	3.3	1.26	2.12	2.66	2.78

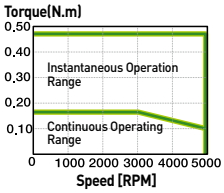
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

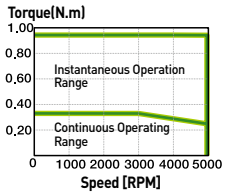
■ 3 Phase AC200V

■ 3Phase AC230V

APMC-FALR5A



APMC-FAL01A



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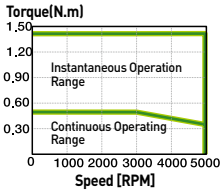

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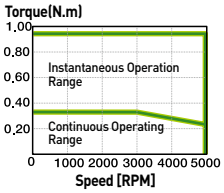

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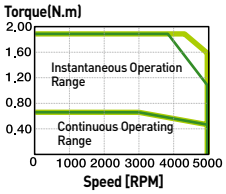

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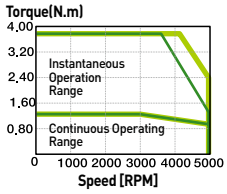

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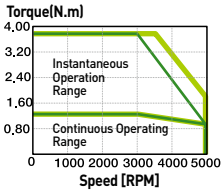

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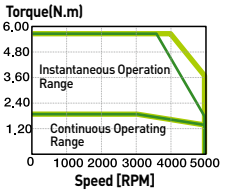

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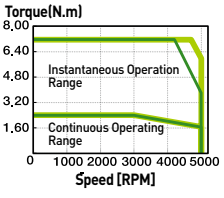

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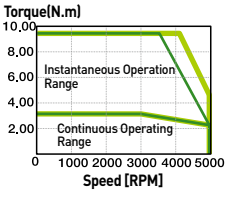
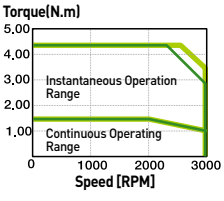


APMC-FCL03D



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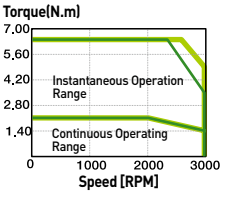
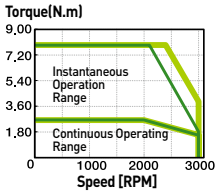
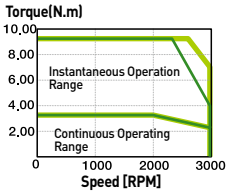


APMC-FCL06D



APMC-FCL07D



Servo Motor Specifications & Torque Characteristics (200V)

Motor Specifications [Rated 3000r/min]

Servo Motor (APM-□□□□)		FE09A	FE15A	FE22A	FE30A	FF30A	FF50A
Applicable Drive		L7□A010	L7□A020		L7□A035		L7□A050
Flange Size(□)		□130				□180	
Rated Output	[kW]	0.9	1.5	2.2	3	3	5
Rated Torque	[N·m]	2.86	4.77	7	9.55	9.55	15.91
	[kgf·cm]	29.2	48.7	71.4	97.4	97.4	162.3
Max. Instanta-neous Torque	[N·m]	8.59	14.32	21.01	28.65	28.65	47.74
	[kgf·cm]	87.7	146.1	214.3	292.2	292.3	487
Rated Current	[A]	6.45	9.15	13.24	16.09	15.26	26.47
Max.Current	[A]	19.35	27.45	39.72	48.27	45.78	79.41
Rated Speed	[r/min]	3000					
Max. Speed	[r/min]	5000					
Inertia Moment	[kg·m²X10⁻⁴]	5.66	10.18	14.62	19.04	27.96	46.56
	[gf·cm·s²]	5.77	10.39	14.92	19.43	28.53	47.51
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia	
Rated Power Rate	[kW/s]	14.47	22.38	33.59	47.85	32.59	54.33
Speed/Position Detector	Standard	Serial Type 19[Bit]					
	Option	×					
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1]					
	Rated Time	Continuous					
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]					
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)					
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.					
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)					
Weight	[kg]	5	6.7	8.5	10.1	12.5	17.4

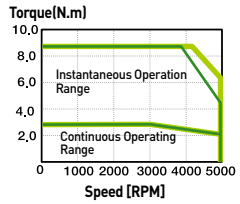
Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

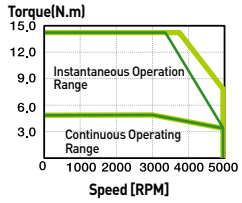
■ 3 Phase AC200V

■ 3Phase AC230V

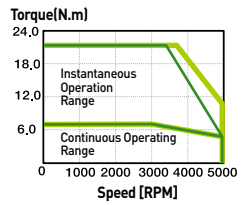
APM-FE09A



APM-FE15A



APM-FE22A



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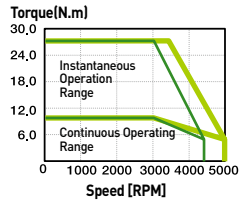

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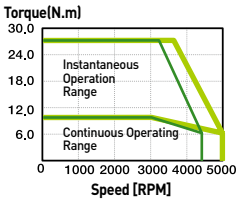
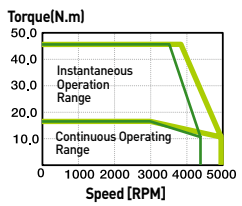


APM-FF50A



Motor Specifications [Rated 2000r/min]

Servo Motor (APM-□□□□)		FE06D	FE11D	FE16D	FE22D
Applicable Drive		L7□A008	L7□A010	L7□A020	
Flange Size(□)		□130			
Rated Output	[kW]	0.6	1.1	1.6	2.2
Rated Torque	[N·m]	2.86	5.25	7.63	10.5
	[kgf·cm]	29.20	53.6	77.9	107.1
Max. Instanta-neous Torque	[N·m]	8.59	15.75	22.92	31.51
	[kgf·cm]	87.7	160.7	233.8	321.4
Rated Current	[A]	4.56	6.47	10.98	12.97
Max.Current	[A]	13.68	19.41	32.94	38.91
Rated Speed	[r/min]	2000			
Max. Speed	[r/min]	3000			
Inertia Moment	[kg·m^{2}X10^{-4}]	5.66	10.18	14.62	19.04
	[gf·cm·s^2]	5.77	10.39	14.92	19.43
Allowable Load Inertia Ratio		10 times of motor inertia			
Rated Power Rate	[kW/s]	14.49	27.08	39.89	57.9
Speed/Position Detector	Standard	Serial Multi-Turn Type(19bit)			
	Option	×			
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1]			
	Rated Time	Continuous			
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]			
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)			
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.			
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)			
Weight	[kg]	5	6.7	8.5	10.1

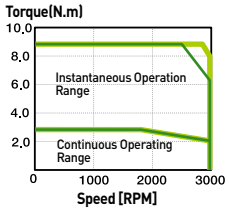
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

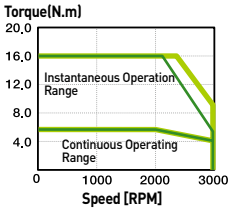
■ 3 Phase AC200V

■ 3Phase AC230V

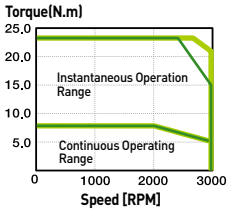
APM-FE06D



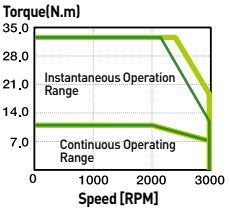
APM-FE11D



APM-FE16D



APM-FE22D



Servo Motor Specifications & Torque Characteristics (200V)

Motor Specifications [Rated 2000r/min]

Servo Motor (APM-□□□□)		FF22D	FF35D	FF55D	FF75D	FG22D	FG35D	FG55D	FG75D	FG110D
Applicable Drive		L7□A020	L7□A035	L7□A050	L7□A075	L7□A020	L7□A035	L7□A050	L7□A075	L7□A150
Flange Size(□)		□180				□220				
Rated Output	[kW]	2.2	3.5	5.5	7.5	2.2	3.5	5.5	7.5	11
Rated Torque	[N·m]	10.5	16.7	26.25	35.81	10.5	16.71	26.25	35.81	52.52
	[kgf·cm]	107.1	170.4	267.8	365.4	107.1	170.4	267.8	365.4	535.9
Max. Instanta-neous Torque	[N·m]	31.5	50.1	78.76	89.53	31.51	50.12	78.76	89.53	157.55
	[kgf·cm]	321.3	511.4	803.4	913.5	321.3	511.3	803.4	913.5	1607.60
Rated Current	[A]	13.07	16.48	28.78	32.95	10.25	14.67	29.74	30.17	51.39
Max.Current	[A]	39.21	49.44	86.34	82.38	30.75	44.01	89.22	75.43	154.17
Rated Speed	[r/min]	2000								
Max. Speed	[r/min]	3000			2500	3000	2700	3000	2500	
Inertia Moment	[kg·m²X10⁻⁴]	27.96	46.56	73.85	106.7	41.13	71.53	117.52	149.4	291.36
	[gf·cm·s²]	28.53	47.51	75.36	108.9	41.97	72.99	120.12	152.45	297.31
Allowable Load Inertia Ratio		5 times of motor inertia								
Rated Power Rate	[kW/s]	39.43	59.89	93.27	120.15	26.78	38.99	58.51	85.83	94.65
Speed/Position Detector	Standard	Serial Type(19bit)								
	Option	×								
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1]								
	Rated Time	Continuous								
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]								
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)								
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.								
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)								
Weight	[kg]	12.5	17.4	25.12	33.8	15.4	20.2	28.12	33.45	66.2

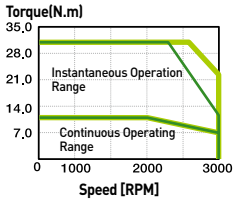
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

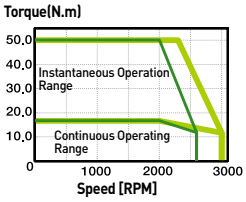
■ 3 Phase AC200V

■ 3Phase AC230V

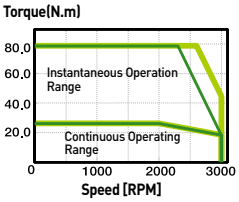
APM-FF22D



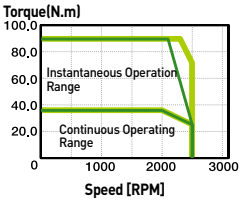
APM-FF35D



APM-FF55D



APM-FF75D



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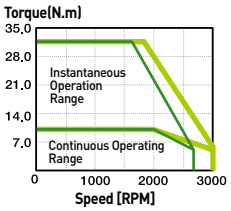

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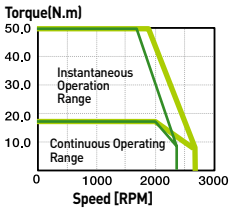

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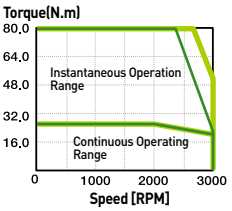

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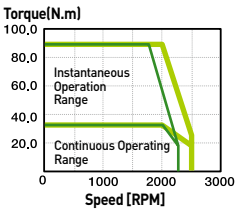
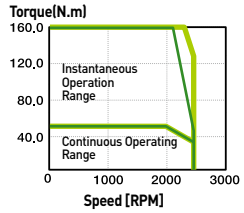


APM-FG110D



Motor Specifications [Rated 1500r/min]

Servo Motor (APM-□□□□)		FE05G	FE09G	FE13G	FE17G	FF20G	FF30G	FF44G	FF60G	FF75G	FG20G	FG30G	FG44G	FG60G	FG85G	FG110G	FG150G
Applicable Drive		L7□A008	L7□A010	L7□A020		L7□A020	L7□A035	L7□A050	L7□A075	L7□A075	L7□A020	L7□A035	L7□A050	L7□A075	L7□A150		
Flange Size(□)		□130				□180					□220						
Rated Output	[kW]	0.45	0.85	1.3	1.7	1.8	2.9	4.4	6	7.5	1.8	2.9	4.4	6	8.5	11	15
Rated Torque	[N·m]	2.86	5.41	8.27	10.82	11.45	18.46	28	38.2	47.7	11.5	18.5	28	38.2	54.11	69.99	95.45
	[kgf·cm]	29.22	55.19	84.41	110.38	116.9	188.3	285.7	389.8	487.2	116.9	188.4	285.8	389.7	552.1	714.2	974
Max. Instantaneous Torque	[N·m]	8.59	16.23	24.82	32.46	34.35	55.38	78.4	95.5	119.3	34.4	55.4	78.4	95.5	162.32	209.97	238.63
	[kgf·cm]	87.66	165.57	253.23	331.14	350.6	564.9	799.6	974.9	1217.3	350.8	565.1	800.24	974.3	1656.30	2142.60	2435
Rated Current	[A]	4.56	6.67	11.9	13.36	12.16	15.98	30.7	35.14	35.26	11.18	16.21	31.72	32.18	52.94	59.3	75.6
Max.Current	[A]	13.68	20.01	35.7	40.08	36.48	47.94	85.96	87.85	88.15	33.54	48.63	88.82	96.54	158.82	177.9	189
Rated Speed	[r/min]	1500															
Max. Speed	[r/min]	3000				3000	2700	3000	2500	2200	2700		3000	2500	2500	2000	2000
Inertia Moment	[kg·m²X10⁻⁴]	5.66	10.18	14.62	19.04	27.96	46.56	73.85	106.7	131.3	41.13	71.53	117.72	149.4	291.36	291.36	424.57
	[gf·cm·s²]	5.77	10.39	14.92	19.43	28.53	47.51	75.36	108.9	134	41.97	72.99	120.12	152.45	297.31	297.31	416.08
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia											
Rated Power Rate	[kW/s]	14.49	28.74	46.81	61.46	46.92	73.14	106.15	136.73	173.63	31.91	47.66	66.64	97.63	100.48	168.27	223.44
Speed/Position Detector	Standard	Serial Type 19[bit]															
	Option	×															
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1]															
	Rated Time	Continuous															
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]															
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)															
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.															
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)															
Weight	[kg]	5.0	6.7	8.5	10.1	12.5	17.4	25.2	33.8	38.5	15.4	20.2	28	33.45	66.2	66.3	92.2

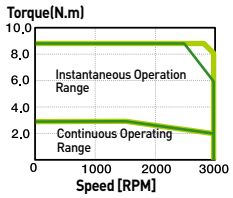
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

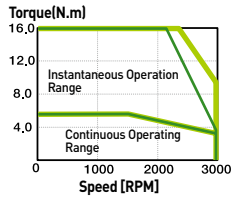
■ 3 Phase AC200V

■ 3Phase AC230V

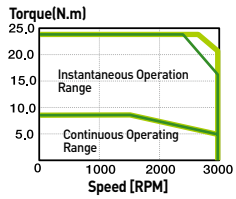
APM-FE05G



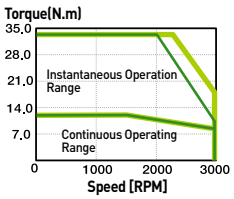
APM-FE09G



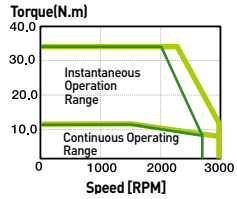
APM-FE13G



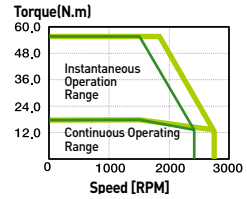
APM-FE17G



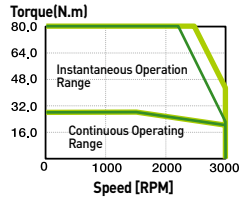
APM-FF20G



APM-FF30G



APM-FF44G



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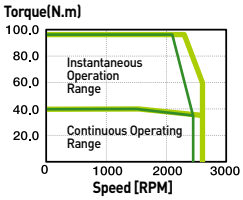
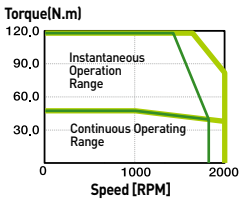
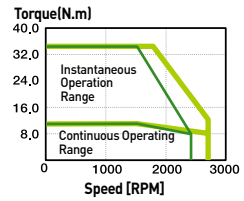


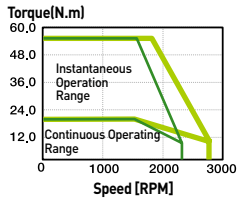
APM-FF75G



APM-FG20G



APM-FG30G



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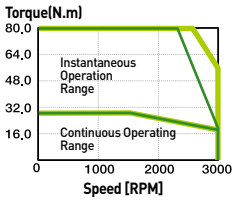
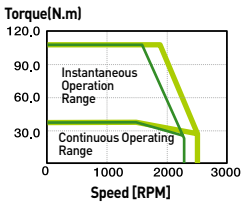
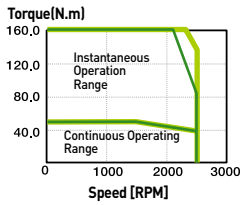


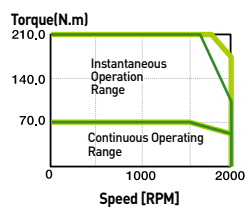
APM-FG60G



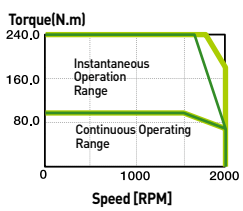
APM-FG85G



APM-FG110G



APM-FG150G



Servo Motor Specifications & Torque Characteristics (200V)

Motor Specifications [Rated 1000r/min]

Servo Motor (APM-□□□□)		FE03M	FE06M	FE09M	FE12M	FF12M	FF20M	FF30M	FF44M	FG12M	FG20M	FG30M	FG44M	FG60M
Applicable Drive		L7□A004	L7□A008	L7□A010	L7□A020			L7□A035	L7□A050	L7□A020		L7□A035	L7□A050	L7□A075
Flange Size(□)		□130				□180				□220				
Rated Output	[kW]	0.3	0.6	0.9	1.2	1.2	2	3	4.4	1.2	2	3	4.4	6.0
Rated Torque	[N·m]	2.86	5.72	8.59	11.46	11.46	19.09	28.64	42.02	11.5	19.1	28.6	42	57.29
	[kgf·cm]	29.22	58.4	87.7	116.9	116.9	194.8	292.2	428.7	116.9	194.9	292.3	428.7	584.6
Max. Instantaneous Torque	[N·m]	8.59	17.18	25.77	34.22	34.38	57.29	85.94	105.05	34.4	57.3	85.9	126	143.2
	[kgf·cm]	87.66	175.3	262.9	349.1	350.7	584.4	876.6	1071.52	350.8	584.6	876.9	1286.1	1432.4
Rated Current	[A]	2.73	4.56	6.18	10.67	11.01	12.96	16.58	30.6	11.28	13.1	15.52	27.26	39.32
Max.Current	[A]	8.19	13.68	18.54	32.01	33.03	38.88	49.74	85.68	33.84	39.3	46.56	81.78	98.30
Rated Speed	[r/min]	1000												
Max. Speed	[r/min]	2000						1700	2000			1600	1900	2000
Inertia Moment	[kg·m²X10⁻⁴]	5.66	10.18	14.62	19.04	27.96	46.56	73.85	106.7	41.13	71.53	117.72	149.4	291.36
	[gf·cm·s²]	5.77	10.39	14.92	19.43	28.53	47.51	75.36	108.9	41.97	72.99	120.12	152.45	297.31
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia								
Rated Power Rate	[kW/s]	14.49	32.22	50.48	68.91	46.94	78.27	111.04	165.38	31.91	51	69.7	118.14	112.65
Speed/Position Detector	Standard	Serial Type 19[bit]												
	Option	×												
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]												
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)												
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.												
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)												
Weight	[kg]	5.0	6.7	8.5	10.1	12.5	17.4	25.2	33.8	15.4	20.2	28	33.5	66.2

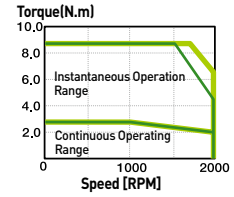
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

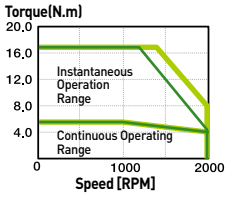
■ 3 Phase AC200V

■ 3Phase AC230V

APM-FE03M



APM-FE06M



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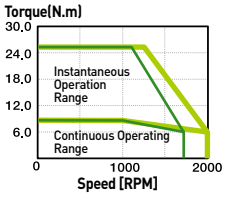
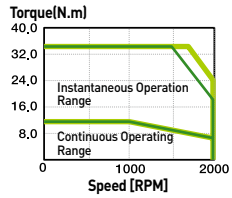
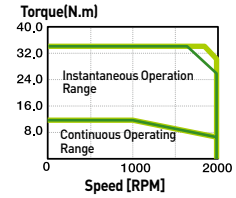


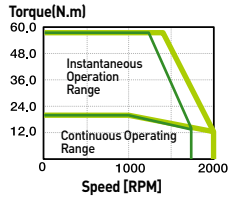
APM-FE12M



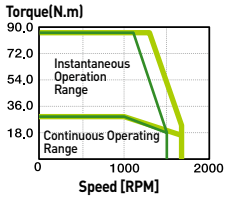
APM-FF12M



APM-FF20M



APM-FF30M



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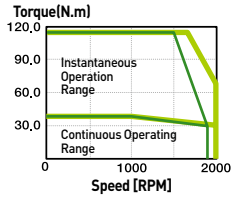
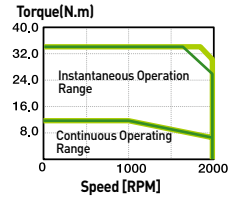
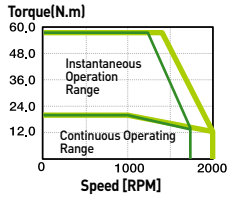


APM-FG12M



APM-FG20M



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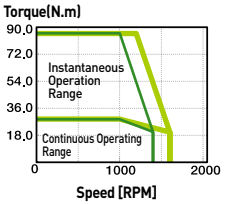

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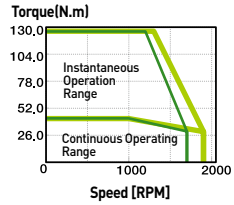
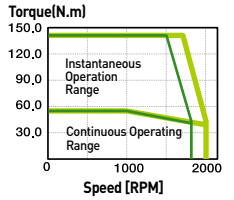


APM-FG60M



Servo Motor Specifications & Torque Characteristics (400V)

Motor Specifications [Rated 3000r/min]

Servo Motor (APM-□□□□)		FEP09A	FEP15A	FEP22A	FEP30A	FFP30A	FFP50A
Applicable Drive		L7□B010□	L7□B020□		L7□B035□		L7□B050□
Flange Size(□)		□130				□180	
Rated Output	[kW]	0.9	1.5	2.2	3	3	5
Rated Torque	[N·m]	2.86	4.77	7	9.55	9.55	15.92
	[kgf·cm]	29.23	48.72	71.46	97.44	97.44	162.4
Max. Instanta-neous Torque	[N·m]	8.59	14.32	21.01	28.65	28.65	39.79
	[kgf·cm]	87.7	146.16	214.37	292.33	292.33	406.01
Rated Current	[A]	3.47	6.68	7.64	9.94	9.79	16.07
Max.Current	[A]	10.4	20.03	22.92	29.81	29.38	40.18
Rated Speed	[r/min]	3000					
Max. Speed	[r/min]	5000					
Inertia Moment	[kg·m²X10⁻⁴]	5.659	10.179	14.619	19.04	27.96	46.56
	[gf·cm·s²]	5.774	10.387	14.917	19.429	28.531	47.51
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia	
Rated Power Rate	[kW/s]	14.5	22.4	33.55	47.89	32.61	54.4
Speed/Position Detector	Standard	Serial Type 19[bit]					
	Option	×					
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1)					
	Rated Time	Continuous					
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]					
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)					
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.					
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)					
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7

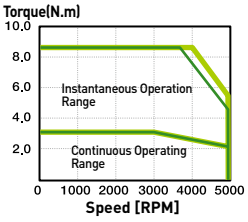
Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

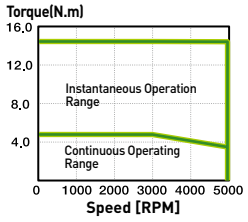
■ 3 Phase AC380V

■ 3Phase AC400V

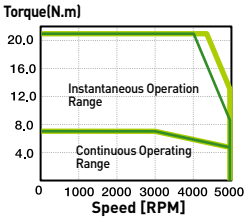
APM-FEP09A



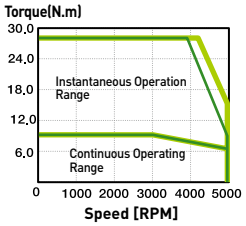
APM-FEP15A



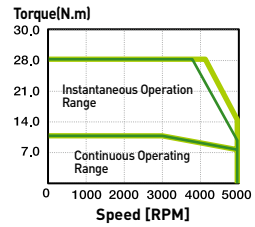
APM-FEP22A



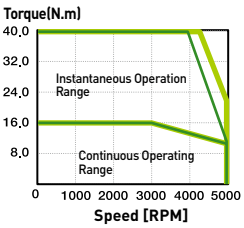
APM-FEP30A



APM-FFP30A



APM-FFP50A



Servo Motor Specifications & Torque Characteristics (400V)

Motor Specifications [Rated 2000r/min]

Servo Motor (APM-□□□□)		FEP06D	FEP11D	FEP16D	FEP22D	FFP22D	FFP35D	FFP55D	FFP75D	FGP22D	FGP35D	FGP55D	FGP75D	FGP110D
Applicable Drive		L7□B010□		L7□B020□			L7□B035□	L7□B050□	L7□B075□	L7□B020□	L7□B035□	L7□B050□	L7□B075□	L7□B150□
Flange Size(□)		□130				□180					□220			
Rated Output	[kW]	0.6	1.1	1.6	2.2	2.2	3.5	5.5	7.5	2.2	3.5	5.5	7.5	11
Rated Torque	[N·m]	2.86	5.25	7.64	10.5	10.5	16.71	26.26	35.81	10.5	16.71	26.26	35.81	52.52
	[kgf·cm]	29.23	53.59	77.95	107.19	107.19	170.52	267.96	365.41	107.19	170.52	267.96	365.41	535.93
Max. Instantaneous Torque	[N·m]	8.59	15.76	22.92	31.51	31.51	50.13	65.65	89.52	31.51	50.13	65.65	89.52	131.30
	[kgf·cm]	87.7	160.78	233.86	321.56	321.56	511.57	669.84	913.52	321.56	511.57	669.84	913.52	1339.69
Rated Current	[A]	3.28	3.4	4.97	6.80	6.93	9.09	14.70	18.97	7.12	8.73	16.04	19.10	27.41
Max.Current	[A]	9.83	10.19	14.92	20.4	20.8	27.26	36.75	47.42	21.35	26.2	40.1	47.76	68.52
Rated Speed	[r/min]	2000												
Max. Speed	[r/min]	3000					2700		2500	3000	2700	3000	2500	
Inertia Moment	[kg·m²X10⁻⁴]	5.659	10.179	14.619	19.04	27.96	46.56	73.85	106.73	41.13	71.53	117.72	149.4	291.36
	[gf·cm·s²]	5.774	10.387	14.917	19.429	28.531	47.51	75.357	108.908	41.97	72.99	120.12	152.45	297.31
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia								
Rated Power Rate	[kW/s]	14.5	27.1	39.92	57.95	39.46	59.98	93.38	120.15	26.83	39.04	58.58	85.83	94.68
Speed/Position Detector	Standard	Serial Type 19[bit]												
	Option	×												
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]												
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)												
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.												
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)												
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7	26.3	35.6	16.95	21.95	30.8	37.52	66.2

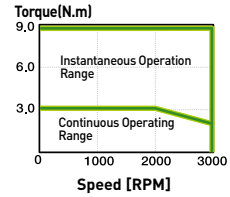
Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

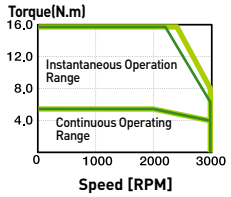
■ 3 Phase AC380V

■ 3Phase AC400V

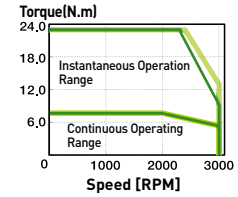
APM-FEP06D



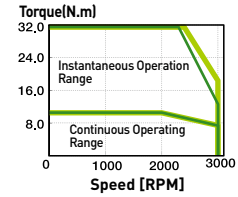
APM-FEP11D



APM-FEP16D



APM-FEP22D



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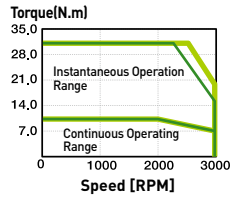

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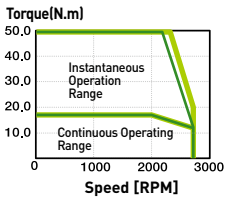
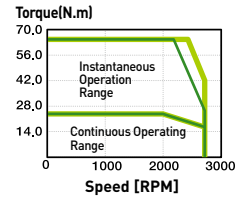
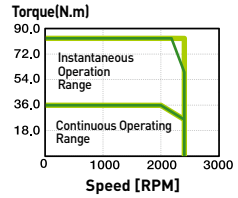


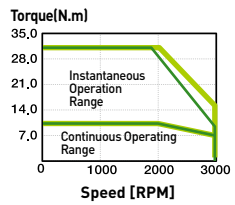
APM-FFP55D



APM-FFP75D



APM-FGP22D



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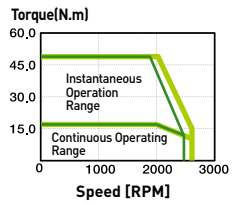

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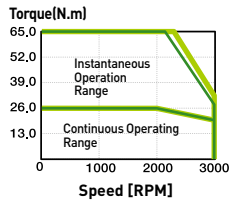

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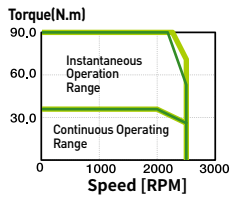

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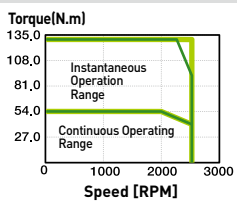


Motor Specifications [Rated 1500r/min]

Servo Motor (APM-□□□□)		FEP05G	FEP09G	FEP13G	FEP17G	FFP20G	FFP30G	FFP44G	FFP60G	FFP75G	FGP20G	FGP30G	FGP44G	FGP60G	FGP85G	FGP110G	FGP150G
Applicable Drive		L7□B010□		L7□B020□			L7□B035□	L7□B050□	L7□B075□		L7□B020□	L7□B035□	L7□B050□	L7□B075□	L7□B150□		
Flange Size(□)		□130				□180					□220						
Rated Output	[kW]	0.45	0.85	1.3	1.7	1.8	2.9	4.4	6	7.5	1.8	2.9	4.4	6	8.5	11	15
Rated Torque	[N·m]	2.86	5.41	8.28	10.82	11.46	18.46	28.01	38.2	47.75	11.46	18.46	28.01	38.2	54.11	70.03	95.49
	[kgf·cm]	29.23	55.22	84.45	110.43	116.93	188.39	285.83	389.77	487.21	116.93	188.39	285.83	389.77	552.17	714.57	974.42
Max. Instanta-neous Torque	[N·m]	8.59	16.23	24.83	32.47	34.38	55.39	70.02	95.49	119.37	34.38	55.39	70.03	95.49	135.28	175.07	238.73
	[kgf·cm]	87.7	166.65	253.35	331.3	350.79	565.16	714.48	974.42	1,218.02	350.79	565.16	714.57	974.42	1,380.43	1,786.43	2,436.05
Rated Current	[A]	3.28	3.50	5.39	7.01	7.56	10.04	15.68	20.23	20.01	7.76	9.65	17.11	20.38	28.24	28.02	35.71
Max.Current	[A]	9.83	10.5	16.16	21.02	22.69	30.12	39.20	50.58	50.03	23.29	28.95	46.19	50.95	70.6	70.05	89.25
Rated Speed	[r/min]	1500															
Max. Speed	[r/min]	3000					2700	2700	2500	2200	3000	2700	3000	2500		2000	
Inertia Moment	[kg·m²X10⁻⁴]	5.659	10.179	14.619	19.04	27.96	46.56	73.85	106.73	131.29	41.13	71.53	117.72	149.4	291.36	291.36	385.05
	[gf·cm·s²]	5.774	10.387	14.917	19.429	28.531	47.51	75.357	108.908	133.969	41.97	72.99	120.12	152.45	297.31	297.31	392.91
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia											
Rated Power Rate	[kW/s]	14.5	28.77	46.85	61.52	46.96	73.21	106.25	136.7	173.64	25.53	47.65	66.65	97.66	100.5	168.3	236.82
Speed/Position Detector	Standard	Serial Type 19[bit]															
	Option	×															
Specifications & Features	Protection	Fully closed·Self cooling IP65 Note1]															
	Rated Time	Continuous															
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]															
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)															
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.															
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)															
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7	26.3	35.6	39.4	16.95	21.95	30.8	37.52	66.2	66.3	92.2

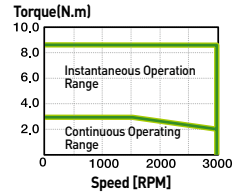
Note1] Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

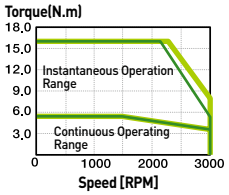
■ 3 Phase AC380V

■ 3Phase AC400V

APM-FEP05G



APM-FEP09G



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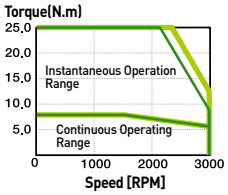

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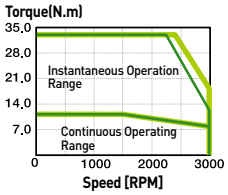

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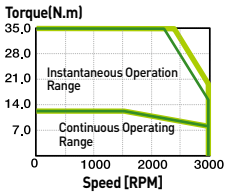

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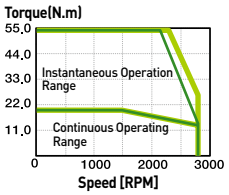
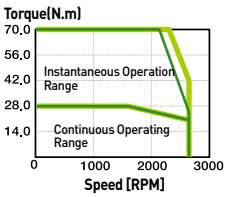


APM-FFP44G



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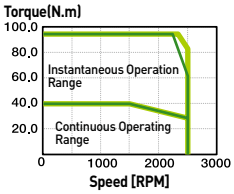

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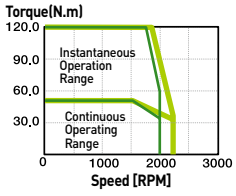

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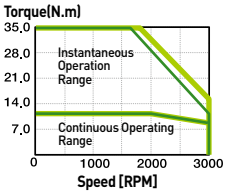

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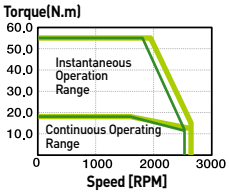

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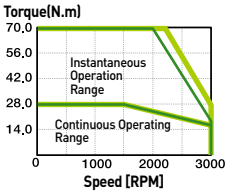

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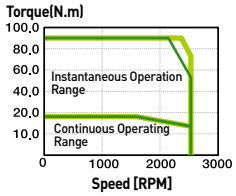
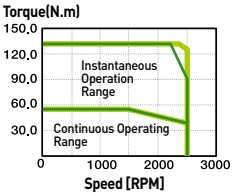
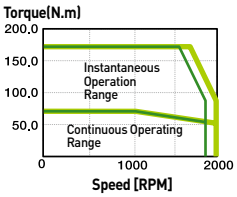


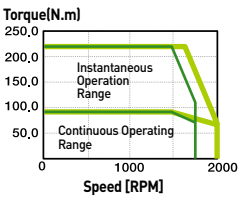
APM-FGP85G



APM-FGP110G



APM-FGP150G



Servo Motor Specifications & Torque Characteristics (400V)

Motor Specifications [Rated 1000r/min]

Servo Motor (APM-□□□□)		FEP03M	FEP06M	FEP09M	FEP12M	FFP12M	FFP20M	FFP30M	FFP44M	FGP12M	FGP20M	FGP30M	FGP44M	FGP60M
Applicable Drive		L7□B010□			L7□B020□			L7□B035□	L7□B050□	L7□B020□		L7□B035□	L7□B050□	L7□B075□
Flange Size(□)		□130				□180				□220				
Rated Output	[kW]	0.3	0.6	0.9	1.2	1.2	2	3	4.4	1.2	2	3	4.4	6.0
Rated Torque	[N·m]	2.86	5.73	8.59	11.46	11.46	19.1	28.65	42.02	11.46	19.1	28.65	42.02	57.30
	[kgf·cm]	29.23	58.47	87.7	116.93	116.93	194.88	292.33	428.74	116.93	194.88	292.33	428.74	584.65
Max. Instantaneous Torque	[N·m]	8.59	17.19	25.78	34.38	34.38	57.3	71.62	105.05	34.38	57.3	85.94	105.05	143.24
	[kgf·cm]	87.7	175.4	263.09	350.79	350.79	584.65	730.81	1071.85	350.79	584.65	876.98	1071.86	1461.63
Rated Current	[A]	3.28	3.28	3.33	4.87	4.83	7.94	9.97	16.69	4.75	7.88	9.97	17.39	20.23
Max.Current	[A]	9.83	9.83	9.99	14.6	14.5	23.83	29.91	41.73	14.24	23.64	29.91	43.48	49.69
Rated Speed	[r/min]	1000												
Max. Speed	[r/min]	2000						1800	2000			1800	2000	1900
Inertia Moment	[kg·m²X10⁻⁴]	5.659	10.179	14.619	19.04	27.96	46.56	73.85	106.73	41.13	71.53	117.72	149.4	291.36
	[gf·cm·s²]	5.774	10.387	14.917	19.429	28.531	47.51	75.357	108.908	41.969	72.99	120.12	152.45	297.31
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia								
Rated Power Rate	[kW/s]	14.5	32.25	50.53	68.97	46.96	78.34	111.13	165.41	31.93	50.99	54.93	118.17	112.64
Speed/Position Detector	Standard	Serial Type 19[bit]												
	Option	×												
Specifications & Features	Protection	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]												
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)												
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.												
	Vibration Resistance	Vibration acceleration 49[m/s²](5G)												
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7	26.3	35.6	16.95	21.95	30.8	37.52	66.2

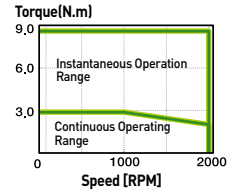
Note1) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

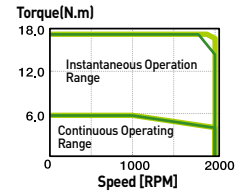
■ 3 Phase AC380V

■ 3Phase AC400V

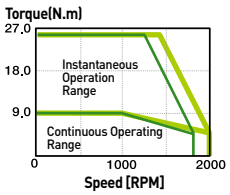
APM-FEP03M



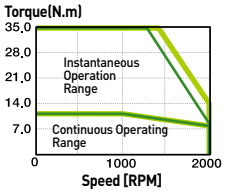
APM-FEP06M



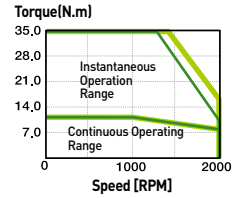
APM-FEP09M



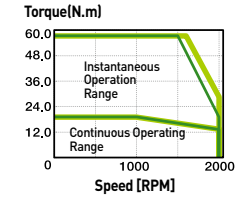
APM-FEP12M



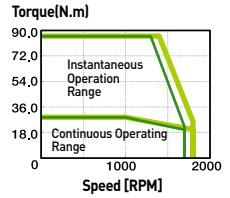
APM-FFP12M



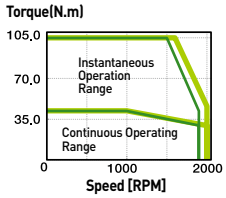
APM-FFP20M



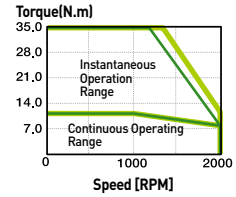
APM-FFP30M



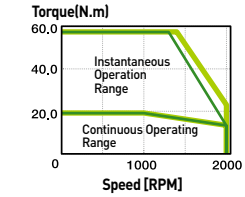
APM-FFP44M



APM-FGP12M



APM-FGP20M



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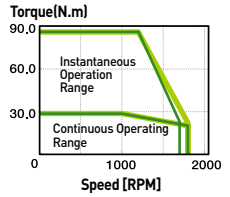

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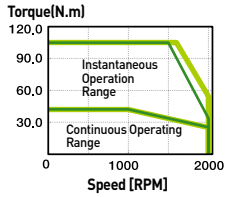
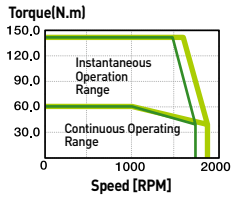


APM-FGP60M



PHOX DC Drive Motor Specifications

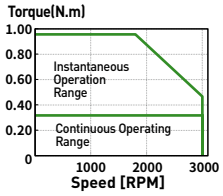
Servo Motor (APMC-□□□□□□-8)		FAL01A-8	FBL01A-8	FBL02A-8	FBL03A-8
Applicable Drive		PHOX-03		PHOX-06	PHOX-06 Note1)
Flange Size(□)		□40	□60	□60	□60
Rated Output	[kW]	0.1	0.1	0.2	0.3
Rated Torque	[N·m]	0.32	0.32	0.64	0.95
	[kgf·cm]	3.25	3.25	6.49	9.74
Max. Instanta-neous Torque	[N·m]	0.96	0.96	1.92	2.54
	[kgf·cm]	9.74	9.74	19.48	25.92
Rated Current	[A]	2.71	2.5	5.54	6.79
Max.Current	[A]	8.13	7.50	16.62	18.0
Rated Speed	[r/min]	3000			
Max. Speed	[r/min]	5000	5000	5000	3000
Inertia Moment	[kg·m^{2}X10^{-4}]	0.042	0.091	0.147	0.248
	[gf·cm·s^2]	0.043	0.093	0.15	0.2353
Allowable Load Inertia Ratio		30 times of motor inertia	20 times of motor inertia		
Rated Power Rate	[kW/s]	24.24	11.13	27.57	36.81
Speed/Position Detector	Standard	Serial Multi-Turn Built-in Type(18bit)	Serial Multi-Turn Built-in Type(19bit)		
	Option	×			
Specifications & Features	Protection	Fully closed · Self cooling IP67 Note2)			
	Rated Time	Continuous			
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]			
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)			
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.			
	Vibration Resistance	Vibration acceleration 49[m/s^2](5G)			
Weight	[kg]	0.45	0.56	0.74	1.06

Note1) If you need to apply PHOX-06 drive to a motor, please contact us.

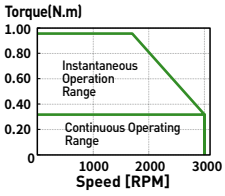
Note2) Axis penetration not included. The IP rating for attached reducers is not guaranteed. Cables may not qualify marked IP rating if bent beyond designated specifications. Use specific cables for IP rating qualification.

Speed-Torque Characteristics

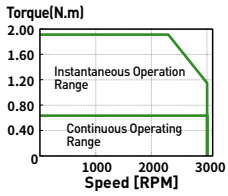
APMC-FAL01A-8



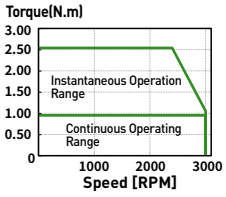
APMC-FBL01A-8



APMC-FBL02A-8



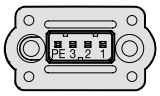
APMC-FBL03A-8

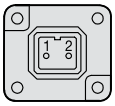


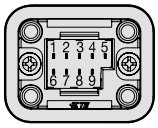
※ The graph above shows the rotational speed-torque characteristics when the drive input power is DC 48[V].

External Dimensions of Servo Motors

FAL Series







Plug Specifications

Power

Pin No.	Signal
1	U
2	V
3	W
PE	Ground

(Power Connector Pin Table)

Brake

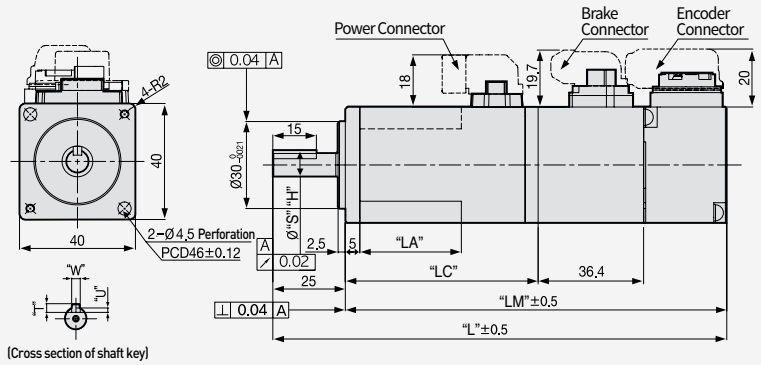
Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

Encoder

Multi Turn (M)	
Pin No.	Signal
1	MA
2	SLO
3	GND_B
4	0V
5	SHIELD
6	$\overline{MA}$
7	$\overline{SLO}$
8	VDD_B
9	+5V

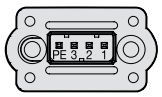
(Encoder Connector Pin Table)

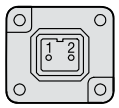


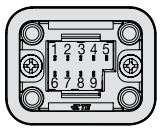
Model	External Dimensions(mm)						Key Dimensions			Weight (kg)
	L	LM	LC	LA	S	H	T	W	U	
FALR5A	103.2(139.6)	78.2(114.6)	49.5	23	8	0 -0.009	3	3	1.8	0.31(0.66)
FAL01A	120.2(156.6)	95.2(131.6)	66.5	35	8	0 -0.009	3	3	1.8	0.45(0.80)
FAL015A	140.2	115.2	86.5	35	8	0 -0.009	3	3	1.8	0.61

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.
Note3) The FAL Type can only draw towards front.

FBL Series







Plug Specifications

Power

Pin No.	Signal
1	U
2	V
3	W
PE	Ground

(Power Connector Pin Table)

Brake

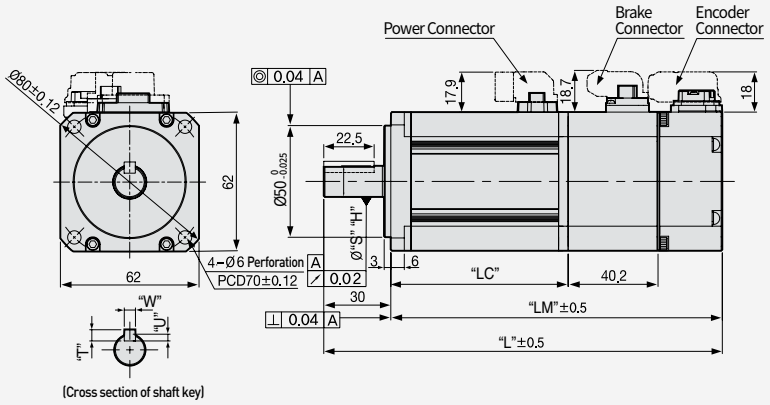
Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

Encoder

Multi Turn (M)	
Pin No.	Signal
1	MA
2	SLO
3	GND_B
4	0V
5	SHIELD
6	$\overline{MA}$
7	$\overline{SLO}$
8	VDD_B
9	+5V

(Encoder Connector Pin Table)

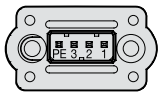


Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
FBL01A	107.2(147.2)	77.2(117.2)	48.5(48.3)	14	0 -0.018	5	5	3	0.56(1.3)
FBL02A	118.2(158.2)	88.2(128.2)	59.5(59.3)	14	0 -0.018	5	5	3	0.74(1.48)
FBL04A	138.2(178.2)	108.2(148.2)	79.5(79.3)	14	0 -0.018	5	5	3	1.06(1.8)

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.
Note3) For external dimensions of oil-sealed type, please contact us separately.

FCL Series

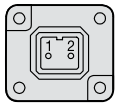
Plug Specifications



Power

Pin No.	Signal
1	U
2	V
3	W
PE	Ground

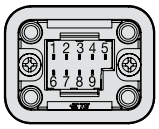
(Power Connector Pin Table)



Brake

Pin No.	Signal
1	BK+
2	BK-

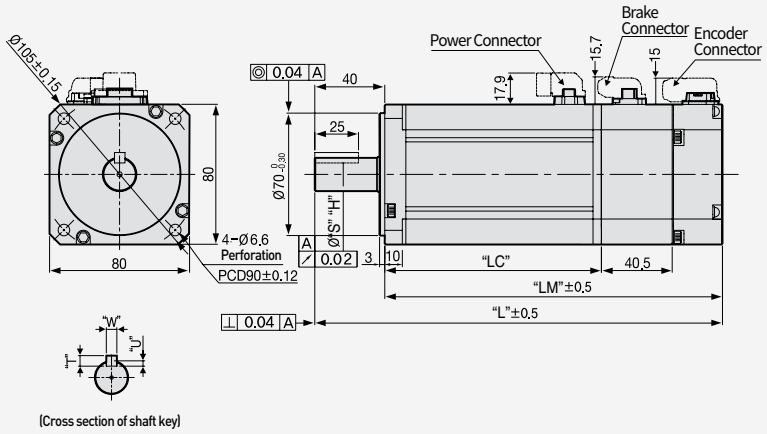
(Brake Connector Pin Table)



Encoder

Multi Turn (M)	
Pin No.	Signal
1	MA
2	SLO
3	GND_B
4	0V
5	SHIELD
6	$\overline{MA}$
7	$\overline{SLO}$
8	VDD_B
9	+5V

(Encoder Connector Pin Table)



(Cross section of shaft key)

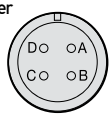
Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
FCL04A, FCL03D	138.7(179)	98.7(139)	70(69.8)	14	0 -0.018	5	5	3	1.52(2.32)/1.26(2.06)
FCL06A, FCL05D	156.7(197)	116.7(157)	88(87.8)	19	0 -0.021	6	6	3.5	2.14(2.94)/2.12(2.92)
FCL08A, FCL06D	174.7(215)	134.7(175)	106(105.8)	19	0 -0.021	6	6	3.5	2.68(3.48)/2.66(3.46)
FCL10A, FCL07D	192.7(233)	152.7(193)	124(123.8)	19	0 -0.021	6	6	3.5	3.30(4.10)/2.78(3.58)

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.
Note3) For external dimensions of oil-sealed type, please contact us separately.

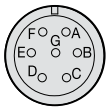
FE, FEP Series

Plug Specifications

Power



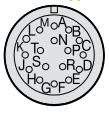
Spec.: MS3102A20-4P
(Standard)



Spec.: MS3102A20-15P
(Brake-attached type)

Encoder

Serial Type



Spec.: MS3102A20-29P

Power

Pin No.	Signal
A	U
B	V
C	W
D	Ground

Pin No.	Signal	Pin No.	Signal
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

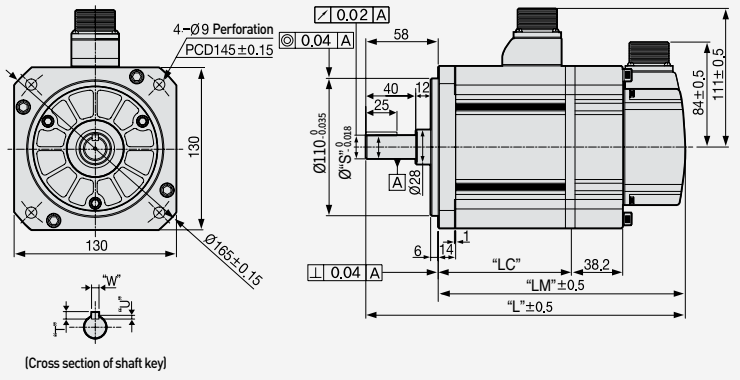
Encoder

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(Single Turn Encoder Connector Pin Table)

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	VDD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)



(Cross section of shaft key)

Model	External Dimensions(mm)				Key Dimensions			Weight (kg)
	L	LM	LC	S	T	W	U	
FE09A, FE06D, FE05G, FE03M, FEP09A, FEP06D, FEP05G,FEP03M	197.3(235.3)	139.3(177.3)	89.8(89.6)	19	5	5	3	5.04(6.58)
FE15A, FE11D, FE09G, FE06M, FEP15A, FEP11D, FEP09G, FEP06M	217.3(255.3)	159.3(197.3)	109.8(109.6)	19	5	5	3	6.74(8.28)
FE22A, FE16D, FE13G, FE09M, FEP22A, FEP16D, FEP13G, FEP09M	237.3(275.3)	179.3(217.3)	129.8(129.6)	22	6	6	3.5	8.48(10.02)
FE30A, FE22D, FE17G, FE12M, FEP30A, FEP22D, FEP17G, FEP12M	255.3(293.3)	197.3(235.3)	147.8(147.6)	24	7	8	4	10.05(11.59)

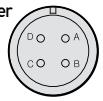
Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.

External Dimensions of Servo Motors

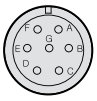
FF, FFP Series

Plug Specifications

Power



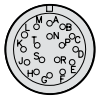
Spec.: MS3102A22-22P
(Standard)



Spec.: MS3102A24-10P
(Brake-attached type)

Encoder

Serial Type



Spec.: MS3102A20-29P

Power

Pin No.	Signal
A	U
B	V
C	W
D	Ground

Pin No.	Signal	Pin No.	Signal
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

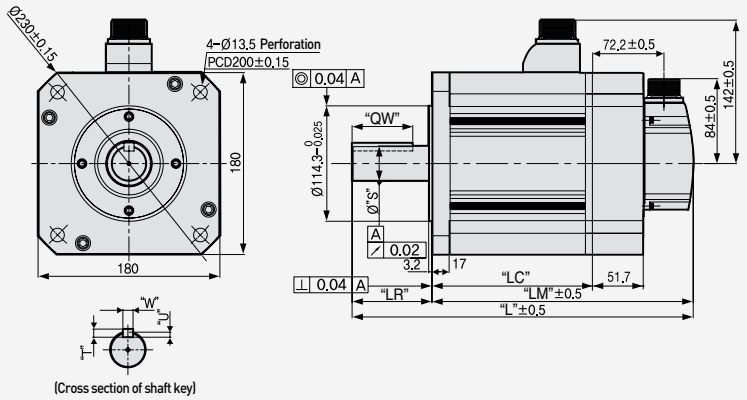
Encoder

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(Single Turn Encoder Connector Pin Table)

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	VDD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)



(Cross section of shaft key)

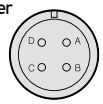
Model	External Dimensions(mm)				Key Dimensions					Weight (kg)
	L	LM	LC	LR	S	QW	T	W	U	
FF30A, FF22D, FF20G, FF12M, FFP30A, FFP22D, FFP20G, FFP12M	257.5 (308.9)	178.5 (229.9)	129 (128.7)	79	$35^{0.01}_{0}$	60	8	10	5	12.5 (19.7)
FF50A, FF35D, FF30G, FF20M, FFP50A, FFP35D, FFP30G, FFP20M	287.5 (338.9)	208.5 (259.9)	159 (158.7)							17.4 (24.6)
FF55D, FF44G, FF30M FFP55D, FFP44G, FFP30M	331.5 (382.9)	252.5 (303.9)	203 (202.7)							25.2 (32.4)
FF75D, FF60G, FF44M FFP75D, FFP60G, FFP44M	384.5 (435.9)	305.5 (356.9)	256 (255.7)		$42^{0}_{0.016}$			12		33.8 (41.0)
FF75G, FFP75G	439.5	326.5	277	113		96				38.5 (45.7)

Note1] This bolt applies to models FF30 and above.
Note2] Use DC[24V]for brake input power supply.
Note3] Dimensions in parantheses are for brake-attached type.
Note4] UseMS3102A32-17 forFF75G Power connector.

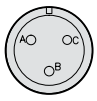
FG, FGP Series

Plug Specifications

Power



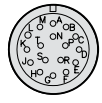
Spec.: MS3102A22-22P
(Standard)



Spec.: MS3102A14-7P
(Brake-attached type)

Encoder

Serial Type



Spec.: MS3102A20-29P

Power

Pin No.	Signal
A	U
B	V
C	W
D	Ground

Pin No.	Signal
A	BK+
B	BK-
C	NC

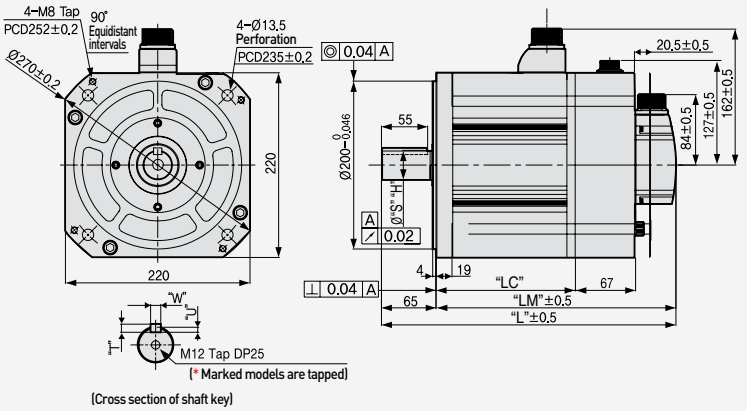
Encoder

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(Single Turn Encoder Connector Pin Table)

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	VDD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)



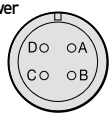
(Cross section of shaft key)

Model	External Dimensions(mm)			Key Dimensions					Weight (kg)	Power Connector
	L	LM	LC	S	H	T	W	U		
FG22D, FG20G, FG12M FGP22D, FGP20G, FGP12M	229.5 (295.7)	164.5 (230.7)	115 (114.2)	35	$^{0}_{-0.016}$	8	10	5	15.42 (29.23)	MS3102A 22-22P
FG35D, FG30G, FG20M FGP35D, FGP30G, FGP20M	250.5 (316.7)	185.5 (251.7)	136 (135.2)						20.22 (34.03)	
FG55D, FG44G, FG30M FGP55D, FGP44G, FGP30M	282.5 (348.7)	217.5 (283.7)	168 (167.2)						28.02 (41.83)	
FG75D, FG60G, FG44M FGP75D, FGP60G, FGP44M	304.5 (370.7)	239.5 (305.7)	190 (189.2)	42	$^{0}_{-0.016}$		12		33.45 (47.26)	
*FG110D, *FG85G, *FG60M *FGP110D, *FGP85G	418.5 (484.7)	353.5 (305.7)	304 (303.2)	45	$^{0}_{-0.016}$		10	6	66.2 (82.6)	MS3102A 32-17P

Note1] Use DC24[V] for brake input power supply.
Note2] Dimensions in parantheses are for brake-attached type.

FG(P)110G

Power

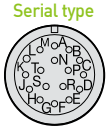


Spec.: MS3102A32-17P

Spec.: MS3102A14-7P
(Brake-attached type)

Encoder

Serial type



Spec.: MS3102A20-29P

Plug Specifications

Power

Pin No.	Signal
A	U
B	V
C	W
D	Ground

Pin No.	Signal
A	BK+
B	BK-
C	NC

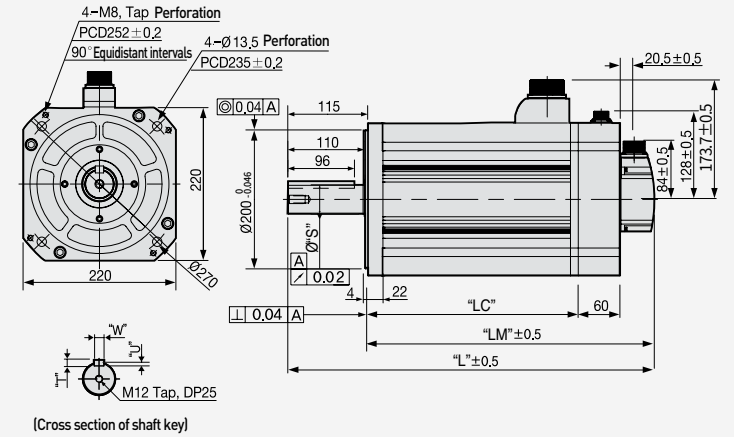
Encoder

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(Single Turn Encoder Connector Pin Table)

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	VDD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)



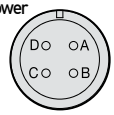
(Cross section of shaft key)

Model	External Dimensions(mm)			Key Dimensions				Weight (kg)	Power Connector
	L	LM	LC	S	T	W	U		
FG(P)110G	468.5 (527.7)	353.5 (419.7)	304 (303.2)	$42^{0}_{-0.016}$	8	12	5	66.3 (82.7)	MS3102A 32-17P

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.
Note3) For external dimensions of oil-sealed type, please contact us separately.

FG(P)150G

Power

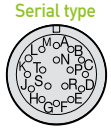


Spec.: MS3102A32-17P

Spec.: MS3102A14-7P
(Brake-attached type)

Encoder

Serial type



Spec.: MS3102A20-29P

Plug Specifications

Power

Pin No.	Signal
A	U
B	V
C	W
D	접지선

Pin No.	Signal
A	BK+
B	BK-
C	NC

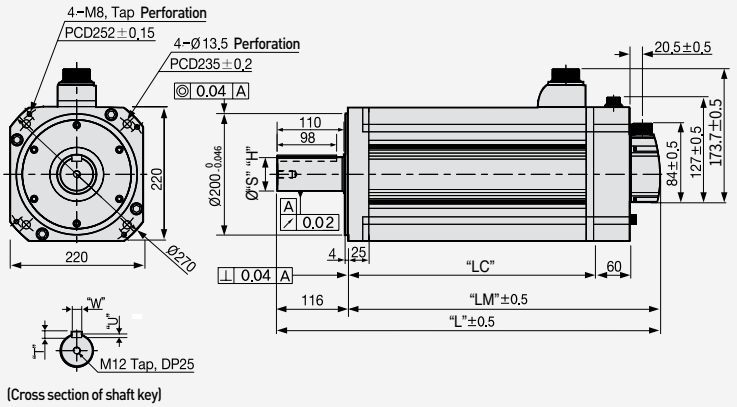
Encoder

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(Single Turn Encoder Connector Pin Table)

Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	VDD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)



(Cross section of shaft key)

Model	External Dimensions(mm)			Key Dimensions					Weight (kg)	Power Connector
	L	LM	LC	S	H	T	W	U		
FG(P)150G	574 (630.5)	458 (514.5)	408 (405)	55	$^{0}_{-0.016}$	10	16	6	92.2 (108.6)	MS3102A 32-17P

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.

Servo Motor Characteristics(200V)

Motor Specifications (With Magnetic Encoder, Rated 3000r/min)

Servo Motor (APMC-□□□□□)		FALR5A	FAL01A	FAL015A[Note1]	FBL01A	FBL02A	FBL04A	FCL04A	FCL06A	FCL08A	FCL10A
Applicable Drive		L7CA001U		L7CA002U	L7CA001U	L7CA002U	L7CA004U		L7CA008U		L7CA010U
Flange Size(□)		□40			□60			□80			
Rated Output	[kW]	0.05	0.1	0.15	0.1	0.2	0.4	0.4	0.6	0.75	1
Rated Torque	[N·m]	0.16	0.32	0.48	0.32	0.64	1.27	1.27	1.91	2.39	3.18
	[kgf·cm]	1.62	3.25	4.87	3.25	6.49	12.99	12.99	19.49	24.36	32.48
Max. Instanta-neous Torque	[N·m]	0.48	0.96	1.43	0.96	1.91	3.82	3.82	5.73	7.16	9.55
	[kgf·cm]	4.87	9.74	14.62	9.74	19.48	38.96	38.98	58.47	73.08	97.44
Rated Current	[A]	0.95	1.25	1.60	0.95	1.45	2.6	2.58	3.81	5.02	5.83
Max.Current	[A]	2.85	3.75	4.80	2.85	4.35	7.8	7.75	11.42	15.07	17.5
Rated Speed	[r/min]	3000									
Max. Speed	[r/min]	5000									
Inertia Moment	[kg·m^{2}X10^{-4}]	0.023	0.042	0.063	0.091	0.147	0.248	0.53	0.897	1.264	1.632
	[gf·cm·s^2]	0.024	0.043	0.065	0.093	0.15	0.253	0.541	0.915	1.29	1.665
Allowable Load Inertia Ratio		30 times of motor inertia		20 times of motor inertia				15 times of motor inertia			
Rated Power Rate	[kW/s]	10.55	23.78	36.19	11.09	27.6	27.07	30.6	40.66	45.09	62.08
Speed/Position Detector	Standard	Serial Single - Turn Built - in Type (17bit)									
Specifications & Features	Protection	Fully closed·Self cooling IP67									
	Rated Time	Continuous									
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]									
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)									
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.									
	Vibration Resistance	Vibration acceleration 49[m/s^2] (5G)									
Weight	[kg]	0.31	0.45	0.61	0.56	0.74	1.06	1.52	2.14	2.68	3.3

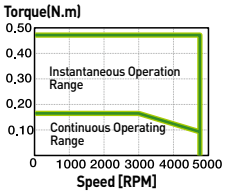
Note1) Brake is not applicable for FAL015A

Speed-Torque Characteristics

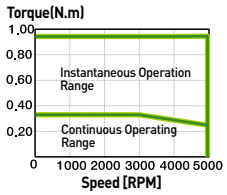
■ 3 Phase AC200V

■ 3Phase AC230V

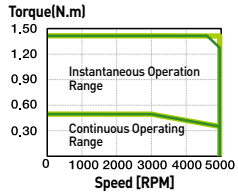
APMC-FALR5A



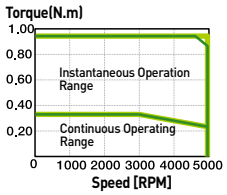
APMC-FAL01A



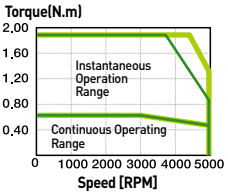
APMC-FAL015A



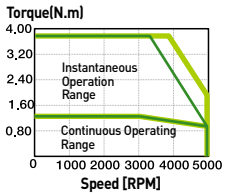
APMC-FBL01A



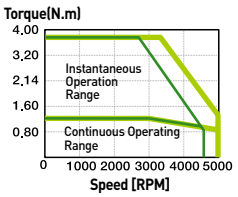
APMC-FBL02A



APMC-FBL04A



APMC-FCL04A



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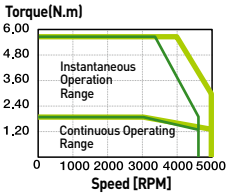

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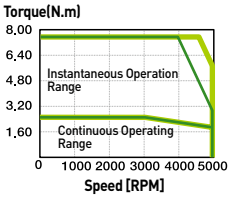
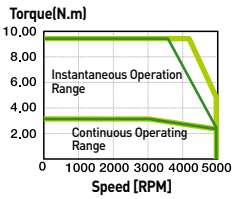


APMC-FCL10A



Motor Specifications (With Magnetic Encoder, Rated 2000r/min)

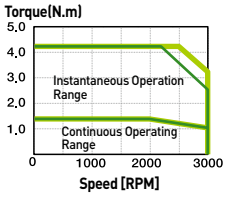
Servo Motor (APMC-□□□□□)		FCL03D	FCL05D	FCL06D	FCL07D
Applicable Drive		L7CA004U	L7CA008U		
Flange Size(□)		□80			
Rated Ouatput	[kW]	0.3	0.45	0.55	0.65
Rated Torque	[N·m]	1.43	2.15	2.63	3.1
	[kgf·cm]	14.62	21.92	26.8	31.67
Max. Instanta-neous Torque	[N·m]	4.3	6.45	7.88	9.31
	[kgf·cm]	43.85	65.77	80.39	95.01
Rated Current	[A]	2.5	3.05	3.06	3.83
Max.Current	[A]	7.51	9.16	9.18	11.5
Rated Speed	[r/min]	2000			
Max. Speed	[r/min]	3000			
Inertia Moment	[kg·m^{2}X10^{-4}]	0.53	0.897	1.264	1.63
	[gf·cm·s^2]	0.541	0.915	1.29	1.66
Allowable Load Inertia Ratio		15 times of motor inertia			
Rated Power Rate	[kW/s]	38.73	51.47	54.56	59.03
Speed/Position Detector	Standard	Serial Single - Turn Built - in Type (17bit)			
Specifications & Features	Protection	Fully closed·Self cooling IP67			
	Rated Time	Continuous			
	Ambient Temp	Operating : 0 ~ 40[°C] Storage : -10 ~ 60[°C]			
	Ambient Humidity	Operating : Below80[%]RH / Storage : Below 90[%]RH(Noncondensing)			
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas or liquid.			
	Vibration Resistance	Vibration acceleration49[m/s^2] (5G)			
Weight	[kg]	1.26	2.12	2.66	2.78

Speed-Torque Characteristics

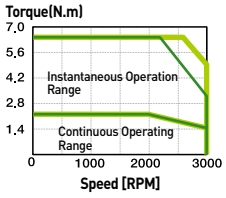
■ 3 Phase AC200V

■ 3Phase AC230V

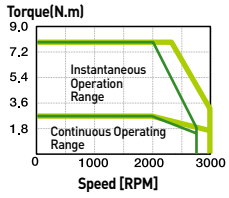
APMC-FCL03D



APMC-FCL05D



APMC-FCL06D



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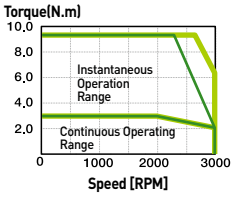
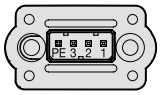
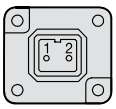
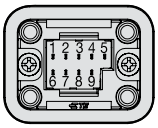


External Dimensions of Servo Motors

FAL Series with Magnetic Encoder







Plug Specifications

Power

Pin No.	Signal
1	U
2	V
3	W
PE	Ground

(Power Connector Pin Table)

Brake

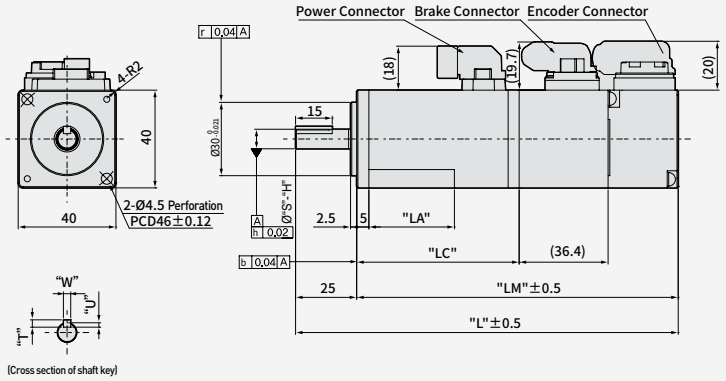
Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

Encoder

Single Turn (N)	
Pin No.	Signal
1	MA
2	SLO
3	-
4	0V
5	SHIELD
6	$\overline{MA}$
7	$\overline{SLO}$
8	-
9	+5V

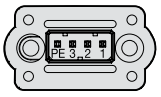
(Encoder Connector Pin Table)

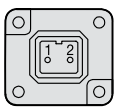


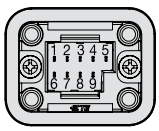
Model	External Dimensions(mm)						Key Dimensions			Weight (kg)
	L	LM	LC	LA	S	H	T	W	U	
FALR5A	103.2(139.6)	78.2(114.6)	49.5	23	8	$^{0}_{-0.009}$	3	3	1.8	0.31(0.66)
FAL01A	120.2(156.6)	95.2(131.6)	66.5	35	8	$^{0}_{-0.009}$	3	3	1.8	0.45(0.80)
FAL015A	140.2	115.2	86.5	35	8	$^{0}_{-0.009}$	3	3	1.8	0.61

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.
Note3) For external dimensions of oil-sealed type, please contact us separately.

FBL Series with Magnetic Encoder







Plug Specifications

Power

Pin No.	Signal
1	U
2	V
3	W
PE	Ground

(Power Connector Pin Table)

Brake

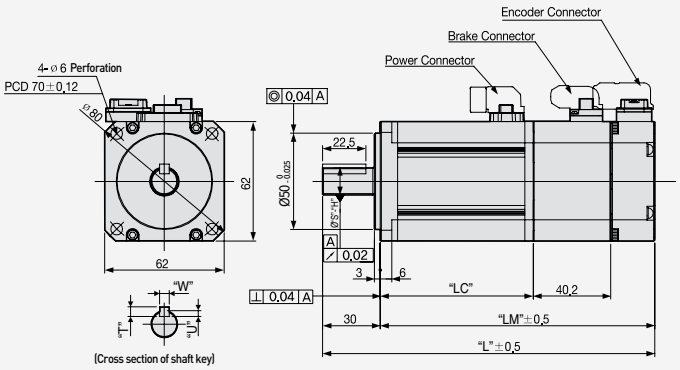
Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

Encoder

Single Turn (N)	
Pin No.	Signal
1	MA
2	SLO
3	-
4	0V
5	SHIELD
6	$\overline{MA}$
7	$\overline{SLO}$
8	-
9	+5V

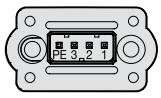
(Encoder Connector Pin Table)

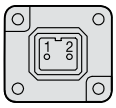


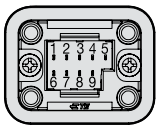
Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
FBL01A	101.2(141.2)	71.2(111.2)	48.5(48.3)	14	$^{0}_{-0.018}$	5	5	3	0.54(1.28)
FBL02A	112.2(152.2)	82.2(122.2)	59.5(59.3)	14	$^{0}_{-0.018}$	5	5	3	0.72(1.46)
FBL04A	132.2(172.2)	102.2(142.2)	79.5(79.3)	14	$^{0}_{-0.018}$	5	5	3	1.04(1.78)

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.

FCL Series with Magnetic Encoder







Plug Specifications

Power

Pin No.	Signal
1	U
2	V
3	W
PE	Ground

(Power Connector Pin Table)

Brake

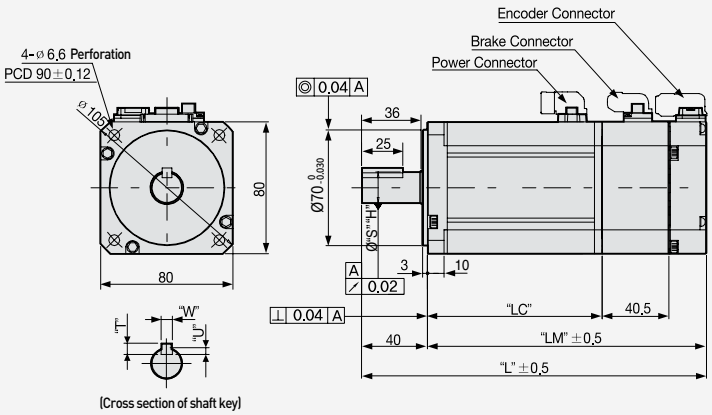
Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

Encoder

Single Turn (N)	
Pin No.	Signal
1	MA
2	SLO
3	-
4	0V
5	SHIELD
6	$\overline{MA}$
7	$\overline{SLO}$
8	-
9	+5V

(Encoder Connector Pin Table)



Model	External Dimensions(mm)					Key Dimensions			Weight (kg)
	L	LM	LC	S	H	T	W	U	
FCL04A, FCL03D	132.7(173)	92.7(133)	70(69.8)	14	0 -0.018	5	5	3	1.49(2.29)/1.23(2.03)
FCL06A, FCL05D	150.7(191)	110.7(151)	88(87.8)	19	0 -0.021	6	6	3.5	2.11(2.91)/2.09(2.89)
FCL08A, FCL06D	168.7(209)	128.7(169)	106(105.8)	19	0 -0.021	6	6	3.5	2.65(3.45)/2.63(3.43)
FCL10A, FCL07D	186.7(227)	146.7(187)	124(123.8)	19	0 -0.021	6	6	3.5	3.27(4.03)/2.75(3.55)

Note1) Use DC[24V] for brake input power supply.
Note2) Dimensions in parantheses are for brake-attached type.

Brake Specifications & Heat Sink Specifications

Brake Specifications

Motor Series	FAL	FBL	FCL	FE/FEP	FF/FFP	FG/FGP	FG/FGP110G FG/FGP150G
Purpose	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance
Input Voltage [V]	DC 24V	DC 24V	DC 24V	DC 24V	DC 24V	DC 90V	DC 24V
Static Friction Torque[Nm]	0.32	1.47	3.23	10.4	40	74	120
Capacity [W]	6	6.5	9	19.4	25	32	26
Coil Resistance [Ω]	96	67	64	29.6	23	257	18
Rated Current [A]	0.25	0.36	0.38	0.81	1.04	0.35	1.33
Insulation Class	F	F	F	F	F	F	F

Note1) All electromagnetic brakes built-in LS servo motors are of the same specification.
Note2) Electromagnetic brakes are for keeping the motors stationary. Do not use for braking operating motors.
Note3) Electromagnetic brake properties were measured at 20°C.
Note4) Specifications are subject to change. Please check your motor for voltage specifications.
Note5) Series FAL, FBL, FCL, FF and FFP comply with Class 2 Brake UL Standard.

Heat Sink Specifications

Classfication	Standard(mm) Servo Motor	Material
AP04 (□40)	250×250×6	Aluminum
AP06 (□60)	250×250×6	
AP08 (□80)	250×250×12	
AP13 (□130)	350×350×20	
AP18 (□180)	550×550×30	
AP22 (□220)	650×650×35	

Note1) The data on the product features is measured when those heat sinks were applied.
Note2) Axis penetration not included.
Note3) The IP rating for attached reducers is not guaranteed.
Note4) Cables may not qualify marked IP rating if bent beyond designated specifications.
Note5) Use specific cables for IP rating qualification.

DD Motor Designation

DD Motor Designation

MDM – D D None 34 D NO H – I

Motor Type
D: DD MOTOR

Input Power Supply
None: 200VAC

Rated Speed
A : 300rpm
D : 200rpm
G : 150rpm
M : 100rpm
S : 50rpm

Shape of Shaft End
H: Hollow Type

External Diameter
B: 135mm
C: 175mm
D: 230mm
E: 290mm
F: 360mm
G: 380mm

Rated Torque
03: 3N·m Output
06: 6N·m Output
09: 9N·m Output
...
60: 60N·m Output
...
A6: 160N·m Output
C3: 330N·m Output

Encoder Type						
	135	175	230	290	360	Remark
No	20Bit Serial (Single Turn Abs. BiSS Communication)					

Features of Direct-Drive Motor

We Use Our Own Technologies to Produce Motors, Drives and Encoders Domestically

Optimized for Low-speed, High-torque and High-precision Operation

- Power connection provided for the connection of DC-Link Terminal
- Compact Size and Easy Wring (Compared with 3 phase AC Reactor)
- DC input connecton provided (PI, N)

Reduced Cogging Torque and Optimized Torque Design

- Optimal ratio of the permanent magnet and coil / slot selected through electromagnetic analysis
- Multiple permanent magnets used to reduce torque ripple and to maximize torque
- Uses high-energy rare-earth permanent magnets (Nd-Fe-B)

High-performance rotary optical encoder with BiSS Protocol adoption used

- Resolution of 1,048,576 CPR (20bit Single turn)
- Using our own encoder technology to reduce the cost and shorten the delivery time

Compatible With Our L7 Series AC Servo Drive (3Phase AC 220V)

- Both standard I/O type (serial communication supported) and network type (EtherCAT) applicable

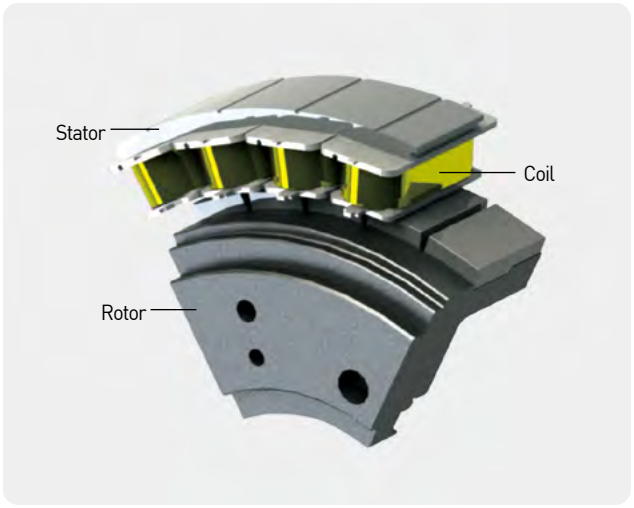
Direct Drive Structure

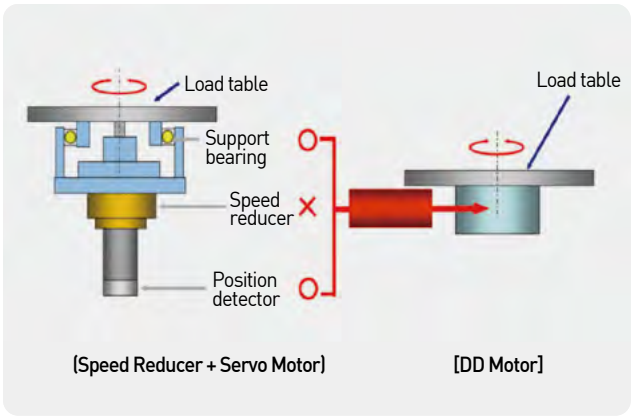
- No backlash impact
- High-precision operation and shortened installation time
- Smooth rotary motion
- Reduced noise

Hollow Type Efficient for Wiring and Piping

A Wide Range of Products

- Rated output: 63W - 2.5kW
- Rated torque: 3.0N·m-330N·m (The instantaneous maximum torque should be 3 times the rated torque)
- Rated speed: 50RPM-200RPM
- Frame diameter: 135mm, 175mm, 230mm, 290mm, 360mm and 380mm (14 models)





(Speed Reducer + Servo Motor) [DD Motor]

Features of Direct-Drive Motor

DD Motor Specifications

Ratings and Specifications

- Insulation class : Class B
- Protection class: IP 40
- Cooling type : Fully enclosed self-cooling
- Vibration class : V15
- Insulation resistance : 500 VDC, 10[MΩ]or higher
- Insulation withstand voltage: 1500VAC, 1 minute
- Operating voltage: 200 VAC
- Operating temperature: 0 - 40[°C] / Storage temperature: -10~60[°C]
- Ambient humidity: 20 - 80% RH (Noncondensing)
- Installation location: Place with no harmful substances such as corrosive / flammable gases, cutting fluid, metal dust or grease. Keep out of direct sunlight.

Line-up Table

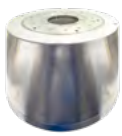
Rated Torque[N·m]			3	6	9	12	18	22	34	40	60	110	160	330
Max. Instantaneous Torque[Nm]			9	18	27	36	54	66	102	120	180	330	480	1000
Rated Speed 200[rpm]	Maximum Speed 500[rpm]	Ø135	DB03D	DB06D	DB09D									
		Ø175		DC06D		DC12D								
		Ø230				DD12D								
	Maximum Speed 400[rpm]	Ø175					DC18D							
		Ø230						DD22D	DD34D					
	Maximum Speed 300[rpm]	Ø290							DE40D	DE60D				
Rated Speed 150[rpm]	Maximum Speed 250[rpm]	Ø360									DFA1G	DFA6G		
Rated Speed 50[rpm]	Maximum Speed 100[rpm]	Ø380												DGC3S

Drive Combination Table

MDM Serial Type

Rated Speed (RPM)	Maximum Speed (RPM)	External Diameter of Motor(Ø)	Motor	Drive	Standard Encoders	Encoders Cable (Serial)	Power Cable (Power)
200	500	135	DB03D	L7□A002□	APCS-P□□□YS	APCS-E□□□ZS	20Bit Serial (Single-turn Abs. BiSS interface)
				iX7□A002□	APCS-P□□□YSX		
			DB06D	L7□A002□	APCS-P□□□YS		
				iX7□A002□	APCS-P□□□YSX		
			DB09D	L7□A004□	APCS-P□□□YS		
				iX7□A004□	APCS-P□□□YSX		
		175	DC06D	L7□A002□	APCS-P□□□YS		
				iX7□A002□	APCS-P□□□YSX		
			DC12D	L7□A004□	APCS-P□□□YS		
				iX7□A004□	APCS-P□□□YSX		
	400		DC18D	L7□A008□	APCS-P□□□YS		
				iX7□A008□	APCS-P□□□YSX		
	500	230	DD12D	L7□A004□	APCS-P□□□YS		
				iX7□A004□	APCS-P□□□YSX		
	400		DD22D	L7□A008□	APCS-P□□□YS		
				iX7□A008□	APCS-P□□□YSX		
			DD34D	L7□A010□	APCS-P□□□YS		
				iX7□A010□	APCS-P□□□YSX		
	300	290	DE40D	L7□A010□	APCS-P□□□YS		
				iX7□A010□	APCS-P□□□YSX		
			DE60D	L7□A020□	APCS-P□□□YS		
				iX7□A020□	APCS-P□□□YSX		
150	250	360	DFA1G	L7□A020□	APCS-P□□□ZS		
				iX7□A020□	APCS-P□□□ZSX		
			DFA6G	L7□A035□	APCS-P□□□ZS		
				iX7□A35□	APCS-P□□□ZSX		
50	100	380	DGC3S	L7□A020□	APCS-P□□□ZS		
				iX7□A020□	APCS-P□□□ZSX		

Motor Shape

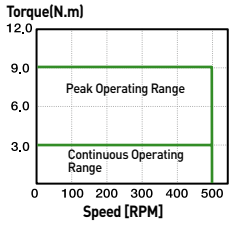
MDM-DB06DN0H-I	MDM-DC12DN0H-I	MDM-DD22DN0H-I	MDM-DE40DN0H-I	MDM-DFA6GN0H-I	MDM-DGC3SN0H-I
					
					
					

Specifications and Torque Characteristics

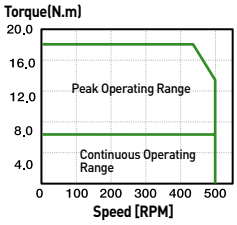
Motor Designation		MDM-DB□□D□□H-I			MDM-DC□□D□□H-I		
		03	06	09	06	12	18
Applicable Drive		L7□A001□	L7□A002□	L7□A004□	L7□A002□	L7□A004□	L7□A008□
Ext. Diameter of Motor	mm	Ø135			Ø175		
Rated Output	W	63	126	188	126	251	377
Rated Torque	N·m	3	6	9	6	12	18
Max Torque	N·m	9	18	27	18	36	54
Rated Current	Arms	1.12	1.46	2.63	1.48	2.41	3.0
Max Current	Arms	3.36	4.38	7.89	4.44	7.23	9.0
Rated Speed	rpm	200			200		
Max Speed	rpm	500	500	500	500	500	400
Torque Constant	N·m/Arms	2.76	4.25	3.57	4.18	5.13	6.12
Inertia Moment	$kg \cdot m^2 X10^{-4}$	11.56	18.42	26.02	45.83	70.37	94.91
Allowable Load Inertia Ratio		30 times of motor inertia			15 times of motor inertia		
Power Rate	kW/S	7.8	19.6	31.2	7.9	20.5	34.1
Positioning Accuracy	arc-sec	±30					
Positioning Repeatability	arc-sec	±1.3					
Axial run-out	mm	0.015					
Radial run-out	mm	0.03					
Allowable Thrust Load	N	1500			3300		
Allowable Moment Load	N·m	40			70		
Encoder Type		20-bit single turn serial encoder (Biss/Absolute)					
Weight(Approx.)	kg	5.2	6.8	8.9	7.4	9.8	12.0
Working Environment	Ambient Temp	Ambient temperature: 0~40[°C] / storage: -20~60[°C]					
	Ambient Humidity	20~80[%] RH(Noncondensing)					
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas.					

Speed-Torque Characteristics

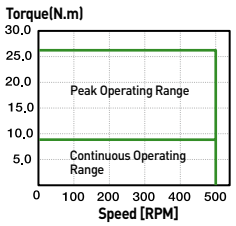
MDM-DB03D



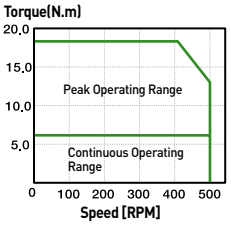
MDM-DB06D



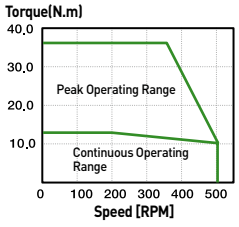
MDM-DB09D



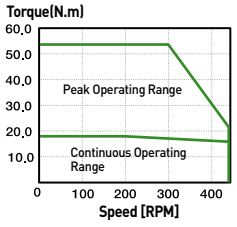
MDM-DC06D



MDM-DC12D



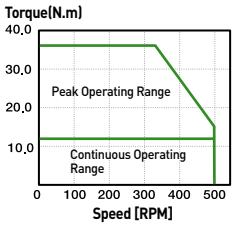
MDM-DC18D



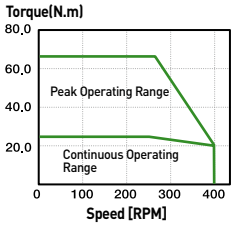
Motor Designation		MDM-DD□□D□□H-I			MDM-DE□□D□□H-I		MDM-DF□□G□□H-I		MDM-DG□□S□□H-I
		12	22	34	40	60	A1	A6	C3
Applicable Drive		L7□A004□	L7□A008□	L7□A010□	L7□A010□	L7□A020□	L7□A020□	L7□A035□	L7□A020□
Ext. Diameter of Motor	mm	Ø230			Ø290		Ø360		Ø380
Rated Output	W	251	461	712	838	1,257	1,728	2,513	1,728
Rated Torque	N·m	12	22	34	40	60	110	160	330
Max Torque	N·m	36	66	102	120	180	330	480	1,000
Rated Current	Arms	2.58	3.33	5.72	5.3	8.33	9.48	14.6	12.0
Max Current	Arms	7.74	9.99	17.16	15.9	24.99	28.44	43.8	36.0
Rated Speed	rpm	200			200		150		50
Max Speed	rpm	500	400	400	300	300	250	250	100
Torque Constant	N·m/Arms	4.8	6.81	6.13	7.77	7.42	11.95	11.29	28.59
Inertia Moment	kg·m^{2}X10^{-4}	94.70	141.10	190.70	427.2	587.9	2507.0	3457.0	6449.0
Allowable Load Inertia Ratio		15 times of motor inertia			3 times of motor inertia				
Power Rate	kW/S	15.2	34.3	60.6	37.5	61.2	48.3	74.1	169.1
Positioning Accuracy	arc-sec	±30							
Positioning Repeatability	arc-sec	±1.3							
Axial run-out	mm	0.015							
Radial run-out	mm	0.03							
Allowable Thrust Load	N	4,000			11,000		15,000		21,000
Allowable Moment Load	N·m	93			250		350		450
Encoder Type		20-bit single turn serial encoder (Biss/Absolute)							
Weight(Approx.)	kg	14.5	18.8	23.2	28.0	34.5	53.5	69.0	162
Working Environment	Ambient Temp	Ambient temperature: 0~40[°C] / storage: -20~60[°C]							
	Ambient Humidity	20~80[%] RH(Noncondensing)							
	Atmosphere	Avoid direct sunlight and corrosive / flammable gas.							

Speed-Torque Characteristics

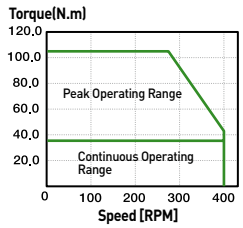
MDM-DD12D



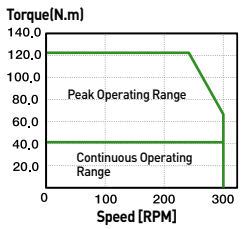
MDM-DD22D



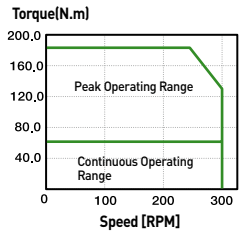
MDM-DD34D



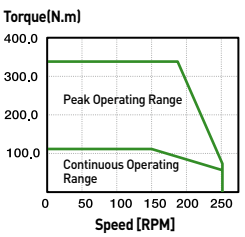
MDM-DE40D



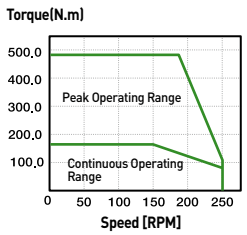
MDM-DE60D



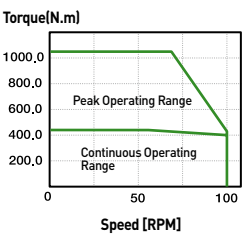
MDM-DFA1G



MDM-DFA6G

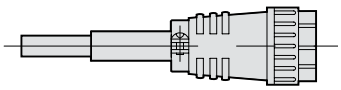


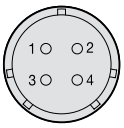
MDM-DGC3S



External Dimensions

MDM-DB03D, MDM-DB06D, MDM-DB09D

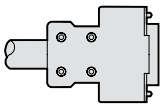


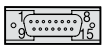


NJC-24-4-PM

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
Ground		4

(Power Connector Pin Table)

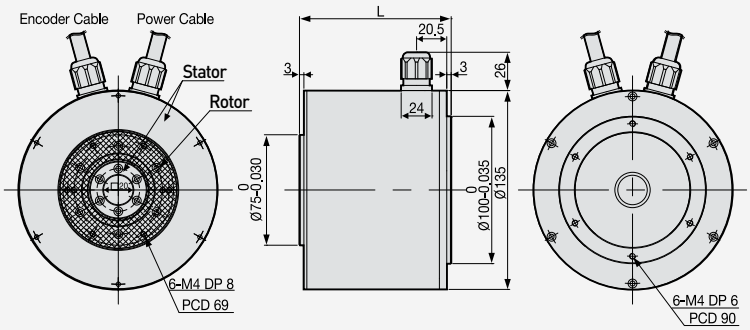




D- Sub Connector (15pin)

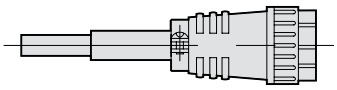
D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	9	+5V
2	SLO	10	-
3	-	11	-
4	0V	12	-
5	SHIELD	13	-
6	$\overline{MA}$	14	-
7	$\overline{SLO}$	15	-
8	-		

(Encoder Connector Pin Table)



Model	External Dimensions(mm)	Weight (kg)
	L	
MDM-DB03D	78	6.3
MDM-DB06D	100	7.2
MDM-DB09D	124	9.2

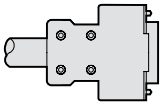
MDM-DC06D, MDM-DC12D, MDM-DC18D

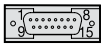


NJC-24-4-PM

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
Ground		4

(Power Connector Pin Table)

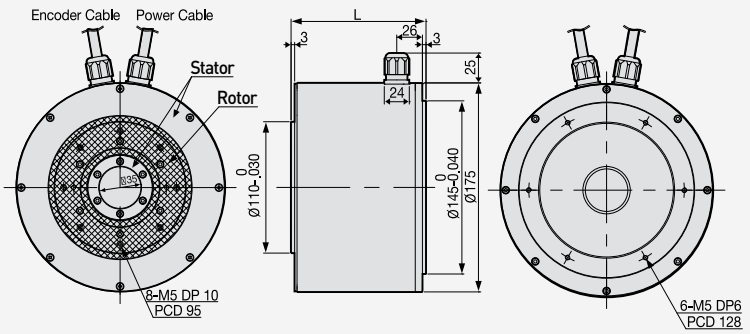




D- Sub Connector (15pin)

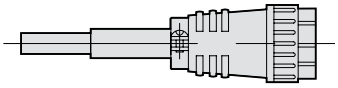
D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	9	+5V
2	SLO	10	-
3	-	11	-
4	0V	12	-
5	SHIELD	13	-
6	$\overline{MA}$	14	-
7	$\overline{SLO}$	15	-
8	-		

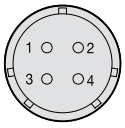
(Encoder Connector Pin Table)



Model	External Dimensions(mm)	Weight (kg)
	L	
MDM-DC06D	77	8.7
MDM-DC12D	95	10.6
MDM-DC18D	113	12.6

MDM-DD12D, MDM-DD22D, MDM-DD34D

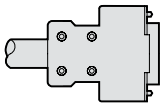


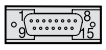


NJC-24-4-PM

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
Ground		4

(Power Connector Pin Table)

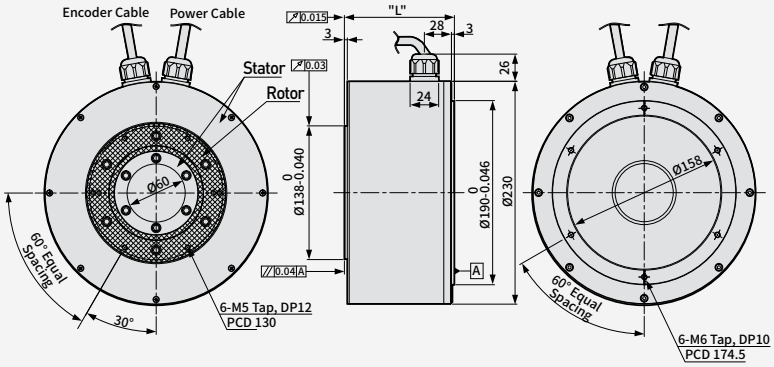




D- Sub Connector (15pin)

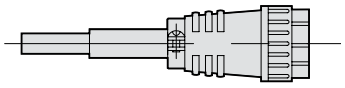
D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	9	+5V
2	SLO	10	-
3	-	11	-
4	0V	12	-
5	SHIELD	13	-
6	$\overline{MA}$	14	-
7	$\overline{SLO}$	15	-
8	-		

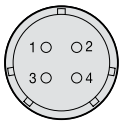
(Encoder Connector Pin Table)



Model	External Dimensions(mm)	Weight (kg)
	L	
MDM-DD12D	82.5	17.3
MDM-DD22D	100.5	19.6
MDM-DD34D	118.5	21.9

MDM-DE40D, MDM-DE60D

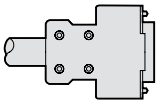


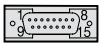


NJC-24-4-PM

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
Ground		4

(Power Connector Pin Table)

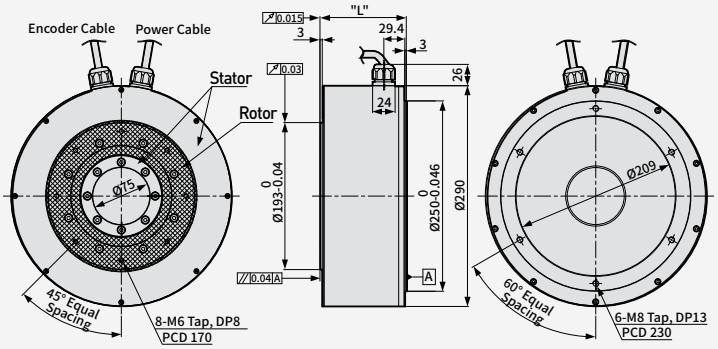




D- Sub Connector (15pin)

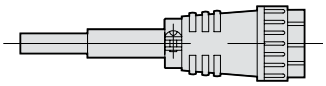
D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	9	+5V
2	SLO	10	-
3	-	11	-
4	0V	12	-
5	SHIELD	13	-
6	$\overline{MA}$	14	-
7	$\overline{SLO}$	15	-
8	-		

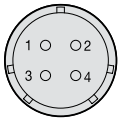
(Encoder Connector Pin Table)



Model	External Dimensions(mm)	Weight (kg)
	L	
MDM-DE40D	95.4	28.2
MDM-DE60D	113.4	35

MDM-DFA1G, MDM-DFA6G

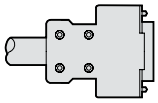


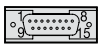


NJC-24-4-PM

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
Ground		4

(Power Connector Pin Table)

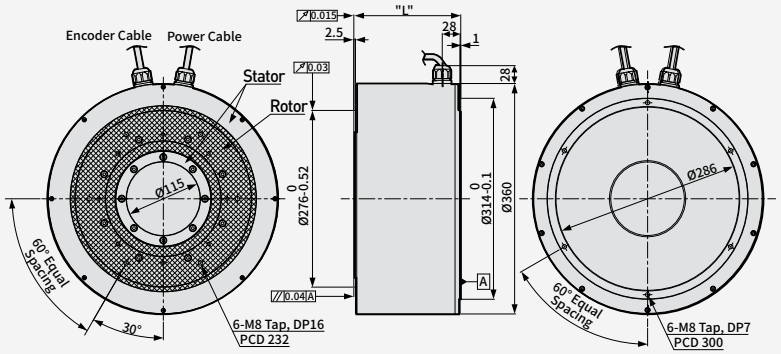




D- Sub Connector (15pin)

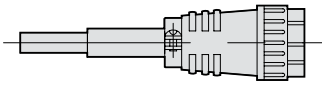
D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	9	+5V
2	SLO	10	-
3	-	11	-
4	0V	12	-
5	SHIELD	13	-
6	$\overline{MA}$	14	-
7	$\overline{SLO}$	15	-
8	-		

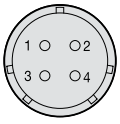
(Encoder Connector Pin Table)



Model	External Dimensions(mm)	Weight (kg)
	L	
MDM-DFA1G	131	54
MDM-DFA6G	167	70.3

MDM-DGC3SN0H

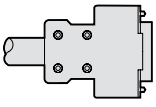


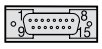


NJC-24-4-PM

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
Ground		4

(Power Connector Pin Table)

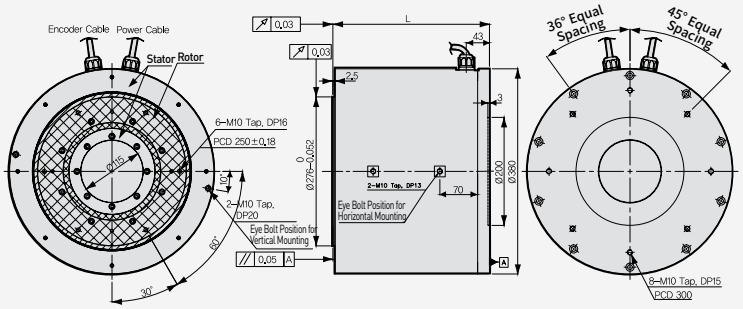




D- Sub Connector (15pin)

D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	9	+5V
2	SLO	10	-
3	-	11	-
4	0V	12	-
5	SHIELD	13	-
6	$\overline{MA}$	14	-
7	$\overline{SLO}$	15	-
8	-		

(Encoder Connector Pin Table)



Model	External Dimensions(mm)	Weight (kg)
	L	
MDM-DGC3SN0H	290	162

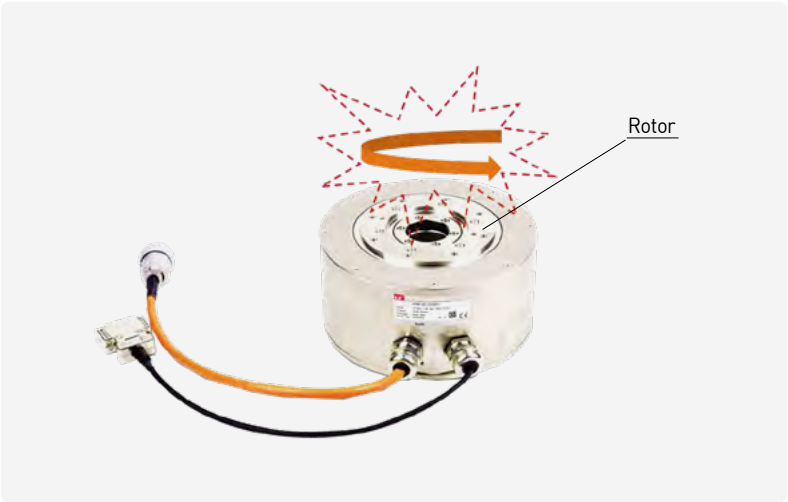
Troubleshooting

If an overcurrent alarm occurs

- Please check if the drive output and the encoder are wired properly.
- Please check for equipment collision or restraint.

High performance

- Please inspect the input voltage and load condition.
- Please check if the drive output and the encoder are wired properly.
- Please check for equipment collision or restraint.



DD Motor Flange Type Designation

DD Motor Flange Type Designation

MDM – DF B None 03 D N4 H

Motor Type	External Diameter	Input Power Supply	Rated Troque	Rated Speed	Encoder Type	Shaft Shape
DF : DD MOTOR Flange Type	B: 135mm	None: 200VAC	03 : 3N·m	D : 200rpm	N4 – 135mm / 175mm / 230mm – 24Bit Serial (Single Turn Abs. BiSS-C Communication)	H: Standard Hollow Type
	C: 175mm		06 : 6N·m			
	D: 230mm		12 : 12N·m			

Features of DD Motor Flange Type

Using the Own Technologies to Produce Motors, Drives and Encoders Domestically

Optimized for Low-speed, High-torque and High-precision Operation

- Providing Power connection for the connection of DC-Link Terminal
- Compact Size and Easy Wring (Compared with 3 phase AC Reactor)
- Providing Connection for DC Input (PI, N)

Reduced Cogging Torque and Optimized Torque Design

- Optimal ratio of the permanent magnet and coil / slot selected through electromagnetic analysis
- Using multiple permanent magnets to reduce torque ripple and to maximize torque
- Using a permanent magnet of high-energy rare earth elements (Nd-Fe-B)

High-performance Optical Encoder with BiSS Protocol

- DD MOTOR Flange Type
  Resolution : 16, 777, 216 [Pulse/rev] (24Bit, Single turn)

Compatible with Our AC Servo Drive (3-phase 200V AC)

- L7 Series(200VAC), iX7NH Series(200VAC)
  Both standard I/O type with serial communication and network (EtherCAT) type are applicable

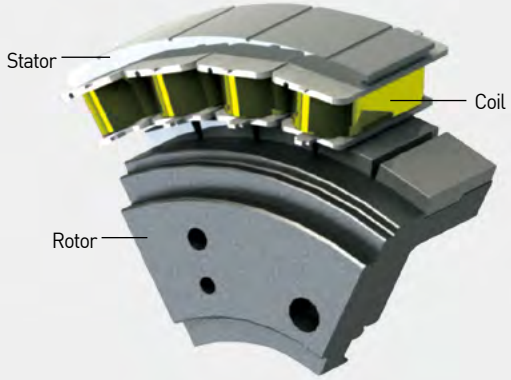
Direct Drive Structure

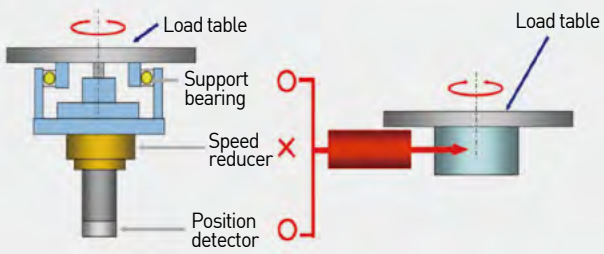
- No backlash impact
- High-precision operation and shortened installation time
- Smooth rotary motion
- Noise reduction

Hollow Structure Enables Efficient Wiring & Piping

Diverse Product Range

- Rated output: 63W, 126W, 251W
- Rated torque: 3N·m, 6N·m, 12N·m
  (Instantaneous maximum torque is 3x)
- Rated speed: 200RPM
- Frame diameter: 135mm, 175mm, 230mm





(Speed Reducer + Servo Motor) [DD Motor]

DD Motor Flange Type Properties

DD Motor Specifications

Ratings and Specifications

- Insulation Class : Class B
- Ingress Protection Code : IP40
- Cooling : Fully-enclosed, self-cooling
- Vibration Class : V15
- Insulation Resistance : 500 VDC, 10MΩ or higher
- Withstand Voltage : 1500 VAC, 1 min
- Operating Voltade : 200 VAC
- Operating Temperature : 0˚ to 40˚C
- Storage Temperature : -10˚ to 60˚C
- Relative Humidity : 20% to 80% noncondensing
- Installation Environment : Keep away from hazardous substances such as corrosive or flammable gas, cutting fluid, metal dust or oil. Keep away from direct sunlight.

Line-up Table

Rated Torque[N·m]			3	6	12
Maximum Torque[N·m]			9	18	36
Rated Speed 200[rpm]	Maximum Speed 500[rpm]	Ø135	DFB03D 		
		Ø175		DFC06D 	
		Ø230			DFD12D 

Drive Combination Table

MDM Serial Type

Rated Speed (RPM)	Maximum Speed (RPM)	External Diameter of Motor(Ø)	Motor	Drive	Power Cables	Encoders Cable (Serial)	Standard Encoders
200	500	135	DFB03D	L7□A001□	APCS-P□□□YS1	APCS-E□□□ZS1	24Bit Serial (Single Turn Abs. BiSS-C communication)
				iX7□A001□	APCS-P□□□YSX1		
		175	DFC06D	L7□A002□	APCS-P□□□YS1		
				iX7□A002□	APCS-P□□□YSX1		
		230	DFD12D	L7□A004□	APCS-P□□□YS1		
				iX7□A004□	APCS-P□□□YSX1		

Motor Shape

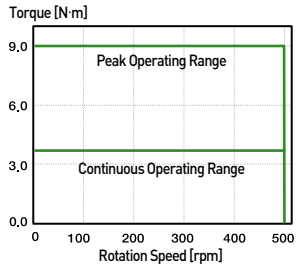
MDM-DFB03DN4H	MDM-DFC06DN4H	MDM-DFD12DN4H
		
		
		

Specifications and Torque Properties

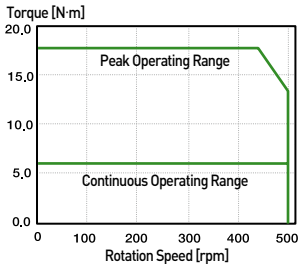
Motor Designation		MDM-DFB03DN4H	MDM-DFC06DN4H	MDM-DFD12DN4H
		03	06	12
Applicable Drive		L7□A002□	L7□A002□	L7□A004□
Flange Size	mm	135	175	230
Rated Output	W	63	126	251
Rated Torque	N·m	3	6	12
Max Torque	N·m	9	18	36
Rated Current	Arms	1.43	1.50	2.60
Max Current	Arms	4.29	4.50	7.80
Rated Speed	rpm	200	200	200
Max Speed	rpm	500	500	500
Constant of Torque	N·m/Arms	2.22	4.18	4.8
Inertia	$kg \cdot m^2 X10^{-4}$	10.30	58.05	110.00
Allowable Load Inertia Ratio		30 times of motor inertia	15 times of motor inertia	
Power Rate	kW/S	8.7	6.21	13.1
Positioning Accuracy	arc-sec	±30	±30	±30
Positioning Repeatability	arc-sec	1.3	1.3	1.3
Axial run-out	mm	0.015	0.015	0.015
Radial run-out	mm	0.03	0.03	0.03
Allowable Thrust Load	N	1500	3300	3600
Max. Instantaneous	N·m	40	70	80
Encoder Type		24-bit single turn serial encoder (BiSS/Absolute)		
Weight(Approx.)	kg	3.8	6.9	12.3
Working Environment	Ambient Temp	Operating Temperature : 0° to 40°C / Storage Temperature : -20° to 60°C		
	Ambient Humidity	20% to 80% noncondensing		
	Atmosphere	Keep out of direct sunlight, corrosive substances or flammable gas.		

Speed-Torque Characteristics

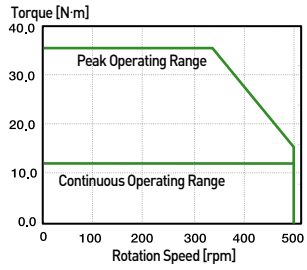
MDM-DFB03D



MDM-DFC06D



MDM-DFD12D



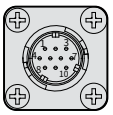
External Dimensions

MDM-DFB03D

JN1AS04MK1(JAE)

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
FG	FG	4

(Power Connector Pin Table)

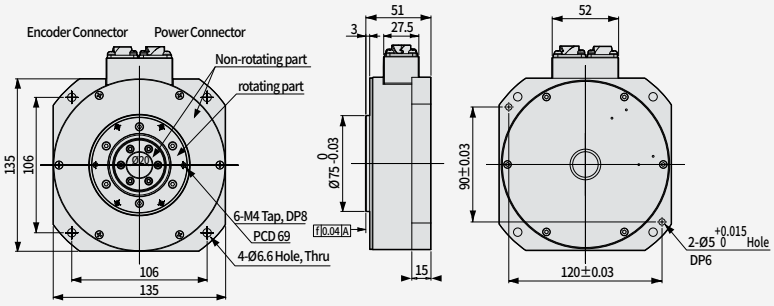


JN1AS10ML1-R(JAE)

D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	6	$\overline{MA}$
2	SLO	7	$\overline{SLO}$
3	-	8	-
4	OV	9	+5V
5	SHIELD	10	-

(Encoder Connector Pin Table)

3.8 [kg]

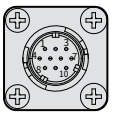


MDM-DFC06D

JN1AS04MK1(JAE)

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
FG	FG	4

(Power Connector Pin Table)

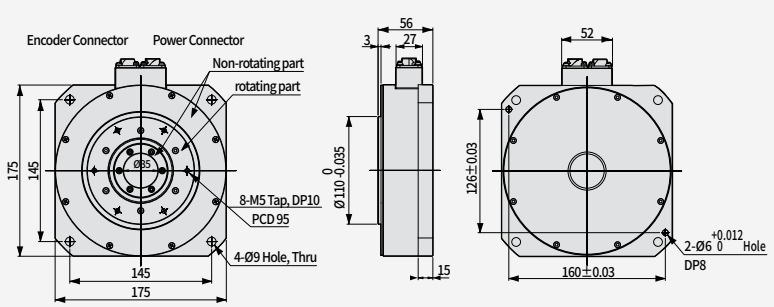


JN1AS10ML1-R(JAE)

D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	6	$\overline{MA}$
2	SLO	7	$\overline{SLO}$
3	-	8	-
4	OV	9	+5V
5	SHIELD	10	-

(Encoder Connector Pin Table)

6.9 [kg]

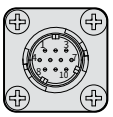


MDM-DFD12D

JN1AS04MK1(JAE)

Contents		Pin No.
LEAD WIRE	U	1
	V	2
	W	3
FG	FG	4

(Power Connector Pin Table)

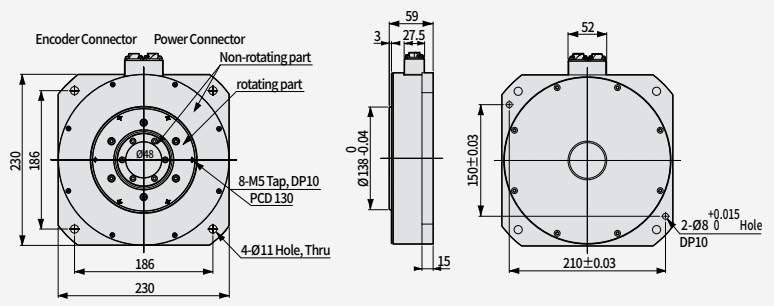


JN1AS10ML1-R(JAE)

D.D SERVO ENCODER CABLE			
NO.	Encoder Signal	NO.	Encoder Signal
1	MA	6	$\overline{MA}$
2	SLO	7	$\overline{SLO}$
3	-	8	-
4	OV	9	+5V
5	SHIELD	10	-

(Encoder Connector Pin Table)

12.3 [kg]



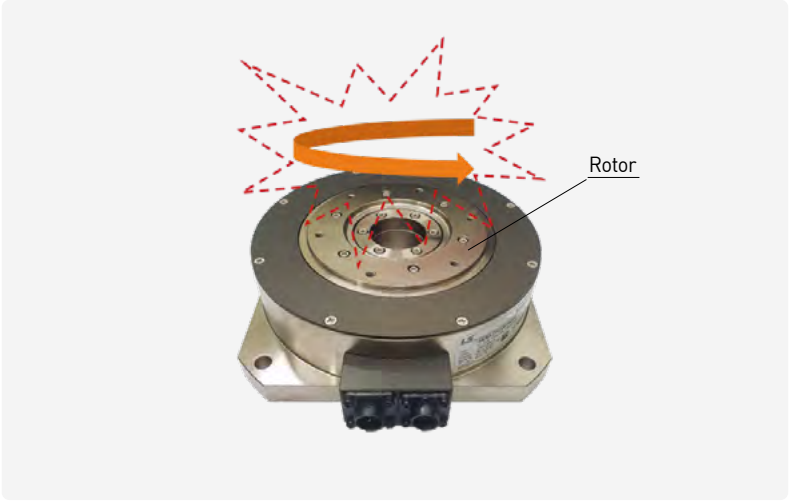
Troubleshooting

If an overcurrent alarm occurs

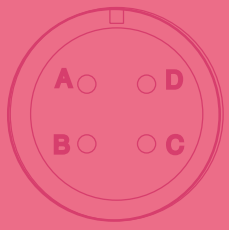
- Please check if the drive output and the encoder are wired properly.
- Please check for equipment collision or restraint.

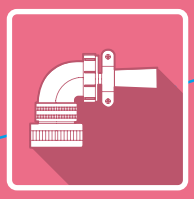
High performance

- Please inspect the input voltage and load condition.
- Please check if the drive output and the encoder are wired properly.
- Please check for equipment collision or restraint.



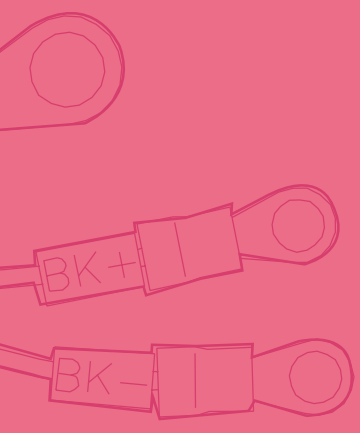

1
2
4
5
7
8
9
U
V
W
FG





Options and Accessories

Contents



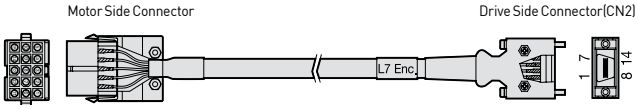
Designation

APCS	–	E	N	03	□□	–	R
APCS-: iX7NH Series / L7 Series 200V APCF-: L7 Series 400V APC-: L7 Series APCV-: PHOX Series		E: Encoder Cable P: Power Cable B: Brake Cable	N: General (Non-moving Type) F: Robotic (Moving Type)	01 : 1m 02 : 2m 03 : 3m ... 18 : 18m 19 : 19m 20 : 20m	Motor Spec.		None: Connector Load Direction -'R': Connector Reverse Load Direction

Note) Unstable ground connections to power and encoder options cables may result in AL due to noise

Note) 01- 20: 1m to 20m C able Length Provided, Cable Length Selection in 1m Increments

Signal Cables

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Signal	H Series Cable (Small Capacity)	APCS-E □□□AS	L7SA□□□A L7NHA□□□U L7PA□□□U L7NHF□□□U	All Models of HB Series	

PIN No.	Encoder Signal	PIN No.	Encoder Signal
A	A	M	V
B	$\overline{A}$	N	$\overline{V}$
C	B	P	W
D	$\overline{B}$	R	$\overline{W}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	U	J	SHIELD
L	$\overline{U}$		

[Motor Side Connector]

PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	W	8	$\overline{Z}$
2	$\overline{W}$	9	Z
3	V	10	$\overline{B}$
4	$\overline{V}$	11	B
5	U	12	$\overline{A}$
6	$\overline{U}$	13	A
7	0V	14	+5V
PLATE		SHIELD	

[Driver Side Connector]

1. Motor Side Connector
- Cap Spec.(15 Position): 172163-1(AMP)
- Socket Spec. : 170361-1(AMP)

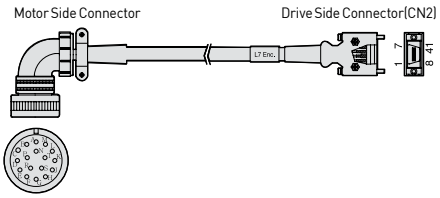
2. Driver Side Connector(CN2)
- Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone)
- Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone)

3. Cable Spec. : 7P×0.2SQ or 7P×AWG24

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

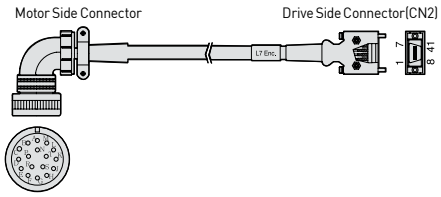
Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Signal</td><td>H Series Cable (Middle Capacity)</td><td>APCS-E□□□BS</td><td>L7SA□□□A
L7NHA□□□U
L7PA□□□U
L7NHF□□□U</td><td>All Models of HE Series</td><td>


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>A</td><td>A</td><td>M</td><td>V</td></tr>
<tr><td>B</td><td>$\overline{A}$</td><td>N</td><td>$\overline{V}$</td></tr>
<tr><td>C</td><td>B</td><td>P</td><td>W</td></tr>
<tr><td>D</td><td>$\overline{B}$</td><td>R</td><td>$\overline{W}$</td></tr>
<tr><td>E</td><td>Z</td><td>H</td><td>+5V</td></tr>
<tr><td>F</td><td>$\overline{Z}$</td><td>G</td><td>0V</td></tr>
<tr><td>K</td><td>U</td><td>J</td><td>SHIELD</td></tr>
<tr><td>L</td><td>$\overline{U}$</td><td></td><td></td></tr>
</table>
[Motor Side Connector]
<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN번호</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>W</td><td>8</td><td>$\overline{Z}$</td></tr>
<tr><td>2</td><td>$\overline{W}$</td><td>9</td><td>Z</td></tr>
<tr><td>3</td><td>V</td><td>10</td><td>$\overline{B}$</td></tr>
<tr><td>4</td><td>$\overline{V}$</td><td>11</td><td>B</td></tr>
<tr><td>5</td><td>U</td><td>12</td><td>$\overline{A}$</td></tr>
<tr><td>6</td><td>$\overline{U}$</td><td>13</td><td>A</td></tr>
<tr><td>7</td><td>0V</td><td>14</td><td>+5V</td></tr>
<tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr>
</table>
[Driver Side Connector]

1. Motor Side Connector(MS : Military Standard)
• Plug Spec.: MS3108A20-29S

2. Driver Side Connector(CN2)
• Case Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
• Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)

3. Cable Spec. : 7P×0.2SQ or 7P×AWG24
</td></tr>
<tr><td>For Signal</td><td>F Series Motor S-turn Encoder Cable (Middle Capacity)</td><td>APCS-E□□□DS</td><td>L7S□□□B
L7NH□□□□U
L7PA□□□U
L7NHF□□□U
L7CA□□□U</td><td>All Models of FE/FEP FF/FFP FG/FGP Series</td><td>


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>A</td><td>MA</td><td>M</td><td>-</td></tr>
<tr><td>B</td><td>$\overline{MA}$</td><td>N</td><td>-</td></tr>
<tr><td>C</td><td>SLO</td><td>P</td><td>-</td></tr>
<tr><td>D</td><td>$\overline{SLO}$</td><td>R</td><td>-</td></tr>
<tr><td>E</td><td>-</td><td>H</td><td>+5V</td></tr>
<tr><td>F</td><td>-</td><td>G</td><td>0V</td></tr>
<tr><td>K</td><td>-</td><td>J</td><td>SHIELD</td></tr>
<tr><td>L</td><td>-</td><td></td><td></td></tr>
</table>
[Motor Side Connector]
<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td><td>8</td><td>-</td></tr>
<tr><td>2</td><td>-</td><td>9</td><td>-</td></tr>
<tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr>
<tr><td>4</td><td>$\overline{MA}$</td><td>11</td><td>-</td></tr>
<tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr>
<tr><td>6</td><td>$\overline{SLO}$</td><td>13</td><td>-</td></tr>
<tr><td>7</td><td>0V</td><td>14</td><td>+5V</td></tr>
<tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr>
</table>
[Driver Side Connector]

1. Motor Side Connector(MS : Military Standard)
• Plug Spec.: MS3108A20-29S

2. Driver Side Connector(CN2)
• Case Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
• Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)

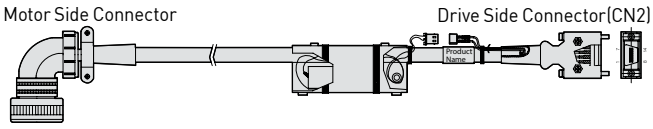
3. Cable Spec. : 3P×0.2SQ or 3P×24AWG
</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

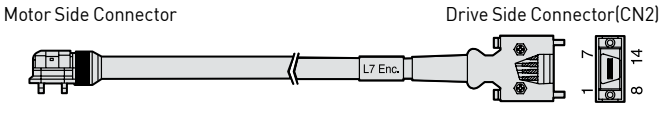
Signal Cable

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name</th><th>Applicable Drive</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Signal</td><td>F Series Motor M-turn Encoder Cable (Middle Capacity)</td><td>Note1)
APCS-E□□□DS1</td><td>L7S□□□B
L7NH□□□□U
L7PA□□□U
L7NHF□□□U</td><td>All Models of FE/FEP FF/FFP FG/FGP SERIES Series</td><td>



MS3108B20-29S
<table>
<tr><th>PIN No</th><th>Encoder Signal</th><th>PIN No</th><th>Encoder Signal</th></tr>
<tr><td>A</td><td>MA</td><td>M</td><td>-</td></tr>
<tr><td>B</td><td>$\overline{MA}$</td><td>N</td><td>-</td></tr>
<tr><td>C</td><td>SLO</td><td>P</td><td>-</td></tr>
<tr><td>D</td><td>$\overline{SLO}$</td><td>R</td><td>-</td></tr>
<tr><td>E</td><td>VOD_B</td><td>H</td><td>+5V</td></tr>
<tr><td>F</td><td>GND_B</td><td>G</td><td>0V</td></tr>
<tr><td>K</td><td>-</td><td>J</td><td>SHELD</td></tr>
<tr><td>L</td><td>-</td><td></td><td></td></tr>
</table>
(Motor Side Connector)

<table>
<tr><th>PIN No</th><th>Encoder Signal</th><th>PIN No</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td><td>8</td><td>-</td></tr>
<tr><td>2</td><td>-</td><td>9</td><td>-</td></tr>
<tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr>
<tr><td>4</td><td>$\overline{MA}$</td><td>11</td><td>-</td></tr>
<tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr>
<tr><td>6</td><td>$\overline{SLO}$</td><td>13</td><td>-</td></tr>
<tr><td>7</td><td>0V</td><td>14</td><td>+5V</td></tr>
<tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr>
</table>
(Drive Side Connector)

<table>
<tr><th>PIN No</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td></tr>
<tr><td>2</td><td>-</td></tr>
</table>
(Battery Connector)

1. Motor Side Connector(MS: Military Standard)
• Plug Spec.: MS3108A20-29S
2. Drive Side Connector(CN2)
• Case Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
• Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)
• Cable Spec. : 4P×0.2SQ or 4P×24AWG
• BATTERY CONNECTOR Spec. : 5267-02A(MOLEX)</td></tr>
<tr><td>For Signal</td><td>F Series Motor S-turn Encoder Cable (Small Capacity)</td><td>Note2)
APCS-E□□□ES-□</td><td>L7S□□□B
L7NH□□□□U
L7PA□□□U
L7NHF□□□U
L7CA□□□U</td><td>All Models of FAL FBL FCL Series</td><td>



Front Direction
Rear Direction
Tyco Connector (7Circuits)
<table>
<tr><th>PIN No</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>MA</td></tr>
<tr><td>2</td><td>SLO</td></tr>
<tr><td>3</td><td>-</td></tr>
<tr><td>4</td><td>0V</td></tr>
<tr><td>5</td><td>SHIELD</td></tr>
<tr><td>6</td><td>$\overline{MA}$</td></tr>
<tr><td>7</td><td>$\overline{SLO}$</td></tr>
<tr><td>8</td><td>-</td></tr>
<tr><td>9</td><td>+5V</td></tr>
</table>
(Motor Side Connector)

<table>
<tr><th>PIN No</th><th>Encoder Signal</th><th>PIN No</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td><td>8</td><td>-</td></tr>
<tr><td>2</td><td>-</td><td>9</td><td>-</td></tr>
<tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr>
<tr><td>4</td><td>$\overline{MA}$</td><td>11</td><td>-</td></tr>
<tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr>
<tr><td>6</td><td>$\overline{SLO}$</td><td>13</td><td>-</td></tr>
<tr><td>7</td><td>0V</td><td>14</td><td>+5V</td></tr>
<tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr>
</table>
(Drive Side Connector)

1. Motor Side Connector
• Cap Spec.: 2201825-1(Tyco)
• Socket Spec.: 2174065-4(Tyco)
2. Drive Side Connector(CN2)
• Case Spec.: 10314-52A0-008(3M사) or SM-14J(Suntone)
• Connector Spec.: 10114-3000VE(3M사) or SM-14J(Suntone)
• Cable Spec.: 3P×0.2SQ or 3P×24AWG</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.
Note2) In case a model name contains a single blank square, the connector can draw towards both front(load) and rear(half-load). (Front Type: no markings, Rear Type: marked -R)
The FAL Type can only draw towards front.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note3) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Signal	L Series Motor M-turn Encoder Cable (Small Capacity)	APCS-E□□□ ES1-□	L7SA□□□B L7NHA□□□U L7PA□□□U L7CA□□□U Note3)	All Models of FAL FBL FCL Series	Motor Side Connector — Drive Side Connector(CN2) (Front Direction) (Rear Direction) (Motor Side Connector): PIN No 1 MA, 2 SLO, 3 GND_B, 4 OV, 5 SHELD, 6 $\overline{MA}$, 7 $\overline{SLO}$, 8 VOD_B, 9 +5V (Drive Side Connector): PIN No 1 -, 2 -, 3 MA, 4 $\overline{MA}$, 5 SLO, 6 $\overline{SLO}$, 7 OV, PLATE; PIN No 8 -, 9 -, 10 -, 11 -, 12 -, 13 -, 14 +5V, SHIELD (Battery Connector): PIN No 1 BATTERY (VDD_B), 2 BATTERY 0V (GND_B) **1. Motor Side Connector** • Cap Spec.: 2201825-1(Tyco) • Socket Spec.: 2174065-4(Tyco) **2. Drive Side Connector(CN2)** • Case Spec.: 10314-52A0-008(3M) or SM-14J(Suntone) • Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone) • Cable Spec. : 4P×0.2SQ or 4P×24AWG • BATTERY CONNECTOR Spec. : 5267-02A(MOLEX)
For Signal	L Series Motor S-turn Encoder Cable (Small Capacity)	Note2) APCS-E□□□ EM-□	iX7M-A-□□□□B	All Models of FAL FBL FCL Series	Motor Side Connector — Drive Side Connector(CN2) (Front Direction) (Rear Direction) (Motor Side Connector): PIN No 1 MA, 2 SLO, 3 -, 4 OV, 5 SHIELD; PIN No 6 $\overline{MA}$, 7 $\overline{SLO}$, 8 -, 9 +5V (Drive Side Connector): PIN No 1 +5V, 2 OV, 3 SLO, 4 $\overline{SLO}$; PIN No 5 MA, 6 $\overline{MA}$, Plate SHIELD **1. Motor Side Connector** • Cap Spec.: 2201825-1(Tyco) • Socket Spec.: 2174065-4(Tyco) **2. Drive Side Connector(CN2)** • Case Spec.: 10314-52A0-008(3M) or SM-14J(Suntone) • Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone) • Cable Spec. : 4P×0.2SQ or 4P×24AWG
For Signal	L Series Motor M-turn Encoder Cable (Small Capacity)	Note2) APCS-E□□□ EM1-□	iX7M-A-□□□□B	All Models of FAL FBL FCL Series	Motor Side Connector — Drive Side Connector(CN2) (Front Direction) (Rear Direction) (Motor Side Connector): PIN No 1 MA, 2 SLO, 3 -, 4 OV, 5 SHIELD; PIN No 6 $\overline{MA}$, 7 $\overline{SLO}$, 8 -, 9 +5V (Drive Side Connector): PIN No 1 +5V, 2 OV, 3 SLO, 4 $\overline{SLO}$; PIN No 5 MA, 6 $\overline{MA}$, Plate SHIELD (Battery Connector): PIN No 1 BATTERY (VDD_B), 2 BATTERY 0V (GND_B) **1. Motor Side Connector** • Cap Spec.: 2201825-1(Tyco) • Socket Spec.: 2174065-4(Tyco) **2. Drive Side Connector(CN2)** • Case Spec.: 10314-52A0-008(3M) or SM-14J(Suntone) • Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone) • Cable Spec. : 4P×0.2SQ or 4P×24AWG • BATTERY CONNECTOR Spec. : 5267-02A(MOLEX)

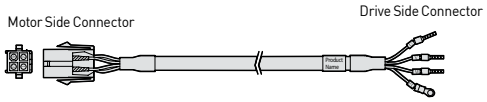
Note1) The three blank squares in model names indicate the type and length of cables.
And the designation is as right. In case a model name contains a single blank square,
the connector can draw towards both front(load) and rear(half-load).
(Front Type: no markings, Rear Type: marked -R) The FAL Type can only draw towards front.

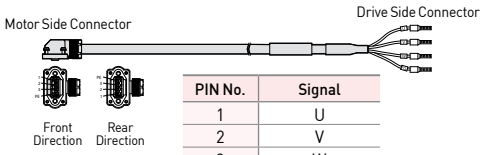
Note2) The three blank squares in model names indicate drive capacity.
For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58 / 66 / 72page

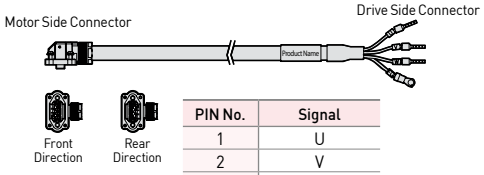
Note3) Multi-turn function cannot be used when L7C drive and APMC-F0L00YK product are combined.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Power Cable [200V]

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Power</td><td>H Series Power Cable (Small Capacity)</td><td>APCS-P
□□□GS</td><td>L7SA□□□A
L7NHA□□□U
L7PA□□□U
L7NHF□□□U</td><td>All Models of HB Series</td><td>


<table>
<tr><th>PIN No.</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>Ground</td></tr>
</table>
1. Motor Side Connector
• Cap Spec(4 Position) : 172159-1(AMP)
• Socket Spec.: 170362-1(AMP)
2. Drive Side Connector(U, V, W, FG)
• U, V, W Pin Spec. : F1512
• FG Pin Spec.: 1.5X4(Ring Terminal)
• Cable Spec.: 4C×0.75SQ or 4C×18AWG
</td></tr>
<tr><td>For Power</td><td>F Series Power Cable (iX7NH)</td><td>APCS-P
□□□LSX</td><td>iX7NHA□□□U</td><td>All Models of FAL FBL FCL Series with iX7NH Application</td><td>


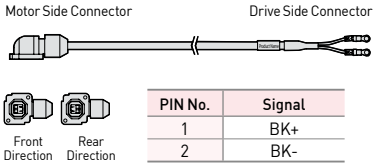
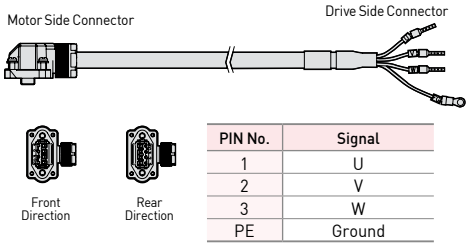
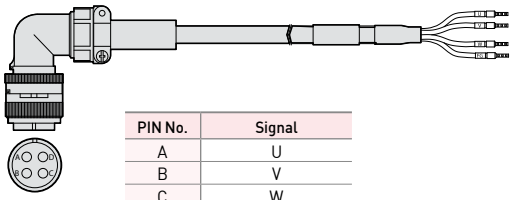
<table>
<tr><th>PIN No.</th><th>Signal</th></tr>
<tr><td>1</td><td>U</td></tr>
<tr><td>2</td><td>V</td></tr>
<tr><td>3</td><td>W</td></tr>
<tr><td>PE</td><td>Ground</td></tr>
</table>
1. Motor Side Connector
• CAP Spec: SM-JN8FT04N(Suntone)
• Socket Spec.: SMS-201(Suntone)
2. Drive Side Connector
• U, V, W, FG Pin Spec.: 1008 or 010008
• Cable Spec.: 4Cx0.75SQ or 4Cx18AWG
※ Specifications are subject to change without notice.
</td></tr>
<tr><td>For Power</td><td>F Series (L7C)</td><td>APCS-P
□□□LSC</td><td>L7CA□□□U</td><td>All Models of FAL FBL FCL Series with L7C Application</td><td>


<table>
<tr><th>PIN No.</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>PE</td><td>Ground</td></tr>
</table>
1. Motor Side Connector
• CAP Spec: SM-JN8FT04N
• Socket Spec.: SMS-201
2. Drive Side Connector
• U, V, W Pin Spec.: F1506
• Cable Spec.: 4C×0.75SQ or 4C×18AWG
</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

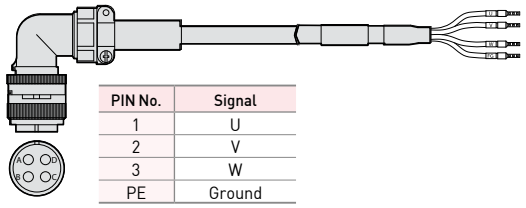
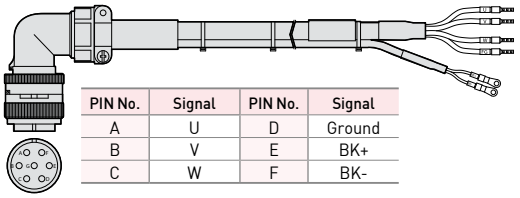
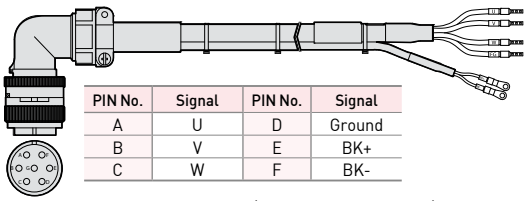
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Brake Cable for Flat Motor (Small Capacity)	APCS-B □□□ QS-□	L7SA□□□B L7NHA□□□U L7PA□□□U L7NHF□□□U L7CA□□□U	All Models of FAL FBL FCL Series	 PIN No. / Signal: 1 BK+, 2 BK- **1. Motor Side Connector** • Cap Spec: KN5FT02SJ1 • Socket Spec.: ST-KN-S-C1B-3500 **2. Drive Side Connector** • Connecting Terminal Spec. : 1.5×3(Ring Terminal) • Cable Spec.: 2C×0.5SQ or 2C×20AWG
For Power	L Series Power Cable (Small Capacity)	APCS-P □□□ LS-□	L7SA□□□B L7NHA□□□U L7PA□□□U L7NHFA□□□U	All Models of FAL FBL FCL Series	 PIN No. / Signal: 1 U, 2 V, 3 W, PE Ground **1. Motor Side Connector** • Cap Spec: SM-JN8FT04N • Socket Spec.: SMS-201 **2. Drive Side Connector** • U, V, W Pin Spec.: F1512 • FG Pin Spec.: 1.5x4(Ring Terminal) • Cable Spec.: 4C×0.75SQ or 4C×18AWG ※ In Case of FAL Products, Please install Power Cable First Before Connecting Encoder Cable
For Power	F Series Power Cable (iX7NH)	APCS-P □□□ HSX1	iX7NHA□□□U	All Models of FE Series with iX7NH Application, FE09A/ FE15A FE06D/ FE11D FE05G/ FE09G FE03M/ FE06M FEP Series	 PIN No. / Signal: A U, B V, C W, D Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-4S **2. Drive Side Connector** • U, V, W Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 ※ Specifications are subject to change without notice.

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.
In case a model name contains a single blank square, the connector can draw towards both front(load) and rear(half-load). (Front Type: no markings, Rear Type: marked -R)
The FAL Type can only draw towards front.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

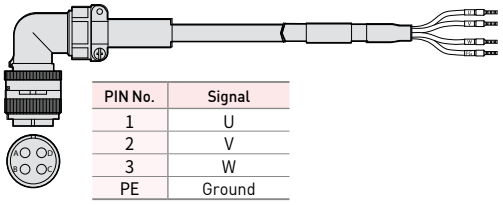
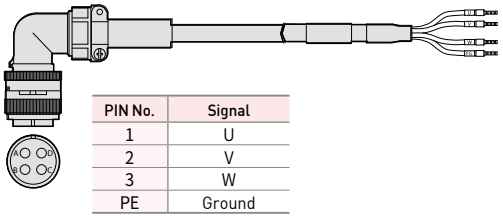
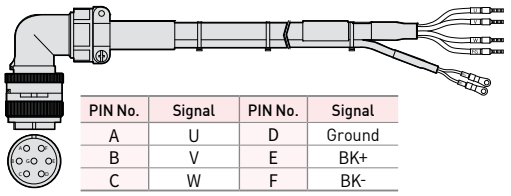
Power Cable [200V]

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable F Series (iX7NH)	APCS-P □□□HSX	iX7NHA□□□U	FE Series with iX7NH Application, FE22A/ FE30A FE16D/FE22D FE13G/FE17G FE12M	 PIN No. / Signal: 1 U; 2 V; 3 W; PE Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-4S **2. Drive Side Connector** • U, V, WPin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 ※ Specifications are subject to change without notice.
For Power	Power Cable F Series (iX7NH)	APCS-P □□□ NBX1	iX7NHA□□□U	FE Series with iX7NH Application, FE09A/FE15A FE06D/FE11D FE05G/FE09G FE03M/FE06M FE09M All Models of FEP Series	 PIN No. / Signal / PIN No. / Signal: A U D Ground; B V E BK+; C W F BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-15S **2. Drive Side Connector** • U, V, W Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.
For Power	Power Cable F Series (iX7NH)	APCS-P □□□NBX	iX7NHA□□□U	FE Series with iX7NH Application, FE22A/ FE30A FE16D/FE22D FE13G/FE17G FE12M	 PIN No. / Signal / PIN No. / Signal: A U D Ground; B V E BK+; C W F BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-15S **2. Drive Side Connector** • U, V, W Pin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

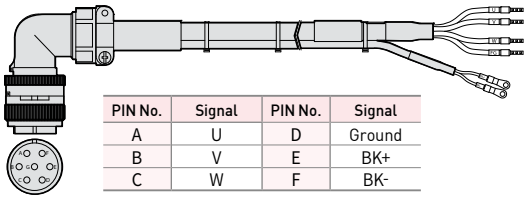
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable E Series F Series (iX7NH)	APCS-P □□□ISX	iX7NHA□□□U	FF Series with iX7NH FF30A/FF30G/ FF20M EE Series EF30A/EF30G EF20M	 PIN No. / Signal 1 U 2 V 3 W PE Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 22-22S **2. Drive Side Connector** • U, V, WPin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□ISX1	iX7NHA□□□U	FE Series with iX7NH FF22D/FF20G FF12M EE Series EF20G/EF12M	 PIN No. / Signal 1 U 2 V 3 W PE Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 22-22S **2. Drive Side Connector** • U, V, W Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 ※ Specifications are subject to change without notice.
For Power	Power Cable E Series F Series (iX7NH)	APCS-P □□□PBX	iX7NHA□□□U	FE Series with iX7NH FF30A/FF30G FF20M EE Series EF30A/EF30G EF20M	 PIN No. / Signal / PIN No. / Signal A U D Ground B V E BK+ C W F BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 24-10S **2. Drive Side Connector** • U, V, W Pin Spec.: F2508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
Cable Length(m)	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Power Cable [200V]

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable E Series F Series (iX7NH)	APCS-P □□□PBX1	iX7NHA□□□U	FE Series with iX7NH FF22D/FF20G FF12M EE Series EF20G/EF12M	

PIN No.	Signal	PIN No.	Signal
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

1. Motor Side Connector(MS:Military Standard)
- PLUG Spec: MS 3108A 24-10S

2. Drive Side Connector
- U, V, W Pin Spec.: F2508
- Cable Spec.: 4Cx2.5SQ or 4Cx14AWG
- FG Pin Spec.: F2508

3. Brake Power side Connector
- BK Pin Spec.: 1.5x3(Ring Terminal)
- Cable Spec.: 2Cx0.75SQ or 2Cx18AWG

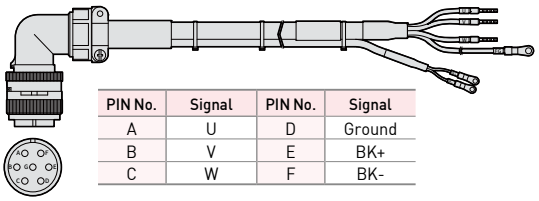
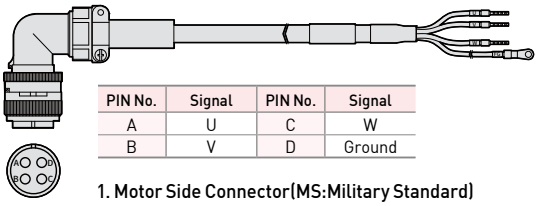
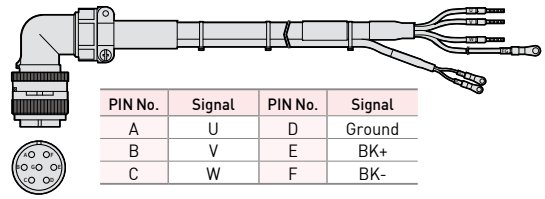
※ Specifications are subject to change without notice.

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Power Cable [Common use for 200V and 400V]

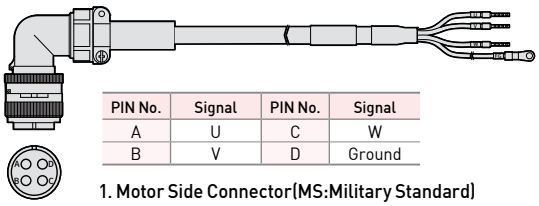
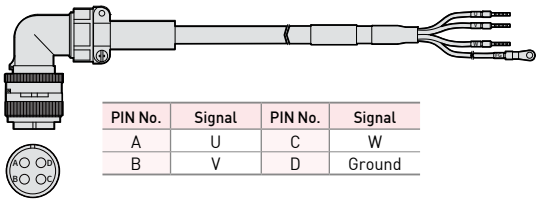
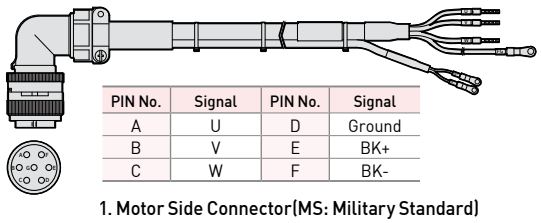
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable (Brake Type)	APCS-P □□□NB1	L7S□□□□□ L7NH□□□□U L7NHFA□□□U L7P□□□□U	FE Series FE09A/FE15A FE06D/FE11D FE05G/FE09G FE03M/FE06M FE09M All Model of FEP Series EE Series EE09A/EE15A EE06D/EE11D EE03M/EE06M EE09M	 PIN No. / Signal / PIN No. / Signal A / U / D / Ground B / V / E / BK+ C / W / F / BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-15S **2. Drive Side Connector** • U, V, W Pin Spec.: F1512 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: 1.5x4(Ring Terminal) **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG
For Power	Power Cable	APCS-P □□□HS1	L7S□□□□□ L7NH□□□□U L7NHFA□□□U L7P□□□□U	FE Series FE09A/FE15A FE06D/FE11D FE05G/FE09G FE03M/FE06M FE09M All Model of FEP Series HE Series HE09A/HE15A EE Series EE09A/EE15A EE06D/EE11D EE03M/EE06M EE09M	 PIN No. / Signal / PIN No. / Signal A / U / C / W B / V / D / Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-4S **2. Drive Side Connector** • U, V, W Pin Spec.: F1512 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: 1.5x4(Ring Terminal)
For Power	Power Cable (Brake Type)	APCS-P □□□NB	L7SA□□□□ L7NHA□□□U L7NHFA□□□U L7PA□□□U	FE Series FE22A/FE30A FE16D/FE22D FE13G/FE17G FE12M EE Series EE22A/EE30A EE16D/EE22D EE12M	 PIN No. / Signal / PIN No. / Signal A / U / D / Ground B / V / E / BK+ C / W / F / BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-15S **2. Drive Side Connector** • U, V, W Pin Spec.: F2512 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: 2.5x4(Ring Terminal) **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

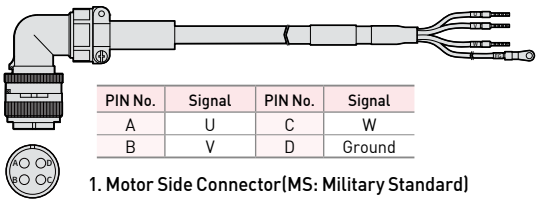
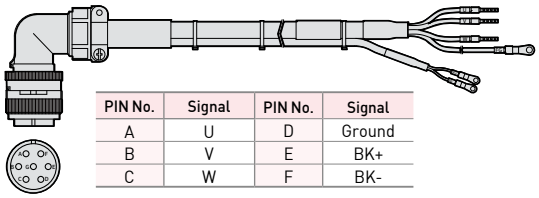
Power Cable [Common use for 200V and 400V]

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable	APCS-P □□□HS	L7SA□□□□ L7NHA□□□□U L7NHFA□□□U L7PA□□□U	FE Series FE22A/FE30A FE16D/FE22D FE13G/FE17G FE12M EE Series EE22A/EE30A EE16D/EE22D EE12M	 PIN No. / Signal / PIN No. / Signal A / U / C / W B / V / D / Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 20-4S **2. Drive Side Connector** • U, V, WPin Spec.: F2512 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: 2.5x4(Ring Terminal)
For Power	Power Cable	APCS-P □□□IS1	L7S□□□□□ L7NH□□□□U L7NHFA□□□U L7P□□□□U	FF Series FF22D/FF20G FF12M FG Series FG22D/FG20G FG12M FFP Series FFP30A/FFP22D FFP35D/FFP20G FFP30G/FFP12M FFP20M/FP30M FGP Series FGP22D/FGP35D FGP20G/FGP30G FGP12M/FGP20M FGP30M EF Series EF20G/EF12M	 PIN No. / Signal / PIN No. / Signal A / U / C / W B / V / D / Ground **1. Motor Side Connector(MS: Military Standard)** • PLUG Spec: MS 3108A 22-22S **2. Drive Side Connector** • U, V, W Pin Spec.: F1512 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: 1.5x4(Ring Terminal)
For Power	Power Cable (Brake Type)	APCS-P □□□PB1	L7S□□□□□ L7NH□□□□U L7NHF□□□□U L7P□□□□U	FF Series FF22D/FF20G FF12M FFP Series FFP30A/FFP22D FFP35D/FFP20G FFP30G/FFP12M FFP20M/FFP30M EF Series EF20G/EF12M	 PIN No. / Signal / PIN No. / Signal A / U / D / Ground B / V / E / BK+ C / W / F / BK- **1. Motor Side Connector(MS: Military Standard)** • PLUG Spec: MS 3108A 24-10S **2. Drive Side Connector** • U, V, W Pin Spec.: F1512 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: 1.5x4(Ring Terminal) **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Power</td><td>Power Cable</td><td>APCS-P
□□□IS</td><td>L7SA□□□□
L7NHA□□□U
L7NHFA□□□U
L7PA□□□U</td><td>FF Series
FF30A/FF35D
FF30G/FF20M
FF30M
FG Series
FG35D/FG30G
FG20M/FG30M
EF Series
EF30A/EF30G
EF20M/EF30M</td><td> 
<table><tr><th>PIN No.</th><th>Signal</th><th>PIN No.</th><th>Signal</th></tr><tr><td>A</td><td>U</td><td>C</td><td>W</td></tr><tr><td>B</td><td>V</td><td>D</td><td>Ground</td></tr></table>1. Motor Side Connector(MS: Military Standard)
• PLUG Spec: MS 3108A 22-22S
2. Drive Side Connector
• U, V, W Pin Spec.: F2512
• Cable Spec.: 4Cx2.5SQ or 4Cx14AWG
• FG Pin Spec.: 2.5x4(Ring Terminal)</td></tr>
<tr><td>For Power</td><td>Power Cable (Brake Type)</td><td>APCS-P
□□□PB</td><td>L7SA□□□□
L7NHA□□□U
L7NHFA□□□U
L7PA□□□U</td><td>FF Series
FF30A/FF35D
FF30G/FF20M
FF30M
EF Series
EF30A/EF30G
EF20M/EF30M</td><td> 
<table><tr><th>PIN No.</th><th>Signal</th><th>PIN No.</th><th>Signal</th></tr><tr><td>A</td><td>U</td><td>D</td><td>Ground</td></tr><tr><td>B</td><td>V</td><td>E</td><td>BK+</td></tr><tr><td>C</td><td>W</td><td>F</td><td>BK-</td></tr></table>1. Motor Side Connector(MS: Military Standard)
• PLUG Spec: MS 3108A 24-10S
2. Drive Side Connector
• U, V, W Pin Spec.: F2512
• Cable Spec.: 4Cx2.5SQ or 4Cx14AWG
• FG Pin Spec.: 2.5x4(Ring Terminal)
3. Brake Power side Connector
• BK Pin Spec.: 1.5x3(Ring Terminal)
• Cable Spec.: 2Cx0.75SQ or 2Cx18AWG</td></tr>
<tr><td>For Power</td><td>Power Cable</td><td>APCS-P
□□□JS1</td><td>L7SB□□□□
L7NHB□□□U
L7PB□□□U</td><td>FFP Series
FFP50A/
FFP55D
FFP75D/
FFP44G
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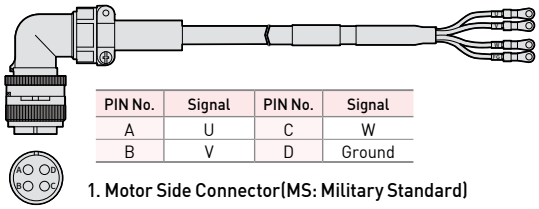
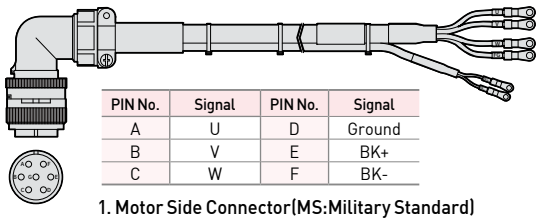
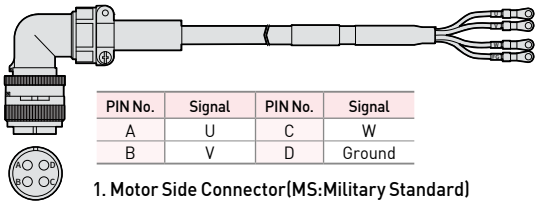
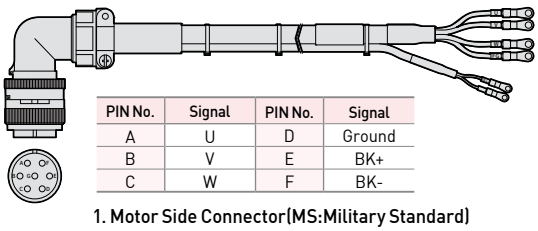
FGP60G
FGP44M</td><td> 
<table><tr><th>PIN No.</th><th>Signal</th><th>PIN No.</th><th>Signal</th></tr><tr><td>A</td><td>U</td><td>C</td><td>W</td></tr><tr><td>B</td><td>V</td><td>D</td><td>Ground</td></tr></table>1. Motor Side Connector(MS: Military Standard)
• PLUG Spec: MS 3108A 22-22S
2. Drive Side Connector
• U, V, W Pin Spec.: 4.0x5(Ring Terminal)
• Cable Spec.: 4Cx4.0SQ or 4Cx11AWG
• FG Pin Spec.: 4.0x5(Ring Terminal)</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

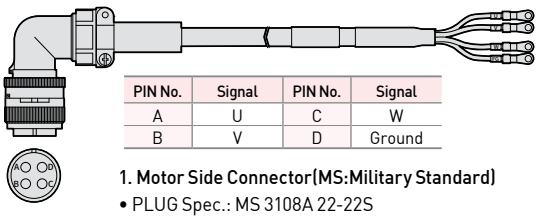
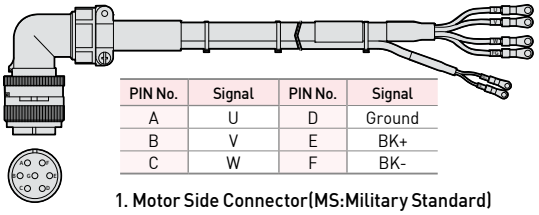
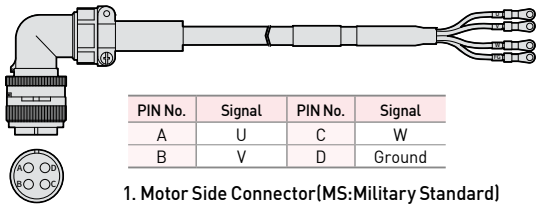
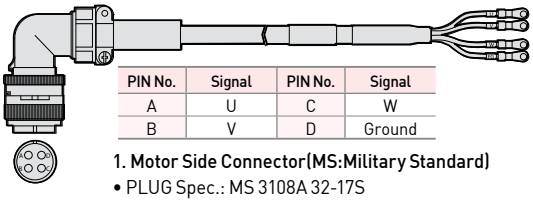
Power Cable [Common use for 200V and 400V]

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable (Brake Type)	APCS-P □□□LB1	L7SB□□□□ L7NHB□□□U L7PB□□□U	FFP Series FFP50A/ FFP55D FFP75D/ FFP44G FFP60G/ FFP44M	 PIN No. / Signal / PIN No. / Signal A U D Ground B V E BK+ C W F BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 24-10S **2. Drive Side Connector** • U, V, W Pin Spec.: 4.0x5(Ring Terminal) • Cable Spec.: 4Cx4.0SQ or 4Cx11AWG • FG Pin Spec.: 4.0x5(Ring Terminal) **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG
For Power	Power Cable	APCS-P □□□JS	L7SA□□□□ L7NHA□□□U L7NHFA□□□U L7PA□□□U	FF Series FF50A/ FF55D FF44G/ FF44M FG Series FG55D/ FG44G FG44M EF Series EF50A/ EF44G EF44M	 PIN No. / Signal / PIN No. / Signal A U C W B V D Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 22-22S **2. Drive Side Connector** • U, V, W Pin Spec.: 6.0x5(Ring Terminal) • Cable Spec.: 4Cx6.0SQ or 4Cx10AWG • FG Pin Spec.: 6.0x5(Ring Terminal)
For Power	Power Cable (Brake Type)	APCS-P □□□LB	L7SA□□□□ L7NHA□□□U L7NHFA□□□U L7PA□□□U	FF Series FF50A/ FF55D FF44G/ FF44M EF Series EF50A/ EF44G EF44M	 PIN No. / Signal / PIN No. / Signal A U D Ground B V E BK+ C W F BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec: MS 3108A 24-10S **2. Drive Side Connector** • U, V, W Pin Spec.: 6.0x5(Ring Terminal) • Cable Spec.: 4Cx6.0SQ or 4Cx10AWG • FG Pin Spec.: 6.0x5(Ring Terminal) **3. Brake Power Side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

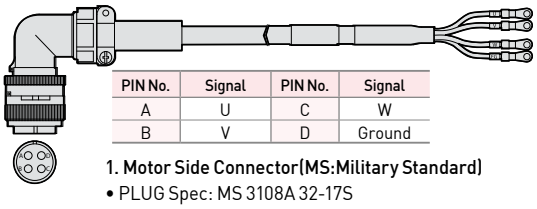
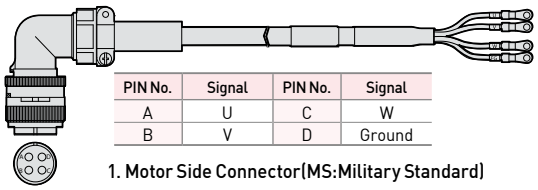
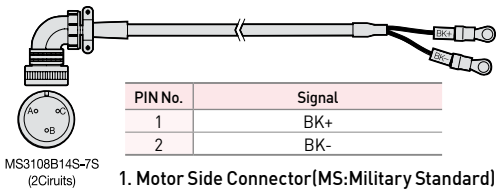
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable	APCS-P □□□JS2	L7SA□□□□ L7NHA□□□U L7NHFA□□□U L7PA□□□U	FF Series FF75D/FF60G FG Series FG75D/FG60G EF Series EF60G/EF75G	 PIN No. / Signal / PIN No. / Signal A / U / C / W B / V / D / Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec.: MS 3108A 22-22S **2. Drive Side Connector** • U, V, W Pin Spec.: 10.0x5(Ring Terminal) • Cable Spec.: 4Cx10.0SQ or 4Cx8AWG • FG Pin Spec.: 10.0x5(Ring Terminal)
For Power	Power Cable (Brake Type)	APCS-P □□□LB2	L7SA□□□□ L7NHA□□□U L7NHFA□□□U L7PA□□□U	FF Series FF75D/ FF60G EF Series EF60G	 PIN No. / Signal / PIN No. / Signal A / U / D / Ground B / V / E / BK+ C / W / F / BK- **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec.: MS 3108A 24-10S **2. Drive Side Connector** • U, V, W Pin Spec.: 10.0x5(Ring Terminal) • Cable Spec.: 4Cx10.0SQ or 4Cx8AWG • FG Pin Spec.: 10.0x5(Ring Terminal) **3. Brake Power side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG
For Power	Power Cable	APCS-P □□□MS1	L7SB□□□□ L7NHB□□□U L7PB□□□U	FFP Series FFP75G FGP Series FGP60M/ FGP110D/ FGP85G/ FGP110G	 PIN No. / Signal / PIN No. / Signal A / U / C / W B / V / D / Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec.: MS 3108A 32-17S **2. Drive Side Connector** • U, V, W Pin Spec.: 6.0x5(Ring Terminal) • Cable Spec.: 4Cx6.0SQ or 4Cx10AWG • FG Pin Spec.: 6.0x5(Ring Terminal)
For Power	Power Cable	APCS-P □□□MS	L7S□□□□□ L7NH□□□□U L7NHF□□□□U L7P□□□□U	FF Series FF75G FG Series FG60M FGP Series FGP150G	 PIN No. / Signal / PIN No. / Signal A / U / C / W B / V / D / Ground **1. Motor Side Connector(MS:Military Standard)** • PLUG Spec.: MS 3108A 32-17S **2. Drive Side Connector** • U, V, W Pin Spec.: 10.0x5(Ring Terminal) • Cable Spec.: 4Cx10.0SQ or 4Cx8AWG • FG Pin Spec.: 10.0x5(Ring Terminal)

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

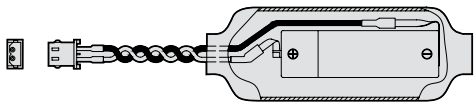
Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Power Cable [Common use for 200V and 400V]

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Power</td><td>Power Cable</td><td>APCS-P
□□□0S</td><td>L7SA□□□□
L7NHA□□□U
L7PA□□□U</td><td>FG Series
FG110D/
FG85G
FG110G</td><td> 
<table>
<tr><th>PIN No.</th><th>Signal</th><th>PIN No.</th><th>Signal</th></tr>
<tr><td>A</td><td>U</td><td>C</td><td>W</td></tr>
<tr><td>B</td><td>V</td><td>D</td><td>Ground</td></tr>
</table>
1. Motor Side Connector(MS:Military Standard)
• PLUG Spec: MS 3108A 32-17S
2. Drive Side Connector
• U, V, W Pin Spec.: 16.0x6(Ring Terminal)
• Cable Spec.: 4Cx16.0SQ or 4Cx5AWG
• FG Pin Spec.: 16.0x6(Ring Terminal)</td></tr>
<tr><td>For Power</td><td>Power Cable</td><td>APCS-P
□□□VS</td><td>L7SA□□□□
L7NHA□□□U
L7PA□□□U</td><td>FG Series
FG150G</td><td> 
<table>
<tr><th>PIN No.</th><th>Signal</th><th>PIN No.</th><th>Signal</th></tr>
<tr><td>A</td><td>U</td><td>C</td><td>W</td></tr>
<tr><td>B</td><td>V</td><td>D</td><td>Ground</td></tr>
</table>
1. Motor Side Connector(MS:Military Standard)
• PLUG Spec: MS 3108A 32-17S
2. Drive Side Connector
• U, V, W Pin Spec.: 25.0x6(Ring Terminal)
• Cable Spec.: 4Cx25.0SQ or 4Cx3AWG
• FG Pin Spec.: 22.0x6(Ring Terminal)</td></tr>
<tr><td>For Power</td><td>Brake Cable</td><td>APCS-P
□□□SB</td><td>L7S□□□□□
L7NH□□□□U
L7NHFA□□□U
L7P□□□□U</td><td>All Model of FG Series</td><td> 

MS3108B14S-7S
(2Ciruits)
<table>
<tr><th>PIN No.</th><th>Signal</th></tr>
<tr><td>1</td><td>BK+</td></tr>
<tr><td>2</td><td>BK-</td></tr>
</table>
1. Motor Side Connector(MS:Military Standard)
• PLUG Spec: MS3108A 14S-7S
2. Drive Side Connector
• Connecting Terminal Spec.: 1.5×3(Ring Terminal)
3. Cable Spec.: 2C×0.75SQ or 2C×18AWG</td></tr>
<tr><td>Encoder Battery</td><td>Battery for ABS</td><td>APCS-BATT36</td><td>All Model of L7 Series
iX7NHA□□□U
iX7M-A-□□□□B</td><td>All Model of F Series

All Model of E Series</td><td> 

<table>
<tr><th>PIN No.</th><th>Signal</th></tr>
<tr><td>1</td><td>BK+</td></tr>
<tr><td>2</td><td>BK-</td></tr>
</table>
• PLUG Spec: 5264-02(Molex)
• PLUG Pin Spec.: 5263PBT(Molex)
• Battery Spec: ER6V/3.6V, 2000mAh(TOSHIBA)</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Signal Cable E Series Motor

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Power</td><td>E Series Motor S-turn Encoder Cable (Small Capacity)

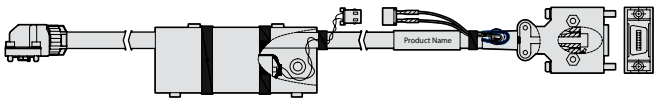
E Series batteryless inverter apply For motor M-turn encoder cable (small capacity)</td><td>APCS-E□□□ RS-□</td><td>L7SA□□□B
L7NHA□□□U
L7PA□□□U
L7CA□□□U
iX7NHA□□□U</td><td>All Model of
EA
EB
EC
SERIES</td><td>
Motor Side Connector
Drive Side Connector(CN2)


Front Direction

Rear Direction
<table><tr><th>PIN No.</th><th>Encoder Signal</th></tr><tr><td>1</td><td>SHIELD</td></tr><tr><td>2</td><td>$\overline{SLO}$</td></tr><tr><td>3</td><td>SLO</td></tr><tr><td>4</td><td>$\overline{MA}$</td></tr><tr><td>5</td><td>MA</td></tr><tr><td>6</td><td>-</td></tr><tr><td>7</td><td>-</td></tr><tr><td>8</td><td>OV</td></tr><tr><td>9</td><td>+5V</td></tr></table>
(Motor Side Connector)

<table><tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr><tr><td>1</td><td>-</td><td>8</td><td>-</td></tr><tr><td>2</td><td>-</td><td>9</td><td>-</td></tr><tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr><tr><td>4</td><td>$\overline{MA}$</td><td>11</td><td>-</td></tr><tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr><tr><td>6</td><td>$\overline{SLO}$</td><td>13</td><td>-</td></tr><tr><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr><tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr></table>
(Drive Side Connector)

1. Motor Side Connector
• Cap Spec: : SJ117363(Front, JAE), SJ121270(Rear, JAE)
• Socket Spec.: JN-24S-C1B-10000(JAE)

2. Drive Side Connector(CN2)
• Cable Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
• Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)
• Cable Spec.: 3P×0.2SQ or 3P×24AWG
</td></tr>
<tr><td>For Power</td><td>E Series Motor M-turn Encoder Cable (Small Capacity)</td><td>APCS-E□□□ RS1-□</td><td>L7SA□□□B
L7NHA□□□U
L7PA□□□U
L7CA□□□U
iX7NHA□□□U</td><td>All Model of
EA
EB
EC
SERIES</td><td>
Motor Side Connector
Drive Side Connector(CN2)


Front Direction

Rear Direction
<table><tr><th>PIN No.</th><th>Encoder Signal</th></tr><tr><td>1</td><td>SHIELD</td></tr><tr><td>2</td><td>$\overline{SLO}$</td></tr><tr><td>3</td><td>SLO</td></tr><tr><td>4</td><td>$\overline{MA}$</td></tr><tr><td>5</td><td>MA</td></tr><tr><td>6</td><td>GND_B</td></tr><tr><td>7</td><td>VOD_B</td></tr><tr><td>8</td><td>OV</td></tr><tr><td>9</td><td>+5V</td></tr></table>
(Motor Side Connector)

<table><tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr><tr><td>1</td><td>-</td><td>8</td><td>-</td></tr><tr><td>2</td><td>-</td><td>9</td><td>-</td></tr><tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr><tr><td>4</td><td>$\overline{MA}$</td><td>11</td><td>-</td></tr><tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr><tr><td>6</td><td>$\overline{SLO}$</td><td>13</td><td>-</td></tr><tr><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr><tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr></table>
(Drive Side Connector)

<table><tr><th>PIN No.</th><th>Encoder Signal</th></tr><tr><td>1</td><td>BATTERY (VDD_B)</td></tr><tr><td>2</td><td>BATTERY 0V (GND_B)</td></tr></table>
(Battery Connector)

1. Motor Side Connector
• Cap Spec: : SJ117363(Front, JAE), SJ121270(Rear, JAE)
• Socket Spec.: JN-24S-C1B-10000(JAE)

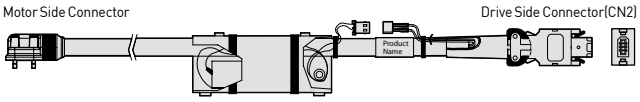
2. Drive Side Connector(CN2)
• Cable Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
• Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)
• Cable Spec.: 4P×0.2SQ or 4P×24AWG
• BATTERY CONNECTOR Spec.: 5267-02A(MOLEX)
</td></tr>
</table>

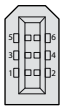
Note1)The three blank squares in model names indicate the type and length of cables. And the designation is as below.
Note2) In case a model name contains a single blank square, the connector can draw towards both front(load) and rear(half-load). (Front Type: no markings, Rear Type: marked -R)

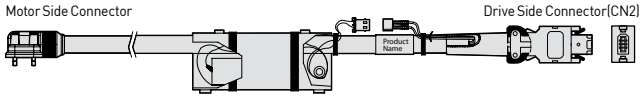
Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

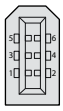
Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Signal Cable E Series Motor

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td rowspan="2">For Power</td><td>E Series Motor S-turn Encoder Cable (Small Capacity)</td><td>APCS-E□□□ RM-□</td><td>iX7M-A-□□□□B</td><td>All Model of EA EB EC SERIES</td><td>


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>SHIELD</td></tr>
<tr><td>2</td><td>SLO</td></tr>
<tr><td>3</td><td>SLO</td></tr>
<tr><td>4</td><td>MA</td></tr>
<tr><td>5</td><td>MA</td></tr>
<tr><td>6</td><td>-</td></tr>
<tr><td>7</td><td>-</td></tr>
<tr><td>8</td><td>OV</td></tr>
<tr><td>9</td><td>+5V</td></tr>
</table>
(Motor Side Connector)

<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>+5V</td></tr>
<tr><td>2</td><td>OV</td></tr>
<tr><td>3</td><td>SLO</td></tr>
<tr><td>4</td><td>SLO</td></tr>
</table>
<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>5</td><td>MA</td></tr>
<tr><td>6</td><td>MA</td></tr>
<tr><td>Plate</td><td>SHIELD</td></tr>
</table>
(Drive Side Connector)

1. Motor Side Connector
• Cap Spec: : SJ117363(Front, JAE), SJ121270(Rear, JAE)
• Socket Spec.: JN-24S-C1B-10000(JAE)
2. Drive Side Connector(CN2)
• Cable Spec.: SC-06B-2N00-702(Sunchu)
• Connector Spec.: SC-06B-2N00-702(Sunchu)
• Cable Spec.: 3P×0.2SQ or 3P×24AWG</td></tr>
<tr><td>E Series Motor M-turn Encoder Cable (Small Capacity)</td><td>APCS-E□□□ RM1-□</td><td>iX7M-A-□□□□B</td><td>All Model of EA EB EC SERIES</td><td>


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>SHIELD</td></tr>
<tr><td>2</td><td>SLO</td></tr>
<tr><td>3</td><td>SLO</td></tr>
<tr><td>4</td><td>MA</td></tr>
<tr><td>5</td><td>MA</td></tr>
<tr><td>6</td><td>GND_B</td></tr>
<tr><td>7</td><td>VOD_B</td></tr>
<tr><td>8</td><td>OV</td></tr>
<tr><td>9</td><td>+5V</td></tr>
</table>
(Motor Side Connector)

<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>+5V</td></tr>
<tr><td>2</td><td>OV</td></tr>
<tr><td>3</td><td>SLO</td></tr>
<tr><td>4</td><td>SLO</td></tr>
<tr><td>5</td><td>MA</td></tr>
<tr><td>6</td><td>MA</td></tr>
<tr><td>Plate</td><td>SHIELD</td></tr>
</table>
(Drive Side Connector)


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>BATTERY (VDD_B)</td></tr>
<tr><td>2</td><td>BATTERY 0V (GND_B)</td></tr>
</table>
(Battery Connector)

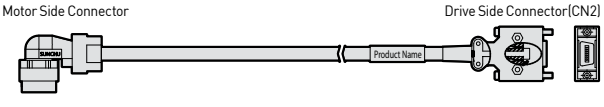
1. Motor Side Connector
• Cap Spec: : SJ117363(Front, JAE), SJ121270(Rear, JAE)
• Socket Spec.: JN-24S-C1B-10000(JAE)
2. Drive Side Connector(CN2)
• Cable Spec.: SC-06B-2N00-702(Sunchu)
• Connector Spec.: SC-06B-2N00-702(Sunchu)
• Cable Spec.: 4P×0.2SQ or 4P×24AWG
• BATTERY CONNECTOR Spec.: 5267-02A(MOLEX)</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	E Series batteryless For encoder-applied motors M-turn Encoder Cable (Small Capacity)	APCS-E □□□SC	L7SA□□□B L7NHA□□□U L7PA□□□U IX7NHA□□□U	All Model of EE EF Series	Motor Side Connector / Drive Side Connector(CN2)
	E Series Motor M-turn Encoder Cable (Medium to large capacity)	APCS-E □□□SC1	L7SA□□□B L7NHA□□□U L7PA□□□U IX7NHA□□□U	All Model of EE EF Series	Motor Side Connector / Drive Side Connector(CN2)



PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	+5V	6	MA
2	0V	7	$\overline{MA}$
3	-	8	SLO
4	VOD_B	9	$\overline{SLO}$
5	GND_B	10	SHIELD

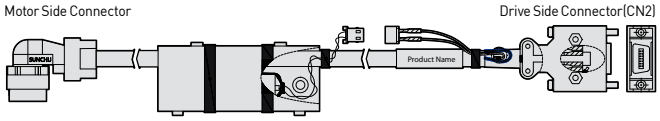
(Motor Side Connector)

PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	-	8	-
2	-	9	-
3	MA	10	-
4	$\overline{MA}$	11	-
5	SLO	12	-
6	$\overline{SLO}$	13	-
7	0V	14	+5V
PLATE		SHIELD	

(Drive Side Connector)

1. Motor Side Connector(Sunchu)
- Plug Spec: : SC-CMV1-AP10C

2. Drive Side Connector(CN2)
- Cable Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
- Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)
- Cable Spec.: 4P×0.2SQ or 4P×24AWG



PIN No.	Encoder Signal
1	+5V
2	0V
3	-
4	VOD_B
5	GND_B
6	MA
7	$\overline{MA}$
8	SLO
9	$\overline{SLO}$
10	SHIELD

(Motor Side Connector)

PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	-	8	-
2	-	9	-
3	MA	10	-
4	$\overline{MA}$	11	-
5	SLO	12	-
6	$\overline{SLO}$	13	-
7	0V	14	+5V
PLATE		SHIELD	

(Drive Side Connector)

PIN No.	Encoder Signal
1	BATTERY (VDD_B)
2	BATTERY 0V (GND_B)

(Battery Connector)

1. Motor Side Connector(Sunchu)
- Plug Spec: : SC-CMV1-AP10C

2. Drive Side Connector(CN2)
- Cable Spec.: 10314-52A0-008(3M) or SM-14J(Suntone)
- Connector Spec.: 10114-3000VE(3M) or SM-14J(Suntone)
- Cable Spec.: 4P×0.2SQ or 4P×24AWG
- BATTERY CONNECTOR Spec.: 5267-02A(MOLEX)

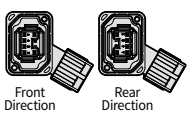
Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Power Cable E Series Motor (iX7NH, iX7M)

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Powr Cable E Series	APCS-P□□□ EX1-□	iX7NHA□□□U iX7M-A-□□□□B	All Model of iX7NH applied EA Series	Motor Side Connector / Drive Side Connector

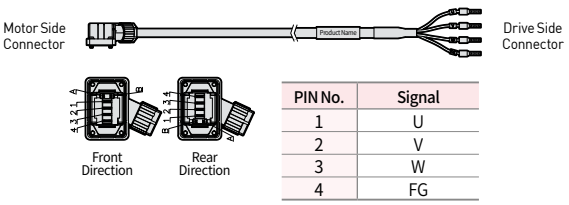
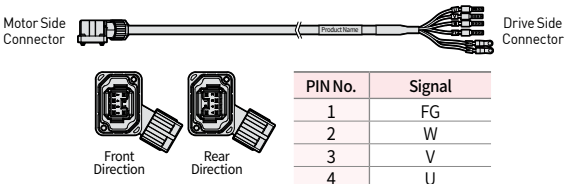
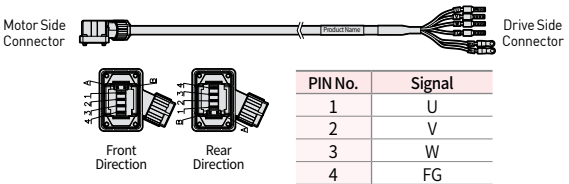


PIN 번호	신호
1	FG
2	W
3	V
4	U

1. Motor Side Connector
- CAP Spec: : SC-MC6S-AK20-00(Sunchu)
- Socket Spec: : FMC19012220(Sunchu)

2. Drive Side Connector
- U, V, W, FG pin Spec.: 0208(002508) or 0308
- Cable Spec.: 6C×0.2SQ or 6C×24(25)AWG

Power Cable E Series Motor (iX7NH, iX7M)

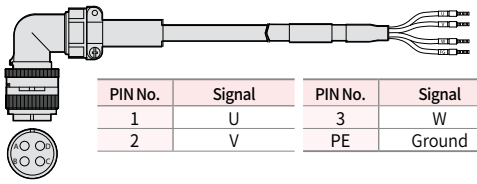
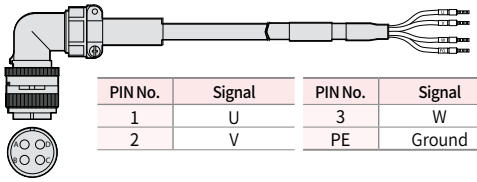
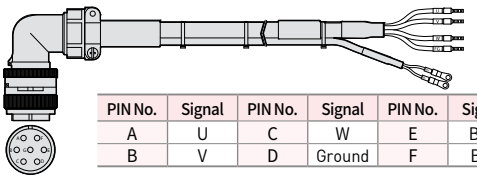
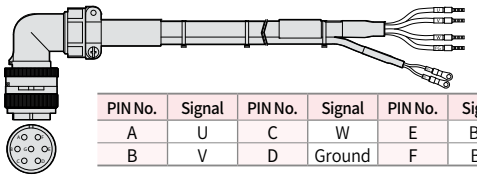
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable E Series	APCS-P□□□ EX-□	iX7NHA□□□U iX7M-A-□□□□B	All Model of iX7NH applied EB EC Series	 PIN No. / Signal: 1 U; 2 V; 3 W; 4 FG **1. Motor Side Connector** • Cap Spec: : SC-MC6S-AJ20-00(Sunchu) • Socket Spec.: FMC2201220(Sunchu) **2. Drive Side Connector** • U, V, W, FG Pin Spec.: 007508 or 0708 • Cable Spec.: 4C×0.5SQ(20AWG) + 2C×0.2SQ(24AWG) or 4Cx0.75SQ(18AWG)+2CX0.12SQ(26AWG)
For Power	Power Cable E Series (Brake Type)	APCS-P□□□ EBX1-□	iX7NHA□□□U iX7M-A-□□□□B	All Model of iX7NH applied EA Series	 PIN No. / Signal: 1 FG; 2 W; 3 V; 4 U; A BK+; B BK- **1. Motor Side Connector** • Cap Spec: : SC-MC6S-AJ20-00(Sunchu) • Socket Spec.: FMC2201220(Sunchu) **2. Drive Side Connector** • U, V, W, FG Pin Spec.: 0208(002508) or 0308 • Cable Spec.: 6C×0.2SQ or 6C×24(25AWG) **3. Brake Power Side Connector** • BKPin Spec.: 1.5×3(Ring Terminal)
For Power	Power Cable E Series (Brake Type)	APCS-P□□□ EBX-□	iX7NHA□□□U iX7M-A-□□□□B	All Model of iX7NH applied EB EC Series	 PIN No. / Signal: 1 U; 2 V; 3 W; 4 FG; A BK+; B BK- **1. Motor Side Connector** • Cap Spec: : SC-MC6S-AJ20-00(Sunchu) • Socket Spec.: FMC2201220, FMC19012220 (Sunchu) **2. Drive Side Connector** • U, V, W, FG Pin Spec.: 007508 or 0708 • Cable Spec.: 4C×0.5SQ(20AWG) + 2C×0.2SQ(24AWG) or 4Cx0.75SQ(18AWG)+2CX0.12SQ(26AWG) **3. Brake Power Side Connector** • BKPin Spec.: 1.5×3(Ring Terminal)

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page
Note 3) In case of □40 50W, □60 100W, pay attention to the power connector protrusion when applying to the front.

Power Cable E Series Motor (iX7NH)

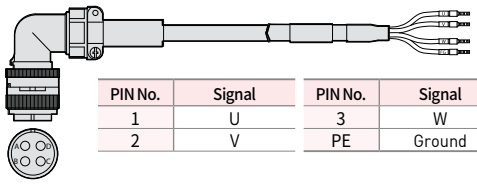
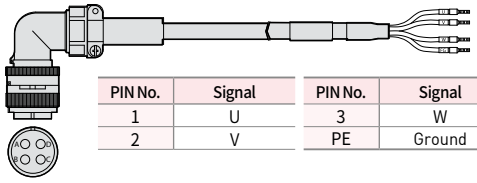
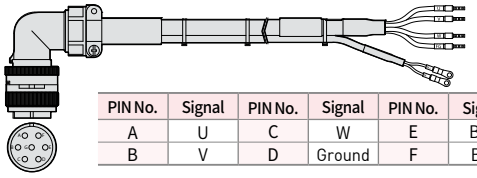
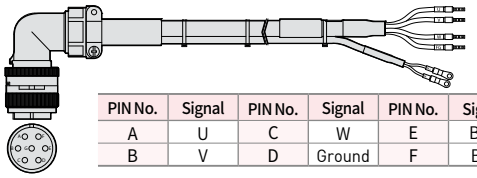
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable E Series (iX7NH)	APCS-P □□□HSX1	iX7NHA□□□U	iX7NH applied EE Series EE09A/EE15A EE06D/EE11D EE03M/EE06M EE09M	 PIN No. / Signal: 1 U, 2 V; PIN No. / Signal: 3 W, PE Ground **1. Motor Side Connector (MS:Military Standard)** • Plug Spec: : MS 3108A 20-4S **2. Drive Side Connector** • U, V, W, Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□HSX	iX7NHA□□□U	iX7NH applied EE Series EE22A/EE30A EE16D/EE22D EE12M	 PIN No. / Signal: 1 U, 2 V; PIN No. / Signal: 3 W, PE Ground **1. Motor Side Connector (MS:Military Standard)** • Plug Spec: : MS 3108A 20-4S **2. Drive Side Connector** • U, V, W, Pin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□NBX1	iX7NHA□□□U	iX7NH applied EE Series EE09A/EE15A EE06D/EE11D EE03M/EE06M EE09M	 PIN No. / Signal / PIN No. / Signal / PIN No. / Signal: A U C W E BK+; B V D Ground F BK- **1. Motor Side Connector(MS:Military Standard)** • Plug Spec: : MS 3108A 20-15S **2. Drive Side Connector** • U, V, W, Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 **3. Brake Side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□NBX	iX7NHA□□□U	iX7NH applied EE Series EE22A/EE30A EE16D/EE22D EE12M	 PIN No. / Signal / PIN No. / Signal / PIN No. / Signal: A U C W E BK+; B V D Ground F BK- **1. Motor Side Connector(MS:Military Standard)** • Plug Spec: : MS 3108A 20-15S **2. Drive Side Connector** • U, V, W, Pin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 **3. Brake Side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Power Cable E Series Motor (iX7NH)

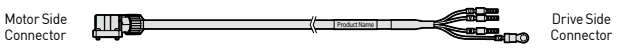
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable E Series (iX7NH)	APCS-P □□□ISX	iX7NHA□□□U	iX7NH applied EF Series EF30A/EF30G EF20M	 PIN No. / Signal: 1 U, 2 V; PIN No. / Signal: 3 W, PE Ground **1. Motor Side Connector (MS:Military Standard)** • Plug Spec: : MS 3108A 22-22S **2. Drive Side Connector** • U, V, W, Pin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□ISX1	iX7NHA□□□U	iX7NH applied EF Series EF20G/EF12M	 PIN No. / Signal: 1 U, 2 V; PIN No. / Signal: 3 W, PE Ground **1. Motor Side Connector (MS:Military Standard)** • Plug Spec: : MS 3108A 22-22S **2. Drive Side Connector** • U, V, W, Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□PBX	iX7NHA□□□U	iX7NH applied EF Series EF30A/EF30G EF20M	 PIN No. / Signal: A U, B V; PIN No. / Signal: C W, D Ground; PIN No. / Signal: E BK+, F BK- **1. Motor Side Connector(MS:Military Standard)** • Plug Spec: : MS 3108A 24-10S **2. Drive Side Connector** • U, V, W, Pin Spec.: F1508 • Cable Spec.: 4Cx1.5SQ or 4Cx15AWG • FG Pin Spec.: F1508 **3. Brake Power Side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.
For Power	Power Cable E Series (iX7NH)	APCS-P □□□PBX1	iX7NHA□□□U	iX7NH applied EF Series EF20G/EF12M	 PIN No. / Signal: A U, B V; PIN No. / Signal: C W, D Ground; PIN No. / Signal: E BK+, F BK- **1. Motor Side Connector(MS:Military Standard)** • Plug Spec: : MS 3108A 24-10S **2. Drive Side Connector** • U, V, W, Pin Spec.: F2508 • Cable Spec.: 4Cx2.5SQ or 4Cx14AWG • FG Pin Spec.: F2508 **3. Brake Power Side Connector** • BK Pin Spec.: 1.5x3(Ring Terminal) • Cable Spec.: 2Cx0.75SQ or 2Cx18AWG ※ Specifications are subject to change without notice.

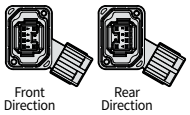
Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

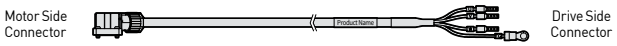
Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

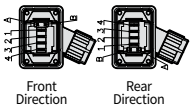
Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

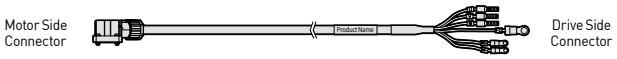
Power Cable E Series Motor (L7)

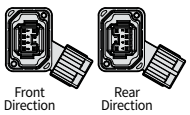
<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Power</td><td>Power Cable E Series</td><td>APCS-P□□□ EL1-□</td><td>L7SA□□□B
L7NHA□□□U
L7PA□□□U</td><td>All Model of EA Series</td><td>




<table>
<tr><th>PIN No.</th><th>Signal</th></tr>
<tr><td>1</td><td>FG</td></tr>
<tr><td>2</td><td>W</td></tr>
<tr><td>3</td><td>V</td></tr>
<tr><td>4</td><td>U</td></tr>
</table>
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AK20-00(Sunchu)
• Socket Spec: : FMC19012220(Sunchu)
2. Drive Side Connector
• U, V, W, FG Pin Spec.: 1.5×4(Ring Terminal)
• Cable Spec.: 6C×0.2SQ or 6C×24(25)AWG
</td></tr>
<tr><td>For Power</td><td>Power Cable E Series</td><td>APCS-P□□□ EL-□</td><td>L7SA□□□B
L7NHA□□□U
L7PA□□□U
L7□□□U</td><td>All Model of EB EC Series</td><td>




<table>
<tr><th>PIN No.</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>FG</td></tr>
</table>
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AJ20-00(Sunchu)
• Socket Spec: : FMC2201220(Sunchu)
2. Drive Side Connector
• U, V, W, FG Pin Spec.: 1.5×4(Ring Terminal)
• Cable Spec.: 4C×0.5SQ(20AWG) + 2C×0.2SQ(24AWG)
or 4Cx0.75SQ(18AWG)+2CX0.12SQ(26AWG)
</td></tr>
<tr><td>For Power</td><td>Power Cable E Series (Brake Type)</td><td>APCS-P□□□ EBL1-□</td><td>L7SA□□□B
L7NHA□□□U
L7PA□□□U
L7□□□U</td><td>All Model of EA Series</td><td>




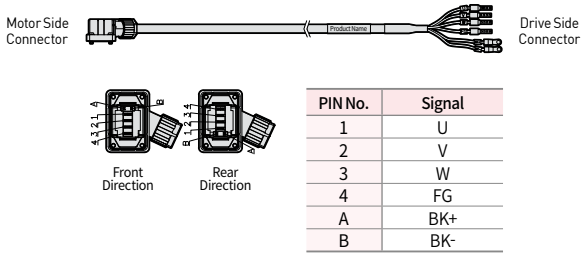
<table>
<tr><th>PIN No.</th><th>Signal</th></tr>
<tr><td>1</td><td>FG</td></tr>
<tr><td>2</td><td>W</td></tr>
<tr><td>3</td><td>V</td></tr>
<tr><td>4</td><td>U</td></tr>
<tr><td>A</td><td>BK+</td></tr>
<tr><td>B</td><td>BK-</td></tr>
</table>
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AK20-00(Sunchu)
• Socket Spec: : FMC19012220(Sunchu)
2. Drive Side Connector
• U, V, W, Pin Spec.: UA-F0212 or 0312
• Cable Spec.: 6C×0.2SQ or 6C×24(25AWG)
3. Brake Power Side Connector
• BK Pin Spec.: 1.5×3(Ring Terminal)
• FG Pin Spec.: 1.5×4
</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page
Note 3) In case of □40 50W, □60 100W, pay attention to the power connector protrusion when applying to the front.

Power Cable E Series Motor (L7)

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable E Series (Brake Type)	APCS-P□□□ EBL-□	L7SA□□□B L7NHA□□□U L7PA□□□U L7□□□U	All Model of E B EC Series	

PIN No.	Signal
1	U
2	V
3	W
4	FG
A	BK+
B	BK-

1. Motor Side Connector
- Cap Spec: : SC-MC6S-AJ20-00(Sunchu)
- Socket Spec: : FMC2201220, FMC19012220(Sunchu)

2. Drive Side Connector
- U, V, W, Pin Spec.: UA-F0512(or 0712) or CE007512
- Cable Spec.: 4C×0.5SQ(20AWG) + 2C×0.2SQ(24AWG) or 4Cx0.75SQ(18AWG)+2CX0.12SQ(26AWG)

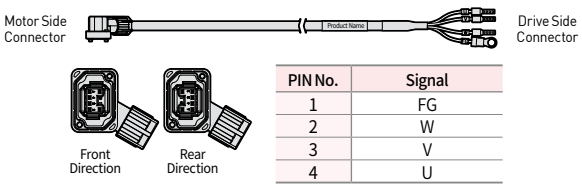
3. Brake Power Side Connector
- BK Pin Spec.: 1.5×3(Ring Terminal)
- FG Pin Spec.: 1.5×4

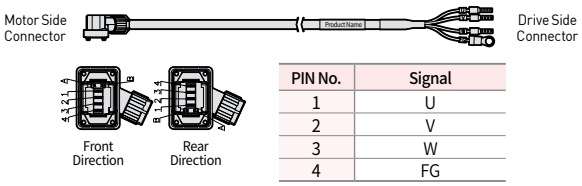
Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

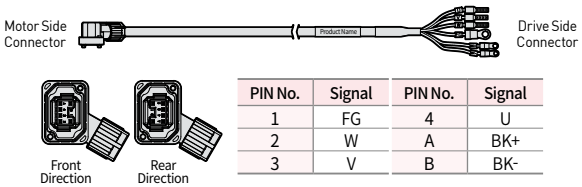
Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

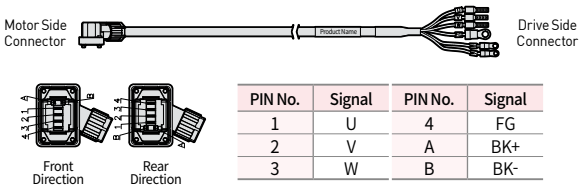
Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page
Note 3) In case of □40 50W, □60 100W, pay attention to the power connector protrusion when applying to the front.

Power Cable E Series Motor (L7C)

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td rowspan="4">For Power</td><td rowspan="2">Power Cable E Series</td><td>APCS-P□□□EC1-□</td><td>L7CA□□□U</td><td>All Model of EA Series</td><td>


PIN No. / Signal: 1 FG; 2 W; 3 V; 4 U
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AK20-00(Sunchu)
• Socket Spec: : FMC19012220(Sunchu)
2. Drive Side Connector
• U, V, W, FG Pin Spec.: CE002506 or CE005006
• Cable Spec.: 6C×0.2SQ or 6C×24(25AWG)
</td></tr>
<tr><td>APCS-P□□□EC-□</td><td>L7CA□□□U</td><td>All Model of EB EC Series</td><td>


PIN No. / Signal: 1 U; 2 V; 3 W; 4 FG
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AJ20-00(Sunchu)
• Socket Spec: : FMC2201220(Sunchu)
2. Drive Side Connector
• U, V, W, FG Pin Spec.: CE005006 or CE007506
• Cable Spec.: 4C×0.5SQ(20AWG) + 2C×0.2SQ(24AWG) or 4Cx0.75SQ(18AWG)+2CX0.12SQ(26AWG)
</td></tr>
<tr><td rowspan="2">Power Cable E Series (Brake Type)</td><td>APCS-P□□□EBC1-□</td><td>L7CA□□□U</td><td>All Model ofE A Series</td><td>


PIN No. / Signal / PIN No. / Signal: 1 FG / 4 U; 2 W / A BK+; 3 V / B BK-
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AK20-00(Sunchu)
• Socket Spec: : FMC19012220(Sunchu)
2. Drive Side Connector
• U, V, W, FG Pin Spec.: CE002506 or CE005006
• Cable Spec.: 6C×0.2SQ or 6C×24(25AWG)
</td></tr>
<tr><td>APCS-P□□□EBC-□</td><td>L7CA□□□U</td><td>All Model of EB EC Series</td><td>


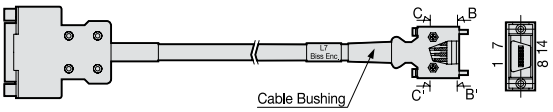
PIN No. / Signal / PIN No. / Signal: 1 U / 4 FG; 2 V / A BK+; 3 W / B BK-
1. Motor Side Connector
• Cap Spec: : SC-MC6S-AJ20-00(Sunchu)
• Socket Spec: : FMC2201220, FMC19012220(Sunchu)
3. Brake Power Side Connector
• BK Pin Spec.: 1.5×3(Ring Terminal)
• FG Pin Spec.: 1.5×4
2. Drive Side Connector
• U, V, W, FG Pin Spec.: CE005006 or CE007506
• Cable Spec.: 4C×0.5SQ(20AWG) + 2C×0.2SQ(24AWG) or 4Cx0.75SQ(18AWG)+2CX0.12SQ(26AWG)
</td></tr>
</table>

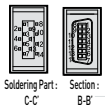
Note1] The three blank squares in model names indicate the type and length of cables. And the designation is as below.

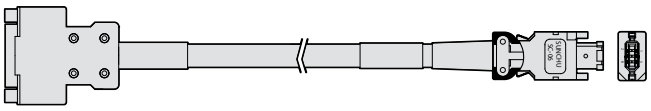
Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

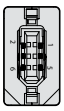
Note2] The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page
Note 3] In case of □40 50W, □60 100W, pay attention to the power connector protrusion when applying to the front.

DD Motor Signal Cable

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td rowspan="2">For Signal</td><td rowspan="2">Encoder Cable</td><td>APCS-E
□□□
ZS</td><td>L7SA□□□B
L7NHA□□□U
L7PA□□□U
L7NHFA□□□U
iX7NHA□□□U</td><td>All Model of DD Motor</td><td>


<table>
<tr><th colspan="4">D.D SERVO ENCODER CABLE</th></tr>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>MA</td><td>9</td><td>+5V</td></tr>
<tr><td>2</td><td>SLO</td><td>10</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>11</td><td>-</td></tr>
<tr><td>4</td><td>OV</td><td>12</td><td>-</td></tr>
<tr><td>5</td><td>SHELD</td><td>13</td><td>-</td></tr>
<tr><td>6</td><td>$\overline{MA}$</td><td>14</td><td>-</td></tr>
<tr><td>7</td><td>$\overline{SLO}$</td><td>15</td><td>-</td></tr>
<tr><td>8</td><td>-</td><td></td><td>-</td></tr>
</table>


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td><td>8</td><td>-</td></tr>
<tr><td>2</td><td>-</td><td>9</td><td>-</td></tr>
<tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr>
<tr><td>4</td><td>$\overline{MA}$</td><td>11</td><td>-</td></tr>
<tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr>
<tr><td>6</td><td>$\overline{SLO}$</td><td>13</td><td>-</td></tr>
<tr><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr>
<tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr>
</table>
1. Motor Side Connector
• CONNECTOR(D-SUB) : DA-15PF-N(Female)
• CONNECTOR CASE(D-SUB) : SK-15H-1A
2. Drive Side Connector
• CASE Spec: 10314-52A0-008(3M)
• CONNECTOR Spec: 10114-3000VE(3M)
• Cable Spec.: 3Px0.2SQ or 3Px24AWG
</td></tr>
<tr><td>APCS-E
□□□
ZM</td><td>iX7M-A-
□□□□B</td><td>All Model of DD Motor</td><td>


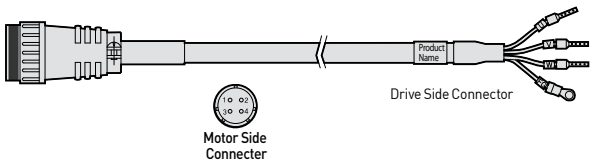
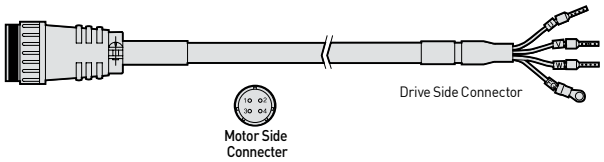
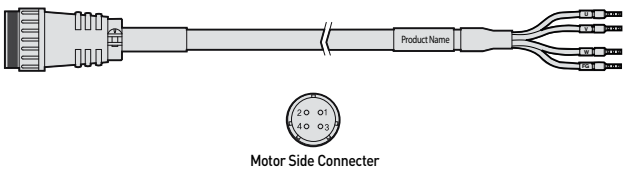

<table>
<tr><th colspan="4">D.D SERVO ENCODER CABLE</th></tr>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>MA</td><td>9</td><td>+5V</td></tr>
<tr><td>2</td><td>SLO</td><td>10</td><td>-</td></tr>
<tr><td>3</td><td>-</td><td>11</td><td>-</td></tr>
<tr><td>4</td><td>OV</td><td>12</td><td>-</td></tr>
<tr><td>5</td><td>SHELD</td><td>13</td><td>-</td></tr>
<tr><td>6</td><td>MA</td><td>14</td><td>-</td></tr>
<tr><td>7</td><td>SLO</td><td>15</td><td>-</td></tr>
<tr><td>8</td><td>-</td><td></td><td>-</td></tr>
</table>

<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>+5V</td><td>4</td><td>$\overline{SLO}$</td></tr>
<tr><td>2</td><td>OV</td><td>5</td><td>$\overline{MA}$</td></tr>
<tr><td>3</td><td>SLO</td><td>6</td><td>$\overline{MA}$</td></tr>
<tr><td colspan="4">Shield Cose SHIELD</td></tr>
</table>
1. Motor Side Connector
• CONNECTOR(D-SUB) : DA-15PF-N(Female)
• CONNECTOR CASE(D-SUB) : SK-15H-1A
2. Drive Side Connector
• CASE Spec: SC-06-4(Sunchu)
• Cable Spec.: 3Px0.2SQ or 3Px24AWG
</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

DD Motor Power Cable

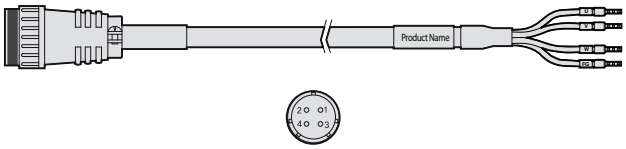
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	L7 Power Cable	APCS-PN □□□YS	L7SA□□□B L7NHA□□□U L7PA□□□U L7NHFA□□□U	DB03D/ DB06D/ DB09D/ DC06D/ DC12D/ DC18D/ DD12D/ DD22D/ DD34D/ DE40D/ DE60D	 **1. Motor Side Connector** • PLUG Spec: NJC-24-4-ADF(Female) **2. Drive Side Connector(U,V,W,FG)** • U, V, W Pin Spec.: 1512 • FG Pin Spec.: 1.5x4(Ring Terminal) • Cable Spec.: 4C×1.5SQ or 4C×16AWG ※ Specifications are subject to change without notice. Item / PIN No. / Signal: Motor 1 U; 2 V; 3 W; 4 Ground
For Power	L7 Power Cable	APCS-PN □□□ZS	L7SA□□□B L7NHA□□□U L7PA□□□U L7NHFA□□□U	DFA1G/ DFA6G/ DGC3S	 **1. Motor Side Connector** • PLUG Spec: NJC-24-4-ADF(Female) **2. Drive Side Connector** • U, V, W Pin Spec.: 2512 • FG Pin Spec.: 2.5x4(Ring Terminal) • Cable Spec.: 4C×1.5SQ or 4C×14AWG ※ Specifications are subject to change without notice. Item / PIN No. / Signal: Motor 1 U; 2 V; 3 W; 4 Ground Drive Side Connector
For Power	iX7 Power Cable	APCS-P □□□ YSX	iX7NHA□□□U iX7M-A- □□□□B	DB03D/ DB06D/ DB09D/ DC06D/ DC12D/ DC18D/ DD12D/ DD22D/ DD34D/ DE40D/ DE60D	 **1. Motor Side Connector** • CONNECTOR : NJC-24-4-ADF(Female) (Nanaboshi Electronic) **2. Drive Side Connector** • U, V, W Pin Spec. : F1508 • FG Pin Spec. : F1508 • Cable Spec. : 4C×1.5SQ or 4C×16AWG ※ Specifications are subject to change without notice. Item / PIN No. / Signal: Motor 1 U; 2 V; 3 W; 4 Ground

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

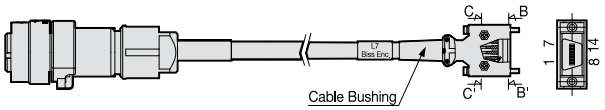
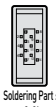
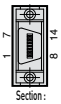
Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

DD Motor Power Cable

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	iX7 Power Cable	APCS-P □□□ ZSX	iX7NHA□□□U iX7M-A-□□□□B	DFA1G/ DFA6G/ DGC3S	 Motor Side Connecter **1. Motor Side Connector** • CONNECTOR : NJC-24-4-ADF(Female) (Nanaboshi Electronic) **2. Drive Side Connector** • U, V, W Pin Spec. : F2508 • FG Pin Spec. : F2508 • Cable Spec. : 4C×2.5SQ or 4C×14AWG ※ Specifications are subject to change without notice.

Item	PIN No.	Signal
Motor	1	U
	2	V
	3	W
	4	Ground

DD Motor Flange Type Signal Cable

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Signal	L7, iX7 Encorder Cable	APCS-E □□□ ZS1	L7SA□□□B L7NHA□□□U L7PA□□□U L7NHFA□□□U iX7NHA□□□U	DFB03D DFC06D DFD12D	  Motor Side Connecter   **1. Motor Side Connector** • CONNECTOR : JN1DS10SL1(JAE) **2. Drive Side Connector** • CONNECTOR CASE : 10314-52A0-008(3M) : SM-14J(Suntone) • CONNECTOR : 10114-3000VE(3M) :SM-14J(Suntone) • Cable Spec. : 3P×0.2SQ or 3P×24AWG

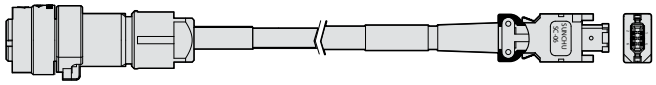
PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	MA	6	$\overline{MA}$
2	SLO	7	$\overline{SLO}$
3	-	8	-
4	0V	9	+5V
5	SHELD	10	-

PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	-	8	-
2	-	9	-
3	MA	10	-
4	$\overline{MA}$	11	-
5	SLO	12	-
6	$\overline{SLO}$	13	-
7	0V	14	+5V
PLATE		SHIELD	

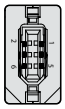
Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Signal	Encorder Cable	APCS-E □□□ ZM1	iX7M-A- □□□□B	DFB03D DFC06D DFD12D	

PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	MA	6	$\overline{MA}$
2	SLO	7	$\overline{SLO}$
3	-	8	-
4	OV	9	+5V
5	SHELD	10	-

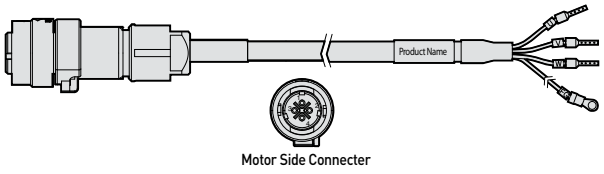


PIN No.	Encoder Signal	PIN No.	Encoder Signal
1	+5V	4	$\overline{SLO}$
2	OV	5	MA
3	SLO	6	$\overline{MA}$
Shield Cose SHIELD			

1. Motor Side Connector
- CONNECTOR : JN1DS10SL1(JAE)

2. Drive Side Connector
- CONNECTOR : JN1DS10SL1(JAE)
- Cable Spec. : 3P×0.2SQ or 3P×24AWG

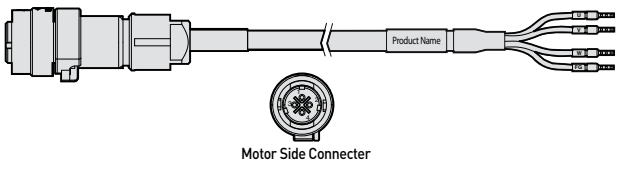
DD Motor Flange Type Power Cable

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	L7 Power Cable	APCS-P □□□ YS1	L7SA□□□B L7NHA□□□U L7PA□□□U L7NHFA□□□U	DFB03D DFC06D DFD12D	

1. Motor Side Connector
- CONNECTOR : JN1DS04FK1(JAE)

2. Drive Side Connector
- U, V, W Pin Spec. : F1512
- FG Pin Spec. : 1.5×4
- Cable Spec. : 4C×0.75SQ or 4C×18AWG

Item	PIN No.	Signal
Motor	1	U
	2	V
	3	W
	4	Ground

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	iX7 Power Cable	APCS-P □□□ YSX1	iX7NHA□□□U iX7M-A- □□□□B	DFB03D DFC06D DFD12D	

1. Motor Side Connector
- CONNECTOR : JN1DS04FK1(JAE)

2. Drive Side Connector
- U, V, W Pin Spec. : 1008 or 010008
- FG Pin Spec. : 1008 or 010008
- Cable Spec. : 4C×0.75SQ or 4C×18AWG

Item	PIN No.	Signal
Motor	1	U
	2	V
	3	W
	4	Ground

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

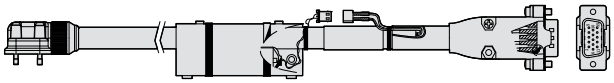
PHOX Series Cable

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name Note1)</th><th>Applicable Drive Note2)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Signal</td><td>Encoder Cable (Single-Turn)</td><td>APCV-E □□□
ES-□</td><td>PHOX Series
PHOX-03/
PHOX-06</td><td>FAL (Low Voltage) Series (All Models of Low Voltage Motors)

FBL (Low Voltage) Series (All Models of Low Voltage Motors)</td><td>


(Front Direction) (Rear Direction)
<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>MA</td></tr>
<tr><td>2</td><td>SLO</td></tr>
<tr><td>3</td><td>-</td></tr>
<tr><td>4</td><td>0V</td></tr>
<tr><td>5</td><td>SHIELD</td></tr>
<tr><td>6</td><td>$\overline{MA}$</td></tr>
<tr><td>7</td><td>$\overline{SLO}$</td></tr>
<tr><td>8</td><td>-</td></tr>
<tr><td>9</td><td>+5V</td></tr>
</table>
(Motor Connector)

<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td><td>9</td><td>-</td></tr>
<tr><td>2</td><td>-</td><td>10</td><td>-</td></tr>
<tr><td>3</td><td>0V</td><td>11</td><td>$\overline{MA}$</td></tr>
<tr><td>4</td><td>-</td><td>12</td><td>MA</td></tr>
<tr><td>5</td><td>5V</td><td>13</td><td>-</td></tr>
<tr><td>6</td><td>-</td><td>14</td><td>-</td></tr>
<tr><td>7</td><td>$\overline{SLO}$</td><td>15</td><td>-</td></tr>
<tr><td>8</td><td>SLO</td><td>Plate</td><td>SHIELD</td></tr>
</table>
(Driver Connector)
1. Motor Side Connector
• CAP Spec: 2201825-1(Tyco)
• SOCKET Spec: 2174065-4(Tyco)
2. Drive Side Connector
• CASE Spec: 5748676-1(Tyco)
• CONNECTOR Spec: 10090769-P154ALF(Amphenol FCI)
• Cable Spec.: 3Px0.2SQ or 3Px24AWG
</td></tr>
<tr><td>For Signal</td><td>Encoder Cable (Multi-Turn)</td><td>APCV-E □□□
ES1-□</td><td>PHOX Series
PHOX-03/
PHOX-06</td><td>FAL (Low Voltage) Series (All Models of Low Voltage Motors)

FBL (Low Voltage) Series (All Models of Low Voltage Motors)</td><td>


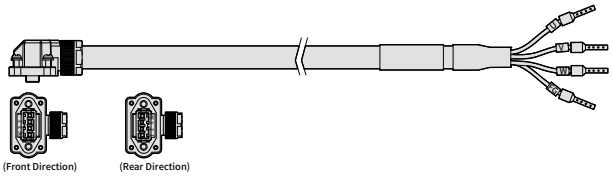
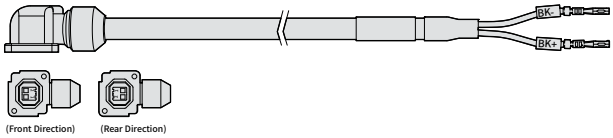
(Front Direction) (Rear Direction)
<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>BATTERY (VDD_B)</td></tr>
<tr><td>2</td><td>BATTERY 0V (GND_B)</td></tr>
</table>
(Battery Connector)
<table>
<tr><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>MA</td></tr>
<tr><td>2</td><td>SLO</td></tr>
<tr><td>3</td><td>GND_B</td></tr>
<tr><td>4</td><td>0V</td></tr>
<tr><td>5</td><td>SHIELD</td></tr>
<tr><td>6</td><td>$\overline{MA}$</td></tr>
<tr><td>7</td><td>$\overline{SLO}$</td></tr>
<tr><td>8</td><td>VDD_B</td></tr>
<tr><td>9</td><td>+5V</td></tr>
</table>
(Motor Connector)

<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>-</td><td>9</td><td>-</td></tr>
<tr><td>2</td><td>-</td><td>10</td><td>-</td></tr>
<tr><td>3</td><td>0V</td><td>11</td><td>$\overline{MA}$</td></tr>
<tr><td>4</td><td>-</td><td>12</td><td>MA</td></tr>
<tr><td>5</td><td>5V</td><td>13</td><td>-</td></tr>
<tr><td>6</td><td>-</td><td>14</td><td>-</td></tr>
<tr><td>7</td><td>$\overline{SLO}$</td><td>15</td><td>-</td></tr>
<tr><td>8</td><td>SLO</td><td>Plate</td><td>SHIELD</td></tr>
</table>
(Driver Connector)
1. Motor Side Connector
• CAP Spec: 2201825-1(Tyco)
• SOCKET Spec: 2174065-4(Tyco)
2. Drive Side Connector
• CASE Spec: 5748676-1(Tyco)
• CONNECTOR Spec: 10090769-P154ALF(Amphenol FCI)
• Cable Spec.: 4Px0.2SQ or 4Px24AWG
• BATTERY CONNECTOR Spec: 5267-02A(MOLEX)
</td></tr>
</table>

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.
In case a model name contains a single blank square, the connector can draw towards both front(load) and rear(half-load). (Front Type: no markings, Rear Type: marked -R)
The FAL Type can only draw towards front.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

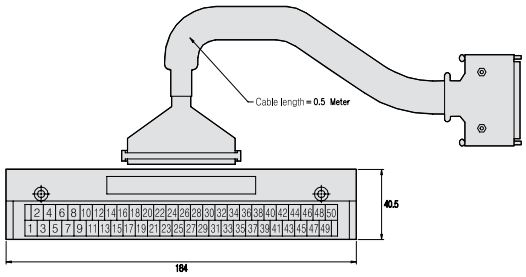
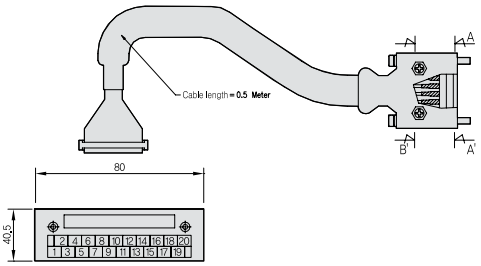
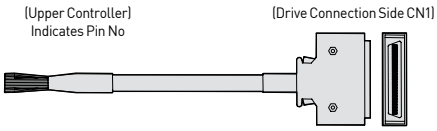
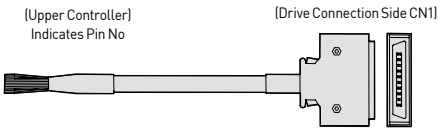
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Applicable Motor	Specifications
For Power	Power Cable	APCV-P □□□LS -□	PHOX Series PHOX-03/ PHOX-06	FAL (Low Voltage) Series (All Models of Low Voltage Motors) FBL (Low Voltage) Series (All Models of Low Voltage Motors)	 **1. Motor Side Connector** • CAP Spec: SM-JN8FT04N(Suntone) • SOCKET Spec: SMS-201(Suntone) **2. Drive Side Connector** • U, V, W Pin Spec: F1506 • FG Pin Spec: F1506 • Cable Spec.: 4Cx0.75SQ or 4Cx18AWG PIN No. / Signal: 1 U; 2 V; 3 W; PE Ground
For Power	Brake Cable	APCV-B □□□QS	PHOX Series PHOX-03/ PHOX-06	FAL (Low Voltage) Series (All Models of Low Voltage Motors) FBL (Low Voltage) Series (All Models of Low Voltage Motors)	 **1. Motor Side Connector** • CAP Spec: KN5FT02SJ1(JAE) • SOCKET Spec: ST-KN-S-C1B-3500(JAE) **2. Drive Side Connector** • Connecting Terminal Spec.: CC79X-2024-01-X • Cable Spec.: 2Cx0.5SQ or 2Cx20AWG PIN No. / Signal: 1 +; 2 -

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	1	2	3	...	18	19	20
General Cable	N01	N02	N03	...	N18	N19	N20
Robotic Cable	F01	F02	F03	...	F18	F19	F20

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Signal Cable

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Specifications
T/B	CN1 T/B	APC-VSCN1T-□□	L7S□□□□B L7P□□□□U L7CA□□□U	 • CN1 T/B extended model for Pulse Type Drive • Available Cable Length: 0.5[m], 1[m], 1.5[m], 2[m], 3[m]
	CN1 T/B	APCS-L7NCN1T-□□	L7NH□□□U iX7NH□□□U	 • CN1 T/B extended model for EtherCAT Drive • Available Cable Length: 0.5[m], 1[m], 1.5[m], 2[m]
For Signal	CN1 Cable	APC-CN1-□□A	L7S□□□□B L7P□□□□U L7CA□□□U	 **Drive Side Connection(CN1)** • CASE Spec. : 10350-52A0-008(3M) • CONNECTOR Spec. : 10150-3000VE(3M) • CABLE Spec. : 20276-SB 25P(AWG28)
For Signal	CN1 Cable	APCS-CN1-□□A	L7NH SERIES iX7NHA□□□U	 **Drive Side Connection(CN1)** • CASE Spec. : 10320-52A0-008(3M) • CONNECTOR Spec. : 10120-3000VE(3M) • CABLE Spec. : ROW-SB0.1C×20C(AWG28)

Note1) The three blank squares in model names indicate the type and length of cables. And the designation is as below.

Cable Length(m)	3	5	10	20
General Cable(N)	N03	N05	N10	N20
Robotic Cable(F)	F03	F05	F10	F20

APC-VSCN1T

Cable Length(m)	0.5	1	1.5	2	3
Designation	None	01	015	02	03

APCS-L7NCN1T

Cable Length(m)	0.5	1	1.5	2
Designation	None	01	015	02

Note2) The three blank squares in model names indicate drive capacity. For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

L7C CN1 Pin Map

L7S/L7C

NO	PIN Function	NO	PIN Function	NO	PIN Function	NO	PIN Function	NO	PIN Function
1	TRQCOM	11	PR+	21	SPD3	31	/BO	41	RDY
2		12	PR-	22	SPD2	32	AO	42	
3		13		23	SPD1	33	/AO	43	ZSPD
4	ZO	14	ALO2	24	GND24	34	+12VA	44	BRAKE
5	/ZO	15	ALO1	25	GND24	35	-12VA	45	INPOS
6		16	ALO0	26		36	SG	46	DIR
7		17	ALMRST	27	SPDCOM	37	GND	47	SVON
8	GND	18	EMG	28	MINIY1	38	ALARM+	48	STOP
9	PF+	19	CWLIM	29	MINIY2	39	ALARM-	49	PULCOM
10	PF-	20	CCWLIM	30	BO	40	RDY+	50	+24V IN

L7P

NO	PIN Function	NO	PIN Function	NO	PIN Function	NO	PIN Function	NO	PIN Function
1	AO	11	+24V IN	21	+24V IN	31	PF+	41	INPOS1+
2	/AO	12	SVON	22	HOME	32	PF-	42	INPOS1-
3	BO	13	POT	23	H-START	33	PR+	43	ORG+
4	/BO	14	NOT	24	ISEL0	34	PR-	44	ORG-
5	ZO	15	A-RST	25	ISEL1	35	ALARM+	45	EOS+
6	/ZO	16	START	26	ISEL2	36	ALARM-	46	EOS-
7	A-TLMT	17	STOP	27	ISEL3	37	RDY+	47	TGON+
8	AGND	18	REGT	28	ISEL4	38	RDY-	48	TGON-
9	A-OVR	19	EMG	29	ISEL5	39	BRAKE+	49	TLMT+
10	AGND	20		30	PULCOM	40	BRAKE-	50	TLMT-

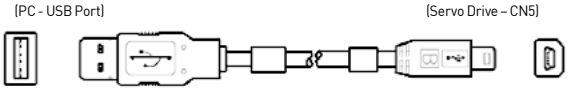
L7NH

NO	PIN Function	NO	PIN Function
1	BRAKE+	11	POT
2	BRAKE-	12	NOT
3	RDY+	13	PCON
4	RDY-	14	GAIN2
5	AGND	15	A-TLMT
6	+24V IN	16	
7	HOME	17	ALARM+
8	STOP	18	ALARM-
9	PCL	19	ZSPD+
10	NCL	20	ZSPD-

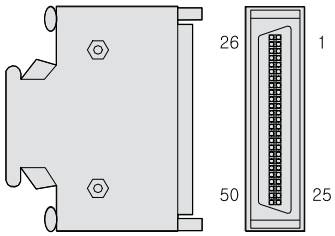
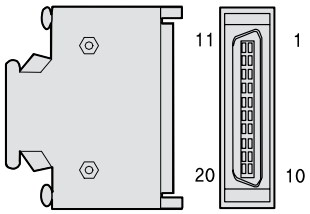
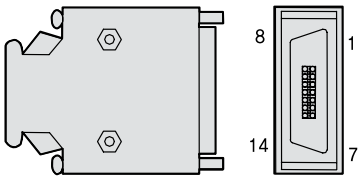
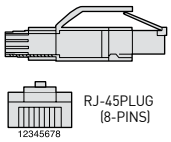
iX7NH

NO	PIN Function	NO	PIN Function
1	BRAKE	11	POT
2	DOCOM	12	NOT
3	ALARM	13	PCON
4	READY	14	GAIN2
5	AGND	15	A-TLMT
6	+24V IN	16	GND
7	HOME	17	ZO
8	STOP	18	/ZO
9	AO	19	BO
10	/AO	20	/BO

Signal Cable / Connector

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Specifications
For Signal	Communication Cable	APCS-CN5L7U	All Models of iX7NH, L7 Series, PEGA Series, PH0X Series	 • PC Side Connector : USB A Plug • Drive Side Connector(CN5) : Mini USB 5P Plug • Electric Requirements Spec : Double Shielded, Twisted Pair, EMI-filter attached type (Ex. : KU-AMB518, SANWA) • Only 1.8m length of cable is available to use

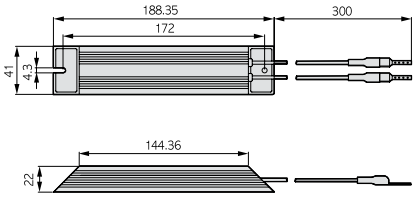
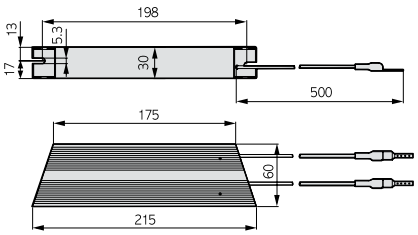
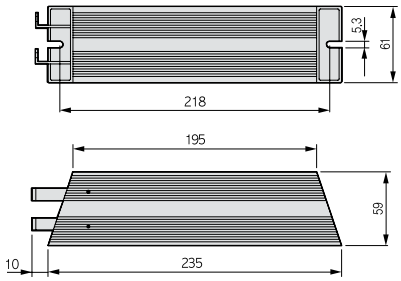
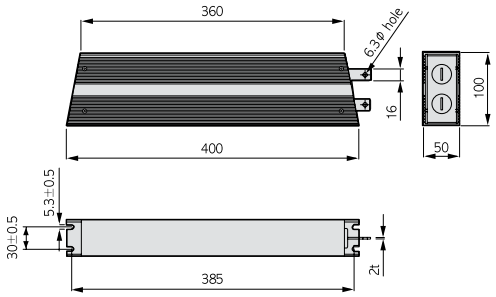
Options (Connectors)

Type	Product Type	Model Name	Applicable Drive Note1)	Specifications
CN	CN1 Connector	APC-CN1NNA	L7S□□□B L7CA□□□U L7PA□□□U	 • CASE Spec. : 10350-52A0-008(3M) • CONNECTOR Spec. : 10150-3000VE(3M)
CN	CN1 Connector	APC-CN2NNA	L7NH□□□U iX7NHA□□□U	 • CASE Spec. : 10320-52A0-008(3M) • CONNECTOR Spec. : 10120-3000VE(3M)
CN	CN2 Connector	APC-CN3NNA	iX7NH SERIES L7 SERIES 전 모델	 • CASE Spec. : 10314-52A0-008(3M) • CONNECTOR Spec. : 10114-3000VE(3M)
CN	CN3 CN4 EtherCAT Connector	APCS-CN4NNA	L7NH□□□U L7NHF□□□U iX7NHA□□□U iX7M- A□□□□B	 * EtherCAT use only 4 Signal(1, 2, 3, 6) PIN No. / Signal / Line Color 1 / TX/RX0 Plus / White/Orange 2 / TX/RX0 Minus / Orange 3 / TX/RX1 Plus / White/Green 4 / TX/RX2 Plus / Blue 5 / TX/RX2 Minus / White/Blue 6 / TX/RX1 Minus / Green 7 / TX/RX3 Plus / White/Brown 8 / TX/RX3 Minus / Brown PLATE / SHIELD
CN	CN6 Connector	APCS-CN6K	L7NH□□□U iX7NHA□□□U iX7M- A□□□□B	 Pin No.  Wiring Schematic • MINI I/O By-pass Connector : 1971153(TE)

Note1) The former blank square in model names indicates drive type, and the latter indicates encoder type.
For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

200V Braking Resistor

*Optional braking resistors are selectable items for user's need.

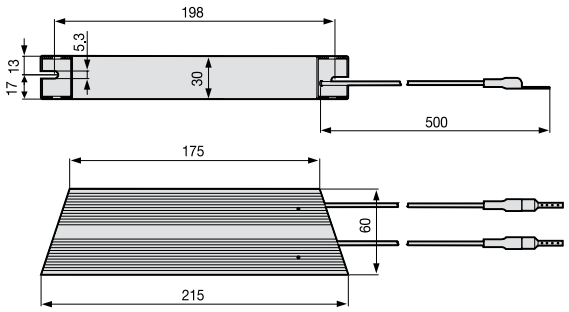
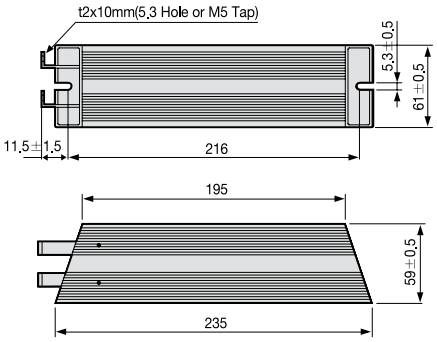
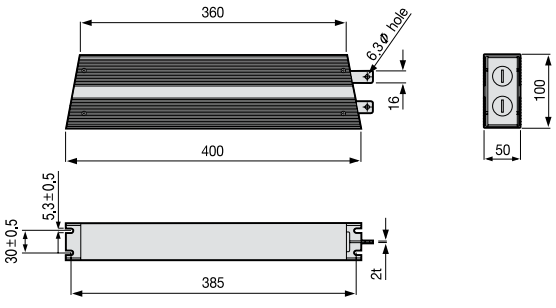
Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Specifications
Resistor	Braking Resistor	APCS-140R50 (50Ω/140W)	L7□A001□ L7□A002□ L7□A004□ iX7□A001□ iX7□A002□ iX7□A004□ iX7M-A-22XXB iX7M-A-44XXB iX7M-A-222XB iX7M-A-2222B	 • IRH140-50Ω
Resistor	Braking Resistor	APCS-300R30 (30Ω/300W)	L7□A008□ L7□A010□ iX7□A008□ iX7□A010□ iX7M-A-88XXB iX7M-A-AAXXB iX7M-A-444XB iX7M-A-4444B	 • IRV300-30Ω
Resistor	Braking Resistor	APC-600R30 ×2P(Parallel) (30Ω/600W ×2P(Parallel) =15Ω/1200W)	L7□A020□ iX7□A020□	 • IRV600-30Ω • IRV600-28Ω Note) IRV600-30Ω and IRV600-28Ω have the same external dimensions.
		APC-600R30 ×3P(Parallel) (30Ω/600W ×3P(Parallel) =10Ω/1800W)	L7□A035□ iX7□A035□	
		APC-600R28 ×4P(Parallel) (28Ω/600W ×4P(Parallel) =7Ω/2400W)	L7□A050□ L7□A075□	
Resistor	Braking Resistor	APCS-2000R3R3 (3.3Ω/2000W)	L7□A150□	 • IRM2000-3.3Ω

Note1) Products in the L7 Series(100W to 7.5kW) are internally equipped with the same braking resistor.
If your device is prone to regeneration, please refer to the table above and select the appropriate optional braking resistor.

Note2) The former blank square in model names indicates drive type, and the latter indicates encoder type.
For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

400V Braking Resistor

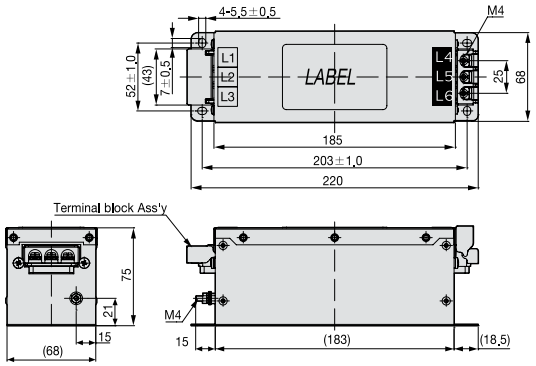
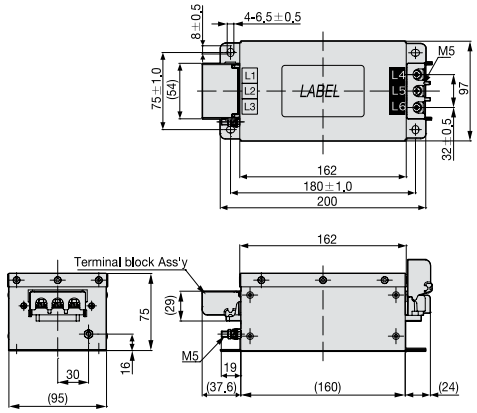
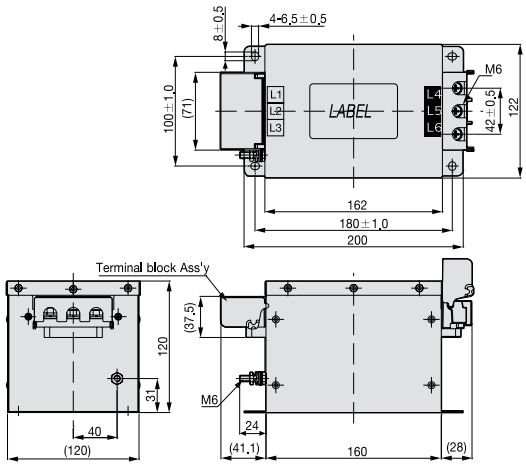
*Optional braking resistors are selectable items for user's need.

Type	Product Type	Model Name Note1)	Applicable Drive Note2)	Specifications
Resistor	Braking Resistor	APCS-300R82 (82Ω/300W)	L7□B010□	 • IRV300-82Ω
Resistor	Braking Resistor	APCS-600R75 ×2P(Parallel) (75Ω/600W ×2P(Parallel) =37.5Ω/1200W)	L7□B020□ L7□B035□	 • IRV600-75Ω
Resistor	Braking Resistor	APCS-600R75 ×3P(Parallel) (75Ω/600W ×3P(Parallel) =25Ω/1800W)	L7□B050□ L7□B075□	
Resistor	Braking Resistor	APCS-2000R13R4 (13.4Ω/2000W)	L7□B150□	 • IRM2000-13.4Ω

Note1) Products in the L7 Series(100W to 7.5kW) are internally equipped with the same braking resistor.
If your device is prone to regeneration, please refer to the table above and select the appropriate optional braking resistor.

Note2) The former blank square in model names indicates drive type, and the latter indicates encoder type.
For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

Noise Filter

Type	Product Type	Model Name	Applicable Drive[Note2]	Specifications
Resistor	Noise Filter	APCS-TB6-B010LBEI	L7□A001□ L7□A002□ L7□A004□ L7□A008□ L7□A010□ L7□B010□ iX7□A001□ iX7□A002□ iX7□A004□ iX7□A008□ iX7□A010□ iX7M-A-22XXB iX7M-A-44XXB iX7M-A-222XB iX7M-A-2222B	
		APCS-TB6-B020NBDC	L7□B020□ L7□B035□ iX7M-A-88XXB iX7M-A-AAXXB iX7M-A-444XB iX7M-A-4444B	
		APCS-TB6-B030NBDC	L7□A020□ L7□A035□ L7□B050□ iX7□A020□ iX7□A035□	
		APCS-TB6-B040AS	L7□A050□ L7□B075□	
		APCS-TB6-B060LAS	L7□A075□ L7□B150□	
		APCS-TB6-B080LAS	L7□A150□	

Note2] The former blank square in model names indicates drive type, and the latter indicates encoder type.
For details regarding the designation, please refer to pages 16 / 22 / 28 / 38 / 44 / 54 / 58/ 66 / 72page

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Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

- According to The WEEE Directive, please do not discard the device with your household waste.

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