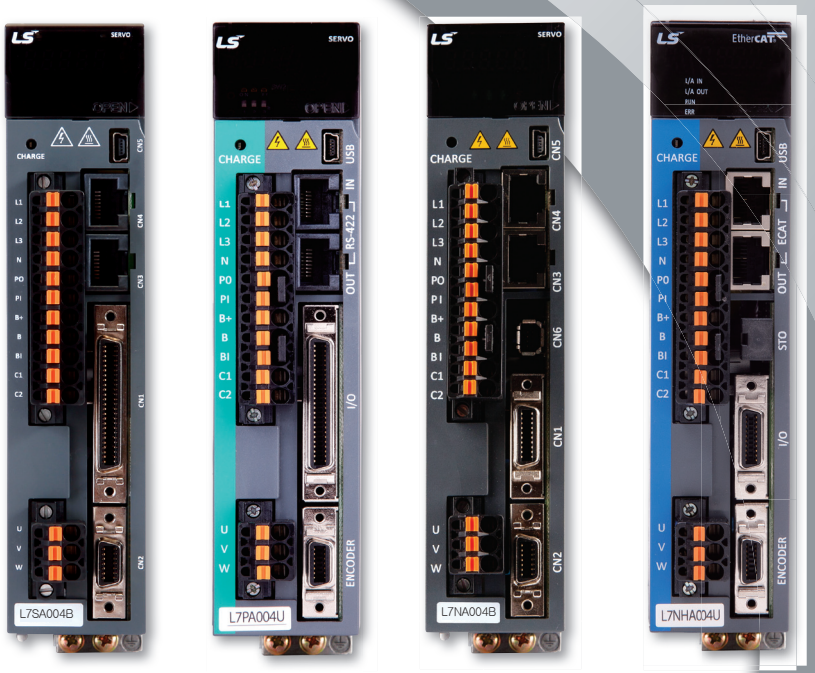
Moving towards tomorrow

LS MECAPION

L7 Series

Game Must Be Changed !



LS Mecapion

Products Collection **Vol. 1.1**

L7 Drive

Designing your future with

LS Mecapion L7 Series.

Your reasonable selection for total solution

The wide range of LS Mecapion line up will satisfy your requirements for the motion system through optimal application and use of the products. With the excellent functionality, high precision and high-speed control, LS Mecapion AC servo system is customer-friendly and cost-effective.

Moving towards tomorrow

The Best Automation **Brand** in Korea

The World Class Leader in Automation System

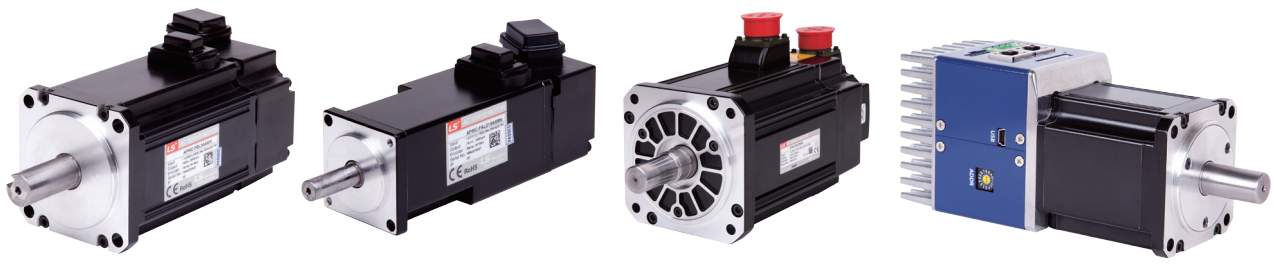
LS Mecapion has supplied not only the servo drives and servo motors of high quality and high efficiency but also rotary encoders and actuators for the Korean and Global Industries for the past 20 years.

We are making efforts to provide a variety of products to our customers all over the world to satisfy their requirements. We have provided cutting-edge technologies that consider the needs of our customers by adopting the best functionality as well as innovative ideas.

We have accumulated a deep and wide range of experiences in the field of the control system for years and are venturing into new possibilities to provide the technologies of a higher level to our customers.

We hope that you don't miss the opportunity to use the proven, **world-class products** from **LS Mecapion** to improve the performance and value of your equipment.

We hope that we can provide the best services and partnerships for our customers by utilizing our expertise and technologies.



L7 SERIES SYSTEM

Features of L7 Drive

Compact Size

Capacity	400W (44% Down Size)			1kW (46% Down Size)			3.5kw (62% Down Size)		
Series	L7	VS	Competitor	L7	VS	Competitor	L7	VS	Competitor
L [mm]	38	80	40	58	88	60	88	137	90
W [mm]	169	187	168	169	210	168	169	256	168
H [mm]	173	132	170	198	195	195	198	225	195

Compared with VS (Slim up to 52% More) Compared with a representative competitor (Slim up to 5% More)

Ultra-thin 38 mm width (400 W)

Its small footprint allows flexible installation, reducing the size of the equipment.

■ 400W

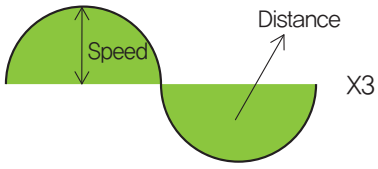
■ 1kW

■ 3.5kW

Easy to USE

● The automatic inertia detection function for easier gain adjustment.

- Fast and accurate inertia detection
- Off-line tuning
- Parameters for inertia detection (speed and distance) provided



● Encoder based on two-way high-speed serial communication

- Automatic recognition for motors and encoders
- BiSS protocol
- Wire-saving system (7-line) for encoder, resistant to noise

BiSS INTERFACE

● Support for various motors and encoders [L7NH and L7P Series]

- Support for standard BiSS encoders as well as other encoders

Motor	Encoder
Rotary	Quadrature / BiSS Interface Tamagawa serial absolute EnDat 2.2 / Resolver
DD	
Linear	

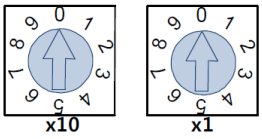
Features of L7 Drive

● Sufficient input/output contacts and various functions

- L7S: Digital input contacts: 10, output contacts: 8 / Analog input contacts: 2 and output contacts: 2
- L7N: Digital input contacts: 6, output contacts: 4 / Analog input contacts: 2 and output contacts: 2
- L7NH: Digital input contacts: 8, output contacts: 4 / Analog input contacts: 1 and output contacts: 2
- 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)

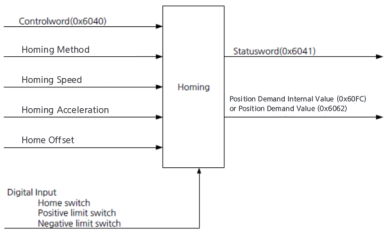
● Using the rotary switch to configure the drive node address [L7NH, L7P, and PEGASUS]

- Using the rotary switch to configure the drive node address conveniently
- L7NH: 0–99, L7P: 0–31, PEGASUS: 0–15



● Various homing functions [L7NH, L7P, and PEGASUS]

- The drive provides the homing function.
- You can specify the speed, acceleration, offset, and homing method.

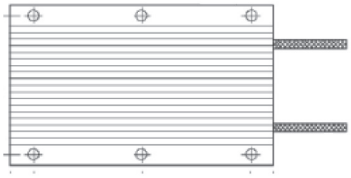


● Easy firmware upgrade [L7NH, L7P, and PEGASUS]

- Supporting the USB OTG function to allow firmware download with a USB memory
- Useful where space is limited or environmentally unfavorable

● Built-in regenerative braking resistance in the drive

- Drive installed inside to improve user convenience (100 W – 3.5 kW)
- Providing the connection for external installation
- Enhanced protection algorithm



● Plug-in type power connector

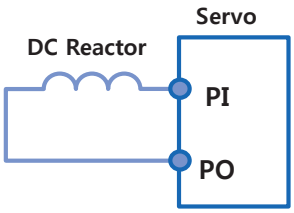
- Expanded to 100 W – 3.5 kW for improved wiring convenience

Features of L7 Drive

Reliability

- **Main capacitor quality improved**
  - Long-life type capacitor applied (2.5 times 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 the detection of the control power turn-off**

- **CE certification and RoHS certification**

- **Enhanced protection function**
  - Triple protection function for the protection of power module
  - Detection of the main power phase loss
  - Temperature sensor installed in the drive and motor for the prevention of overheat
  - Alarm code grouping and dedicated output contacts (ALO0, ALO1, ALO2)
  - Warning function (Digital output WARN)

High Performance

- **Serial encoder of high resolution (19 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 [L7NH, L7P, and PEGASUS]**
  - FPU (Floating Point Unit) for reliable precision calculation
  - 16 kHz switching frequency for precision current control
  - 32 bit operation for increased synchronous command processing rate (MIPS)

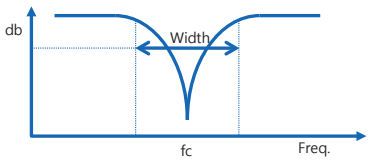
- **Dedicated PC program**
  - L7S, and L7N: LIVE-I.C.E / L7NH, L7P, and PEGASUS: Drive CM
  - PC program for shortened equipment tuning time and debugging
  - Monitoring for speed, torque, current feedback, position values and positional error values and alarm occurrence time

Features of L7 Drive

Intelligent Control

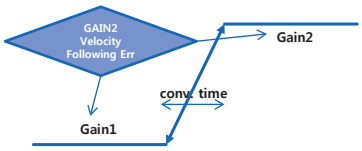
● Notch filter for resonance suppression

- 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



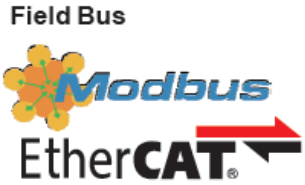
● Various dynamic brake control modes

- Configuring the operation mode at stop and after stop

Network Based - EtherCAT Network Type

● A wide range of products

- L7N: EtherCAT communication command type
- L7NH: All-in-one EtherCAT communication command type
- PEGASUS: Motor drive-integrated EtherCAT communication command type



● High performance

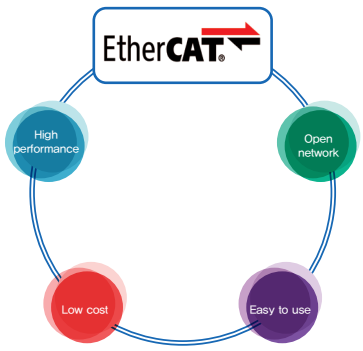
- Synchronization mechanism of high speed, high accuracy, and real-time communication
- Various Gain1 ↔ Gain2 switching modes

● Open network

- An international standard network with 1,600 members over the world

● Low cost

- Standard Ethernet connector and cabling supported and slave-master implemented at a low cost



● Easy to use

- Various topology types supported and easy diagnosis for devices

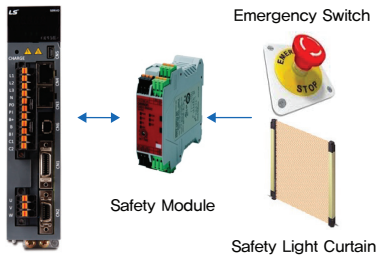
● L7 drive with a built-in EtherCAT interface

- 100BASE-TX (100 Mbps) real-time communication
- CiA402 (IEC61800-7) drive profile supported
- Connection with various masters and slaves
- Up to 100 m connection between nodes
- Precision synchronization mechanism of 1 us or less

Features of L7 Drive

● Various operation modes

- L7N: Using the EtherCAT communication to support Cyclic (P/S/T) and Profile (P/S/T) modes
- L7NH and PEGASUS: Using the 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 involvement of the drive CPU and FPGA (ASIC); international standards adopted (IEC61508))

● Flexible I/O setup

- Mapping and level (A/B) setup by parameters

● High-speed position capture

- Touch probe function (PROBE1 and PROBE2)

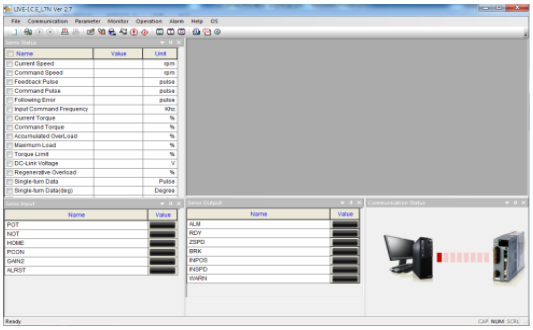
● Adjustment function linked with XGT series from LSIS

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

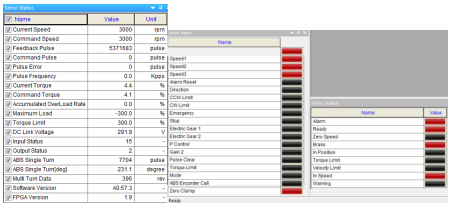
● EtherCAT drive compatibility

- Verified by CTT (Conformance Test Tool)

Servo Setup Software

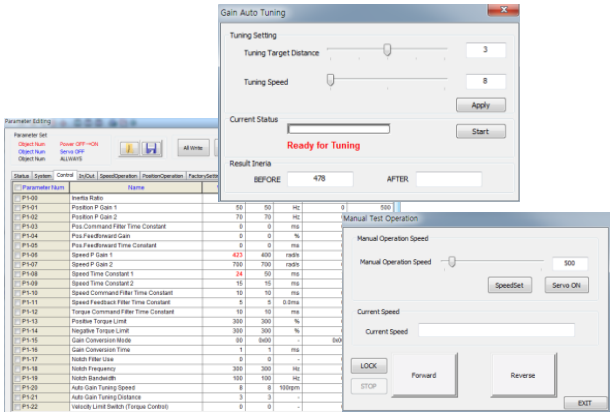


Software dedicated for Live-ICE / L7S and L7N Series



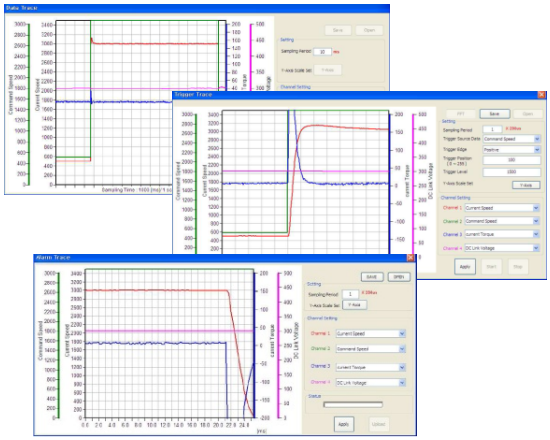
Monitoring function

- Monitoring for I/O input contact and I/O output contact
- Driving Information monitoring: Monitoring and displaying the parameter values
- Communication connection monitoring : Displaying the current communication connection status using animation in real time



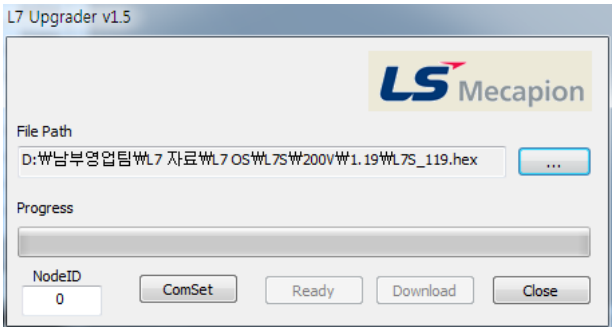
Setup function

- Using the PC to read and write parameters
- Manual JOG function: Manual jog speed adjustment and forward/reverse test
- Automatic gain tuning
- Alarm history and alarm reset



Graph function

- Data Trace: Graphic presentation of pre-defined channels in real time
- Trigger Monitoring: Graphic presentation by the channel and trigger settings
- Alarm Trace: Graphic presentation of alarm history for channels

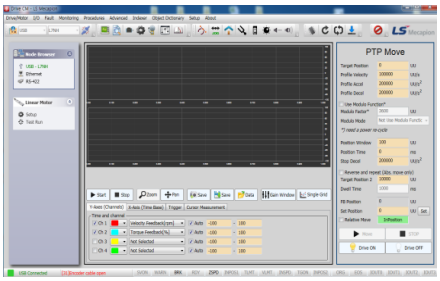


Download software

- OS Download: Firmware version upgrade software

L7 SERIES SYSTEM

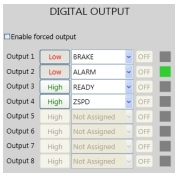
Servo Setup Software

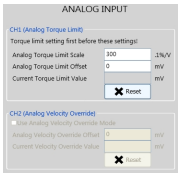


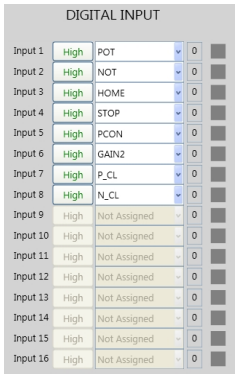
Software dedicated for Drive CM / L7NH, L7P, and PEGASUS Series

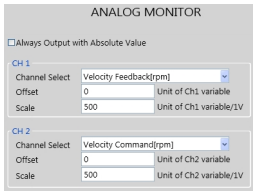
I/O CONFIG

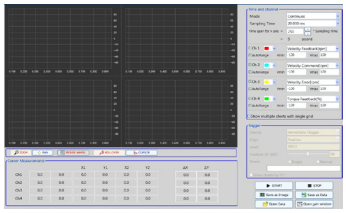
- Setting the output function and its signal level for I/O input contacts and I/O output signal pins
- Limiting the analog input torque and using the analogue voltage to override the speed
- Analog monitoring output for the gain tuning or internal state variables of the drive

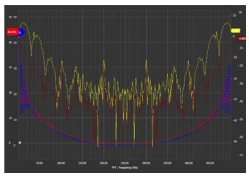


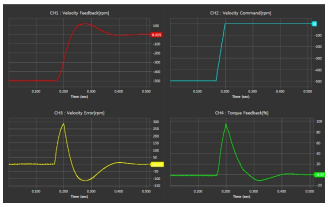










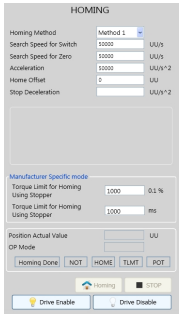


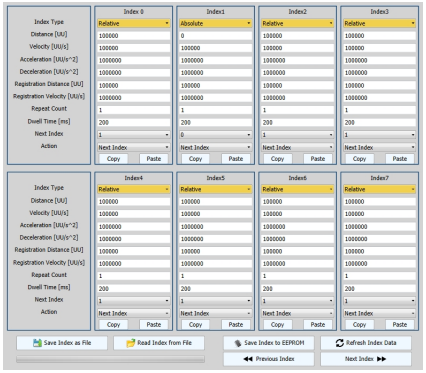
Monitoring function

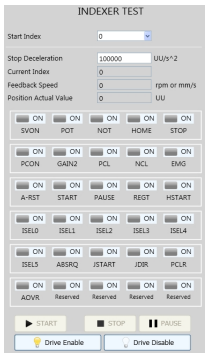
- Implementation of 4-channel tracer or trigger monitor
- Performing various operations, including Manual Jog, Program Jog, PTP Move, etc., and monitoring the operation state
- Monitoring Zoom or Pan / Mouse Wheel / Rollover or Cursor

Setup function

- Configuring the data structure including parameters, state variables, commands, etc. inside the drive
- Using Manual Jog and Program Jog to carry out the test
- Using Offline Auto Tuning for one-touch adjustment
- Customer convenience functions such as PTP movement, homing, and touch probe







Indexer setup [L7P only]

- Using Index Edit to enter/configure the index parameters
- Using Indexer Test to configure the operation and provide testing function

INDEX

Servo Drive

Servo Motor

Options

Integrated Servo System

L7 SERIES SYSTEM

Contents

■ Servo Drive

General Pulse Type, Analog Command Type

L7S Series

Servo Drive Designation

L7	S	A	004	B	AA
Model Name	Communication	Input Power Supply	Capacity	Encoder Type	Option
Servo Series	S : Standard I/O Type	A : 200VAC	001 : 100W	A : Quadrature (Pulse Type)	Exclusive Option Code
		B : 400VAC	002 : 200W	B : Serial (Communication Type)	
			004 : 400W		
			008 : 750W		
			010 : 1.0kW		
			020 : 2.0kW		
			035 : 3.5kW		
			050 : 5.0kW		
			075 : 7.5kW		
			150 : 15.0kW		

* Range
- 200V : 0.1KW~5.0KW
- 400V : 1.0KW~15KW

L7S Series

Characteristic

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

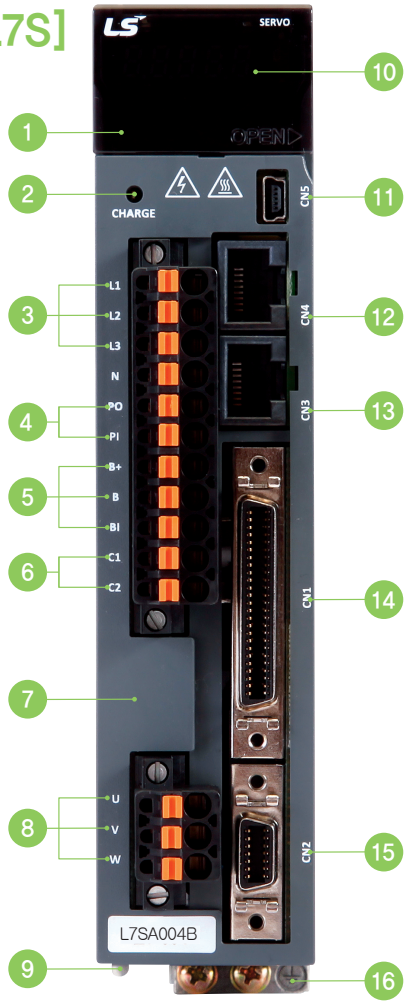
- CE, RoHS Certificated
- Drive Protection Function and Warning Function

High Response for Precision Control

- High Resolutions Serial type Encoder(19Bit, BiSS)
- Improved Speed Response(≒1Khz) Frequency

Identifying the Part of L7S

[L7S]



1. Operation keys (Mode, Up, Down, Set)
2. Charge Lamp
3. Main Power Connector (L1, L2, L3)
4. DC Reactor Connector(PO, PI)
   - Short-Circuit when not used
5. Regenerative resistance connector (B+, B, BI)
   - Short-Circuit B, BI terminals when standard type
   - Use B+, 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

L7S Drive Combination Table

L7SA Incremental Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder Cable	Power Cable		
					Quadrature Type	INC	For power	Power + Brake	Brake
3,000	5,000	□40	SAR3A	L7SA001A	2,048 P/R	APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□KB
		□40	SAR5A	L7SA001A					
		□40	SA01A	L7SA001A					
		□40	SA015A	L7SA002A					
		□60	SB01A	L7SA002A	3,000 P/R				
		□60	SB02A	L7SA002A					
		□60	SB04A	L7SA004A					
		□80	SC04A	L7SA004A					
		□80	SC06A	L7SA008A					
		□80	SC08A	L7SA008A					
		□80	SC10A	L7SA010A					
		□130	SE09A	L7SA008A		APCS-E□□□BS	APCS-P□□□HS	APCS-P□□□NB	
		□130	SE15A	L7SA020A					
		□130	SE22A	L7SA020A					
		□130	SE30A	L7SA050A					
		□180	SF30A	L7SA035A			APCS-P□□□IS	APCS-P□□□PB	
		□180	SF50A	L7SA050A			APCS-P□□□JS	APCS-P□□□LB	
2,000	3,000	□80	SC03D	L7SA004A		APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□KB
		□80	SC05D	L7SA008A					
		□80	SC06D	L7SA008A					
		□80	SC07D	L7SA008A					
		□130	SE06D	L7SA008A		APCS-E□□□BS	APCS-P□□□HS	APCS-P□□□NB	
		□130	SE11D	L7SA010A					
		□130	SE16D	L7SA020A					
		□130	SE22D	L7SA020A					
		□180	SF22D	L7SA020A			APCS-P□□□IS	APCS-P□□□PB	
		□180	LF35D	L7SA035A					
		□180	SF55D	L7SA050A			APCS-P□□□JS	PCS-P□□□LB	
	3,000	□220	SG22D	L7SA020A			APCS-P□□□IS		APCS-P□□□SB
		□220	LG35D	L7SA035A					
		□220	SG55D	L7SA050A			APCS-P□□□JS		
1,500	3,000	□130	SE05G	L7SA008A			APCS-P□□□HS	APCS-P□□□NB	
		□130	SE09G	L7SA010A					
		□130	SE13G	L7SA020A					
		□130	SE17G	L7SA020A					
		□180	SF20G	L7SA035A			APCS-P□□□IS	APCS-P□□□PB	
	2,700	□180	LF30G	L7SA035A					
	3,000	□180	SF44G	L7SA050A			APCS-P□□□JS	APCS-P□□□LB	
	3,000	□220	SG20G	L7SA020A			APCS-P□□□IS		APCS-P□□□SB
	2,700	□220	LG30G	L7SA035A					
	3,000	□220	SG44G	L7SA050A			APCS-P□□□JS		
1,000	2,000	□130	SE03M	L7SA004A			APCS-P□□□HS	APCS-P□□□NB	
		□130	SE06M	L7SA008A					
		□130	SE09M	L7SA010A					
		□130	SE12M	L7SA020A					
		□180	SF12M	L7SA020A			APCS-P□□□IS	APCS-P□□□PB	
		□180	SF20M	L7SA035A					
	1,700	□180	LF30M	L7SA035A					
	2,000	□180	SF44M	L7SA050A			APCS-P□□□JS	APCS-P□□□LB	
		□220	SG12M	L7SA020A			APCS-P□□□IS		APCS-P□□□SB
		□220	SG20M	L7SA035A					
	1,700	□220	LG30M	L7SA035A					
	2,000	□220	SG44M	L7SA050A			APCS-P□□□JS		
3000	3500	□60	HB01A	L7SA002A	1,024 P/R	APCS-E□□□AS	APCS-P□□□GS		
		□60	HB02A	L7SA002A					
		□60	HB04A	L7SA004A					
		□130	HE09A	L7SA008A	2,048 P/R	APCS-E□□□BS	APCS-P□□□HS		
		□130	HE15A	L7SA020A					
		□130	HE30A	L7SA050A					

L7S Drive Combination Table

L7SA Serial Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder Cable		Power Cable		
					Serial Type	Single Turn	Multi Turn	For power	Power + Brake	Brake
3,000	5,000	□40	FALR5A	L7SA001B	18Bit Serial / M-Turn Abs	APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□40	FAL01A	L7SA001B						
		□40	FAL015A	L7SA002B						
		□60	FBL01A	L7SA001B	19Bit Serial / M-Turn Abs					
		□60	FBL02A	L7SA002B						
		□60	FBL04A	L7SA004B						
		□80	FCL04A	L7SA004B						
		□80	FCL06A	L7SA008B						
		□80	FCL08A	L7SA008B						
		□80	FCL10A	L7SA010B						
		□60	FB01A	L7SA001B				APCS-P□□□FS		
		□60	FB02A	L7SA002B						
		□60	FB04A	L7SA004B						
		□80	FC04A	L7SA004B						
		□80	FC06A	L7SA008B						
		□80	FC08A	L7SA008B						
		□80	FC10A	L7SA010B						
		□130	FE09A	L7SA010B		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE15A	L7SA020B						
		□130	FE22A	L7SA020B						
		□130	FE30A	L7SA035B				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF30A	L7SA035B				APCS-P□□□JS	APCS-P□□□LB	
		□180	FF50A	L7SA050B						
2,000	3,000	□80	FCL03D	L7SA004B		APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□80	FCL05D	L7SA008B						
		□80	FCL06D	L7SA008B						
		□80	FCL07D	L7SA008B						
		□80	FC03D	L7SA004B						
		□80	FC05D	L7SA008B				APCS-P□□□FS		
		□80	FC06D	L7SA008B						
		□80	FC07D	L7SA008B						
		□130	FE06D	L7SA008B						
		□130	FE11D	L7SA010B		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE16D	L7SA020B						
		□130	FE22D	L7SA020B						
		□180	FF22D	L7SA020B				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF35D	L7SA035B						
		□180	FF55D	L7SA050B				APCS-P□□□JS	APCS-P□□□LB	
	3,000	□220	FG22D	L7SA020B				APCS-P□□□IS		APCS-P□□□SB
	2,700	□220	FG35D	L7SA035B						
	3,000	□220	FG55D	L7SA050B				APCS-P□□□JS		
1,500	3,000	□130	FE05G	L7SA008B				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE09G	L7SA010B						
		□130	FE13G	L7SA020B						
		□130	FE17G	L7SA020B						
		□180	FF20G	L7SA020B				APCS-P□□□IS	APCS-P□□□PB	
	2,700	□180	FF30G	L7SA035B						
	3,000	□180	FF44G	L7SA050B				APCS-P□□□JS	APCS-P□□□LB	
	3,000	□220	FG20G	L7SA020B				APCS-P□□□IS		APCS-P□□□SB
	2,700	□220	FG30G	L7SA035B						
	3,000	□220	FG44G	L7SA050B				APCS-P□□□JS		
1,000	2,000	□130	FE03M	L7SA004B				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE06M	L7SA008B						
		□130	FE09M	L7SA010B						
		□130	FE12M	L7SA020B						
		□180	FF12M	L7SA020B				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF20M	L7SA020B						
	1,700	□180	FF30M	L7SA035B						
	2,000	□180	FF44M	L7SA050B				APCS-P□□□JS	APCS-P□□□LB	
		□220	FG12M	L7SA020B				APCS-P□□□IS		APCS-P□□□SB
		□220	FG20M	L7SA020B						
	1,700	□220	FG30M	L7SA035B						
	2,000	□220	FG44M	L7SA050B				APCS-P□□□JS		

L7S Drive Combination Table

L7SB Serial Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder Cable		Power Cable		
					Serial Type	Single Turn	Multi Turn	For power	Power + Brake	Brake
3,000	5,000	□130	FEP09A	L7SB010B	19Bit Serial / M-Turn Abs	APCS-E□□□DS	APCS-E□□□DS1	APCF-P□□□HS	APCF-P□□□NB	APCF-P□□□SB
		□130	FEP15A	L7SB020B						
		□130	FEP22A	L7SB035B						
		□130	FEP30A	L7SB035B						
		□180	FFP30A	L7SB035B				APCF-P□□□IS	APCF-P□□□PB	
		□180	FFP50A	L7SB050B				APCF-P□□□JS	APCF-P□□□LB	
2,000	3,000	□130	FEP06D	L7SB010B				APCF-P□□□HS	APCF-P□□□NB	
		□130	FEP11D	L7SB010B						
		□130	FEP16D	L7SB020B						
		□130	FEP22D	L7SB020B						
		□180	FFP22D	L7SB020B				APCF-P□□□IS	APCF-P□□□PB	
		□180	FFP35D	L7SB035B						
		□180	FFP55D	L7SB050B				APCF-P□□□JS	APCF-P□□□LB	
	2,500	□180	FFP75D	L7SB075B						
	3,000	□220	FGP22D	L7SB020B				APCF-P□□□IS		
		□220	FGP35D	L7SB035B						
		□220	FGP55D	L7SB050B				APCF-P□□□JS		
	2,500	□220	FGP75D	L7SB075B						
		□220	FGP110D	L7SB150B				APCF-P□□□MS		
1,500	3,000	□130	FEP05G	L7SB010B				APCF-P□□□HS	APCF-P□□□NB	
		□130	FEP09G	L7SB010B						
		□130	FEP13G	L7SB020B						
		□130	FEP17G	L7SB020B						
		□180	FFP20G	L7SB020B				APCF-P□□□IS	APCF-P□□□PB	
	2,700	□180	FFP30G	L7SB035B						
	3,000	□180	FFP44G	L7SB050B				APCF-P□□□JS	APCF-P□□□LB	
	2,500	□180	FFP60G	L7SB075B						
	2,200	□180	FFP75G	L7SB075B				APCF-P□□□MS		
	3,000	□220	FGP20G	L7SB020B				APCF-P□□□IS		APCF-P□□□SB
	2,700	□220	FGP30G	L7SB035B						
	3,000	□220	FGP44G	L7SB050B				APCF-P□□□JS		
	2,500	□220	FGP60G	L7SB075B						
		□220	FGP85G	L7SB150B						
	2,000	□220	FGP110G	L7SB150B				APCF-P□□□MS		
		□220	FGP150G	L7SB150B						
1,000	2,000	□130	FEP03M	L7SB010B				APCF-P□□□HS	APCF-P□□□NB	
		□130	FEP06M	L7SB010B						
		□130	FEP09M	L7SB010B						
		□130	FEP12M	L7SB020B						
		□180	FFP12M	L7SB020B				APCF-P□□□IS	APCF-P□□□PB	
		□180	FFP20M	L7SB020B						
	1,700	□180	FFP30M	L7SB035B				APCF-P□□□JS	APCF-P□□□LB	
	2,000	□180	FFP44M	L7SB050B						
		□220	FGP12M	L7SB020B				APCF-P□□□IS		APCF-P□□□SB
		□220	FGP20M	L7SB020B						
		□220	FGP30M	L7SB050B				APCF-P□□□JS		
		□220	FGP44M	L7SB050B						
		□220	FGP60M	L7SB075B				APCF-P□□□MS		

L7SA Drive Product Features

Item \ Type Name			L7SA001□	L7SA002□	L7SA004□	L7SA008□	L7SA010□	L7SA020□	L7SA035□	L7SA050□
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	6.75	13.5	16.7	32
Peak Current[A]			4.2	5.1	9.0	15.6	20.25	40.5	50.1	96
Encoder Type			Quad. Type Incremental Line Driver Max 6000 [P/R] Serial Type : 18bit(FA type), 19bit, 20bit(MDM series)							
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℃]							
	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	RS422		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		Both default built–in and external installation possible							
	Display		Seven segments (5 DIGIT)							
	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, contorl power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over–regenerative, sensor problem, communication problem							
Environment	Temperature		0 ~ 50[℃]							
	Humidity		Below 90[%]RH(avoid dew–condensation)							
	Environment		Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.							

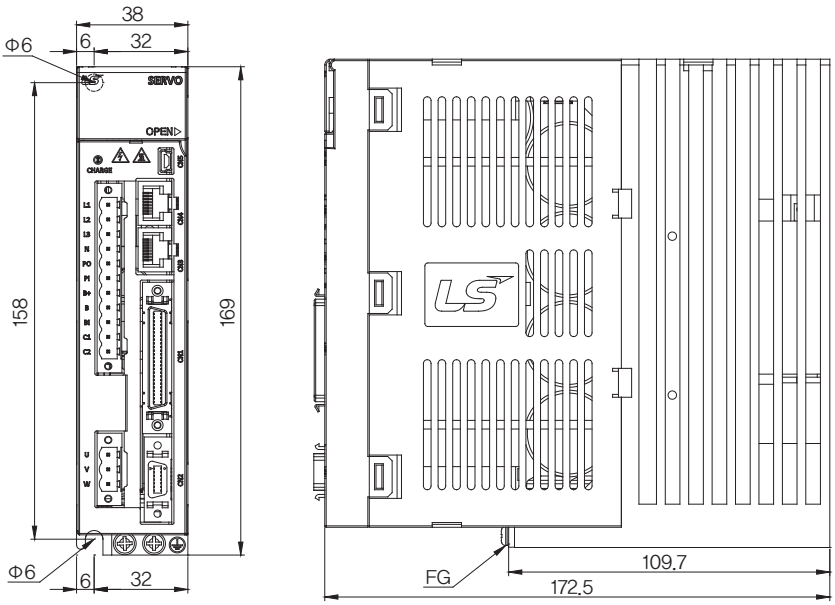
L7SB Drive Product Features

Item \ Type Name			L7SB010□	L7SB020□	L7SB035□	L7SB050□	L7SB075□	L7SB150□
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	10.1	17.5	22.8	39
Peak Current[A]			11.1	24	30.3	52.5	57	97.5
Encoder Type			Quad. Type Incremental Line Driver Max 6000 [P/R] Serial Type : 18bit(FA type), 19bit, 20bit(MDM series)					
Control Performance	Speed Control	Speed Control Range	Maximum 1: 5000					
		Frequency Response	Maximum 1 [kHz] or above (when the 19–bit serial encoder is applied)					
		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℃]					
	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 0 ~ 10[V]					
		Resolution	12[bit]					
	Analog Output	Output Range	DC 0 ~ 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	RS422		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		Both default built–in and external installation possible					
	Display		Seven segments (5 DIGIT)					
	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 heating, drive temperature error), encoder error, excessive regeneration, sensor error, communication error					
Environment		Temperature	0 ~ 50[℃]					
		Humidity	90[%] RH or lower (no condensation)					
		Environment	Indoors, a place free from corrosive gas or combustible gas, or a place without liquid or conductive dust.					

External Dimensions of L7SA Drive

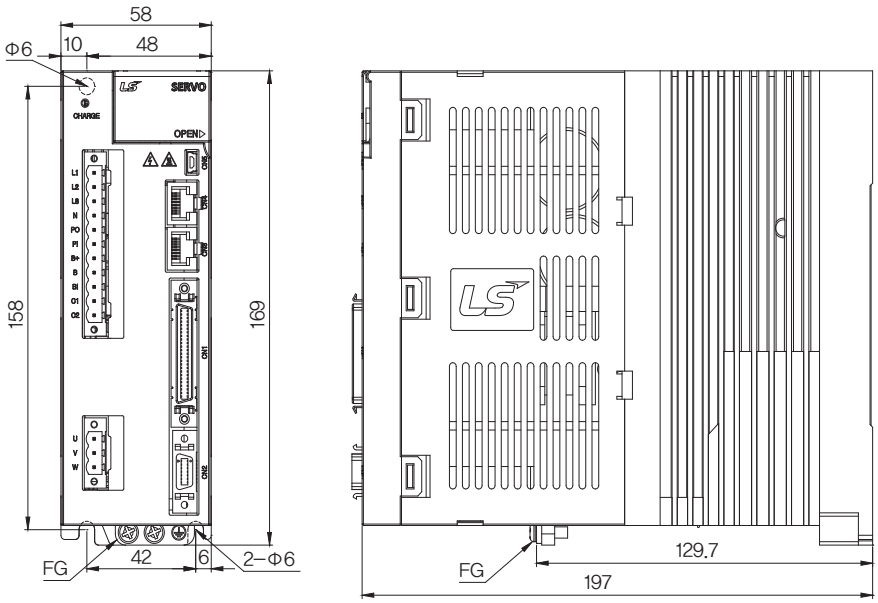
L7SA001□ ~ L7SA004□ [Weight : 1.2kg]

*Unit [mm]



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

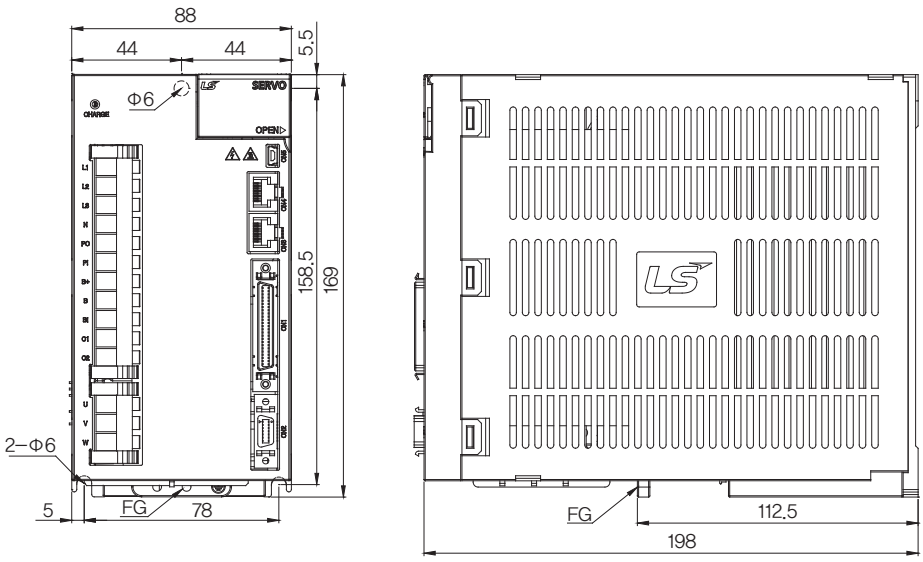
*Unit [mm]



External Dimensions of L7SA Drive

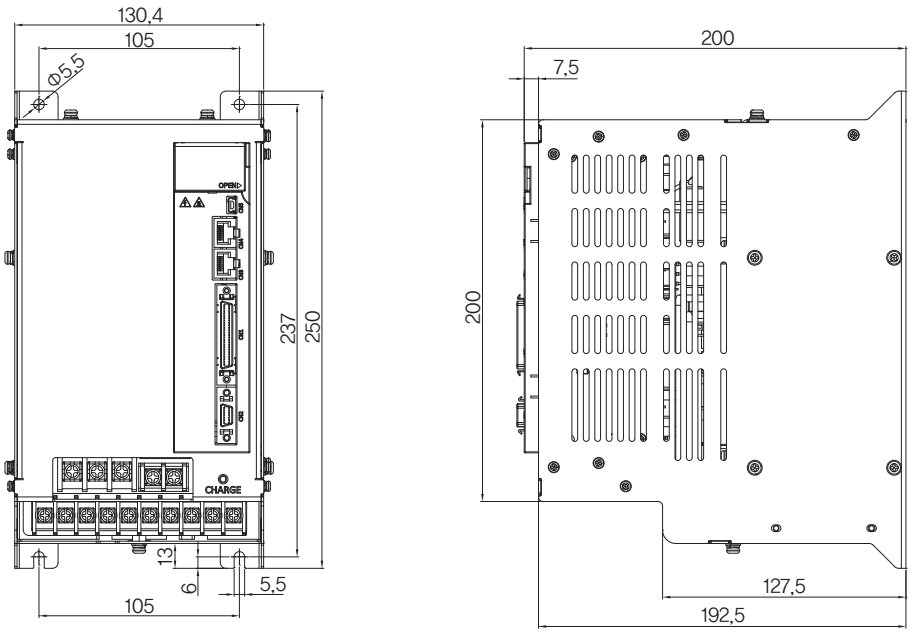
L7SA020□ ~ L7SA035□ [Weight : 2.5kg(Fan-Cooling included)]

*Unit [mm]



L7SA050□ [Weight : 5.5kg(Fan-Cooling included)]

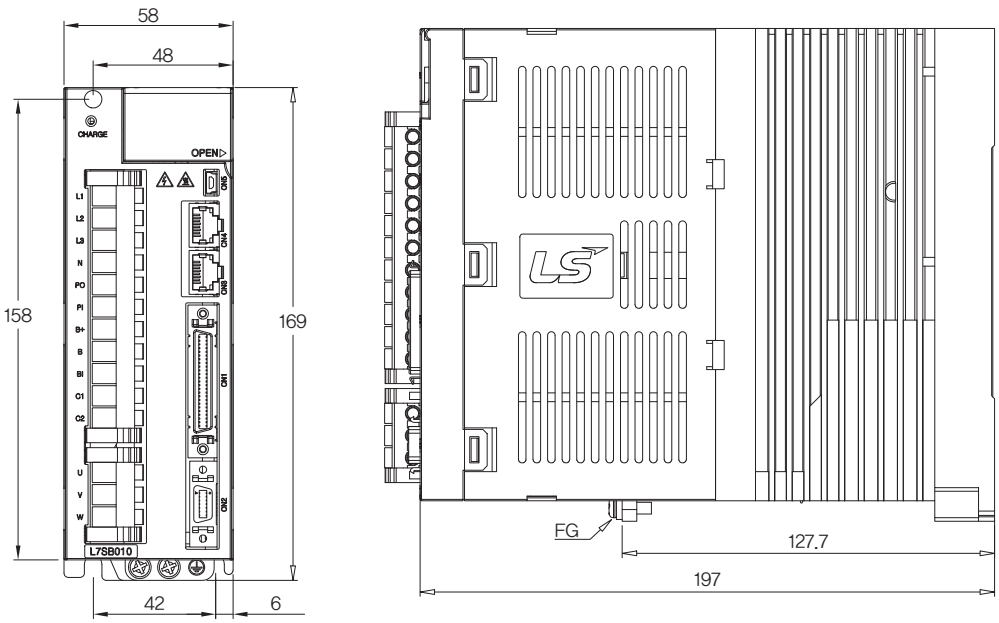
*Unit [mm]



External Dimensions of L7SB Drive

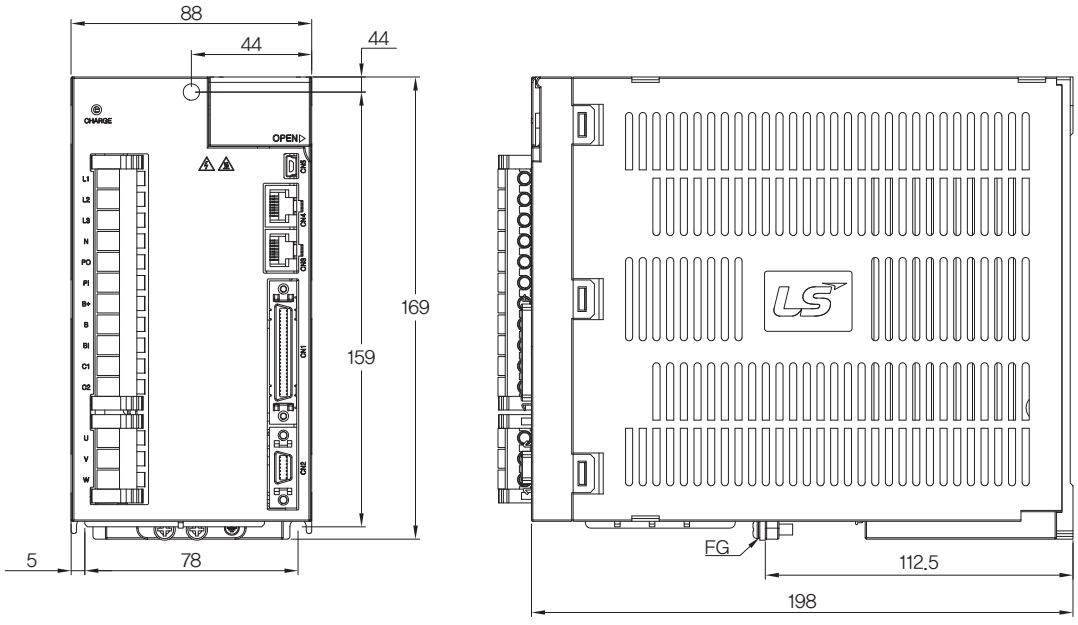
L7SB010□ [Weight : 1.5kg(Fan-Cooling included)]

*Unit [mm]



L7SB020□ / L7SB035□ [Weight : 2.5kg(Fan-Cooling included)]

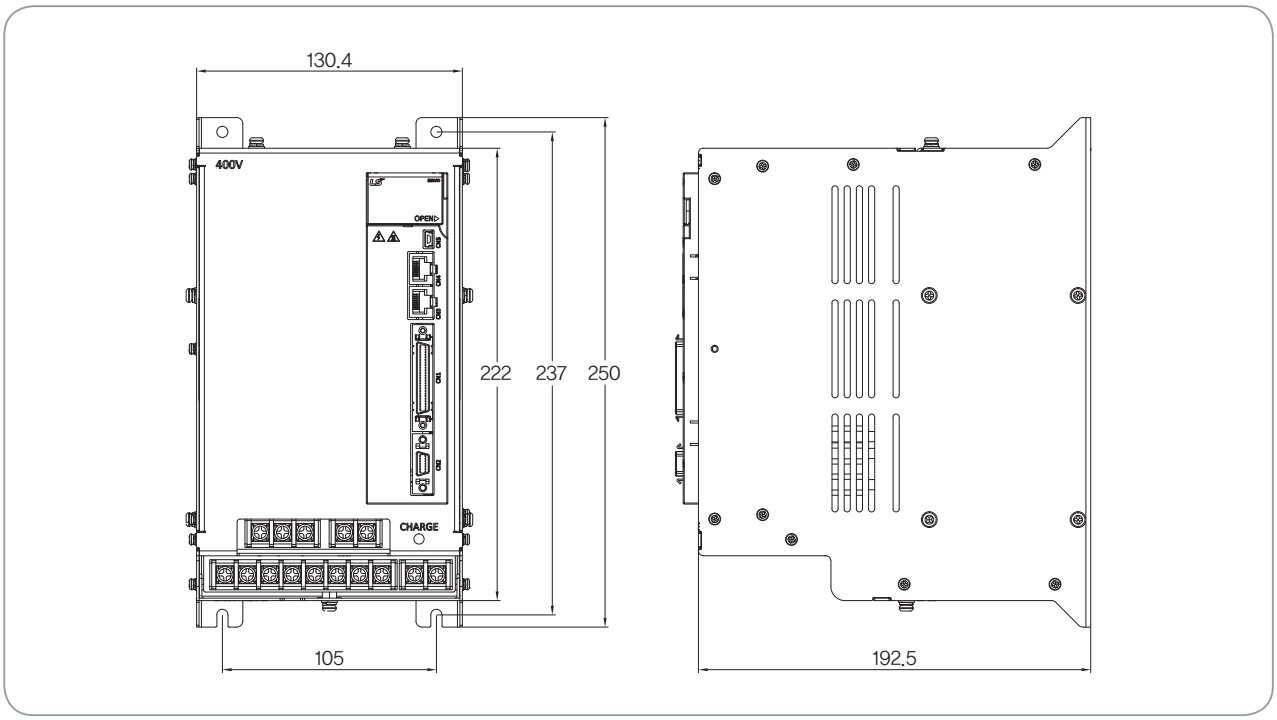
*Unit [mm]



External Dimensions of L7SB Drive

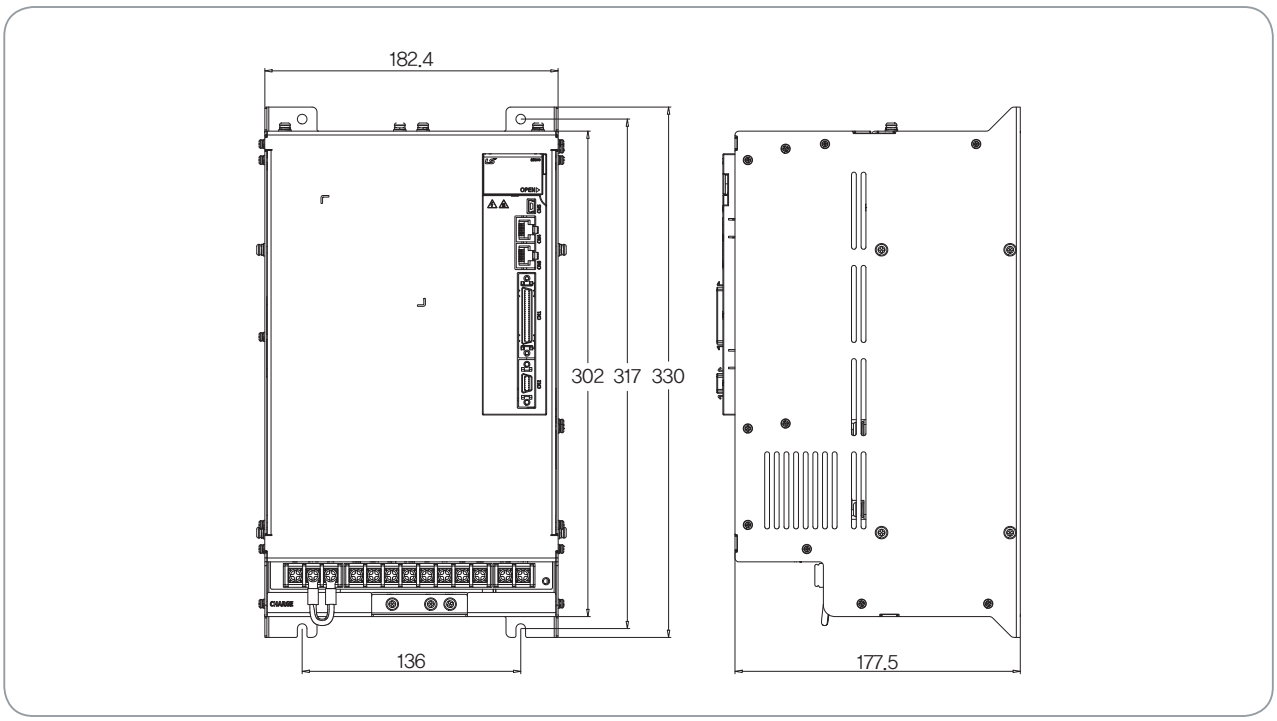
L7SB050□ [Weight : 5.5kg(Fan-Cooling included)]

*Unit [mm]



L7SB075□ [Weight : 8.5kg(Fan-Cooling included)]

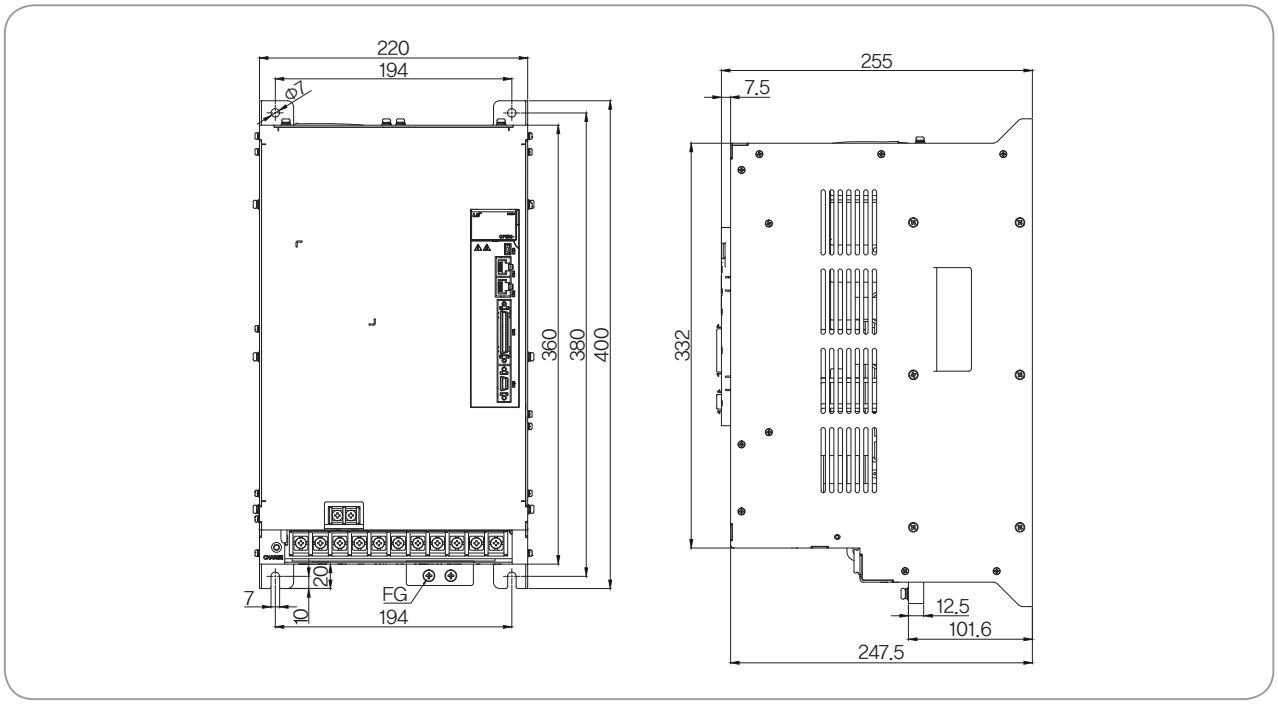
*Unit [mm]



External Dimensions of L7SB Drive

L7SB150□ [Weight : 15.5kg(Fan-Cooling included)]

*Unit [mm]



EtherCAT Communication Command Type

L7N Series

Servo Drive Designation

L7	N	A	004	B	AA
Model Name	Communication	Input Power Supply	Capacity	Encoder Type	Option
Servo Series	Network Type	A : 200VAC	001 : 100W 002 : 200W 004 : 400W 008 : 750W 010 : 1.0kW 020 : 2.0kW 035 : 3.5kW 050 : 5.0kW	B : Serial (Communication Type)	Exclusive Option Code

L7N Series

Characteristic

● Real-time control by EtherCAT

- High speed, Real-time capability and Synchronization mechanism
- 100BASE-TX(100Mbps) EtherNET based real-time communication

● Support Various Operation Mode

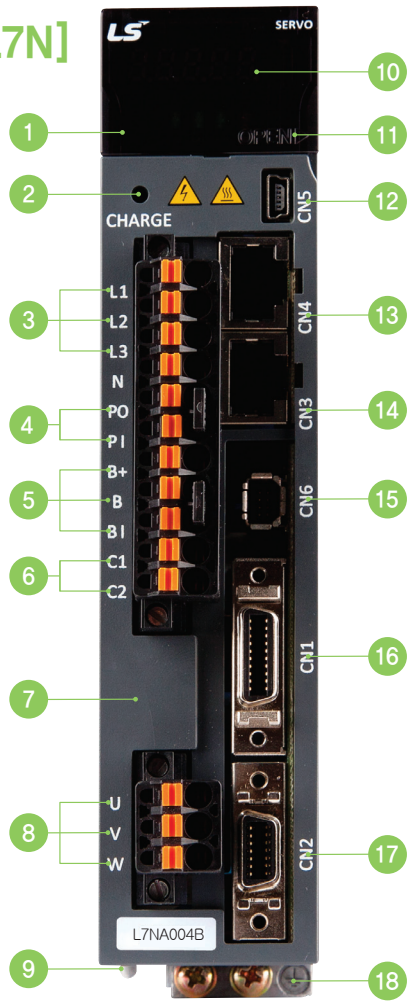
- Cyclic(P/S/T) Mode and Profile (P/S/T)Mode, Homming Mode

● High Response for Precision Control

- High Resolutions Serial type Encoder(19Bit, BiSS)
- Improved Speed Response(=1Khz) Frequency

Identifying the Part of L7N Drive

[L7N]



1. Operation keys (Mode, Up, Down, Set)
2. Charge lamp
3. Main power connector (L1, L2, L3)
4. DC reactor connector(PO, PI)
   - Short circuit when not used
5. Regenerative Resistor Connector (B+, B, BI)
   - Short-Circuit B, BI terminals when standard type
   - Use B+, B terminals when using external resistor
6. Control Power Connector (C1, C2)
7. Front cover
8. Servo Motor Connecting Terminals (U, V, W)
9. Heat Sink
10. Display
11. Status LED
12. CN5:USB connector
13. CN4:EtherCAT Communication Port (IN)
14. CN3:EtherCAT Communication Port (OUT)
15. CN6 : STO Connector
16. CN1 : Control Signal Connector
17. CN2 : Encoder Signal Connector
18. Ground

L7N Drive Combination Table

L7N Serial Type

Rated Speed (rpm)	Maximum speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder Cable		Power Cable		
					Serial Type	Single Turn	Multi Turn	For power	Power + Brake	Brake
3,000	5,000	□40	FALR5A	L7NA001B	18Bit Serial / M-Turn Abs	APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□40	FAL01A	L7NA001B						
		□40	FAL015A	L7NA002B						
		□60	FBL01A	L7NA001B	19Bit Serial / M-Turn Abs					
		□60	FBL02A	L7NA002B						
		□60	FBL04A	L7NA004B						
		□80	FCL04A	L7NA004B						
		□80	FCL06A	L7NA008B						
		□80	FCL08A	L7NA008B						
		□80	FCL10A	L7NA010B						
		□60	FB01A	L7NA001B				APCS-P□□□FS		
		□60	FB02A	L7NA002B						
		□60	FB04A	L7NA004B						
		□80	FC04A	L7NA004B						
		□80	FC06A	L7NA008B						
		□80	FC08A	L7NA008B						
		□80	FC10A	L7NA010B						
		□130	FE09A	L7NA010B		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE15A	L7NA020B						
		□130	FE22A	L7NA020B						
		□130	FE30A	L7NA035B						
		□180	FF30A	L7NA035B				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF50A	L7NA050B				APCS-P□□□JS	APCS-P□□□LB	
2,000	3,000	□80	FCL03D	L7NA004B		APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□80	FCL05D	L7NA008B						
		□80	FCL06D	L7NA008B						
		□80	FCL07D	L7NA008B						
		□80	FC03D	L7NA004B						
		□80	FC05D	L7NA008B				APCS-P□□□FS		
		□80	FC06D	L7NA008B						
		□80	FC07D	L7NA008B						
		□130	FE06D	L7NA008B						
		□130	FE11D	L7NA010B		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE16D	L7NA020B						
		□130	FE22D	L7NA020B						
		□180	FF22D	L7NA020B				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF35D	L7NA035B						
		□180	FF55D	L7NA050B				APCS-P□□□JS	APCS-P□□□LB	
	3,000	□220	FG22D	L7NA020B				APCS-P□□□IS		APCS-P□□□SB
	2,700	□220	FG35D	L7NA035B						
	3,000	□220	FG55D	L7NA050B				APCS-P□□□JS		
1,500	3,000	□130	FE05G	L7NA008B				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE09G	L7NA010B						
		□130	FE13G	L7NA020B						
		□130	FE17G	L7NA020B						
		□180	FF20G	L7NA020B				APCS-P□□□IS	APCS-P□□□PB	
	2,700	□180	FF30G	L7NA035B						
	3,000	□180	FF44G	L7NA050B				APCS-P□□□JS	APCS-P□□□LB	
	3,000	□220	FG20G	L7NA020B				APCS-P□□□IS		APCS-P□□□SB
	2,700	□220	FG30G	L7NA035B						
	3,000	□220	FG44G	L7NA050B				APCS-P□□□JS		
1,000	2,000	□130	FE03M	L7NA004B				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE06M	L7NA008B						
		□130	FE09M	L7NA010B						
		□130	FE12M	L7NA020B						
		□180	FF12M	L7NA020B				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF20M	L7NA020B						
	1,700	□180	FF30M	L7NA035B						
	2,000	□180	FF44M	L7NA050B				APCS-P□□□JS	APCS-P□□□LB	
		□220	FG12M	L7NA020B				APCS-P□□□ □IS		APCS-P□□□SB
		□220	FG20M	L7NA020B						
	1,700	□220	FG30M	L7NA035B						
	2,000	□220	FG44M	L7NA050B				APCS-P□□□JS		

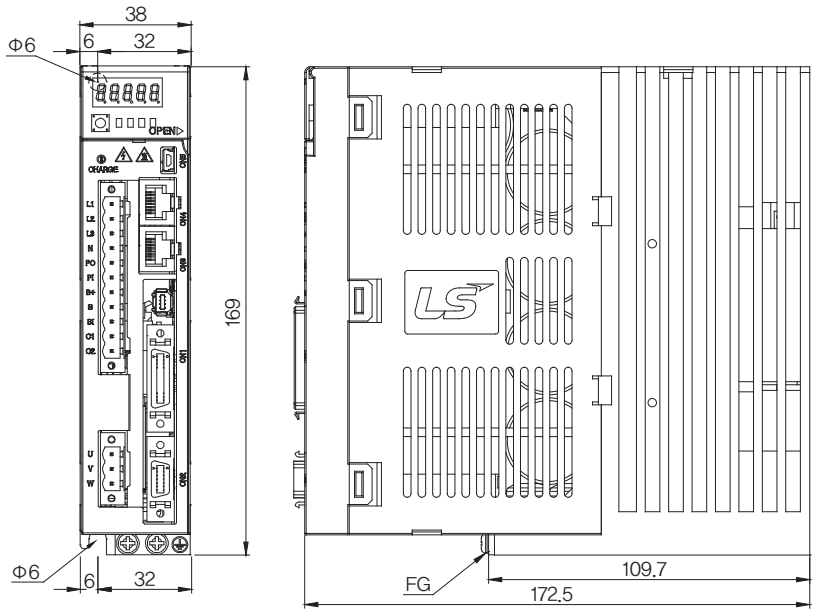
L7N Drive Product Features

Item \ Type Name		L7NA001B	L7NA002B	L7NA004B	L7NA008B	L7NA010B	L7NA020B	L7NA035B	L7NA050B
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	6.75	13.5	16.7	32
Peak Current[A]		4.2	5.1	9.0	15.6	20.25	40.5	50.1	96
Encoder Type		Serial Type : 18 bit(FA type), 19bit, 20bit(MDM series)							
Control Performance	Speed Control Range	Maximum 1: 5000							
	Frequency Response	Maximum 1 kHz or more (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℃[±10]							
	Torque Control Repetition Accuracy	Within ±1%							
Supported Drive Modes (CiA402)		Profile Position Mode Profile Velocity Mode Profile Torque Mode Interpolated Position Mode Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode Cyclic Synchronous Torque Mode Homing Mode							
Digital Input/Output	Digital Input	Total 6 input channels (allocable) PCON, GAIN2, ALMRST, HOME, P–OT, N–OT Above 6 functions can be used selectively for assignment. Signal can be set as positive logic or negative logic.							
	Touch Probe Input	There are 2 input channels. Provides rising and falling edge detection functions for each channel.							
	Digital Output	Total 4 channels (allocable) ALARM, READY, ZSPD, BRAKE, INPOS, INSPD, WARN Above 7 outputs can be used selectively for assignment. Signal can be set as positive logic or negative logic.							
Additional Communication	USB	Program download is available with USB Communication.							
Built–in Functions	Dynamic Braking	Built–in type(operates when Servo alarm or Servo off)							
	Regenerative Braking	Built–in type, and also external connection is available							
	Display	7 segments(5DIGIT)							
	Setting Function	Loder(SET), (MODE)							
	Additional Function	Auto gain tuning function							
	Protective Function	Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, contorl 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	Temperature	0 ~ 50[℃]							
	Humidity	Below 90[%]RH(avoid dew–condensation)							
	Environment	Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.							

External Dimensions of L7SN Drive

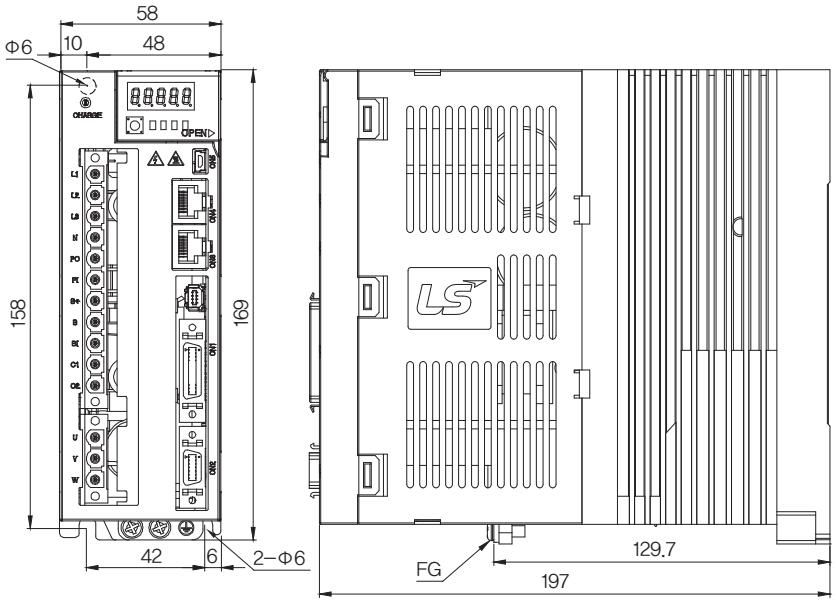
L7NA001B ~ L7NA004B [Weight : 1.0kg]

*Unit [mm]



L7NA008B / L7NA010B [Weight : 1.5kg(Fan-Cooling included)]

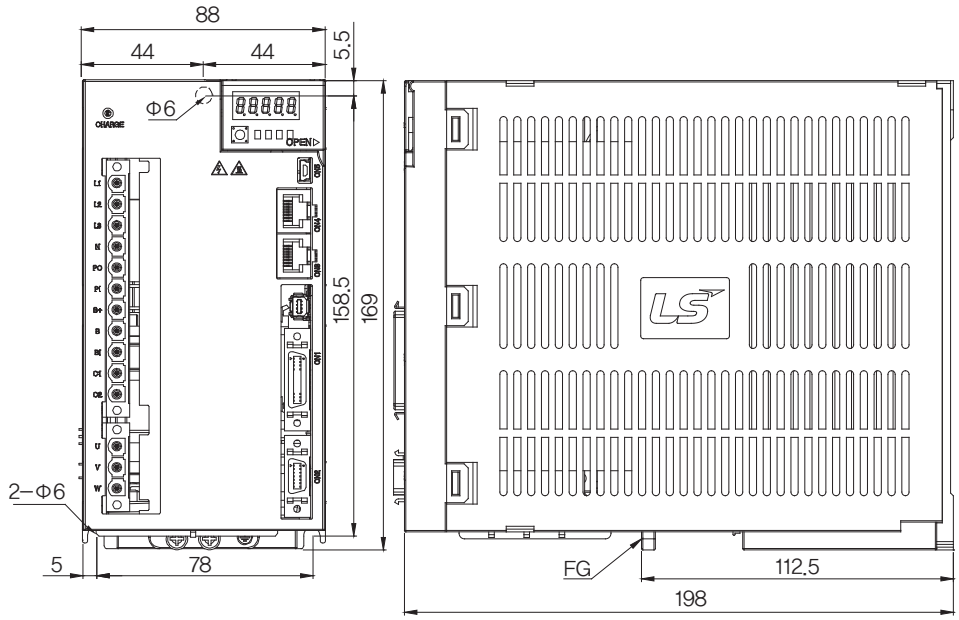
*Unit [mm]



External Dimensions of L7SN Drive

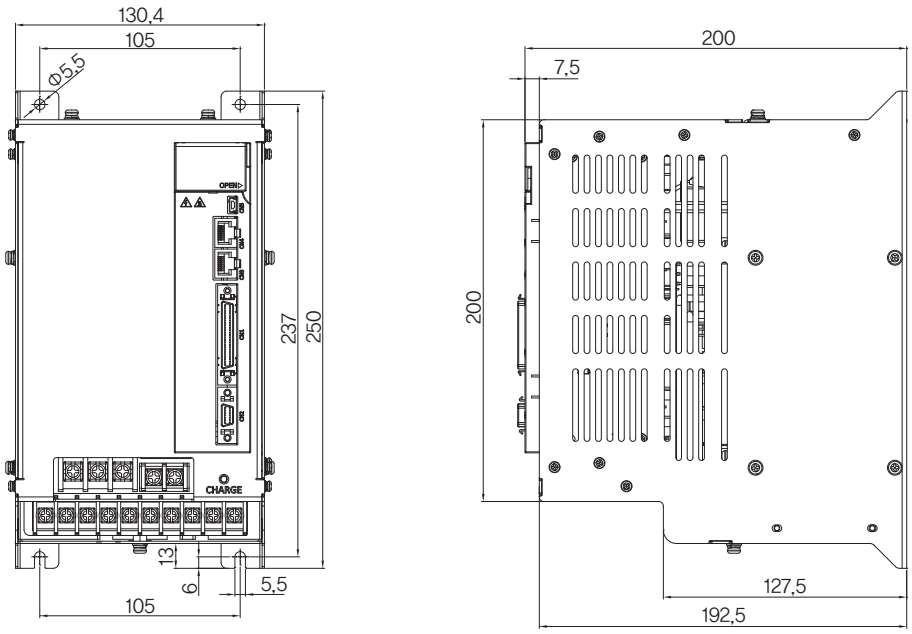
L7NA020B / L7NA035B [Weight : 2.5kg(Fan-Cooling included)]

*Unit [mm]



L7NA050B [Weight : 5.5kg(Fan-Cooling included)]

*Unit [mm]



All-in-one EtherCAT Communication Command Type

L7NH Series

Servo Drive Designation

L7	NH	A	004	B	AA
Model Name	Communication	Input Power Supply	Capacity	Encoder Type	Option
Servo Series	Network / All-in-One Type	A : 200VAC B : 400VAC	001 : 100W 002 : 200W 004 : 400W 008 : 750W 010 : 1.0kW 020 : 2.0kW 035 : 3.5kW 050 : 5.0kW 075 : 7.5kW 110 : 11kW 150 : 15kW	U : Universal	Exclusive Option Code

* Range
- 200V : 0.1KW~3.5KW
- 400V : 1.0KW~15KW

L7NH Series

Characteristic

● Real-time control through EtherCAT

- High speed, Real-time capability and Synchronization mechanism
- Improved EtherCAT communication speed(min. 250us, DC support)
- Supporting CoE, EoE and FoE
- Improved Speed Response(=1.6Khz) Frequency

● Improved Control Performance

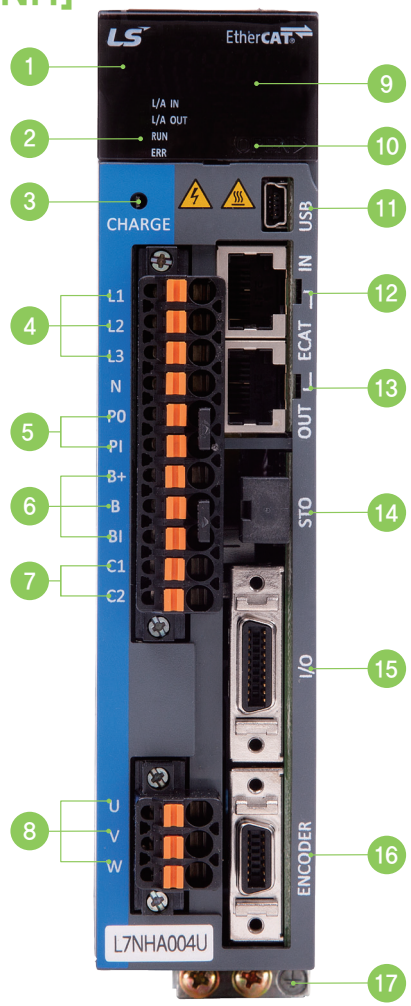
- Improved Control bandwidth
- Providing 4-step Notch-Filter
- Vibration control by Real-time FFT
- Real-time gain tuning function

● Support various motor and Encoder drive

- Supporting Rotary, DD and Motor drive (supporting3rd party motor)
- Quadrature, BiSS-C, Tamagawa serial abs, EnDat 2.2, Resolver

Identifying the Part of L7NH Drive

[L7NH]



1. Display
2. State LED
3. Charge Lamp
4. Main Power Connector (L1, L2, L3)
5. DC Reactor Connector (PO, PI)
6. Regenerative Resistance Connector (B+, B, BI)
   - Short-Circuit B, BI terminals when standard type
   - Use B+, 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
12. EtherCAT Communication Port (IN)
13. EtherCAT Communication Port (OUT)
14. Safety Connector (STO)
15. Input / Output signal /Connector
16. Encoder Connector (ENCODER)
17. Ground Terminal

L7NHA Drive Combination Table

L7NHA Incremental Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder cable	Power Cable		
					Quadrature Type	INC	For power	Power + Brake	Brake
3,000	5,000	□40	SAR3A	L7NHA001U	2,048 P/R	APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□KB
		□40	SAR5A	L7NHA001U					
		□40	SA01A	L7NHA001U					
		□40	SA015A	L7NHA002U					
		□60	SB01A	L7NHA002U	3,000 P/R				
		□60	SB02A	L7NHA002U					
		□60	SB04A	L7NHA004U					
		□80	SC04A	L7NHA004U					
		□80	SC06A	L7NHA008U					
		□80	SC08A	L7NHA008U					
		□80	SC10A	L7NHA010U					
		□130	SE09A	L7NHA008U		APCS-E□□□BS	APCS-P□□□HS	APCS-P□□□NB	
		□130	SE15A	L7NHA020U					
		□130	SE22A	L7NHA020U					
		□180	SF30A	L7NHA035U			APCS-P□□□IS	APCS-P□□□PB	
2,000	3,000	□80	SC03D	L7NHA004U		APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□QS
		□80	SC05D	L7NHA008U					
		□80	SC06D	L7NHA008U					
		□80	SC07D	L7NHA008U					
		□130	SE06D	L7NHA008U		APCS-E□□□BS	APCS-P□□□HS	APCS-P□□□NB	
		□130	SE11D	L7NHA010U					
		□130	SE16D	L7NHA020U					
		□130	SE22D	L7NHA020U					
		□180	SF22D	L7NHA020U			APCS-P□□□IS	APCS-P□□□PB	
		□180	LF35D	L7NHA035U					APCS-P□□□SB
		□220	SG22D	L7NHA020U					
		□220	LG35D	L7NHA035U					
1,500	3,000	□130	SE05G	L7NHA008U			APCS-P□□□HS	APCS-P□□□NB	
		□130	SE09G	L7NHA010U					
		□130	SE13G	L7NHA020U					
		□130	SE17G	L7NHA020U					
		□180	SF20G	L7NHA035U			APCS-P□□□IS	APCS-P□□□PB	
	2,700	□180	LF30G	L7NHA035U					
	3,000	□220	SG20G	L7NHA020U					APCS-P□□□SB
	2,700	□220	LG30G	L7NHA035U					
1,000	2,000	□130	SE03M	L7NHA004U			APCS-P□□□HS	APCS-P□□□NB	
		□130	SE06M	L7NHA008U					
		□130	SE09M	L7NHA010U					
		□130	SE12M	L7NHA020U					
		□180	SF12M	L7NHA020U			APCS-P□□□IS	APCS-P□□□PB	
		□180	SF20M	L7NHA035U					
	1,700	□180	LF30M	L7NHA035U					
		□220	SG12M	L7NHA020U			APCS-P□□□IS		
		□220	SG20M	L7NHA035U					
	1,700	□220	LG30M	L7NHA035U					
3,000	3,500	□60	HB01A	L7NHA002U	1,024 P/R	APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□SB
		□60	HB02A	L7NHA002U					
		□60	HB04A	L7NHA004U					
		□130	HE09A	L7NHA008U	2,048 P/R	APCS-E□□□BS	APCS-P□□□HS		
		□130	HE15A	L7NHA020U					

L7NHA Drive Combination Table

L7NHA Serial Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder cable		Power Cable		
					Serial Type	Single Turn	Multi Turn	For power	Power + Brake	Brake
3,000	5,000	□40	FALR5A	L7NHA001U	18Bit Serial / M-Turn Abs	APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□40	FAL01A	L7NHA001U						
		□40	FAL015A	L7NHA002U						
		□60	FBL01A	L7NHA001U	19Bit Serial / M-Turn Abs					
		□60	FBL02A	L7NHA002U						
		□60	FBL04A	L7NHA004U						
		□80	FCL04A	L7NHA004U						
		□80	FCL06A	L7NHA008U						
		□80	FCL08A	L7NHA008U						
		□80	FCL10A	L7NHA010U						
		□60	FB01A	L7NHA001U				APCS-P□□□FS		
		□60	FB02A	L7NHA002U						
		□60	FB04A	L7NHA004U						
		□80	FC04A	L7NHA004U						
		□80	FC06A	L7NHA008U						
		□80	FC08A	L7NHA008U						
		□80	FC10A	L7NHA010U						
		□130	FE09A	L7NHA010U		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE15A	L7NHA020U						
		□130	FE22A	L7NHA020U						
		□130	FE30A	L7NHA035U						
		□180	FF30A	L7NHA035U				APCS-P□□□IS	APCS-P□□□PB	
2,000	3,000	□80	FCL03D	L7NHA004U		APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□80	FCL05D	L7NHA008U						
		□80	FCL06D	L7NHA008U						
		□80	FCL07D	L7NHA008U						
		□80	FC03D	L7NHA004U						
		□80	FC05D	L7NHA008U				APCS-P□□□FS		
		□80	FC06D	L7NHA008U						
		□80	FC07D	L7NHA008U						
		□130	FE06D	L7NHA008U						
		□130	FE11D	L7NHA010U		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE16D	L7NHA020U						
		□130	FE22D	L7NHA020U						
		□180	FF22D	L7NHA020U						
		□180	FF35D	L7NHA035U				APCS-P□□□IS	APCS-P□□□PB	
		□220	FG22D	L7NHA020U						APCS-P□□□SB
		□220	FG35D	L7NHA035U						
1,500	3,000	□130	FE05G	L7NHA008U				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE09G	L7NHA010U						
		□130	FE13G	L7NHA020U						
		□130	FE17G	L7NHA020U						
		□180	FF20G	L7NHA020U				APCS-P□□□IS	APCS-P□□□PB	
	2,700	□180	FF30G	L7NHA035U						
	3,000	□220	FG20G	L7NHA020U						APCS-P□□□SB
	2,700	□220	FG30G	L7NHA035U						
1,000	2,000	□130	FE03M	L7NHA004U				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE06M	L7NHA008U						
		□130	FE09M	L7NHA010U						
		□130	FE12M	L7NHA020U						
		□180	FF12M	L7NHA020U				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF20M	L7NHA020U						
	1,700	□180	FF30M	L7NHA035U						
		□220	FG12M	L7NHA020U				APCS-P□□□IS		APCS-P□□□SB
		□220	FG20M	L7NHA020U						
	1,700	□220	FG30M	L7NHA035U						

L7NHB Drive Combination Table

L7NHB Incremental Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder cable	Power Cable		
					Quadrature Type	INC	For power	Power + Brake	Brake
3,000	5,000	□130	SEP09A	L7NHB010U	3,000 P/R	APCS-E□□□BS	APCF-P□□□HS	APCF-P□□□NB	APCF-P□□□SB
		□130	SEP15A	L7NHB010U					
		□130	SEP22A	L7NHB020U					
		□130	SEP30A	L7NHB035U					
		□180	SFP30A	L7NHB035U			APCF-P□□□IS	APCF-P□□□PB	
		□180	SFP50A	L7NHB050U			APCF-P□□□JS	APCF-P□□□LB	
2,000	3,000	□130	SEP06D	L7NHB010U			APCF-P□□□HS	APCF-P□□□NB	
		□130	SEP11D	L7NHB010U					
		□130	SEP16D	L7NHB020U					
		□130	SEP22D	L7NHB020U					
		□180	SFP22D	L7NHB020U			APCF-P□□□IS	APCF-P□□□PB	
		□180	SFP35D	L7NHB035U					
		□180	SFP55D	L7NHB050U			APCF-P□□□JS	APCF-P□□□LB	
		□180	SFP75D	L7NHB075U					
		□220	SGP22D	L7NHB020U			APCF-P□□□IS		
		□220	SGP35D	L7NHB035U					
		□220	SGP55D	L7NHB050U			APCF-P□□□JS		
	2,500	□220	SGP75D	L7NHB075U					
		□220	SGP110D	L7NHB150U			APCF-P□□□MS		
1,500	3,000	□130	SEP05G	L7NHB010U			APCF-P□□□HS	APCF-P□□□NB	
		□130	SEP09G	L7NHB010U					
		□130	SEP13G	L7NHB020U					
		□130	SEP17G	L7NHB020U					
		□180	SFP20G	L7NHB020U			APCF-P□□□IS	APCF-P□□□PB	
		□180	SFP30G	L7NHB050U					
		□180	SFP44G	L7NHB050U			APCF-P□□□JS	APCF-P□□□LB	
		□180	SFP60G	L7NHB075U					
	2,500	□180	SFP75G	L7NHB075U			APCF-P□□□MS		
		□220	SGP20G	L7NHB020U			APCF-P□□□IS		APCF-P□□□SB
		□220	SGP30G	L7NHB050U					
	3,000	□220	SGP44G	L7NHB050U			APCF-P□□□JS		
	2,500	□220	SGP60G	L7NHB075U					
		□220	SGP85G	L7NHB150U			APCF-P□□□MS		
	2,000	□220	SGP110G	L7NHB150U					
		□220	SGP150G	L7NHB150U					
1000	2,000	□130	SEP03M	L7NHB010U			APCF-P□□□HS	APCF-P□□□NB	
		□130	SEP06M	L7NHB010U					
		□130	SEP09M	L7NHB010U					
		□130	SEP12M	L7NHB020U					
		□180	SFP12M	L7NHB020U			APCF-P□□□IS	APCF-P□□□PB	
		□180	SFP20M	L7NHB020U					
	1,700	□180	SFP30M	L7NHB035U			APCF-P□□□JS	APCF-P□□□LB	
	2,000	□180	SFP44M	L7NHB050U					
		□220	SGP12M	L7NHB020U			APCF-P□□□IS		APCF-P□□□SB
		□220	SGP20M	L7NHB020U					
		□220	SGP30M	L7NHB050U			APCF-P□□□JS		
		□220	SGP44M	L7NHB050U					
		□220	SGP60M	L7NHB075U			APCF-P□□□MS		

L7NHB Drive Combination Table

L7NHB Serial Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder cable		Power Cable		
					Serial Type	Single Turn	Multi Turn	For power	Power + Brake	Brake
3,000	5,000	□130	FEP09A	L7NHB010U	19Bit Serial / M-Turn Abs	APCS-E□□□DS	APCS-E□□□DS1	APCF-P□□□HS	APCF-P□□□NB	APCF-P□□□SB
		□130	FEP15A	L7NHB020U						
		□130	FEP22A	L7NHB035U						
		□130	FEP30A	L7NHB035U						
		□180	FFP30A	L7NHB035U				APCF-P□□□IS	APCF-P□□□PB	
		□180	FFP50A	L7NHB050U				APCF-P□□□JS	APCF-P□□□LB	
2,000	3,000	□130	FEP06D	L7NHB010U				APCF-P□□□HS	APCF-P□□□NB	
		□130	FEP11D	L7NHB010U						
		□130	FEP16D	L7NHB020U						
		□130	FEP22D	L7NHB020U						
		□180	FFP22D	L7NHB020U				APCF-P□□□IS	APCF-P□□□PB	
		□180	FFP35D	L7NHB035U						
		□180	FFP55D	L7NHB050U				APCF-P□□□JS	APCF-P□□□LB	
	2,500	□180	FFP75D	L7NHB075U						
	3,000	□220	FGP22D	L7NHB020U				APCF-P□□□IS		
	2,700	□220	FGP35D	L7NHB035U						
	3,000	□220	FGP55D	L7NHB050U				APCF-P□□□JS		
	2,500	□220	FGP75D	L7NHB075U						
		□220	FGP110D	L7NHB150U				APCF-P□□□MS		
1,500	3,000	□130	FEP05G	L7NHB010U				APCF-P□□□HS	APCF-P□□□NB	
		□130	FEP09G	L7NHB010U						
		□130	FEP13G	L7NHB020U						
		□130	FEP17G	L7NHB020U						
		□180	FFP20G	L7NHB020U				APCF-P□□□IS	APCF-P□□□PB	
	2,700	□180	FFP30G	L7NHB050U						
	3,000	□180	FFP44G	L7NHB050U				APCF-P□□□JS	APCF-P□□□LB	
	2,500	□180	FFP60G	L7NHB075U						
	2,200	□180	FFP75G	L7NHB075U				APCF-P□□□MS		
	3,000	□220	FGP20G	L7NHB020U				APCF-P□□□IS		APCF-P□□□SB
	2,700	□220	FGP30G	L7NHB035U						
	3,000	□220	FGP44G	L7NHB050U				APCF-P□□□JS		
	2,500	□220	FGP60G	L7NHB075U						
		□220	FGP85G	L7NHB150U						
	2,000	□220	FGP110G	L7NHB150U				APCF-P□□□MS		
		□220	FGP150G	L7NHB150U						
1000	2,000	□130	FEP03M	L7NHB010U				APCF-P□□□HS	APCF-P□□□NB	
		□130	FEP06M	L7NHB010U						
		□130	FEP09M	L7NHB010U						
		□130	FEP12M	L7NHB020U						
		□180	FFP12M	L7NHB020U				APCF-P□□□IS	APCF-P□□□PB	
		□180	FFP20M	L7NHB020U						
	1,700	□180	FFP30M	L7NHB035U				APCF-P□□□JS	APCF-P□□□LB	
	2,000	□180	FFP44M	L7NHB050U						
		□220	FGP12M	L7NHB020U				APCF-P□□□IS		APCF-P□□□SB
		□220	FGP20M	L7NHB020U						
		□220	FGP30M	L7NHB050U				APCF-P□□□JS		
		□220	FGP44M	L7NHB050U						
		□220	FGP60M	L7NHB075U				APCF-P□□□MS		

L7NHA Drive Product Features

Item \ Type Name		L7NHA001U	L7NHA002U	L7NHA004U	L7NHA008U	L7NHA010U	L7NHA020U	L7NHA035U
Input Power	Main Power Supply	3-Phase AC 200-230 [V] (-15~10[%]), 50~60 [Hz]						
	Control Power Supply	Single-Phase AC 200-230 [V] (-15~10[%]), 50~60 [Hz]						
Rated Current[A]		1.4	1.7	3.0	5.2	6.75	13.5	16.7
Peak Current[A]		4.2	5.1	9.0	15.6	20.25	40.5	50.1
Encoder Type		Quadrture (Incremental) BiSS-B, BiSS-C(Absolute, Incremental) Tamagawa Serial (Absolute, Incremental) EnDat 2.2						
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℃[±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)	By DC mode synchronism, 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 : DC 12[V] ~ DC 24[V] Total 8 input channels (allocable) Above 12 functions can be used selectively for assignment. (*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST) *Basic allocation signal						
	Digital Output	Service rating: DC 24[V] ±10%, 120[㎃] Total 4 input channels (allocable) Above 11 functions can be used selectively for assignment. (*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, ,VLMT±, INSPD±, WARN±, TGON±, INPOS2±) *Basic allocation signal						
Analog Monitor		There are 2 input channels. Above 15 functions can be used selectively for assignment.						
Safety Function		2 Input Channels (STO1, STO2), 1 Output Channels (EDM±)						
USB Communication	Fuction	Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy						
	Communication Standard	USB 2.0 Full Speed (applies 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	Both the default built-in brake and an externally installed brake are possible.						
	Display Function	7 segments(5DIGIT)						
	Self-setting Function	The [MODE] key changes the content displayed in 7 segments.						
	Additional Function	Auto gain tuning function						
	Protection Function	Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, contorl power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem						
Environment	Temperature	0 ~ +50[℃] / -20~ +70[℃]						
	Humidity	Below 90[%]RH(avoid dew-condensation)						
	Environment	Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.						

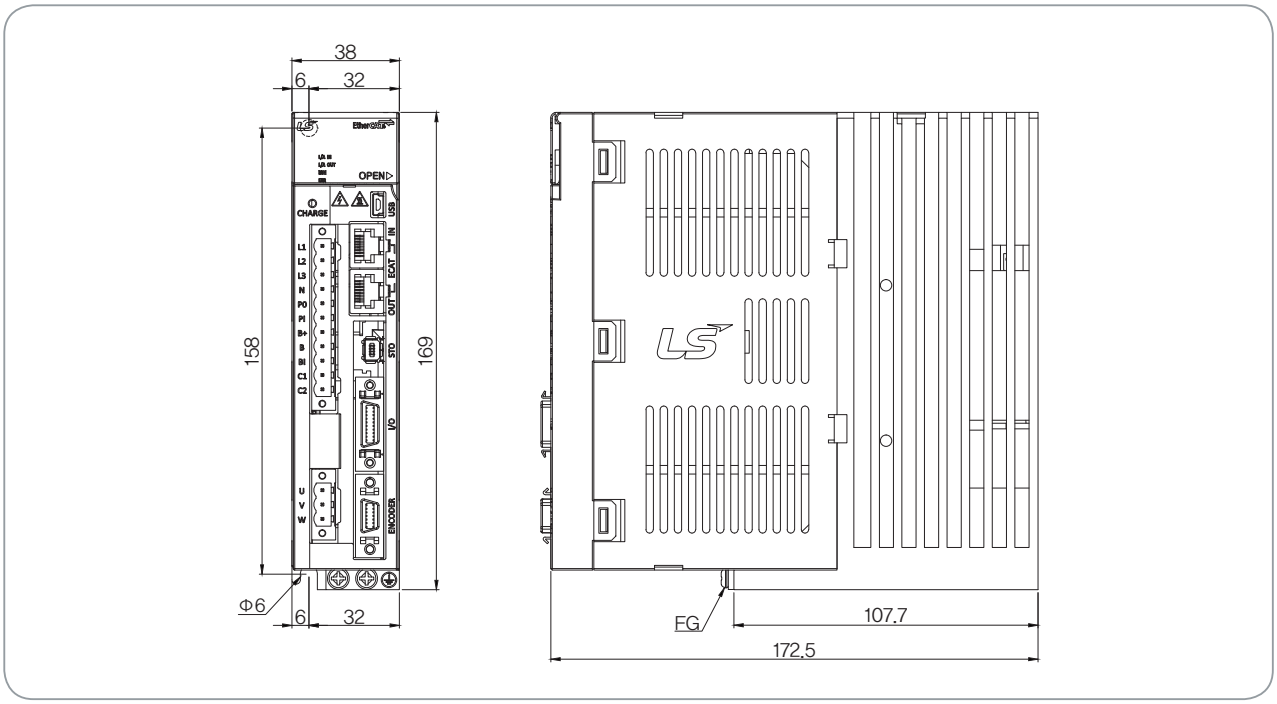
L7NHB Drive Product Features

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	10.1	17.5	22.8	39
Peak Current[A]		11.1	24	30.3	47.25	57	97.5
Encoder Type		Quadrature(Incremental) BiSS-B, BiSS-C(Absolute, Incremental) Tamagawa Serial(Absolute, Incremental) EnDat 2.2					
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℃[±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)	By DC mode synchronism, 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 : DC 12[V] ~ DC 24[V] Total 8 input channels (allocable) Above 12 functions can be used selectively for assignment. (*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST) *Basic allocation signal					
	Digital Output	Service rating: DC 24[V] ±10%, 120[㎃] Total 4 input channels (allocable) Above 11 functions can be used selectively for assignment. (*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, ,VLMT±, INSPD±, WARN±, TGON±, INPOS2±) *Basic allocation signal					
Analog Monitor		There are 2 input channels. Above 15 functions can be used selectively for assignment.					
Safety Function		2 Input Channels (STO1, STO2), 1 Output Channels (EDM±)					
USB Communication	Fuction	Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy					
	Communication Standard	USB 2.0 Full Speed (applies standard)					
	Connect	PC or USB storing medium					
USB Communication	Dynamic Braking	Standard built-in brake (activated when the servo alarm goes off or when the servo is off).					
	Regenerative Braking	Both the default built-in brake and an externally installed brake are possible.					
	Display Function	7 segments(5DIGIT)					
	Self-setting Function	Possible to set the drive node address by using Rotary Switch					
	Additional Function	Auto gain tuning function					
	Protection Function	Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, contorl 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	Temperature	0 ~ +50[℃] / -20~ +70[℃]					
	Humidity	Below 90[%]RH(avoid dew-condensation)					
	Other	Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.					

External Dimensions of L7NHA Drive

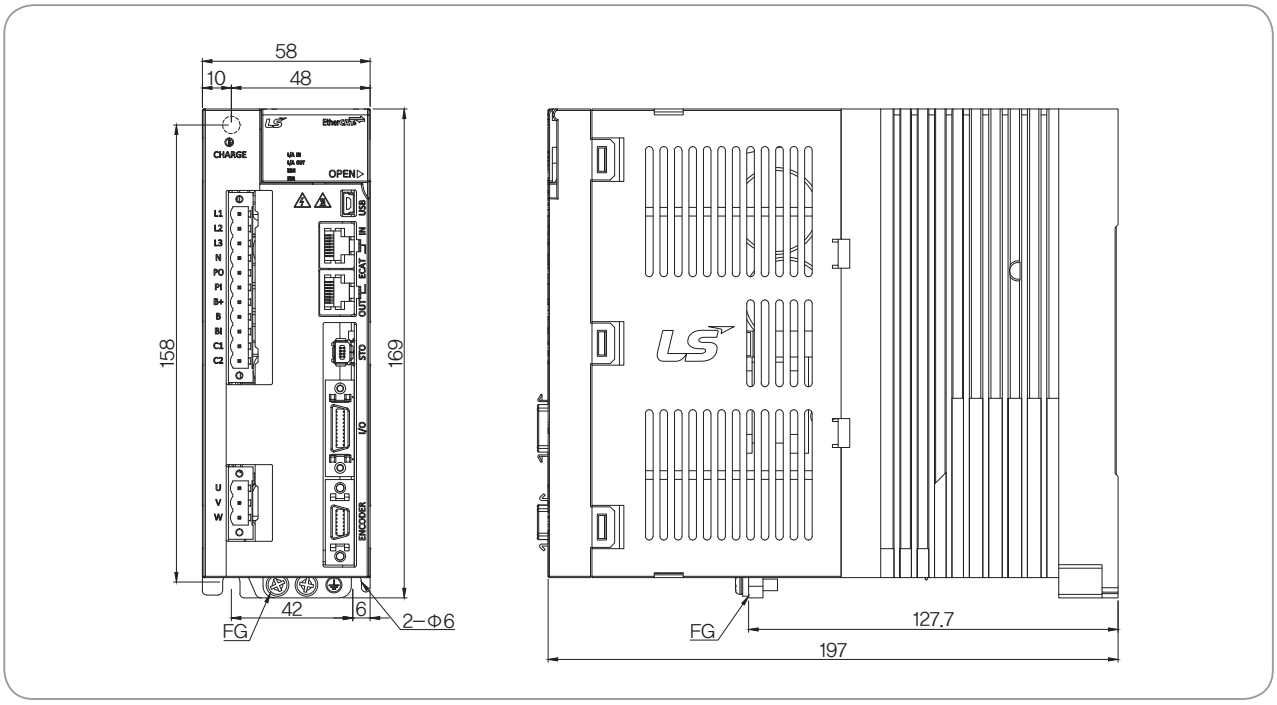
L7NHA001U ~ L7NHA004U [Weight : 1.0kg]

*Unit [mm]



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

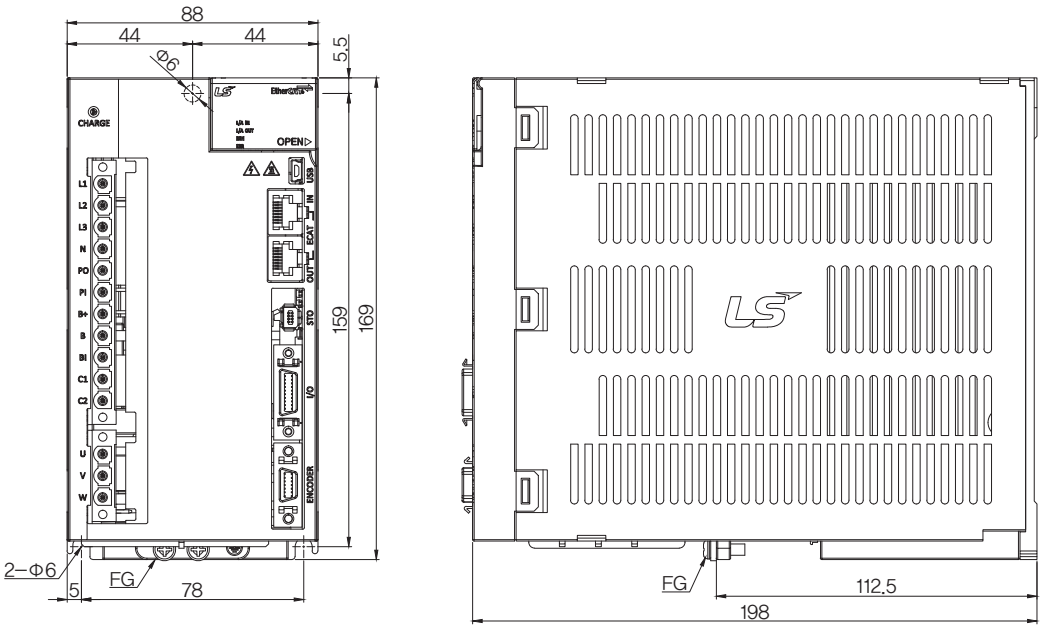
*Unit [mm]



External Dimensions of L7NHA Drive

L7NHA020U / L7NHA035U [Weight : 2.5kg(Fan-Cooling included)]

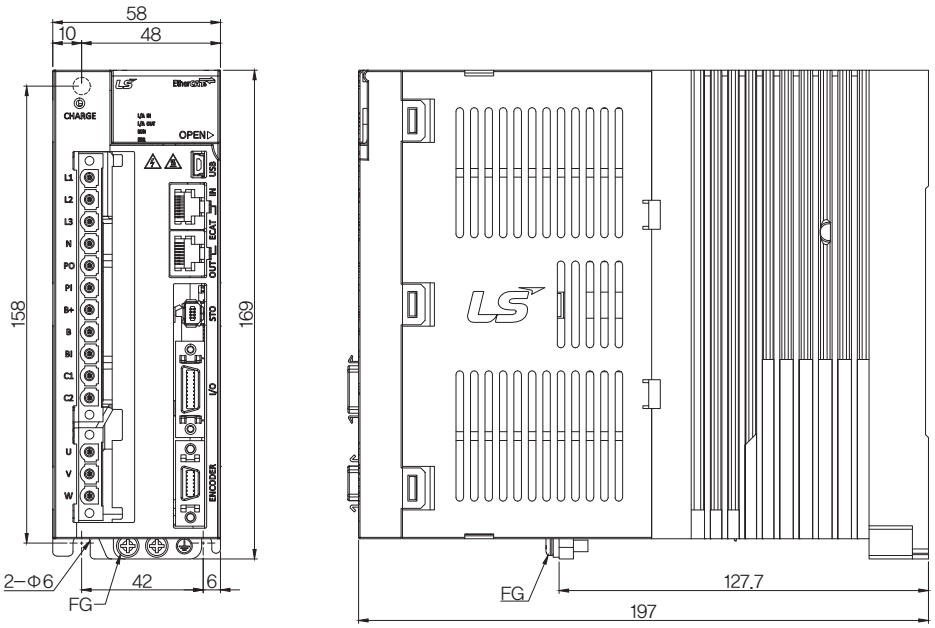
*Unit [mm]



External Dimensions of L7NHB Drive

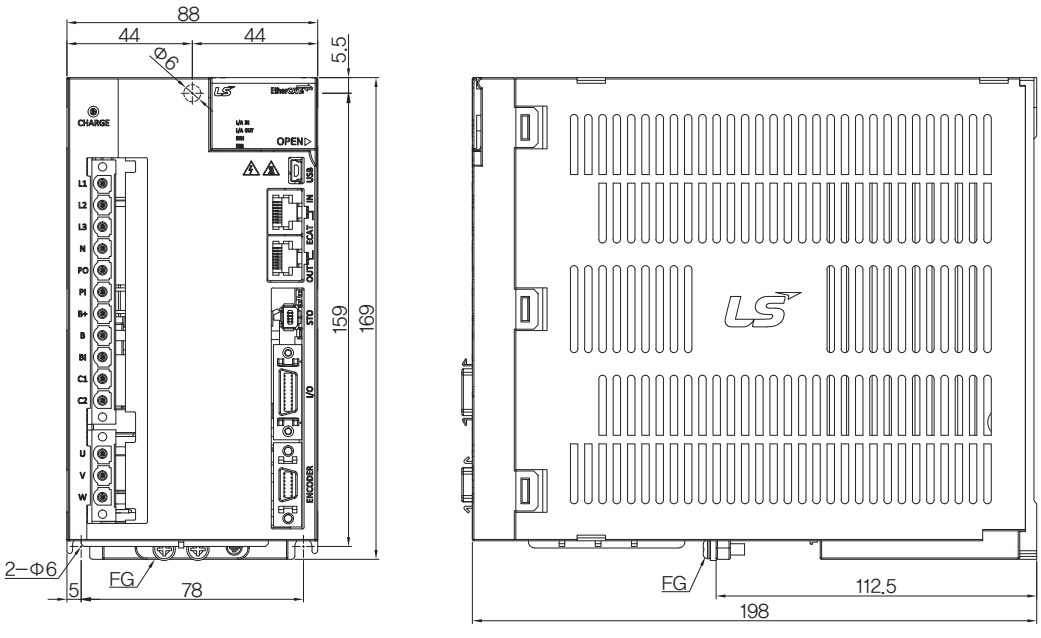
L7NHB010U [Weight : 1.5kg(Fan-Cooling included)]

*Unit [mm]



L7NHB020U / L7NHB035U [Weight : 2.5kg(Fan-Cooling included)]

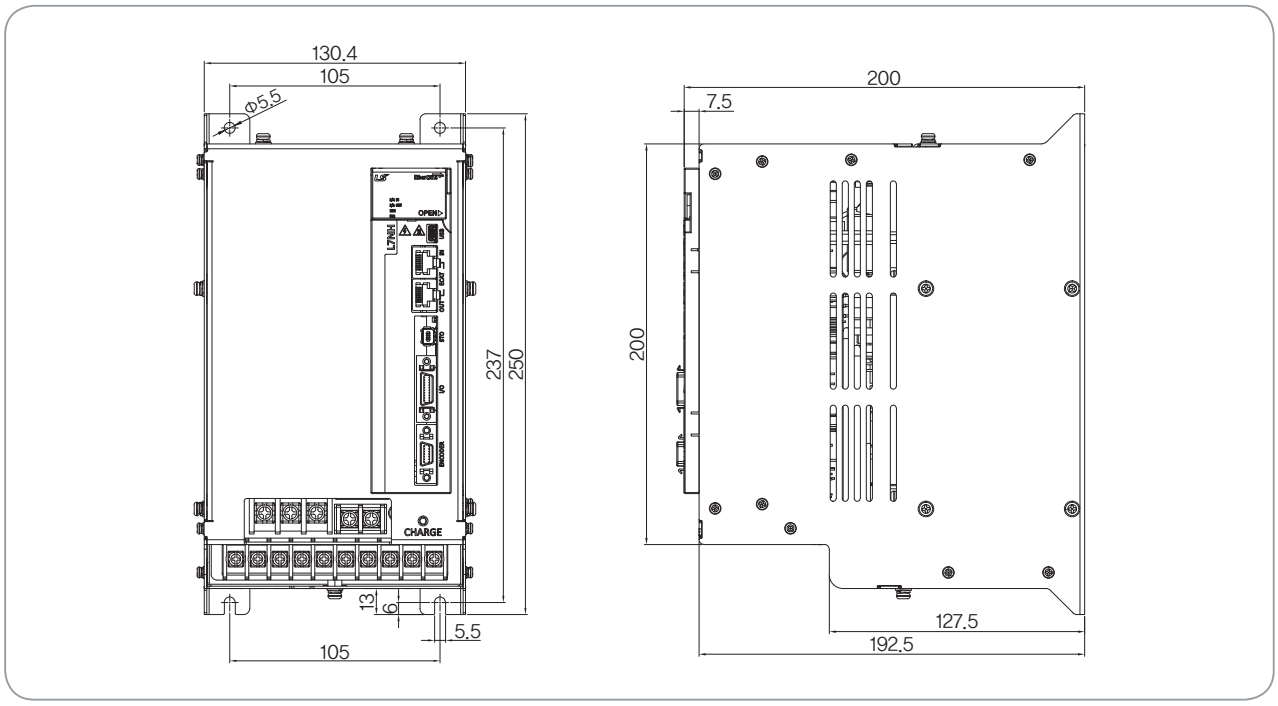
*Unit [mm]



External Dimensions of L7NHB Drive

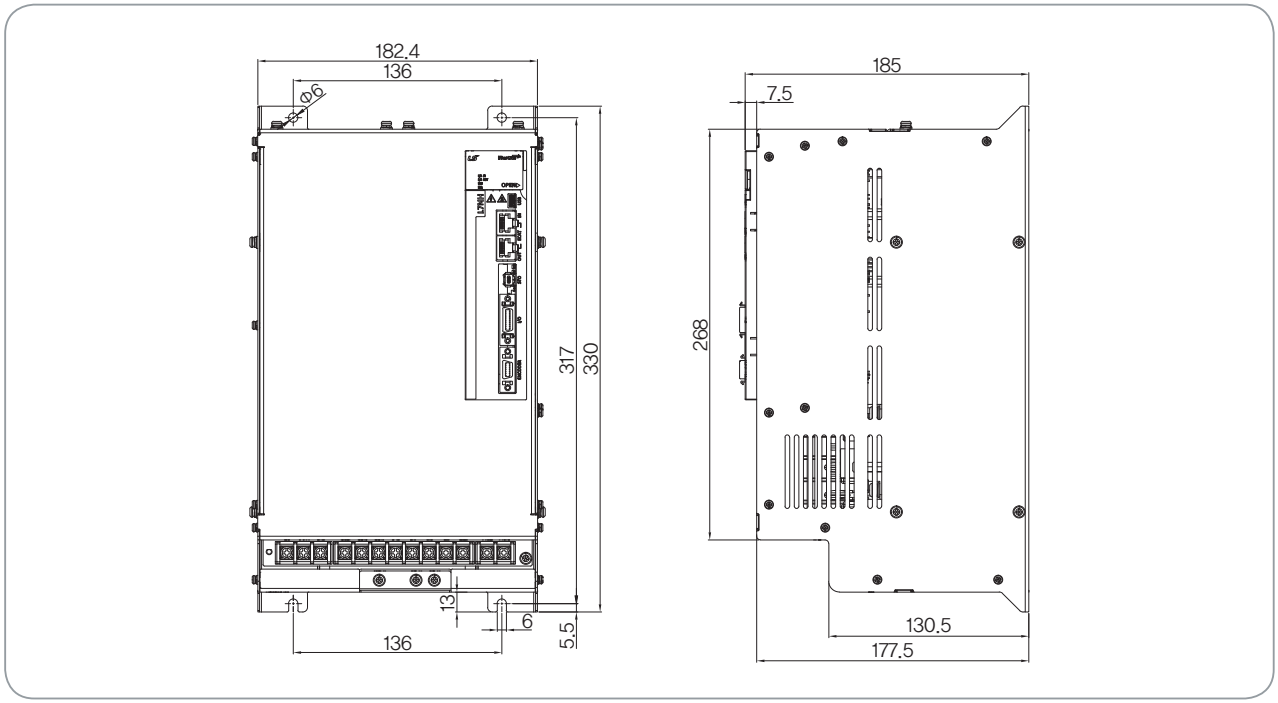
L7NHB050U [Weight : 5.5kg(Fan-Cooling included)]

*Unit [mm]



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

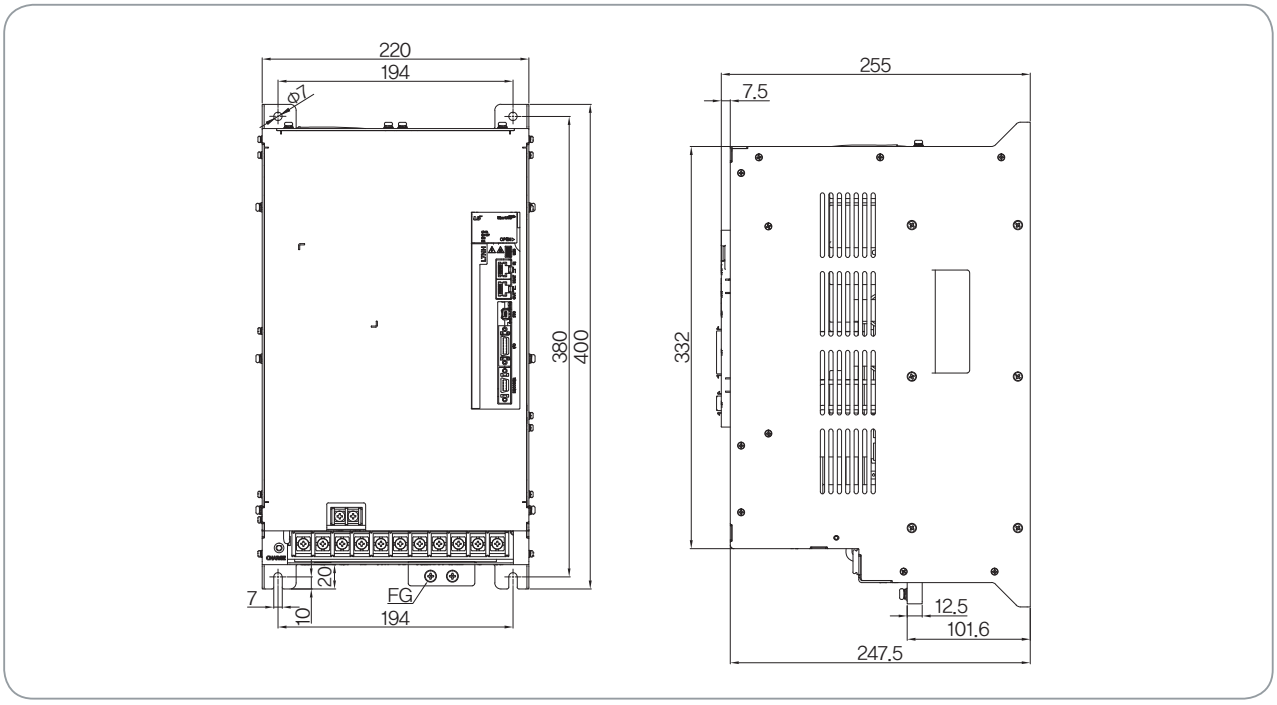
*Unit [mm]



External Dimensions of L7NHB Drive

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

*Unit [mm]



Indexer Function Type

L7P Series

Servo Drive Designation

L7	P	A	004	B	AA
Model Name	Communication	Input Power Supply	Capacity	Encoder Type	Option
Servo Series	Stand I/O & Index Type	A : 200VAC	001 : 100W 002 : 200W 004 : 400W 008 : 750W 010 : 1.0kW 020 : 2.0kW 035 : 3.5kW	U : Universal	Exclusive Option Code

L7P Series

Characteristic

● Providing Program Function built-in single axis position determination module

- Supporting position control mode by pulse input
- Position control mode
- Possible to use without upper controller
- Modbus RTU Protocol (RS-422)

● Improved Control Performance

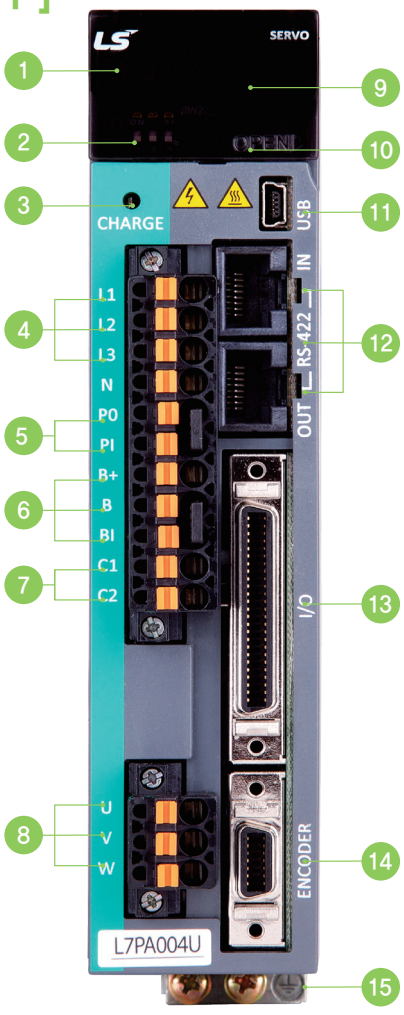
- Improved Control bandwidth
- Providing 4-step Notch-Filter
- Vibration control by Real-time FFT
- Real-time gain tuning function

● Support various motor and Encoder drive

- Supporting Rotary, DD and Motor drive (supporting3rd party motor)
- Quadrature, BiSS-C, Tamagawa serial abs, EnDat 2.2, Resolver

Identifying the Part of L7P Drive

[L7P]



1. Display
2. Status LED
3. Charge Lamp
4. Main Power Connector (L1, L2, L3)
5. DC Reactor Connector(PO, PI) Short-Circuit When Not used
6. Regenerative Resistor Connector (B+, B, BI)
   - Short-Circuit B, BI terminals when standard type
   - Use B+, B terminals when using external resistro
7. Control Power connector (C1, C2)
8. Motor power connector(U, V, W)
9. Connector for analogue monitor
10. Switch for nod address setting
11. USB connector (USB)
12. RS-422 communication connector (CN3, CN4)
13. Control signal connector (I/O)
14. Encoder Connector (ENCODER)
15. Ground

L7P Drive Combination Table

L7P Incremental Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder cable	Power Cable		
					Quadrature Type	INC	For power	Power + Brake	Brake
3,000	5,000	□40	SAR3A	L7PA001U	2,048 P/R	APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□KB
		□40	SAR5A	L7PA001U					
		□40	SA01A	L7PA001U					
		□40	SA015A	L7PA002U					
		□60	SB01A	L7PA002U	3,000 P/R				
		□60	SB02A	L7PA002U					
		□60	SB04A	L7PA004U					
		□80	SC04A	L7PA004U					
		□80	SC06A	L7PA008U					
		□80	SC08A	L7PA008U					
		□80	SC10A	L7PA010U					
		□130	SE09A	L7PA008U		APCS-E□□□BS	APCS-P□□□HS	APCS-P□□□NB	
		□130	SE15A	L7PA020U					
		□130	SE22A	L7PA020U					
		□180	SF30A	L7PA035U			APCS-P□□□IS	APCS-P□□□PB	
2,000	3,000	□80	SC03D	L7PA004U		APCS-E□□□AS	APCS-P□□□GS		APCS-P□□□KB
		□80	SC05D	L7PA008U					
		□80	SC06D	L7PA008U					
		□80	SC07D	L7PA008U					
		□130	SE06D	L7PA008U		APCS-E□□□BS	APCS-P□□□HS	APCS-P□□□NB	
		□130	SE11D	L7PA010U					
		□130	SE16D	L7PA020U					
		□130	SE22D	L7PA020U					
		□180	SF22D	L7PA020U			APCS-P□□□IS	APCS-P□□□PB	
		□180	LF35D	L7PA035U					
		□220	SG22D	L7PA020U					APCS-P□□□SB
		□220	LG35D	L7PA035U					
1,500	3,000	□130	SE05G	L7PA008U			APCS-P□□□HS	APCS-P□□□NB	
		□130	SE09G	L7PA010U					
		□130	SE13G	L7PA020U					
		□130	SE17G	L7PA020U					
		□180	SF20G	L7PA035U			APCS-P□□□IS	APCS-P□□□PB	
	2,700	□180	LF30G	L7PA035U					
	3,000	□220	SG20G	L7PA020U					APCS-P□□□SB
	2,700	□220	LG30G	L7PA035U					
1,000	2,000	□130	SE03M	L7PA004U			APCS-P□□□HS	APCS-P□□□NB	
		□130	SE06M	L7PA008U					
		□130	SE09M	L7PA010U					
		□130	SE12M	L7PA020U					
		□180	SF12M	L7PA020U			APCS-P□□□IS	APCS-P□□□PB	
		□180	SF20M	L7PA035U					
	1,700	□180	LF30M	L7PA035U					
		□220	SG12M	L7PA020U			APCS-P□□□IS		APCS-P□□□SB
		□220	SG20M	L7PA035U					
	1,700	□220	LG30M	L7PA035U					
3,000	3,500	□60	HB01A	L7PA002U	1,024 P/R	APCS-E□□□AS	APCS-P□□□GS		
		□60	HB02A	L7PA002U					
		□60	HB04A	L7PA004U					
		□130	HE09A	L7PA008U	2,048 P/R	APCS-E□□□BS	APCS-P□□□HS		
		□130	HE15A	L7PA020U					

L7P Drive Combination Table

L7P Serial Type

Rated Speed (rpm)	Maximum Speed (rpm)	Flange Size	Applicable Motor	Applicable Drive	Standard Encoder Type	Encoder cable		Power Cable		
					Serial Type	Single Turn	Multi Turn	For power	Power + Brake	Brake
3,000	5,000	□40	FALR5A	L7PA001U	18Bit Serial / M-Turn Abs	APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□40	FAL01A	L7PA001U						
		□40	FAL015A	L7PA002U						
		□60	FBL01A	L7PA001U	19Bit Serial / M-Turn Abs					
		□60	FBL02A	L7PA002U						
		□60	FBL04A	L7PA004U						
		□80	FCL04A	L7PA004U						
		□80	FCL06A	L7PA008U						
		□80	FCL08A	L7PA008U						
		□80	FCL10A	L7PA010U						
		□60	FB01A	L7PA001U				APCS-P□□□FS		
		□60	FB02A	L7PA002U						
		□60	FB04A	L7PA004U						
		□80	FC04A	L7PA004U						
		□80	FC06A	L7PA008U						
		□80	FC08A	L7PA008U						
		□80	FC10A	L7PA010U						
		□130	FE09A	L7PA010U		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE15A	L7PA020U						
		□130	FE22A	L7PA020U						
		□130	FE30A	L7PA035U						
		□180	FF30A	L7PA035U				APCS-P□□□IS	APCS-P□□□PB	
2,000	3,000	□80	FCL03D	L7PA004U		APCS-E□□□ES	APCS-E□□□ES1	APCS-P□□□LS		APCS-P□□□QS
		□80	FCL05D	L7PA008U						
		□80	FCL06D	L7PA008U						
		□80	FCL07D	L7PA008U						
		□80	FC03D	L7PA004U						
		□80	FC05D	L7PA008U				APCS-P□□□FS		
		□80	FC06D	L7PA008U						
		□80	FC07D	L7PA008U						
		□130	FE06D	L7PA008U						
		□130	FE11D	L7PA010U						
		□130	FE16D	L7PA020U						
		□130	FE22D	L7PA020U						
		□180	FF22D	L7PA020U						
		□180	FF35D	L7PA035U						
		□220	FG22D	L7PA020U						
		□220	FG35D	L7PA035U						
1,500	3,000	□130	FE05G	L7PA008U		APCS-E□□□DS	APCS-E□□□DS1	APCS-P□□□HS	APCS-P□□□NB	
		□130	FE09G	L7PA010U						
		□130	FE13G	L7PA020U						
		□130	FE17G	L7PA020U						
		□180	FF20G	L7PA020U						
	2,700	□180	FF30G	L7PA035U				APCS-P□□□IS	APCS-P□□□PB	
	3,000	□220	FG20G	L7PA020U						
	2,700	□220	FG30G	L7PA035U						APCS-P□□□SB
1,000	2,000	□130	FE03M	L7PA004U				APCS-P□□□HS	APCS-P□□□NB	
		□130	FE06M	L7PA008U						
		□130	FE09M	L7PA010U						
		□130	FE12M	L7PA020U						
		□180	FF12M	L7PA020U				APCS-P□□□IS	APCS-P□□□PB	
		□180	FF20M	L7PA020U						
	1,700	□180	FF30M	L7PA035U						
		□220	FG12M	L7PA020U				APCS-P□□□IS		APCS-P□□□SB
		□220	FG20M	L7PA020U						
	1,700	□220	FG30M	L7PA035U						

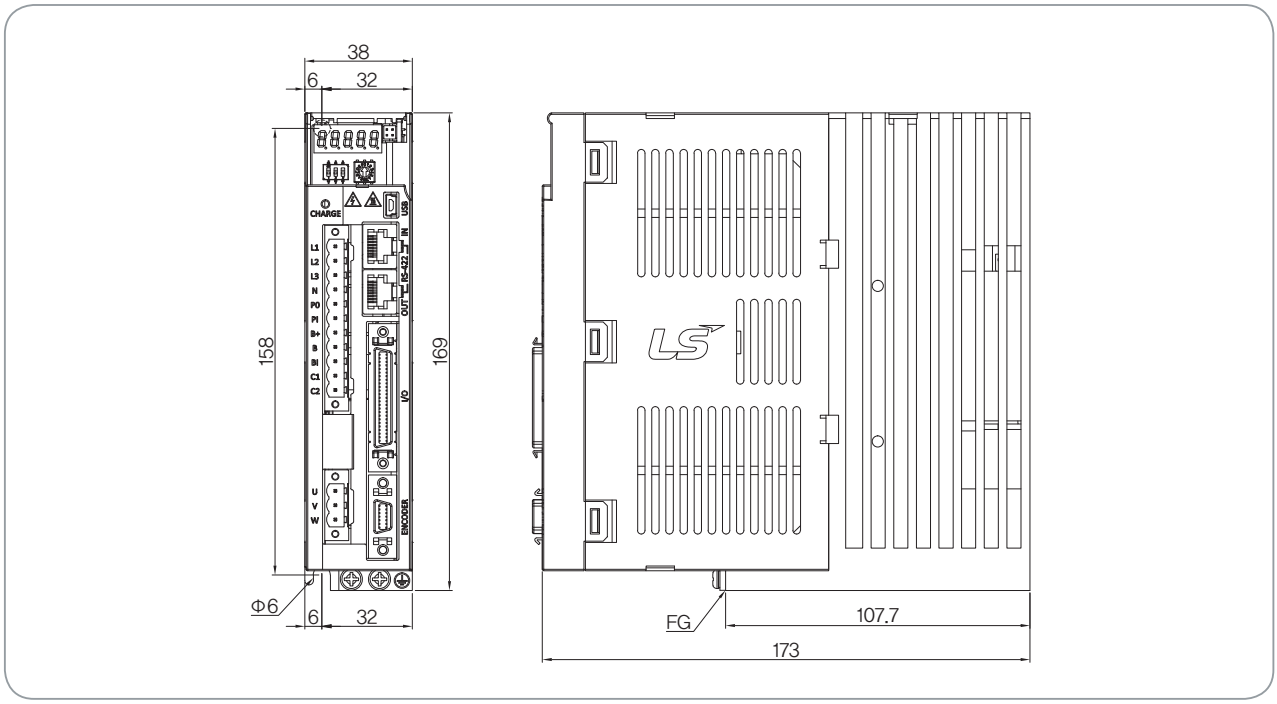
L7P Drive Product Features

Item \ Type Name			L7PA001U	L7PA002U	L7PA004U	L7PA008U	L7PA010U	L7PA020U	L7PA035U
Input Power	Main Power Supply		3-Phase AC 200-230 [V] (-15~10[%]), 50-60 [Hz]						
	Control Power Supply		Single-Phase AC 200-230 [V] (-15~10[%]), 50-60 [Hz]						
Rated Current[A]			1.4	1.7	3.0	5.2	6.75	13.5	16.7
Peak Current[A]			4.2	5.1	9.0	15.6	20.25	40.5	50.1
Encoder Type			Quadrature(Incremental) BiSS-B, BiSS-C(Absolute, Incremental) Tamagawa Serial(Absolute, Incremental) EnDat 2.2						
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℃]						
		속도 가감속시간	Straight or S-curveacceleration/deceleration (0~10,000[ms], 0~1,000[ms] Unitconfigurable)						
		입력주파수	1[Mpps], line drive / 200[kpps], Open Collectopr						
		입력펄스 방식	Symbol + Pulse Series, CW+CCW, A/B Phase						
RS422 Communication Specifications		Communication Specifications	ANSI/TIA/EIA-422 StandardSpecficiations						
		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[㎃] 이하						
		Terminating Resistance	Dip S/W(On/Off), Built-In 120Ω						
Input/Output Signal		Digital Input	Input voltage range: DC 12[V] ~ DC 24[V] Total 16 input channel (allocatable) 32 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, MODE, PAUSE, ABSRQ, JSTART, JDIR, PCLR, AOVR, SPD1/LVSF1, SPD2/LVSF2, SPD3, PROBE1, PROBE2) * Basic allocationsignal.						
		Digital Output	Use rating: DC 24[V] ±10%, 120[㎃] Total 8 input channel (allocatable) 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±) * Standard Allocationsignal						
Analog Input/output		Analog input	Total 2 channels analogspeedoverrideinput(-10[V) ~ +10[V)) analogtorquecommand input(-10[V) ~ +10[V))						
		Analog output	Total 2 channels 15 function inputs can be selectively allocated						
USB Communciation		Protection	Firmware download, parametersetting, tuning, auxiliary function,parametercopy						
		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 servoalarm or servo OFF)						
		Regenerative Braking	Built-in, external brake attachable						
		Display	7 Segment(5 DIGIT)						
		Setting Function	Drive node address can be set using rotary switch						
		Additional Function	Gaintuning, alarm history, JOG operation, origin search						
		Protective Function	Excessie current, overload, excessive current limit, overheating, excessive voltage, low voltage, excessive speed, encoder fail, position following fail, current sensing fail						
Environment		Temperature	0 ~ 50[℃] / -20 ~ 65 ℃						
		Humidity	Below 90[%]RH(avoid dew-condensation)						
		Environment	Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.						

External Dimensions of L7P Drive

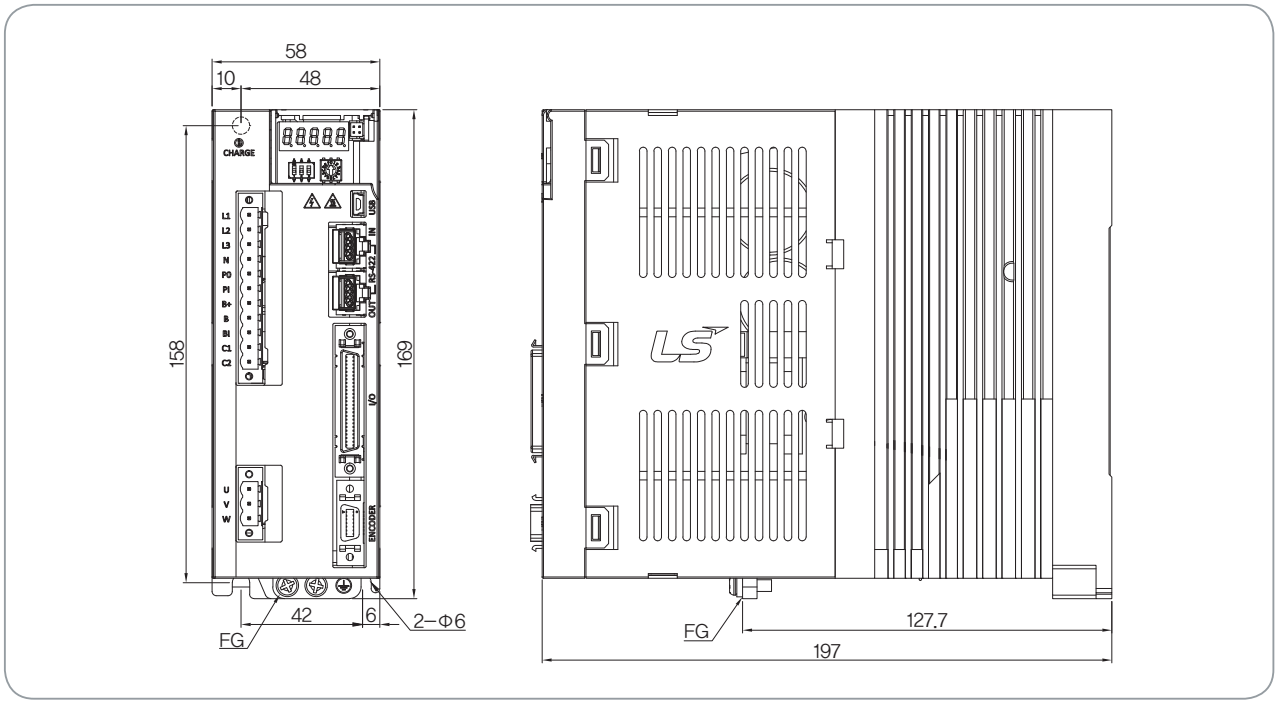
L7PA001U ~ L7PA004U [Weight : 1.0kg(Fan-Cooling included)]

*Unit [mm]



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

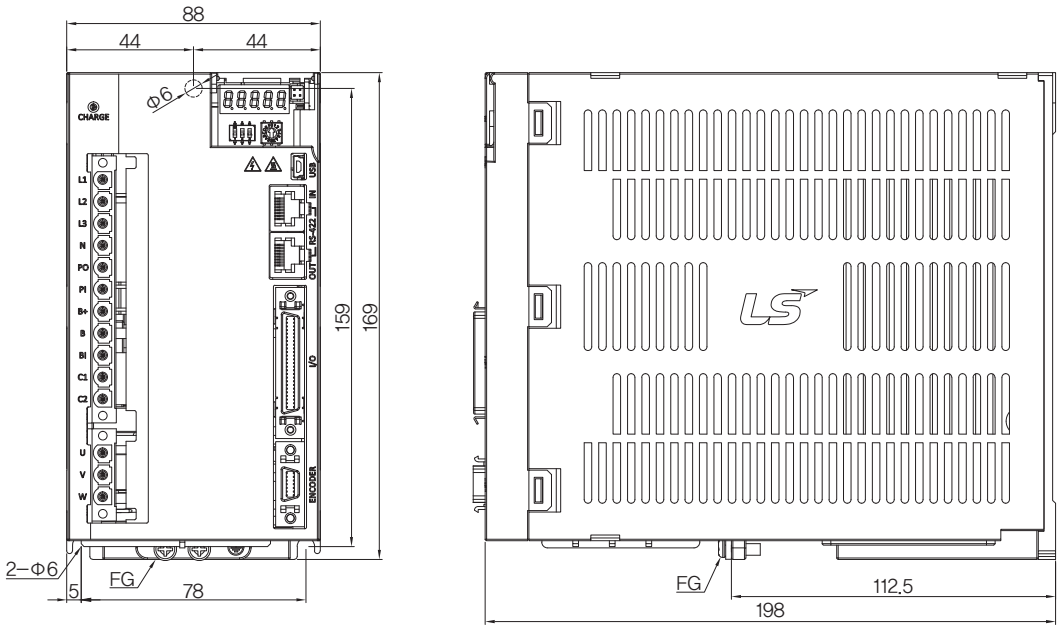
*Unit [mm]



External Dimensions of L7P Drive

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

*Unit [mm]



Contents

■ Servo Motor

Solid/Hollow Type Roatating Servo Motor

S Series

Servo Motor Designation

APMC	–	S	E	P	04	A	E	K	1

Model Name
- APM : Servo Motor [Made in Korea]
- APMC : Servo Motor [Made in China]

Motor Shaft
- S : Solid Shaft(Standard)
- L : Solid Shaft(Low Current)
- H : Hollow Shaft

Flange Size
- A : 40 Flange
- B : 60 Flange
- C : 80 Flange
- E : 130 Flange
- F : 180 Flange
- G : 220 Flange
- H : 250 Flange
- J : 280 Flange

Input Power Supply
- None : 200VAC
- P : 400VAC

Motor Capacity
- R5 : 50[W]
- 01 : 100[W]
- 02 : 200[W]
- 03 : 300[W]
- 04 : 400[W]
- 07 : 650[W]
- 08 : 800[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
- D : Inc. 2500[P/R]
- E : Inc. 3000[P/R]
- M : 19bit Serial Abs
- M8 : 18bit M-Turn Abs[SA Type]

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

Note 1) 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

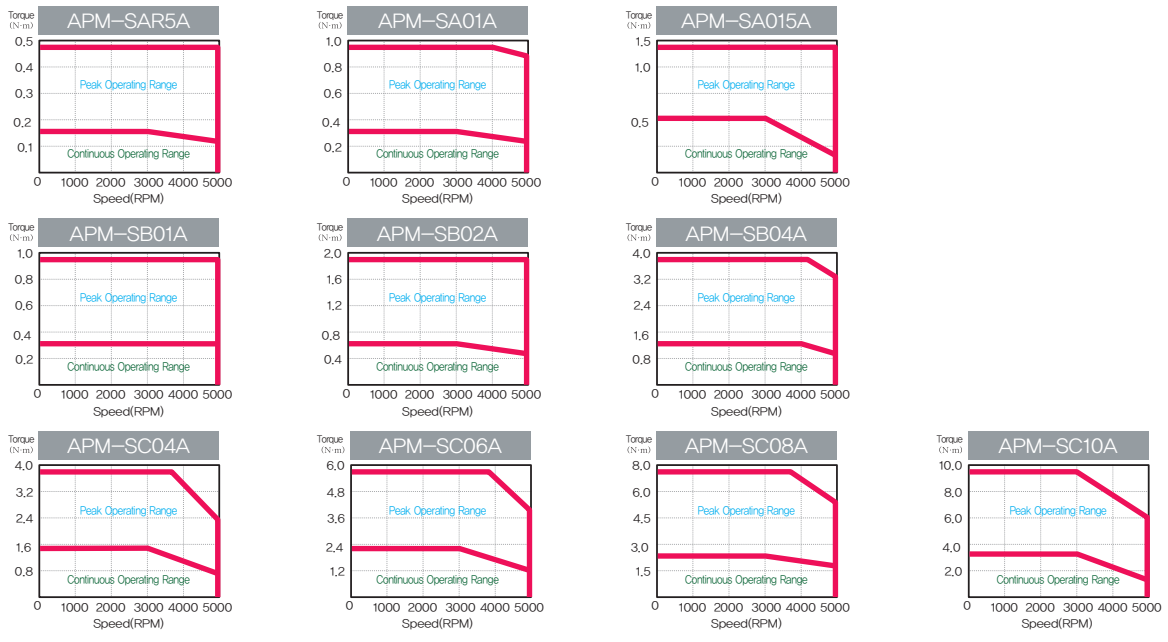
S Series Motor Characteristics (200V)

Motor Specifications [Rated 3000r/min]

Servo Motor (APM-□□□□)		SAR5A	SA01A	SA015A	SB01A	SB02A	SB04A	SC04A	SC06A	SC08A	SC10A
Applicable Drive (L7□A□□)		L7□A001		L7□A002			L7□A004		L7□A008		L7□A010
Flange Size(□)		□40			□60			□80			
Rated Output	[kW]	0.05	0.1	0.15	0.1	0.2	0.4	0.4	0.6	0.8	1
Rated Torque	[N · m]	0.16	0.32	0.48	0.32	0.64	1.27	1.27	1.91	2.55	3.19
	[kgf · cm]	1.62	3.25	4.87	3.25	6.49	12.99	12.99	19.49	25.98	32.48
Max. Instantaneous	[N · m]	0.48	0.96	1.43	0.96	1.91	3.82	3.82	5.73	7.64	9.56
	[kgf · cm]	4.87	9.74	14.62	9.74	19.48	38.96	38.96	58.47	77.95	97.43
Rated Current	[A]	1.2	1.38	1.73	1.65	1.63	2.89	2.82	3.58	4.83	5.37
Max.Current	[A]	3.6	4.14	5.19	4.95	4.89	8.67	8.46	10.74	14.49	16.11
Rated Speed	[r/min]	3000									
Max. Speed	[r/min]	5000									
Inertia	[kg · m^2×10^{-4}]	0.02	0.05	0.06	0.11	0.18	0.32	0.67	1.09	1.51	1.93
	[gf · cm×s^2]	0.02	0.05	0.07	0.12	0.19	0.33	0.69	1.11	1.54	1.97
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	35.34	8.89	22.26	50.49	24.05	33.39	43.02	52.57
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 2048[P/R]			Quad. Type Incremental 3000[P/R]						
	Option	Serial Type 18[Bit]			Serial Type 19[Bit]						
Specifications & Features	Structure	Fully closed · Self cooling IP55 Note1)						Fully closed · Self cooling IP65 Note1)			
	Rated Time	Continuous									
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]									
	Ambient Humidity	20 ~ 80[%] (avoid dew-condensation)									
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.									
	E/V	Elevation/vibration 49[m/s2](5G)									
Weight	[kg]	0.38	0.5	0.7	0.82	1.08	1.58	1.88	2.52	3.15	3.8

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics



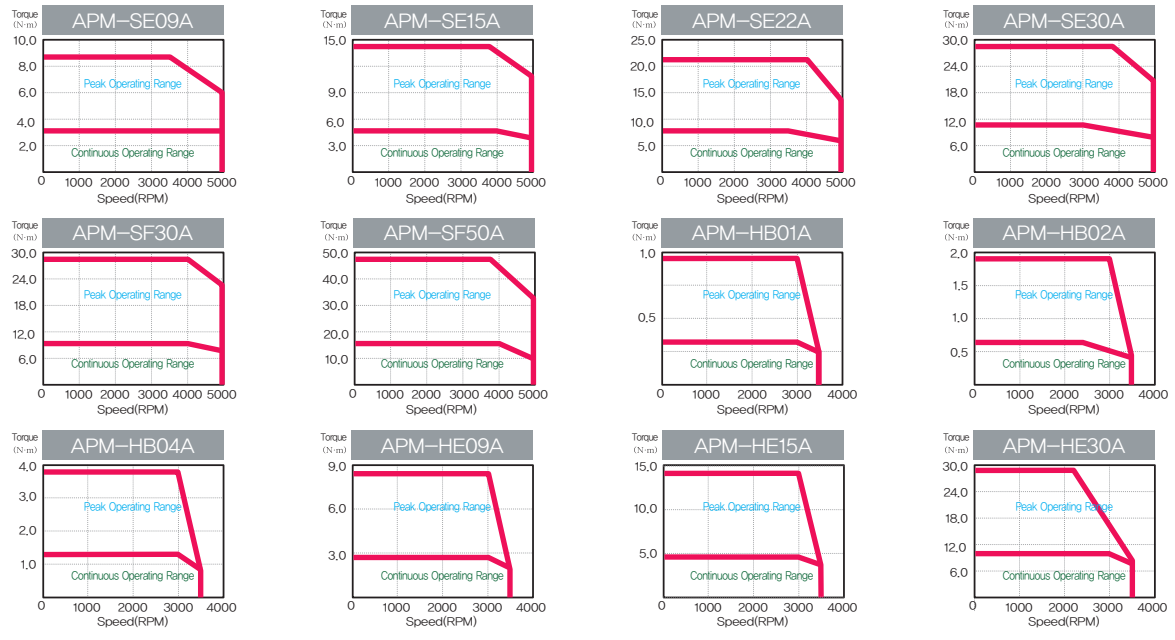
S Series Motor Characteristics (200V)

Motor Specifications [Rated 3000r/min]

Servo Motor (APM-□□□□)		SE09A	SE15A	SE22A	SE30A	SF30A	SF50A	HB01A	HB02A	HB04A	HE09A	HE15A	HE30A
Applicable Drive (L7□A□□)		L7□A008	L7□A020		L7□A050	L7□A035	L7□A050	L7□A002		L7□A004	L7□A008	L7□A020	L7□A050
Flange Size(□)		□130				□180		□60			□130		
Rated Output	[kW]	0.9	1.5	2.2	3	3	5	0.1	0.2	0.4	0.9	1.5	3
Rated Torque	[N · m]	2.86	4.77	7	9.55	9.55	15.91	0.32	0.64	1.27	2.86	4.77	9.55
	[kgf · cm]	29.23	48.72	71.45	97.43	97.43	162.38	3.25	6.49	12.99	29.23	48.72	97.43
Max. Instantaneous	[N · m]	8.59	14.32	21.01	28.64	28.64	47.74	0.96	1.91	3.82	8.59	14.32	28.64
	[kgf · cm]	87.69	146.15	214.35	292.29	292.29	487.15	9.74	19.48	38.96	87.69	146.15	292.29
Rated Current	[A]	4.95	8.23	11.98	17.16	16.7	27.4	1.65	1.63	2.89	4.95	8.23	17.16
Max.Current	[A]	14.85	24.69	35.94	51.48	50.1	82.2	4.95	4.89	8.67	14.85	24.69	51.48
Rated Speed	[r/min]	3000											
Max. Speed	[r/min]	5000						3500					
Inertia	[kg · m^2×10^{-4}]	6.66	12	17.34	22.68	30.74	52.13	0.27	0.33	0.46	19.56	22.27	31.81
	[gf · cm×s^2]	6.8	12.24	17.69	23.14	31.37	53.19	0.27	0.34	0.47	19.96	22.72	32.46
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia		20 times of motor inertia			10 times of motor inertia		
Rated Power Rate	[kW/s]	12.32	18.99	28.28	40.20	29.66	48.58	3.34	11.98	34.47	4.10	10.01	22.03
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]						Quad. Type Incremental 1024[P/R]			Quad. Type Incremental 2048[P/R]		
	Option	Serial Type 19[Bit]						X					
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)						Fully closed · Self cooling IP55 Note1)					
	Rated Time	Continuous											
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]											
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)											
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.											
	E/V	Elevation/vibration 49[m/s2](5G)											
Weight	[kg]	5.5	7.5	9.7	11.8	12.4	17.7	0.9	1.2	1.7	5.8	7.4	

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics



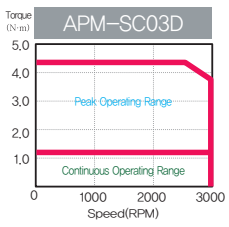
S Series Motor Characteristics (200V)

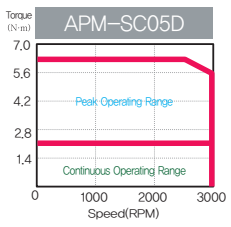
Motor Specifications [Rated 2000r/min]

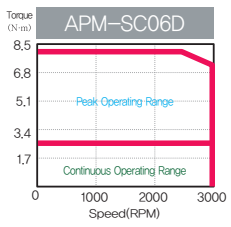
Servo Motor (APM-□□□□)		SC03D	SC05D	SC06D	SC07D	SE06D	SE11D	SE16D	SE22D
Applicable Drive (L7□A□□)		L7□A004	L7□A008			L7□A008	L7□A010	L7□A020	
Flange Size(□)		□80				□130			
Rated Output	[kW]	0.3	0.45	0.55	0.65	0.6	1.1	1.6	2.2
Rated Torque	[N · m]	1.43	2.15	2.63	3.1	2.86	5.25	7.64	10.5
	[kgf · cm]	14.61	21.92	26.79	31.66	29.23	53.59	77.94	107.17
Max. Instantaneous	[N · m]	4.3	6.45	7.88	9.31	8.59	15.75	22.92	31.51
	[kgf · cm]	43.84	65.77	80.38	94.99	87.69	160.76	233.83	321.52
Rated Current	[A]	2.59	3.23	3.82	4.42	3.97	6.28	9.23	12.37
Max.Current	[A]	7.77	9.69	11.46	13.26	11.91	18.84	27.69	37.11
Rated Speed	[r/min]	2000							
Max. Speed	[r/min]	3000							
Inertia	[kg · m^2×10^{-4}]	0.67	1.09	1.51	1.93	6.66	12	17.34	22.68
	[gf · cm×s^2]	0.69	1.11	1.54	1.97	6.8	12.24	17.69	23.14
Allowable Load Inertia Ratio		15 times of motor inertia				10 times of motor inertia			
Rated Power Rate	[kW/s]	30.43	42.27	45.69	49.97	12.32	22.98	33.65	48.64
Speed/Position Detector	Standard(Note1)	Quande. Type Incremental 3000[P/R]							
	Option	Serial Type 19[Bit]							
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)							
	Rated Time	Continuous							
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]							
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s2](5G)							
Weight	[kg]	1.9	2.5	3.2	3.9	5.5	7.5	9.7	11.8

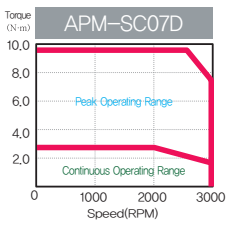
Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

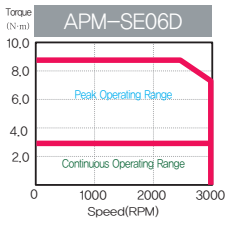
Speed-Torque Characteristics

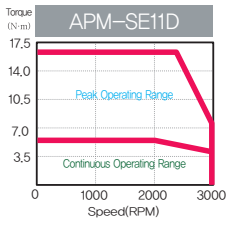


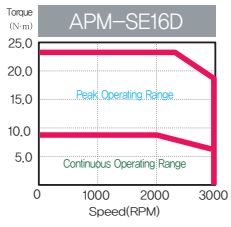


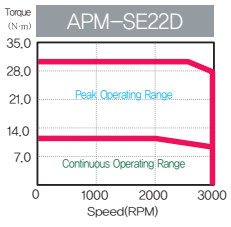












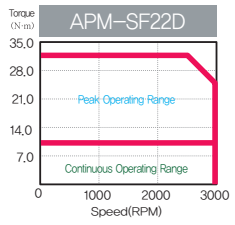
S Series Motor Characteristics (200V)

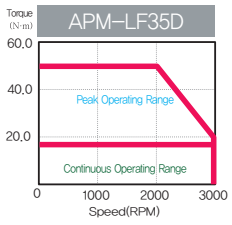
Motor Specifications [Rated 2000r/min]

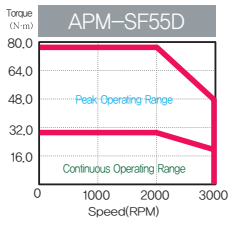
Servo Motor (APM-□□□□)		SF22D	LF35D	SF55D	SF75D	SG22D	LG35D	SG55D	SG75D
Applicable Drive (L7□A□□)		L7□A020	L7□A035	L7□A050	L7□A075	L7□A020	L7□A035	L7□A050	L7□A075
Flange Size(□)		□180				□220			
Rated Output	[kW]	2.2	3.5	5.5	7.5	2.2	3.5	5.5	7.5
Rated Torque	[N · m]	10.5	16.71	26.26	35.81	10.5	16.71	26.26	35.81
	[kgf · cm]	107.17	170.5	267.93	365.36	107.2	170.52	267.9	365.4
Max. Instantaneous	[N · m]	31.51	50.13	78.77	89.51	31.51	50.13	78.77	89.51
	[kgf · cm]	321.52	511.51	803.8	913.41	321.52	511.51	803.8	913.4
Rated Current	[A]	13.5	15.85	30.25	34.6	12.3	16.05	30.25	38
Max.Current	[A]	40.5	47.55	90.75	86.5	36.9	48.15	90.75	102
Rated Speed	[r/min]	2000							
Max. Speed	[r/min]	3000			2500	3000			2500
Inertia	[kg · m^2×10^{-4}]	30.74	52.13	83.6	121.35	51.42	80.35	132.41	172.91
	[gf · cm×s^2]	31.35	53.16	85.31	123.74	52.47	81.99	135.11	176.44
Allowable Load Inertia Ratio		5 times of motor inertia							
Rated Power Rate	[kW/s]	35.88	53.56	82.56	105.75	21.45	34.75	52.07	74.15
Speed/Position Detector	Standard(Note1)	Quande. Type Incremental 3000[P/R]							
	Option	Serial Type 19[Bit]							
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)							
	Rated Time	Continuous							
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]							
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s2](5G)							
Weight	[kg]	12.4	17.7	26.3	35.6	17	22	30.8	37.5

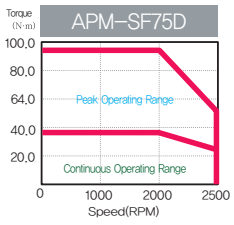
Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

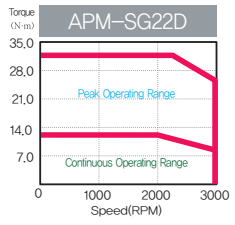
Speed-Torque Characteristics

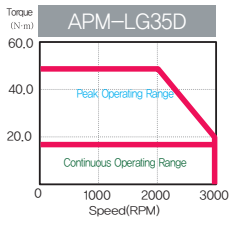


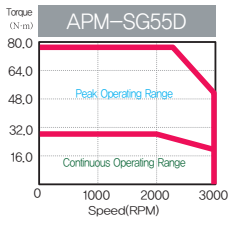


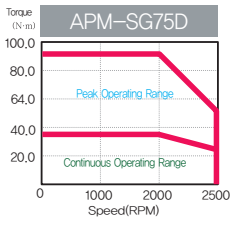












S Series Motor Characteristics (200V)

Motor Specifications [Rated 1500r/min]

Servo Motor (APM-□□□□)		SE05G	SE09G	SE13G	SE17G	SF20G	LF30G	SF44G	SF60G	SG20G	LG30G	SG44G	SG60G
Applicable Drive (L7□A□□)		L7□A008	L7□A010	L7□A020		L7□A035		L7□A050	L7□A075	L7□A020	L7□A035	L7□A050	L7□A075
Flange Size(□)		□130				□180				□220			
Rated Output	[kW]	0.45	0.85	1.3	1.7	1.8	2.9	4.4	6	1.8	2.9	4.4	6
Rated Torque	[N · m]	2.86	5.41	8.28	10.82	11.46	18.46	28.01	38.19	11.46	18.46	28.01	38.19
	[kgf · cm]	29.23	55.21	84.44	110.42	116.92	188.37	285.8	389.7	116.92	188.37	285.8	389.7
Max. Instantaneous	[N · m]	8.59	16.23	24.83	32.46	34.37	55.38	84.02	95.48	34.47	55.38	84.02	95.48
	[kgf · cm]	87.69	165.63	253.32	331.26	350.75	565.1	857.39	974.3	350.8	565.1	857.39	974.3
Rated Current	[A]	3.97	6.47	10	12.75	14.7	15.92	31.75	38	13.1	16.19	31.5	38
Max.Current	[A]	11.91	19.41	30	38.25	44.1	47.64	95.25	102	39.3	48.57	94.5	102
Rated Speed	[r/min]	1500											
Max. Speed	[r/min]	3000				3000	2700	3000	2500	3000	2700	3000	2500
Inertia	[kg · m^2×10^{-4}]	6.66	12	17.34	22.68	30.74	52.13	83.6	121.35	51.42	80.35	132.41	172.91
	[gf · cm×s^2]	6.8	12.24	17.69	23.14	31.37	53.19	85.31	123.83	52.47	81.99	135.11	176.44
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia							
Rated Power Rate	[kW/s]	12.32	24.4	39.49	51.63	42.71	65.37	93.83	120.21	25.53	42.41	59.24	84.36
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]											
	Option	Serial Type 19[Bit]											
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)											
	Rated Time	Continuous											
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]											
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)											
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.											
	E/V	Elevation/vibration 49[m/s2](5G)											
Weight	[kg]	5.5	7.5	9.7	11.8	12.4	17.7	26.3	35.6	17	22	30.8	37.52

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

S Series Motor Characteristics (200V)

Motor Specifications [Rated 1000r/min]

Servo Motor (APM-□□□□)		SE03M	SE06M	SE09M	SE12M	SF12M	SF20M	LF30M	SF44M	SG12M	SG20M	LG30M	SG44M	SG60M
Applicable Drive (L7□A□□)		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
Rated Torque	[N · m]	2.86	5.73	8.59	11.46	11.46	19.1	28.64	42.01	11.46	19.1	28.64	42.01	57.29
	[kgf · cm]	29.23	58.46	87.69	116.92	116.92	194.86	292.29	428.69	116.92	194.86	292.29	428.69	584.6
Max. Instantaneous	[N · m]	8.59	17.19	25.78	34.37	34.37	57.29	85.93	126.04	34.37	57.29	85.93	126.04	171.87
	[kgf · cm]	87.69	175.3	263.06	350.75	350.75	584.58	876.88	1286.08	350.75	584.58	876.88	1,286.08	1,753.80
Rated Current	[A]	2.51	4.15	5.78	7.63	8.4	14.4	15.99	31.24	8.87	15.02	16.04	31.83	38
Max.Current	[A]	7.53	12.45	17.34	22.89	25.2	43.2	47.97	93.72	26.61	45.06	48.12	95.49	102
Rated Speed	[r/min]	1000												
Max. Speed	[r/min]	2000						1700		2000		1700	2000	
Inertia	[kg · m^2×10^{-4}]	6.66	12	17.34	22.68	30.74	52.13	83.6	121.35	51.42	80.35	132.41	172.91	291.36
	[gf · cm×s^2]	6.8	12.24	17.69	23.14	31.37	53.19	85.31	123.83	52.47	81.99	135.11	176.44	297.31
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia								
Rated Power Rate	[kW/s]	12.32	27.35	42.59	57.89	42.71	69.95	98.15	145.45	25.53	45.39	61.97	102.08	112.65
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]												
	Option	Serial Type 19[Bit]												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 49[m/s2](5G)												
Weight	[kg]	5.5	7.5	9.7	11.8	12.4	17.7	26.3	35.6	17	22	30.8	37.5	66.2

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

S Series Motor Characteristics (400V)

Motor Specifications [Rated 3000r/min]

Servo Motor (APM-□□□□)		SEP09A	SEP15A	SEP22A	SEP30A	SFP30A	SFP50A
Applicable Drive (L7□A□□)		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. Instantaneous	[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]	2.97	4.89	7.17	9.78	9.37	15.49
Max.Current	[A]	8.62	14.2	20.84	28.41	27.38	45.27
Rated Speed	[r/min]	3000					
Max. Speed	[r/min]	5000					
Inertia	[kg · m^2×10^{-4}]	6.659	11.999	17.339	22.679	30.74	52.13
	[gf · cm×s^2]	6.795	12.244	17.693	23.142	31.367	53.194
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia	
Rated Power Rate	[kW/s]	12.32	19.00	28.28	40.21	42.71	65.37
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]					
	Option	Serial Type 19[Bit]					
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)					
	Rated Time	Continuous					
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]					
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)					
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.					
	E/V	Elevation/vibration 49[m/s2](5G)					
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

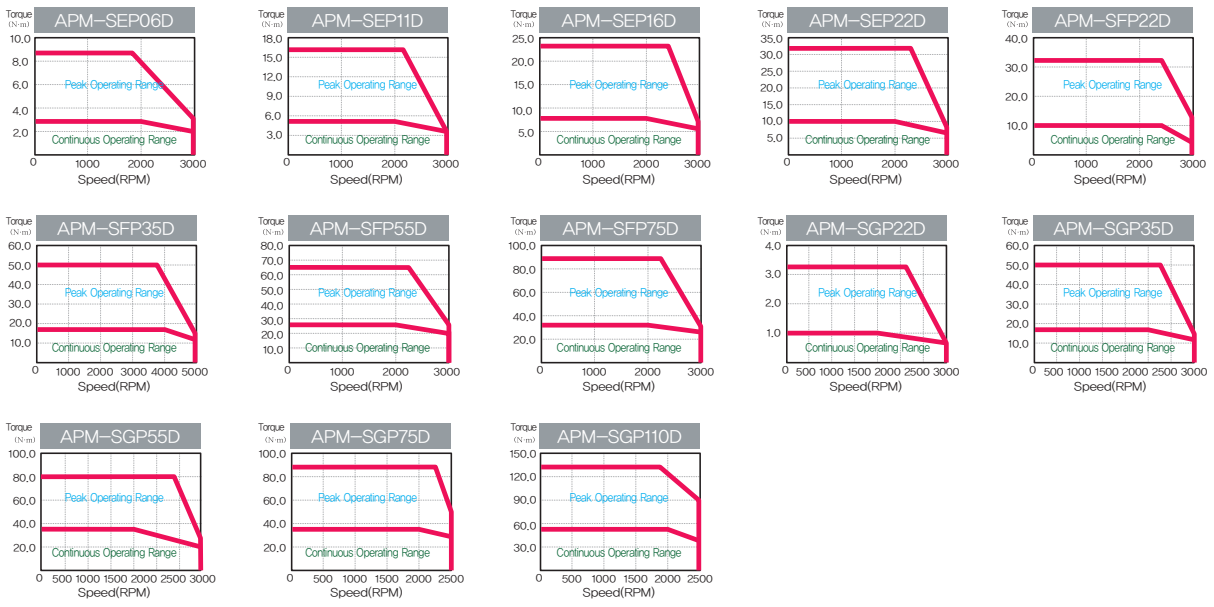
S Series Motor Characteristics (400V)

Motor Specifications [Rated 2000r/min]

Servo Motor (APM-□□□□)		SEP06D	SEP11D	SEP16D	SEP22D	SFP22D	SFP35D	SFP55D	SFP75D	SGP22D	SGP35D	SGP55D	SGP75D	SGP110D
Applicable Drive (L7□A□□)		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	10.50	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	[N · m]	8.59	15.76	22.92	31.51	31.51	50.13	65.65	89.52	31.51	50.13	78.78	89.52	131.30
	[kgf · cm]	87.7	160.78	233.86	321.56	321.56	511.57	669.91	913.52	321.56	511.57	803.89	913.52	1,339.82
Rated Current	[A]	1.78	3.27	4.79	6.54	6.56	10.07	15.82	21.36	6.27	10.03	15.66	18.42	27.41
Max.Current	[A]	5.18	9.5	13.92	19	19.17	29.43	38.64	52.16	18.43	29.51	46.08	45.25	67.33
Rated Speed	[r/min]	2000												
Max. Speed	[r/min]	3000											2500	
Inertia	[kg · m^2×10^{-4}]	6.659	11.999	17.339	22.679	30.74	52.13	83.6	121.35	51.42	80.35	132.41	172.91	291.36
	[gf · cm×s^2]	6.795	12.244	17.693	23.142	31.367	53.194	85.306	123.827	52.47	81.99	135.11	176.44	297.10
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia								
Rated Power Rate	[kW/s]	12.32	22.99	48.64	91.96	35.89	53.57	82.49	105.67	21.46	34.76	52.08	74.16	94.65
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]												
	Option	Serial Type 19[Bit]												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics



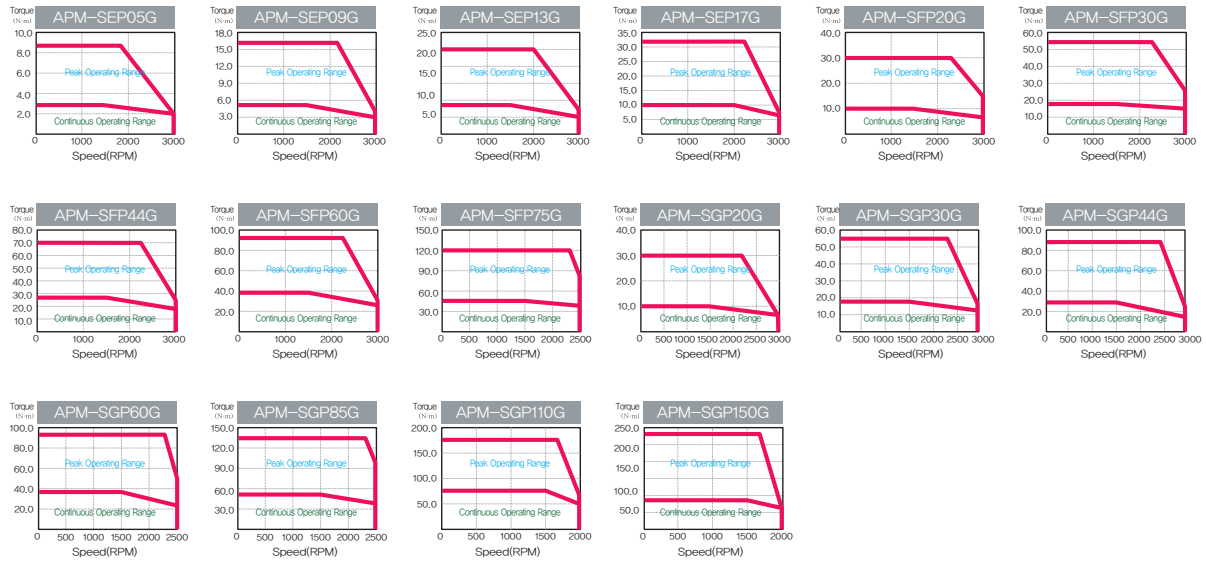
S Series Motor Characteristics (400V)

Motor Specifications [Rated 1500r/min]

Servo Motor (APM-□□□□)		SEP05G	SEP09G	SEP13G	SEP17G	SFP20G	SFP30G	SFP44G	SFP60G	SFP75G	SGP20G	SGP30G	SGP44G	SGP60G	SGP85G	SGP110G	SGP150G
Applicable Drive (L7□A□□)		L7□B010		L7□B020		L7□B020	L7□B050		L7□B075	L7□B150	L7□B020	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. Instantaneous	[N · m]	8.59	16.23	24.83	32.47	34.38	55.39	70.03	95.49	119.37	34.38	55.39	70.03	95.49	135.28	175.07	219.6
	[kgf · cm]	87.7	165.65	253.35	331.3	350.79	565.16	714.57	974.42	1,218.02	350.79	565.16	714.57	974.42	1,380.43	1,786.43	2240
Rated Current	[A]	1.78	3.37	5.19	6.74	7.15	11.12	16.87	22.78	28.13	6.84	11.08	16.71	19.65	28.24	28.28	35.71
Max.Current	[A]	5.18	9.79	15.07	19.58	20.91	165.9	41.21	55.64	65.7	20.11	33	49.15	48.23	69.37	68.83	87.7
Rated Speed	[r/min]	1500															
Max. Speed	[r/min]	3000								2500	3000			2500		2000	
Inertia	[kg · m^2×10^{-4}]	6.659	11.999	17.339	22.679	30.74	52.13	83.6	121.35	143.82	51.42	80.35	132.41	172.91	291.36	291.36	385.54
	[gf · cm×s^2]	6.795	12.244	17.693	23.142	31.367	53.194	85.306	123.827	146.755	52.47	81.99	135.11	176.44	297.31	297.1	393.14
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia											
Rated Power Rate	[kW/s]	12.32	24.4	57.08	97.61	42.72	65.38	93.86	120.23	158.51	25.531	42.41	59.25	84.36	100.5	168.3	214.8
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]															
	Option	Serial Type 19[Bit]															
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)															
	Rated Time	Continuous															
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]															
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)															
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.															
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics



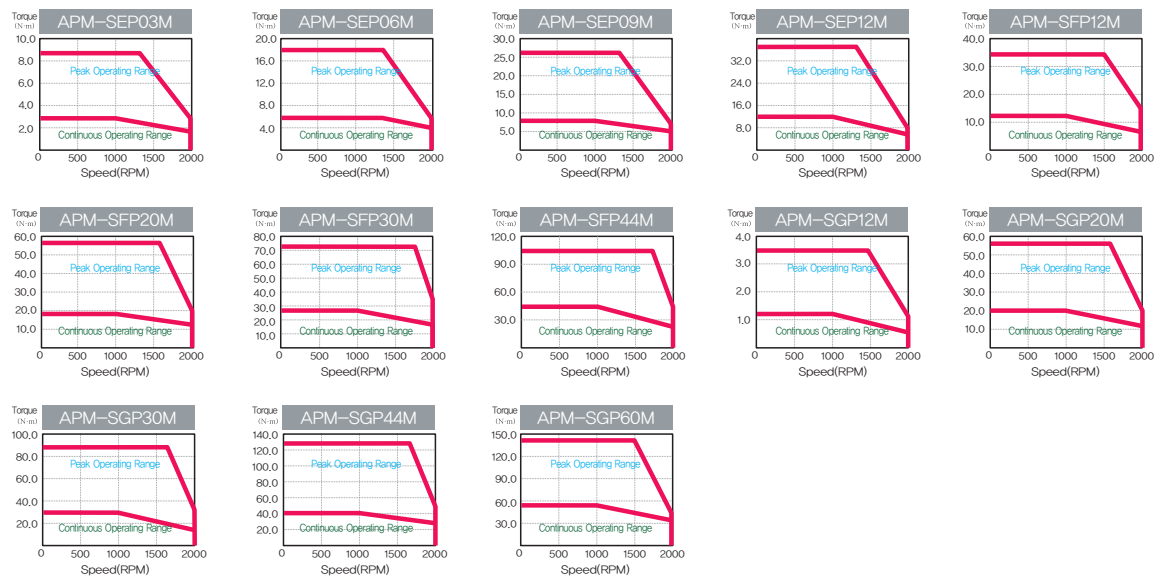
S Series Motor Characteristics (400V)

Motor Specifications [Rated 1000r/min]

Servo Motor (APM-□□□□)		SEP03M	SEP06M	SEP09M	SEP12M	SFP12M	SFP20M	SFP30M	SFP44M	SGP12M	SGP20M	SGP30M	SGP44M	SGP60M
Applicable Drive (L7□A□□)		L7□B010			L7□B035	L7□B020		L7□B050		L7□B020		L7□B050		L7□B150
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
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	57.3
	[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	[N · m]	8.59	17.19	25.78	34.38	34.38	57.3	71.62	105.04	34.38	57.3	85.94	105.04	143.24
	[kgf · cm]	87.7	175.4	263.09	350.79	350.79	584.65	730.81	1,071.86	350.79	584.65	876.98	1,071.86	1,461.63
Rated Current	[A]	1.26	2.42	3.62	4.8	4.77	7.88	11.92	17.15	4.72	7.84	11.73	17.29	23.58
Max.Current	[A]	3.65	7.04	10.51	13.95	13.94	23.03	29.12	41.88	13.87	23.06	34.51	50.87	57.92
Rated Speed	[r/min]	1000												
Max. Speed	[r/min]	2000												
Inertia	[kg · m^2×10^{-4}]	6.659	11.999	17.339	22.679	30.74	52.13	83.6	121.35	51.42	80.35	132.41	172.91	291.36
	[gf · cm×s^2]	6.795	12.244	17.693	23.142	31.367	53.194	85.306	123.827	52.47	81.99	135.11	176.44	297.31
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia								
Rated Power Rate	[kW/s]	12.32	27.36	42.6	57.9	42.72	69.97	98.17	145.48	25.53	45.39	61.97	102.08	112.64
Speed/Position Detector	Standard(Note1)	Quad. Type Incremental 3000[P/R]												
	Option	Serial Type 19[Bit]												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics



External Dimensions of S Series Motor

SA Series

Plug Specifications

[Power]

Spec.
: 172167-1
(Made by AMP)

Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

(Power Connector Pin Table)

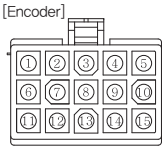
[Brake]

Spec.
: 172165-1
(Made by AMP)

Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

[Encoder]

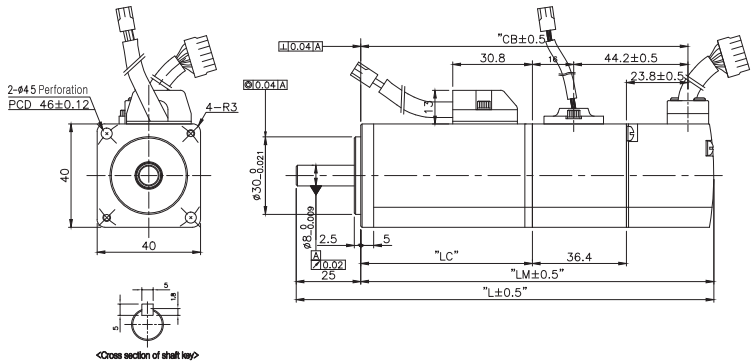


Spec. : 172171-1(Made by AMP)

Pin No.	Signal	Pin No.	Signal
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

(Parallel Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.
Note4) Refer to page 24 for serial encoder pin table.



Model	External Dimensions				Weight(kg)
	L	LM	LC	CB	
SAR3A	101.3(137.6)	76.3(112.6)	42.5(42.4)	66.3(102.3)	0.32(0.67)
SAR5A	108.3(144.6)	83.3(119.6)	49.5(49.4)	73.3(109.3)	0.38(0.73)
SA01A	125.3(161.6)	100.3(136.6)	66.5(66.4)	90.3(126.6)	0.5(0.85)
SA015A	145.3	120.3	86.5	110.3	0.7

SB Series

Plug Specifications

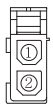
[Power]

Spec.
: 172167-1
(Made by AMP)

Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

(Power Connector Pin Table)

[Brake]

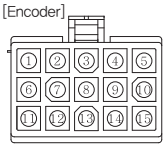


Spec.
: 172165-1
(Made by AMP)

Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

[Encoder]

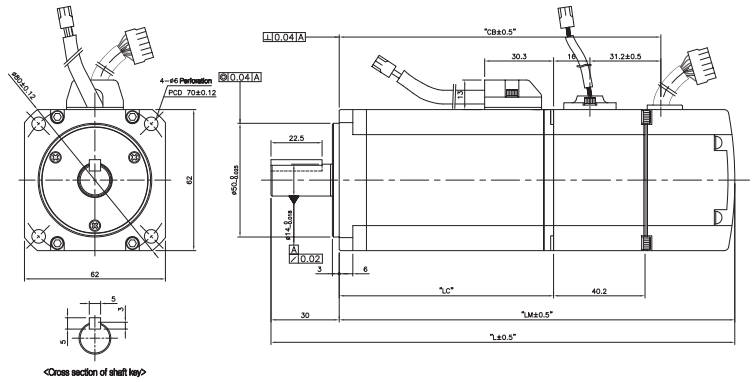


Spec. : 172171-1(Made by AMP)

Pin No.	Signal	Pin No.	Signal
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

(Parallel Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.
Note4) Refer to page 24 for serial encoder pin table.



Model	External Dimensions				Weight(kg)
	L	LM	LC	CB	
SB01A	122(162)	92(132)	52.5(52.3)	59.5(99.5)	0.82(1.4)
SB02A	136(176)	106(146)	66.5(66.3)	73.5(113.5)	1.08(1.66)
SB04A	164(204)	134(174)	94.5(94.3)	101.5(141.5)	1.58(2.16)

External Dimensions of S Series Motor

SC Series

Plug Specifications

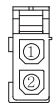
[Power]

Spec.
: 172167-1
(Made by AMP)

Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

(Power Connector Pin Table)

[Brake]

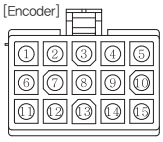


Spec.
: 172165-1
(Made by AMP)

Pin No.	Signal
1	BK+
2	BK-

(Brake Connector Pin Table)

[Encoder]

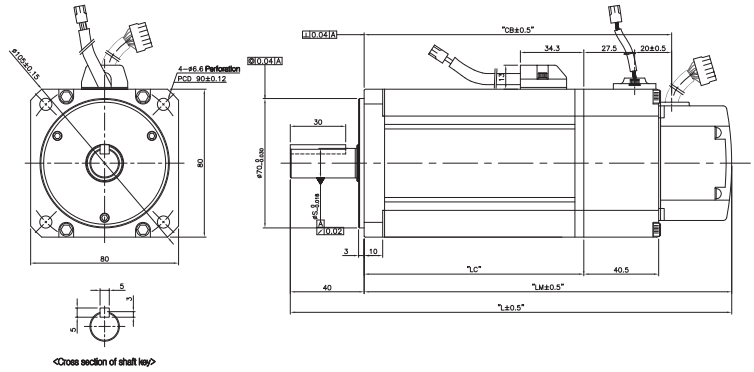


Spec. : 172171-1(Made by AMP)

Pin No.	Signal	Pin No.	Signal
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

(Parallel Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.
Note4) Refer to page 24 for serial encoder pin table.

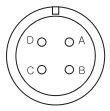


Model	External Dimensions					Weight(kg)
	L	LM	LC	CB	S	
SC04A, SC03D	158.5(199.8)	118.5(158.8)	79(78.8)	86(126.3)	14	1.88(2.92)
SC06A, SC05D	178.5(218.8)	138.5(178.8)	99(98.8)	106(146.3)	16	2.52(3.56)
SC08A, SC06D	198.5(238.8)	158.5(198.8)	119(118.8)	126(166.3)	16	3.15(4.22)
SC10A, SC07D	218.5(258.8)	178.5(218.8)	139(138.8)	146(186.3)	16	3.80(4.94)

SE, SEP Series

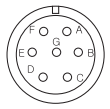
Plug Specifications

[Power]



Spec.
: MS3102A20-4P
(Standard)

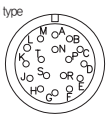
Pin No.	Signal
A	U
B	V
C	W
D	Ground



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

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

[Encoder]
1)Incremental type

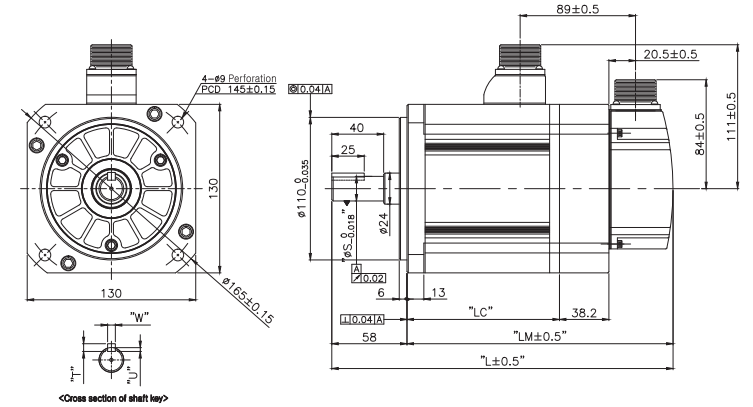


Spec.
: MS3102A20-29P

Pin No.	Signal	Pin No.	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	$\overline{U}$		

(Parallel Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.
Note4) Refer to page 24 for serial encoder pin table.



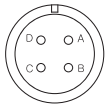
Model	External Dimensions				Key			Weight(kg)
	L	LM	LC	S	T	W	U	
SE09A, SE06D, SE05G, SE03M SEP09A,SEP06D, SEP05G, SEP03M	201.3(239.3)	143.3(181.3)	93.8(93.6)	19	5	5	3	5.5(7.04)
SE15A, SE11D, SE09G, SE06M, SEP15A, SEP11D, SEP09G, SEP06M	225.3(263.3)	167.3(205.3)	117.8(117.6)					7.54(9.08)
SE22A, SE16D, SE13G, SE09M, SEP22A, SEP16D, SEP13G, SEP09M	249.3(287.3)	191.3(229.3)	141.8(141.6)	22	6	6	3.5	9.68(11.22)
SE30A, SE22D, SE17G, SE12M SEP30A, SEP22D, SEP17G, SEP12M	273.3(311.3)	215.3(253.3)	165.8(165.6)					11.78(13.32)

External Dimensions of S Series Motor

SF, LF, SFP Series

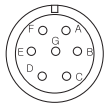
Plug Specifications

[Power]



Spec.
: MS3102A22-22P
(Standard)

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

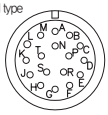


Spec.
: MS3102A24-10P
(Brake-attached type)

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

[Encoder]

1)Incremental type

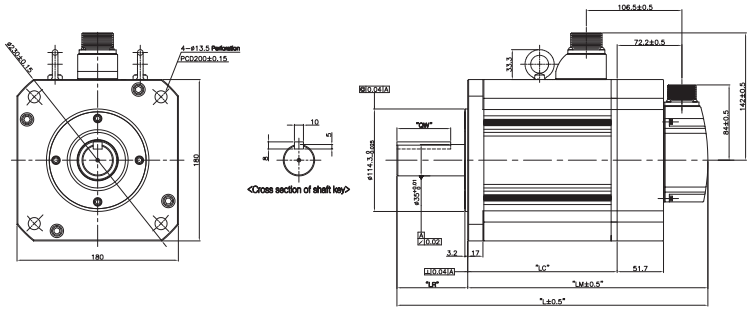


Spec.
: MS3102A20-29P

Pin No.	Signal	Pin No.	Signal
A	A	M	$\overline{V}$
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	$\overline{U}$		

(Parallel Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.
Note4) Refer to page 24 for serial encoder pin table.
Note5) Use MS3102A32-17 for SF75G Power connector.

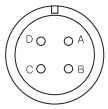


Model	External Dimensions				Key					Weight(kg)
	L	LM	LC	LR	S	QW	T	W	U	
SF30A, SF22D, SF20G, SF12M, SFP30A, SFP22D, SFP20G, SFP12M	261.5(312.9)	182.5(233.9)	133(132.7)	79	$35^{+0.01}_{0}$	60	8	10	5	12.4(19.2)
SF50A, LF35D, LF30G, SF20M SFP50A, SFP20M	295.5(346.9)	216.5(267.9)	167(166.7)							17.7(24.9)
SF55D, SF44G, LF30M SFP55D, SFP44G	345.5(396.9)	266.5(317.9)	217(216.7)							26.3(33.4)
SF75D, SF60G, SF44M SFP75D, SFP60G, SFP44M	405.5(456.9)	326.5(377.9)	277(276.7)							35.6(42.8)
SF75G, SFP75G	457.5	344.5	295	113	$42^{0}_{-0.016}$	96	8	12	5	39.4

SG, LG, SGP Series

Plug Specifications

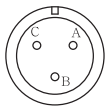
[Power]



Spec.
: MS3102A22-22P
(Standard)

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

[Brack]

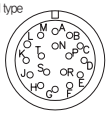


Spec.
: MS3102A14S-7P
(Brake-attached type)

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

[Encoder]

1)Incremental type

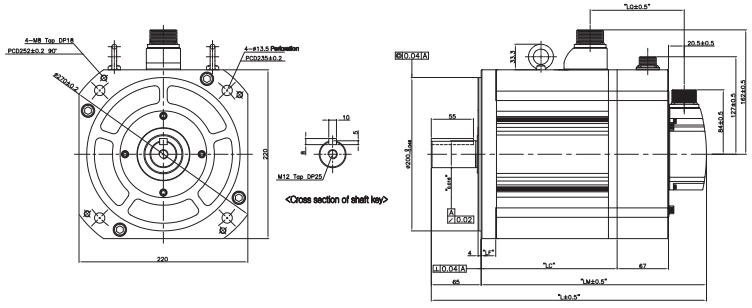


Spec.
: MS3102A20-29P

Pin No.	Signal	Pin No.	Signal
A	A	M	$\overline{V}$
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	$\overline{U}$		

(Parallel Encoder Connector Pin Table)

Note1) In case of SG, use DC[90V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.
Note4) Refer to page 24 for serial encoder pin table.
Note5) Use MS3102A32-17 for SG60M Power connector.



Model	External Dimensions						Key					Weight(kg)	Power Connector
	L	LM	LC	LR	LF	LQ	S	QK	T	W	U		
SG22D, SG20G, SG12M SGP22D, SGP20G, SGP12M	236.5(302.7)	171.5(237.7)	122(121.2)	65	19	56.4 (122.6)	$35^{0}_{-0.016}$	55	8	10	5	16.95(30.76)	MS3102A22 -22P
LG35D, LG30G, SG20M SGP20M	256.5(322.7)	191.5(257.7)	142(142.2)									21.95(35.7)	
SG55D, SG44G, LG30M SGP55D, SGP44G	292.5(358.7)	227.5(293.7)	178(177.2)									30.8(44.94)	
SG75D, SG60G, SG44M SGP75D, SGP60G, SGP44M	320.5(386.7)	255.5(321.7)	206(205.2)									37.52(50.94)	
SG110D,SG85G,SG60M SGP110D, SGP85G, SGP60M	418.5(484.7)	353.5(419.7)	304(303.2)	65	21	66 (132.2)	$45^{0}_{-0.015}$	96	10	12	5	66.2(82.6)	MS3102A32 -17P
SG110G, SG110G	469	354	304	115	21		$42^{0}_{-0.016}$					66.3	
SG150G, SG150G	575	459	409	115	35		$55^{+0.030}_{-0.016}$	96	10	16	6	92.2	

External Dimensions of S Series Motor

HB Series [Hollow Shaft type]

Plug Specifications

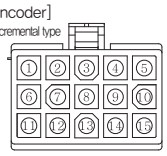
[Power]

Spec.
: 172167-1
(Made by AMP)

Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

(Power Connector Pin Table)

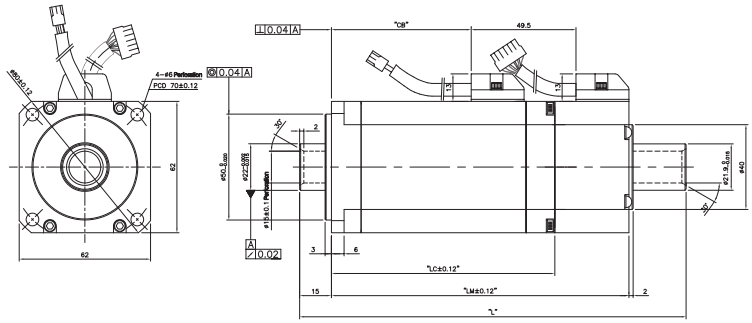
[Encoder]
1)Incremental type



Spec. : 172171-1(Made by AMP)

Pin No.	Signal	Pin No.	Signal
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

(Parallel Encoder Connector Pin Table)



Model	External Dimensions					Weight(kg)
	L	LM	LC	CB	Hollow Shaft	
HB01A	140.5	103.5	68.5	24	15	0.89
HB02A	154.5	117.5	82.5	38	15	1.16
HB04A	182.5	140.5	105.5	66	15	1.69

HE Series [Hollow Shaft type]

Plug Specifications

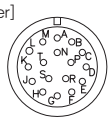
[Power]

Spec.
: MS3102A20-4P
(Standard)

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

(Power Connector Pin Table)

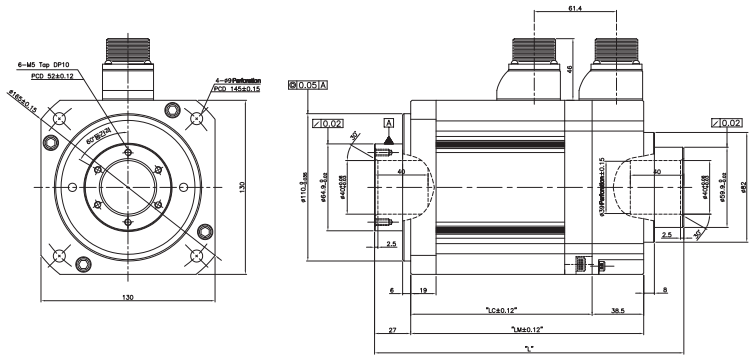
[Encoder]



Spec.
: MS3102A20-29P

Pin No.	Signal	Pin No.	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	$\overline{U}$		

(Parallel Encoder Connector Pin Table)



Model	External Dimensions				Weight(kg)
	L	LM	LC	Hollow Shaft	
HE09A	207	150	111.5	40	5.82
HE15A	231	174	135.5	40	7.43
HE30A	279	222	183.5	40	

Brake and Heat Sink Specificaion

Electric Brake Specifications

Applicable Motor Series	APM-SA,FAL	APM-SB,FB,FBL	APM-SC, FC,FCL	APM-SE,SEP,FE,FEP	APM-SF,SFP,FF,FFP	APM-SG,SGP,FG,FGP
Purpose	Maintenance					
Input voltage [V]	DC 24V	DC 24V	DC 24V	DC 24V	DC 24V	DC 90V
Static friction torque [N • m]	0.32	1.47	3.23	10.4	40	74
Capacity [W]	6	6.5	9	19.4	25	32
Coil resistance [Ω]	96	89	64	29.6	23	327
Rated current [A]	0.25	0.27	0.38	0.81	1.04	0.28
Braking mechanism	Spring brake					
Insulation grade	GraDde F					

Note1) For the Electronic Brake that is attached to our Servo Motor, the same specific-ations are to be applied as per the series.

Note2) Do not use it for braking purpose because the electronic brake is only for maintaining the stopped condition.

Note3) The characteristics of electronic brake is measured at 20℃

Note4) Please make sure to always check the voltage specification on the motor becase indicated brake specifications are subject to change.

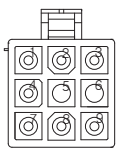
Heat Sink Specifications

Type	Dimensions(mm)	Materials
AP04	250x250x6	Aluminum
AP06	250x250x6	
AP08	250x250x12	
AP13	350x350x20	
AP18	550x550x30	
AP22	650x650x35	

NOTE 1) The data on the product features is measured when those heat sinks are applied.

S Series Encoder Pin Map

SA, SB, SC Series

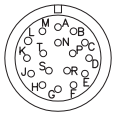


Plug Specification : 172169-1 (AMP)

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

〈Serial Encoder Connector Pin Table〉

SE, SF, SG Series



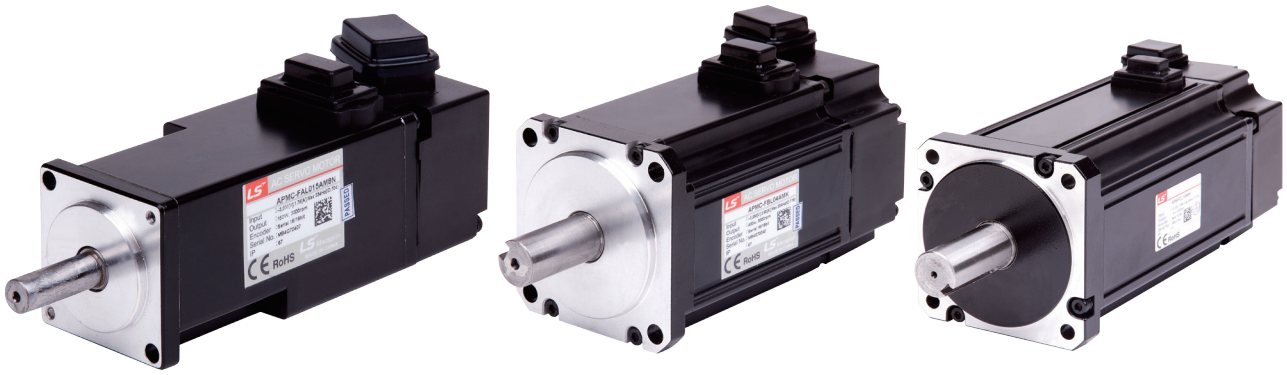
17 Pole Plug (MS3102A20-29P)

Single Turn (N)				Multi Turn (M)			
Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
A	MA	M	–	A	MA	M	–
B	$\overline{MA}$	N	–	B	$\overline{MA}$	N	–
C	SLO	P	–	C	SLO	P	–
D	$\overline{SLO}$	R	–	D	$\overline{SLO}$	R	–
E	–	H	+5V	E	VOD_B	H	+5V
F	–	G	0V	F	GND_B	G	0V
K	–	J	MA	K	–	J	MA
L	–			L	–		

〈Serial Encoder Connector Pin Table〉

Flat Type Servo Motor

F Series



Servo Motor Designation

APMC	F	B	L	04	A	M	K	1
Model Name APM : Servo Motor [Made in Korea] APMC : Servo Motor [Made in China]	**Motor Shaft** F : Flat Type	**Flange Size** A : 40 Flange B : 60 Flange C : 80 Flange E : 130 Flange F : 180 Flange G : 220 Flange H : 250 Flange J : 280 Flange	**Series Classification** None : General Flat Series (200VAC) L : L Series(200VAC) P : Flat Series(400VAC)	**Motor Capacity** R5 : 50[W] 01 : 100[W] 02 : 200[W] 03 : 300[W] 04 : 400[W] 07 : 650[W] 08 : 800[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 M-Turn Abs M8 : 18bit M-Turn Abs[FA Type]	**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 Note 1) 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

F Series Motor Characteristics (200V)

Motor Specifications [Rated 3000r/min, 2000r/min]

Servo Motor (APM-□□□□)		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□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	[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	1.76	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	5.28	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	[kg · m^2×10^{-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×s^2]	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		30 times of motor inertia		20 times of motor inertia				15 times of motor inertia							
Rated Power Rate	[kW/s]	10.55	23.78	35.34	11.09	27.6	27.57	30.6	40.66	45.09	62.08	38.73	51.47	54.56	59.03
Speed/Position Detector	Standard(Note1)	Serial Multi-Turn Built-in Type (18bit)			Serial Multi-Turn Built-in Type(19bit)										
	Option	X													
Specifications & Features	Structure	Fully closed · Self cooling IP67 Note1)													
	Rated Time	Continuous													
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]													
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)													
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.													
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

F Series Motor Characteristics (200V)

Motor Specifications [Rated 3000r/min]

Servo Motor (APM-□□□□)		FB01A	FB02A	FB04A	FC04A	FC06A	FC08A	FC10A	FE09A	FE15A	FE22A	FE30A	FF30A	FF50A
Applicable Drive		L7□A001	L7□A002	L7□A004	L7□A004	L7□A008		L7□A010	L7□A010	L7□A020		L7□A035	L7□A035	L7□A050
Flange Size(□)		□60			□80				□130				□180	
Rated Output	[kW]	0.1	0.2	0.4	0.4	0.6	0.75	1	0.9	1.5	2.2	3	3	5
Rated Torque	[N · m]	0.32	0.64	1.27	1.27	1.91	2.39	3.18	2.86	4.77	7	9.55	9.55	15.91
	[kgf · cm]	3.25	6.5	12.99	13	19.5	24.36	32.5	29.2	48.7	71.4	97.4	97.4	162.3
Max. Instantaneous	[N · m]	0.96	1.91	3.82	3.82	5.73	7.16	9.55	8.59	14.32	21.01	28.65	28.65	47.74
	[kgf · cm]	9.74	19.49	38.98	38.98	58.47	73.08	97.44	87.7	146.1	214.3	292.2	292.3	487
Rated Current	[A]	0.95	1.45	2.6	2.58	3.81	5.02	6.7	6.45	9.15	13.24	16.09	15.26	26.47
Max.Current	[A]	2.86	4.35	7.79	7.75	11.42	15.07	20.09	19.35	27.45	39.72	48.27	45.78	79.41
Rated Speed	[r/min]	3000												
Max. Speed	[r/min]	5000												
Inertia	[kg · m^2×10^{-4}]	0.09	0.15	0.25	0.5	0.88	1.25	1.62	5.66	10.18	14.62	19.04	27.96	46.56
	[gf · cm×s^2]	0.09	0.15	0.25	0.51	0.89	1.27	1.65	5.77	10.39	14.92	19.43	28.53	47.51
Allowable Load Inertia Ratio		20 times of motor inertia			15 times of motor inertia				10 times of motor inertia				5 times of motor inertia	
Rated Power Rate	[kW/s]	11.38	27.95	65.9	32.62	41.69	45.78	62.74	14.47	22.38	33.59	47.85	32.59	54.33
Speed/Position Detector	Standard(Note1)	Serial Type 19[bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 49[m/s2](5G)												
Weight	[kg]	0.7	0.9	1.3	1.6	2.2	2.7	3.8	5	6.7	8.5	10.1	12.5	17.4

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

F Series Motor Characteristics (200V)

Motor Specifications [Rated 2000r/min]

Servo Motor (APM-□□□□)		FC03D	FC05D	FC06D	FC07D	FE06D	FE11D	FE16D	FE22D
Applicable Drive		L7□A004	L7□A008				L7□A010	L7□A020	
Flange Size(□)		□80				□130			
Rated Output	[kW]	0.3	0.45	0.55	0.65	0.6	1.1	1.6	2.2
Rated Torque	[N · m]	1.43	2.15	2.6	3.1	2.86	5.25	7.63	10.5
	[kgf · cm]	14.6	21.9	26.8	31.7	29.2 0	53.6	77.9	107.1
Max. Instantaneous	[N · m]	4.3	6.45	7.88	9.31	8.59	15.75	22.92	31.51
	[kgf · cm]	43.8	65.8	80.4	95	87.7	160.7	233.8	321.4
Rated Current	[A]	2.5	3.05	3.06	3.83	4.56	6.47	10.98	12.97
Max.Current	[A]	7.51	9.16	9.18	11.5	13.68	19.41	32.94	38.91
Rated Speed	[r/min]	2000							
Max. Speed	[r/min]	3000							
Inertia	[kg · m^2×10^{-4}]	0.5	0.88	1.25	1.62	5.66	10.18	14.62	19.04
	[gf · cm×s^2]	0.51	0.89	1.27	1.65	5.77	10.39	14.92	19.43
Allowable Load Inertia Ratio		15 times of motor inertia				10 times of motor inertia			
Rated Power Rate	[kW/s]	41.28	52.76	55.39	59.64	14.49	27.08	39.89	57.9
Speed/Position Detector	Standard(Note1)	Serial Multi-Turn Built-in Type(19bit)							
	Option	X							
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)							
	Rated Time	Continuous							
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]							
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s2](5G)							
Weight	[kg]	1.6	2.2	2.7	3.8	5	6.7	8.5	10.1

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

F Series Motor Characteristics (200V)

Motor Specifications [Rated 2000r/min]

Servo Motor (APM-□□□□)		FF22D	FF35D	FF55D	FF75D	FG22D	FG35D	FG55D	FG75D
Applicable Drive		L7□A020	L7□A035	L7□A050	L7□A075	L7□A020	L7□A035	L7□A050	L7□A075
Flange Size(□)		□180				□220			
Rated Output	[kW]	2.2	3.5	5.5	7.5	2.2	3.5	5.5	7.5
Rated Torque	[N · m]	10.5	16.7	26.25	35.81	10.5	16.71	26.25	35.81
	[kgf · cm]	107.1	170.4	267.8	365.4	107.1	170.4	267.8	365.4
Max. Instantaneous	[N · m]	31.5	50.1	78.76	89.53	31.51	50.12	78.76	89.53
	[kgf · cm]	321.3	511.4	803.4	913.5	321.3	511.3	803.4	913.5
Rated Current	[A]	13.07	16.48	28.78	32.95	10.25	14.67	29.74	30.17
Max.Current	[A]	39.21	49.44	86.34	98.85	30.75	44.01	89.22	90.51
Rated Speed	[r/min]	2000							
Max. Speed	[r/min]	3000			2500	3000	2700	3000	2500
Inertia	[kg · m^2×10^{-4}]	27.96	46.56	73.85	106.7	41.13	71.53	117.72	149.4
	[gf · cm×s^2]	28.53	47.51	75.36	108.9	41.97	72.99	120.12	152.45
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
Speed/Position Detector	Standard(Note1)	Serial Type 19[bit]							
	Option	X							
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)							
	Rated Time	Continuous							
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]							
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s2](5G)							
Weight	[kg]	12.5	17.4	25.12	33.8	15.4	20.2	28.12	33.45

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

F Series Motor Characteristics (200V)

Motor Specifications [Rated 1500r/min]

Servo Motor (APM-□□□□)		FE05G	FE09G	FE13G	FE17G	FF20G	FF30G	FF44G	FF60G	FF75G	FG20G	FG30G	FG44G	FG60G
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
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
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
	[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
Max. Instantaneous	[N · m]	8.59	16.23	24.82	32.46	34.35	55.38	84.03	95.5	143.2	34.4	55.4	84	95.5
	[kgf · cm]	87.66	165.57	253.23	331.14	350.6	564.9	857.1	974.9	1462	350.8	565.1	857.4	974.3
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
Max.Current	[A]	13.68	20.01	35.7	40.08	36.48	47.94	92.1	105.42	105.78	33.54	48.63	95.16	96.54
Rated Speed	[r/min]	1500												
Max. Speed	[r/min]	3000				3000	2700	3000	2500	2200	3000	2700	3000	2500
Inertia	[kg · m^2×10^{-4}]	5.66	10.18	14.62	19.04	27.96	46.56	73.85	106.7	131.3	14.13	71.53	117.72	149.4
	[gf · cm×s^2]	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
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
Speed/Position Detector	Standard(Note1)	Serial Type 19 [bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 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

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

F Series Motor 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□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
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	[N · m]	8.59	17.18	25.77	34.22	34.38	57.29	85.94	126.1	34.4	57.3	85.9	126	171.87
	[kgf · cm]	87.66	175.3	262.9	349.1	350.7	584.4	876.6	128.6	350.8	584.6	876.9	128.61	1,753.80
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	38
Max.Current	[A]	8.19	13.68	18.54	32.01	33.03	38.88	49.74	91.8	33.84	39.3	46.56	81.78	102
Rated Speed	[r/min]	1000												
Max. Speed	[r/min]	2000						1700		2000		1700	2000	
Inertia	[kg · m^2×10^{-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×s^2]	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(Note1)	Serial Type 19 [bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 49[m/s2](5G)												
Weight	[kg]	5	6.7	8.5	10.1	12.5	17.4	25.2	33.8	15.4	20.2	28	33.5	66.2

Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

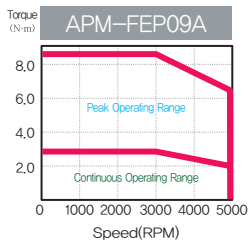
F Series Motor Characteristics (400V)

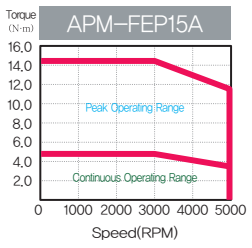
Motor Specifications [Rated 3000r/min]

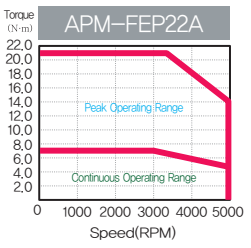
Servo Motor (APM-□□□□)		FEP09A	FEP15A	FEP22A	FEP30A	FFP30A	FFP50A
Applicable Drive		L7□B010□	L7□B020□	L7□B035□			L7□B050□
Flange Size(□)		□130				□180	
Rated Output	[kW]	0.9	1.5	2.2	3.0	3.0	5.0
Rated Torque	[N · m]	2.86	4.77	7.0	9.55	9.55	15.92
	[kgf · cm]	29.23	48.72	71.46	97.44	97.44	162.4
Max. Instantaneous	[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	9.12	9.94	9.79	16.07
Max.Current	[A]	10.4	20.03	27.35	29.81	29.38	48.22
Rated Speed	[r/min]	3000					
Max. Speed	[r/min]	5000					
Inertia	[kg · m^2×10^{-4}]	5.659	10.179	14.619	19.04	27.96	46.56
	[gf · cm×s^2]	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(Note1)	Serial Type 19 [bit]					
	Option	X					
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)					
	Rated Time	Continuous					
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]					
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)					
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.					
	E/V	Elevation/vibration 49[m/s2](5G)					
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7

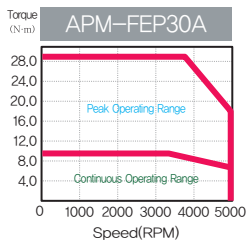
Note1) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

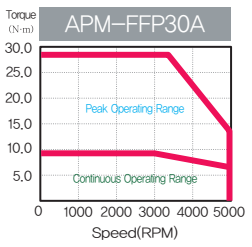
Speed-Torque Characteristics

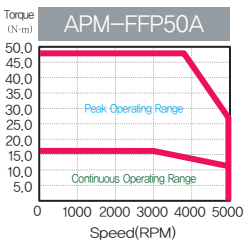












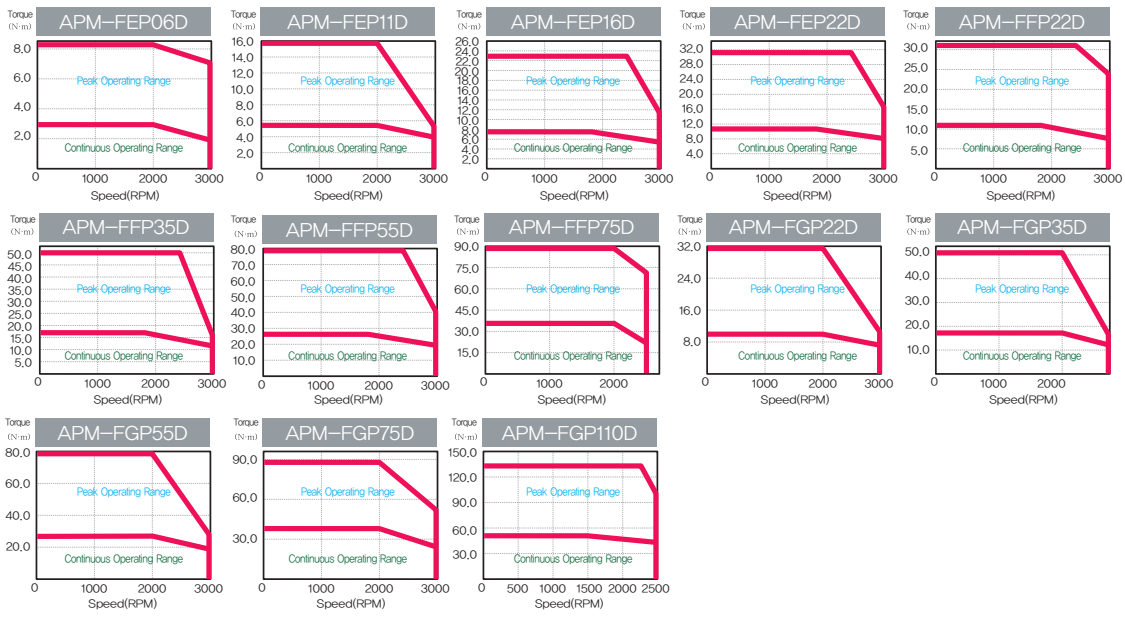
F Series Motor Characteristics (400V)

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	[N · m]	8.59	15.76	22.92	31.51	31.51	50.13	65.65	89.52	31.51	50.13	78.78	89.52	131.30
	[kgf · cm]	87.7	160.78	233.86	321.56	321.56	511.57	669.91	913.52	321.56	511.57	803.89	913.52	1339.82
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	44.1	47.42	21.35	26.2	48.11	47.76	67.33
Rated Speed	[r/min]	2000												
Max. Speed	[r/min]	3000							2500	3000	2700	3000	2500	
Inertia	[kg · m^2×10^{-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×s^2]	5.774	10.387	14.917	19.429	28.531	47.51	75.357	108.908	41.67	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	94.65
Speed/Position Detector	Standard(Note1)	Serial Type 19 [bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics



F Series Motor Characteristics (400V)

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. Instantaneous	[N · m]	8.59	16.23	24.83	32.47	34.38	55.39	84.03	95.49	119.37	34.38	55.39	84.03	95.49	135.28	175.07	238.73
	[kgf · cm]	87.7	165.65	253.35	331.3	350.79	565.16	857.49	974.42	1,218.02	350.79	565.16	857.49	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	28.28	35.71
Max.Current	[A]	9.83	10.5	16.16	21.02	22.69	30.12	47.04	50.58	50.03	23.29	28.95	51.32	50.95	69.37	68.83	87.7
Rated Speed	[r/min]	1500															
Max. Speed	[r/min]	3000					2700	3000	2500	2200	3000	2700	3000	2500		2000	
Inertia	[kg · m^2×10^{-4}]	5.659	10.179	14.619	19.04	27.96	46.56	73.85	106.73	131.29	51.42	80.35	132.41	172.91	291.36	51.42	424.5
	[gf · cm×s^2]	5.774	10.387	14.917	19.429	28.531	47.51	75.357	108.908	133.969	52.47	81.99	135.11	176.44	297.31	52.47	433.2
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	45.39	61.97	102.08	100.5	168.3	214.8
Speed/Position Detector	Standard(Note1)	Serial Type 19 [bit]															
	Option	X															
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)															
	Rated Time	Continuous															
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]															
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)															
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.															
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

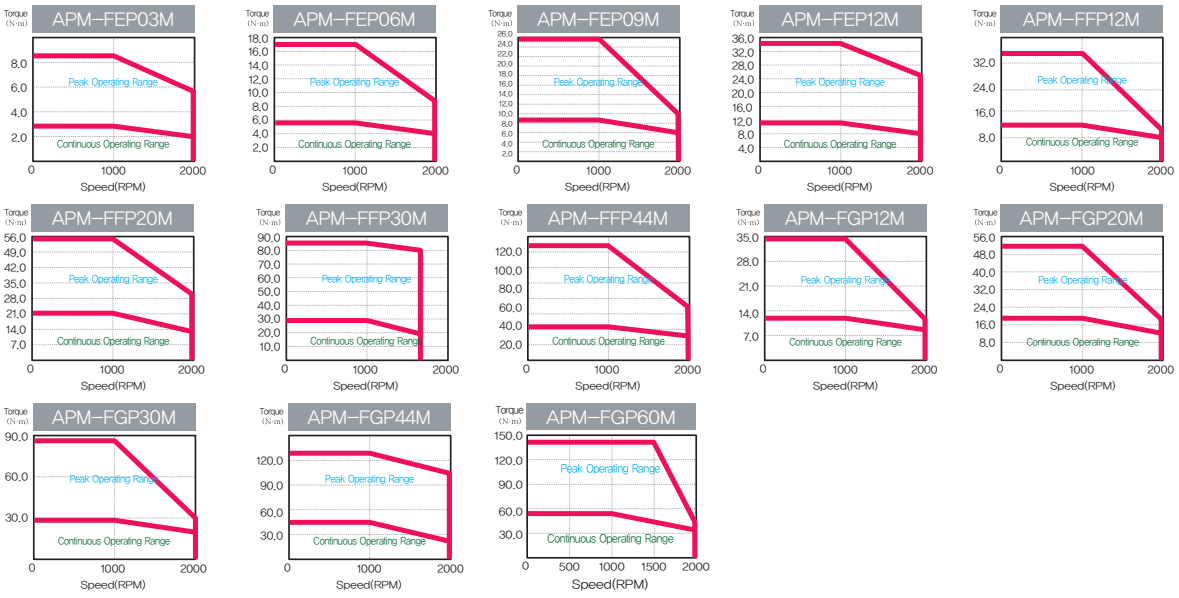
F Series Motor Characteristics (400V)

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□B050□		L7□B020□		L7□B050□		L7□B150
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
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	57.3
	[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	[N · m]	8.59	17.19	25.78	34.38	34.38	57.3	85.94	126.05	34.38	57.3	85.94	126.05	143.24
	[kgf · cm]	87.7	175.4	263.09	350.79	350.79	584.65	876.98	1286.23	350.79	584.65	876.98	1,071.86	1,461.63
Rated Current	[A]	3.28	3.28	3.33	4.87	4.83	7.94	11.9	16.69	4.75	7.88	11.74	17.39	23.58
Max.Current	[A]	9.83	9.83	9.99	14.6	14.5	23.83	35.7	50.08	14.24	23.64	35.22	52.18	57.92
Rated Speed	[r/min]	1000												
Max. Speed	[r/min]	2000						1700	2000					
Inertia	[kg · m^2×10^{-4}]	5.659	10.179	14.619	19.04	27.96	46.56	73.85	106.73	51.42	80.35	132.41	172.91	291.36
	[gf · cm×s^2]	5.774	10.387	14.917	19.429	28.531	47.51	75.357	108.908	52.47	81.99	135.11	176.44	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	78.38	111.13	165.41	25.53	45.39	61.97	102.08	112.64
Speed/Position Detector	Standard(Note1)	Serial Type 19 [bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65 Note1)												
	Rated Time	Continuous												
	Ambient Temp	Operating : 0 ~ 40[℃] Storage : -10 ~ 60[℃]												
	Ambient Humidity	90[%]RH Below (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 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) Except for axis penetration, when you attach reducer to the motor, we don't guarantee IP for reducer. If you bend over specification designated in cable standard, it is difficult to guarantee IP marked
It can be satisfied protection grade when you use private cable only.

Speed-Torque Characteristics

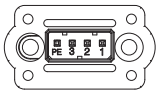


External Dimensions of Servo Motor

FAL Series

Plug Specifications

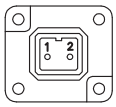
[Power]



Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
PE	Green	Ground

(Power Connector Pin Table)

[Brake]



Pin No.	Signal
1	BK+
2	BK–

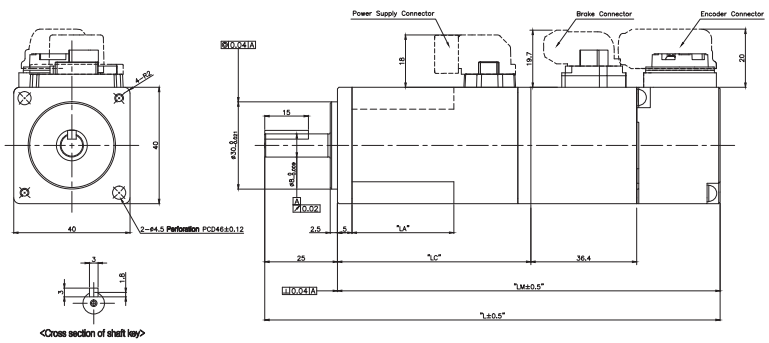
(Brake Connector Pin Table)

[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)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.

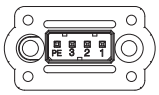


Model	External Dimensions				Weight (kg)
	L	LM	LC	LA	
FALR5A	103.2(139.6)	78.2(114.6)	49.5	23	0.31(0.66)
FAL01A	120.2(156.6)	95.2(131.6)	66.5	35	0.45(0.80)
FAL015A	140.2	115.2	86.5	35	0.61

FBL Series

Plug Specifications

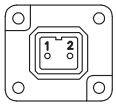
[Power]



Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
PE	Green	Ground

(Power Connector Pin Table)

[Brake]



Pin No.	Signal
1	BK+
2	BK–

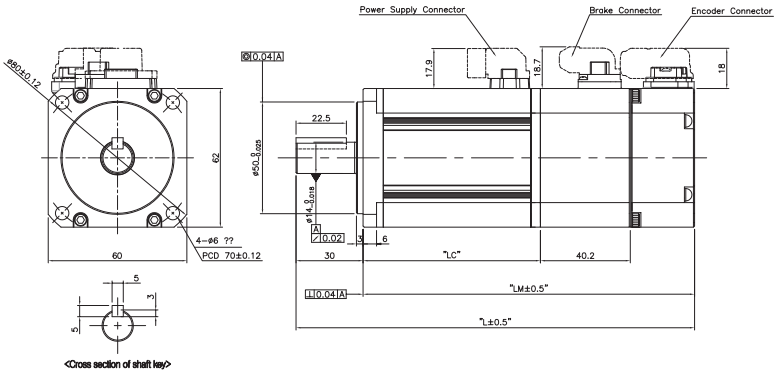
(Brake Connector Pin Table)

[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)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.



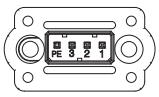
Model	External Dimensions					Key			Weight (kg)
	L	LM	LC	S	H	T	W	U	
FBL01A	107.2(147.2)	77.2(117.2)	48.5(48.3)	14	-0.018	5	5	3	0.56(1.3)
FBL02A	118.2(158.2)	88.2(128.2)	59.5(59.3)	14	-0.018	5	5	3	0.74(1.48)
FBL04A	138.2(178.2)	108.2(148.2)	79.5(79.3)	14	-0.018	5	5	3	1.06(1.8)

External Dimensions of Servo Motor

FCL Series

Plug Specifications

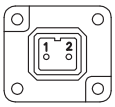
[Power]



Pin No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
PE	Green	Ground

(Power Connector Pin Table)

[Brake]



Pin No.	Signal
1	BK+
2	BK–

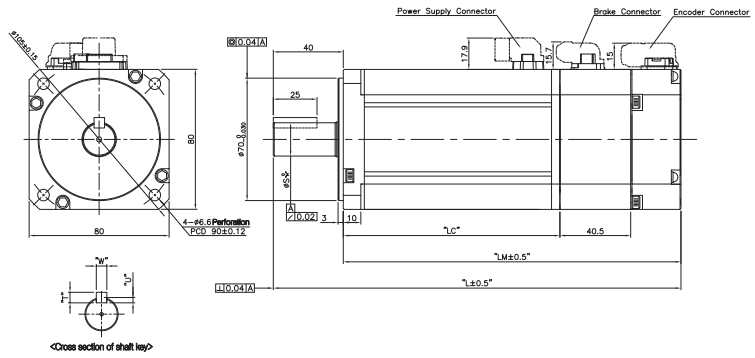
(Brake Connector Pin Table)

[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)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.

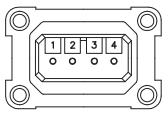


Model	External Dimensions								Weight (kg)
	L	LM	LC	S	H	T	W	U	
FCL04A,FCL03D	138.7(179.5)	98.7(139.5)	70(69.8)	14	-0.018	5	5	3	1.52(2.32)/1.26(2.06)
FCL06A,FCL05D	156.7(197.5)	116.7(157.5)	88(87.8)	19	-0.021	6	6	3.5	2.14(2.94)/2.12(2.92)
FCL08A,FCL06D	174.7(215.5)	134.7(175.5)	106(105.8)	19	-0.021	6	6	3.5	2.68(3.48)/2.66(3.46)
FCL10A,FCL07D	192.7(233.5)	152.7(193.5)	124(123.8)	19	-0.021	6	6	3.5	3.30(4.10)/2.78(3.58)

FB Series

Plug Specifications

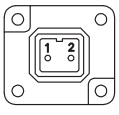
[Power]



Pin No.	Color	Signal
1	Black	W
2	White	V
3	Red	U
4	Green	Ground

(Power Connector Pin Table)

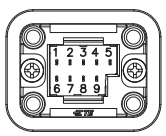
[Brake]



Pin No.	Signal
1	BK+
2	BK–

(Brake Connector Pin Table)

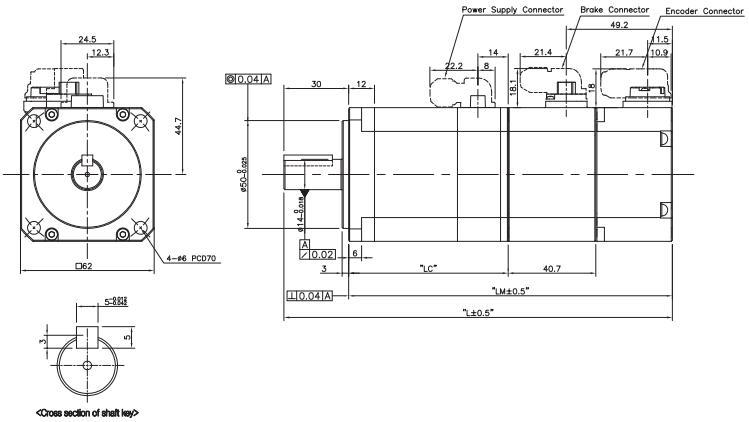
[Encoder]



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)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.



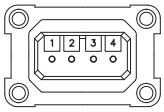
Model	External Dimensions			Weight (kg)
	L	LM	LC	
FB01A	109(149.2)	79(119.2)	43.5(43)	0.72(1.3)
FB02A	120(160.2)	90(130.2)	54.5(54)	0.94(1.49)
FB04A	140(180.2)	110(150.2)	74.5(74)	1.32(1.87)

External Dimensions of Servo Motor

FC Series

Plug Specifications

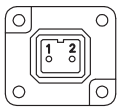
[Power]



Pin No.	Color	Signal
1	Black	W
2	White	V
3	Red	U
4	Green	Ground

(Power Connector Pin Table)

[Brake]



Pin No.	Signal
1	BK+
2	BK–

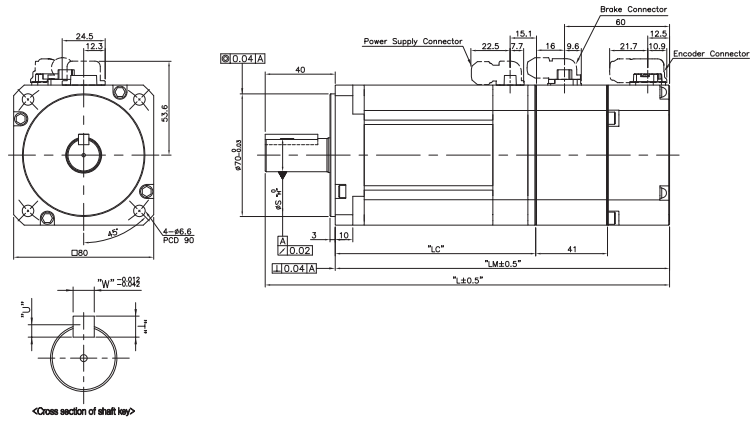
(Brake Connector Pin Table)

[Encoder]

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

(Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.
Note3) For external dimensions for oil-sealed type. Please kindly contact us separately.

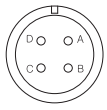


Model	External Dimensions								Weight (kg)
	L	LM	LC	S	H	T	W	U	
FC04A, FC03D	136.5(177)	96.5(137)	61(60.5)	14	-0.018	5	5	3	1.56(2.6)
FC06A, FC05D	154.5(195)	114.5(155)	79(78.5)	19	-0.021	6	6	3.5	2.18(3.22)
FC08A, FC06D	172.5(213)	132.5(173)	97(96.5)	19	-0.021	6	6	3.5	2.72(3.76)
FC10A, FC07D	190.5(231)	150.5(191)	115(114.5)	19	-0.021	6	6	3.5	3.80(4.34)

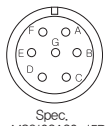
FE, FEP Series

Plug Specifications

[Power]

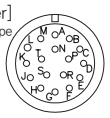


Spec.
: MS3102A20-4P
(Standard)



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

[Encoder]
2)Serial type



Spec.
: MS3102A20-29P

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–

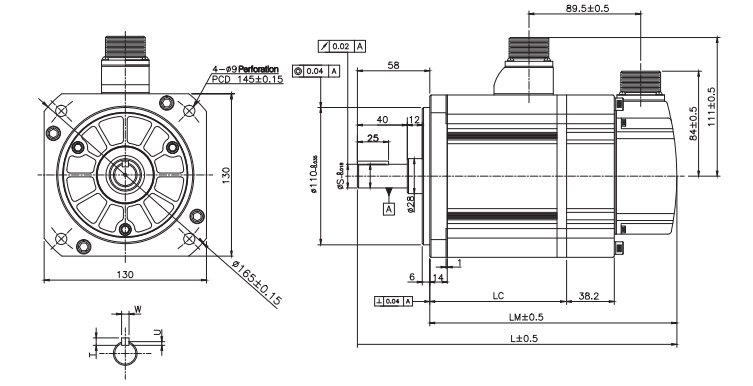
Pin No.	Signal	Pin No.	Signal
A	MA	M	–
B	$\overline{MA}$	N	–
C	SLO	P	–
D	$\overline{SLO}$	R	–
E	–	H	+5V
F	–	G	0V
K	–	J	SHIELD
L	–		

(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	VOD_B	H	+5V
F	GND_B	G	0V
K	–	J	SHIELD
L	–		

(Multi Turn Encoder Connector Pin Table)

Note1) Use DC[24V] for brake input power supply.
Note2) The ( ) is for brake-attached type.



Model	External 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)

External Dimensions of Servo Motor

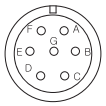
FF, FFP Series

Plug Specifications

[Power]

Spec.
: MS3102A22-22P
(Standard)

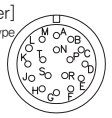
Pin No.	Signal
A	U
B	V
C	W
D	Ground



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

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

[Encoder]
2)Serial type



Spec.
: MS3102A20-29P

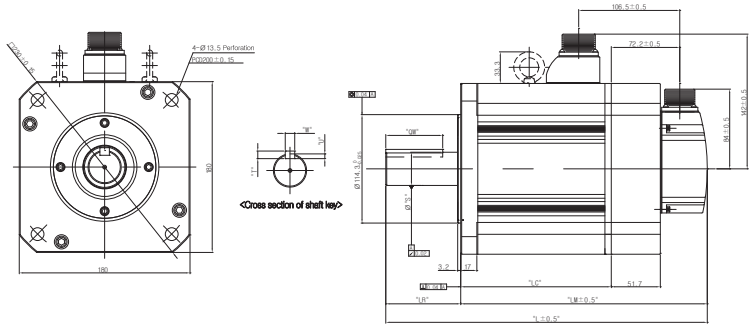
Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(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	VOD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)

Note1) FF30M or above models have eye bolts.
Note2) Use DC[24V] for brake input power supply.
Note3) The ( ) is for brake-attached type.
Note4) Use MS3102A32-17 for FF75G Power connector.



Model	External Dimensions				Key					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)

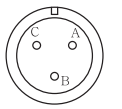
FG, FGP Series

Plug Specifications

[Power]

Spec.
: MS3102A22-22P
(Standard)

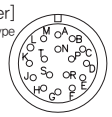
Pin No.	Signal
A	U
B	V
C	W
D	Ground



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

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

[Encoder]
2)Serial type



Spec.
: MS3102A20-29P

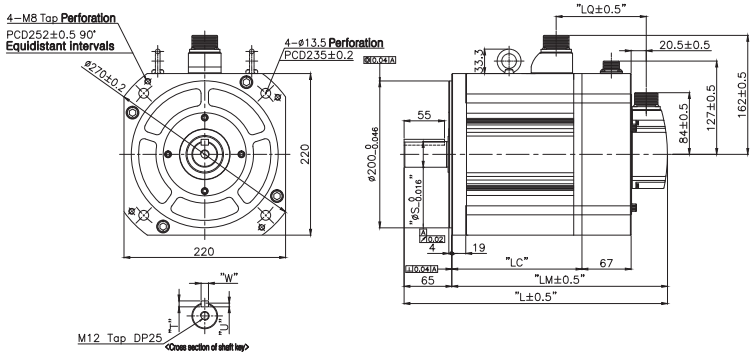
Pin No.	Signal	Pin No.	Signal
A	MA	M	-
B	$\overline{MA}$	N	-
C	SLO	P	-
D	$\overline{SLO}$	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(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	VOD_B	H	+5V
F	GND_B	G	0V
K	-	J	SHIELD
L	-		

(Multi Turn Encoder Connector Pin Table)

Note1) In case of SG, use DC[90V] for brake input power supply.
Note2) The ( ) is for brake-attached type.



Model	External Dimensions			Key				Weight (kg)
	L	LM	LC	S	T	W	U	
FG22D, FG20G, FG12M FGP22D, FGP20G, FGP12M	229.5(295.7)	164.5(230.7)	115(114.2)	35 +0.01 0	8	10	5	15.42(29.23)
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)
FG60M, FGP60M	418.5(484.7)	353.5(419.7)	304(303.2)	45 0 -0.015		10		66.2(82.6)

Direct–Drive motor

Direct–Drive Designation

MDM	–	D	D	None	34	D	NO	H

Motor Type
D : DD MOTOR

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

Input Power Supply
None : 220VAC

Rated Troque
03 : 3Nm Output
06 : 6Nm Output
09 : 9Nm Output
...
60 : 60Nm Output
...
A6 : 160Nm Output

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

Encoder Type

	135	175	230	290	360	remark
NO	20Bit					Single Turn Abs, Biss communication

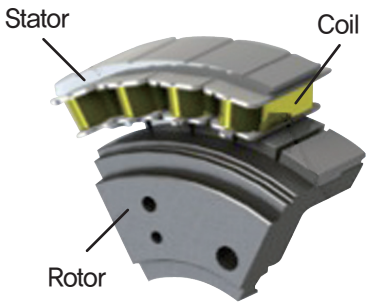
Shape of Shaft End
H : Hollow Type

Features of Mecapion Direct-Drive Motor

● 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 Conection for DC Input (Pl, 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)

● Using the high-performance rotary optical encoder that adopts the Biss protocol

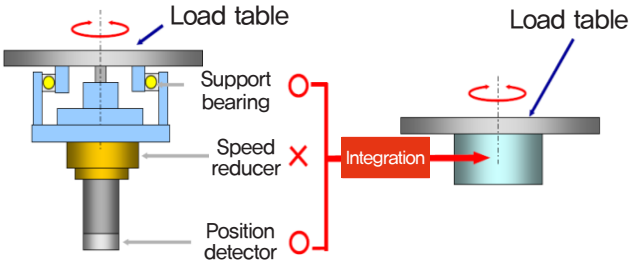
- Resolution of 1,048,576 CPR (Single turn Absolute)
- Using our own encoder technology to reduce the cost and shorten the delivery time

● 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



[Speed Reducer + Servo Motor] [DD Motor]

● Hollow type that is efficient for wiring and piping

● A wide range of products

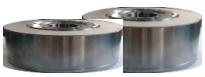
- Rated output: 63W~.25kW
- Rated torque: 3.0N.m~160N.m (the instantaneous maximum torque should be 3 times the rated torque)
- Rated speed: 150RPM~200RPM
- Frame diameter: 135mm,175mm,230mm,290mm, and 360mm (13 models)

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 internal voltage: 1800 VAC, 1 second
- Operating voltage: 200 VAC
- Operating temperature : 0 ~ 40[℃] / Storage temperature: -10~60[℃]
- Ambient humidity : 20 ~ 80% RH (no condensation)
- Installation location : Place with no toxic substances, such as corrosive and combustible gasses, cutting oil, metal dust, grease or direct sunlight

Line-up Table

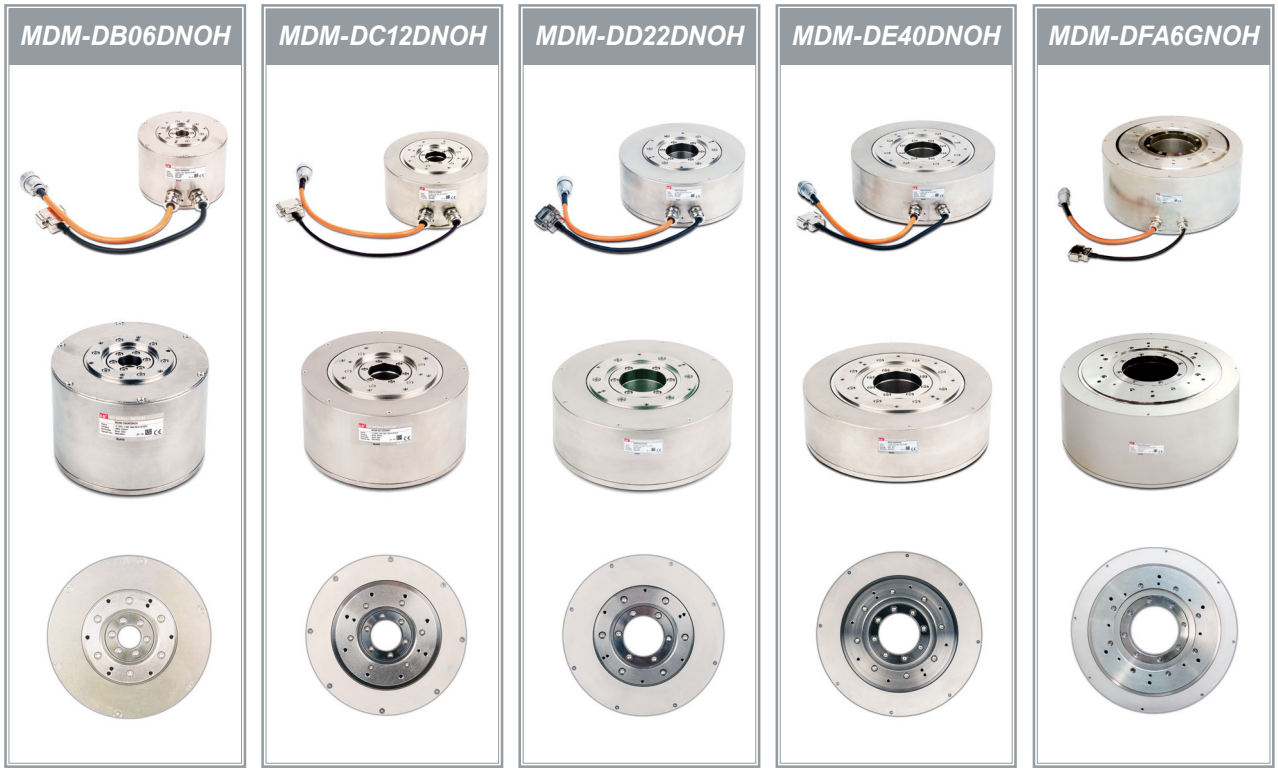
Maximum Torque[Nm]			9	18	27	36	54	66	102	120	180	330	480	
Rated speed 200[rpm]	Maximum speed 500[rpm]	Φ135	DB03D 	DB06D 		DB09D 								
		Φ175		DC06D 		DC12D 								
		Φ230				DD12D 								
	Maximum speed 400[rpm]	Φ175					DC18D 							
		Φ230						DD22D DD34D 						
	Maximum speed 300[rpm]	Φ290								DE40D DE60D 				
Rated speed 150[rpm]	Maximum speed 250[rpm]	Φ360										DFA1D DFA6D 		

Motor Designation

Applicable drive to motor

Rated Speed (RPM)	Maximum Speed (RPM)	External Diameter of Motor(Φ)	Applicable Motor	Applicable Drive	encoder type
200	500	Φ135	DB03D	L7□A001□	20 bit single turn serial encoder (Biss/Absolute)
		Φ135	DB06D	L7□A002□	
		Φ135	DB09D	L7□A004□	
	500	Φ175	DC06D	L7□A002□	
		Φ175	DC12D	L7□A004□	
	400	Φ175	DC18D	L7□A008□	
	500	Φ230	DD12D	L7□A004□	
	400	Φ230	DD22D	L7□A008□	
	400	Φ230	DD34D	L7□A010□	
	300	Φ290	DE40D	L7□A010□	
	300	Φ290	DE60D	L7□A020□	
150	250	Φ360	DFA1G	L7□A020□	
		Φ360	DFA6G	L7□A035□	

Appearances of Motor



Features of Direct Drive Motor

Motor Designation		MDM-DB□□D□H			MDM-DC□□D□H		
		03	06	09	06	12	18
Applicable Drive (L7□-A□□□□)		L7□A001□	L7□A002□	L7□A004□	L7□A002□	L7□A004□	L7□A008□
Flange Size	mm	Φ135			Φ175		
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
Constant of Torque	N-m/Arms	2.76	4.25	3.57	4.18	5.13	6.12
Inertia	kg-m^2×10^{-4}	5.74	8.67	11.5	27.32	38.9	50.48
Rated Power Rate	kW/s	15.68	42.35	70.43	13.18	52.71	118.59
Angular acceleration	rad/s^2	191.2	141.6	127.7	455.03	323.9	280.3
positioning accuracy	arc-sec	±15					
positioning repeatability	arc-sec	±1.3					
Axial run-out	mm	0.015					
Radial run-out	mm	0.03					
Allowable Thrust Load	N	1500			3300		
Max. Instantaneous	N-m	40			70		
Encoder Type		20-bit single turn serial encoder (Biss/Absolute)					
Weight (Approx.)	kg	6.3	7.2	9.2	8.7	10.6	12.6
Working Environment	Ambient Temp	operating : 0~40[℃] / storage : -20~60[℃]					
	Ambient Humidity	20~80[%] RH(avoid dew-condenation)					
	Atmosphere	Avoid direct sunlight, No corrosive gas, Inflammable gas, Oil mist, or Dust					

* In case of allowable load inertia ratio, please apply within 30 times of rotator inertia

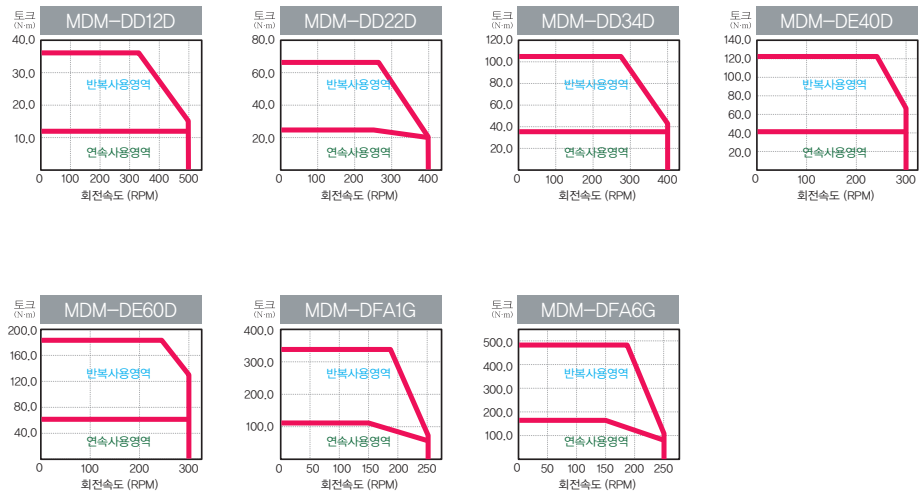
Speed-Torque Characteristics

Features of Direct Drive Motor

Motor Designation		MDM-DD□□D□H			MDM-DE□□D□H		MDM-DF□□G□H	
		12	22	34	40	60	A1	A6
Applicable Drive (L7□-A□□□□)		L7□A004□	L7□A008□	L7□A010□	L7□A010□	L7□A020□	L7□A020□	L7□A035□
Flange Size	mm	Φ230			Φ290		Φ360	
Rated Output	W	251	461	712	838	1,257	1,728	2,513
Rated Torque	N-m	12	22	34	40	60	110	160
Max Torque	N-m	36	66	102	120	180	330	480
Rated Current	Arms	2.58	3.33	5.72	5.3	8.33	9.48	14.6
Max Current	Arms	7.74	9.99	17.16	15.9	24.99	28.44	43.8
Rated Speed	rpm	200			200		150	
Max Speed	rpm	500	400	400	300	300	250	250
Constant of Torque	N-m/Arms	4.8	6.81	6.13	7.77	7.42	11.95	11.29
Inertia	kg-m^2×10^{-4}	54.14	68.15	82.16	311.55	371.71	1410.2	1763.4
Rated Power Rate	kW/s	26.6	71.02	140.7	51.36	96.68	85.9	145.4
Angular acceleration	rad/s^2	450.9	309.6	241.5	778.35	619.1	1281.13	1101.4
positioning accuracy	arc-sec	±15						
positioning repeatability	arc-sec	±1.3						
Axial run-out	mm	0.015						
Radial run-out	mm	0.03						
Allowable Thrust Load	N	4000			11000		15000	
Max. Instantaneous	N-m	93			250		350	
Encoder Type		20-bit single turn serial encoder (Biss/Absolute)						
Weight (Approx.)	kg	17.3	19.6	21.9	28.2	35	54	70.3
Working Environment	Ambient Temp	operating : 0~40[℃] / storage : -20~60[℃]						
	Ambient Humidity	20~80[%] RH(avoid dew-condenation)						
	Atmosphere	Avoid direct sunlight, No corrosive gas, Inflammable gas, Oil mist, or Dust						

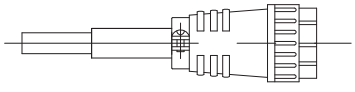
* In case of allowable load inertia ratio, please apply within 30 times of rotator inertia

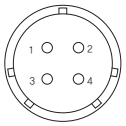
Speed-Torque Characteristics



External Dimensions of Direct-Drive Rotary Motor

MDM-DB03D, MDM-DB06D, MDM-DB09D

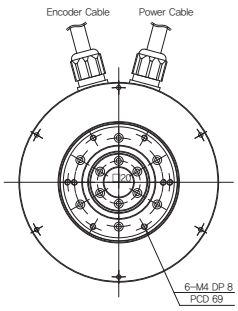


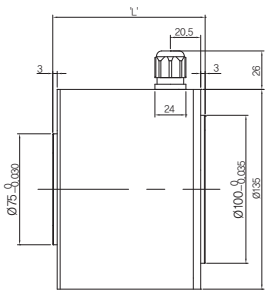


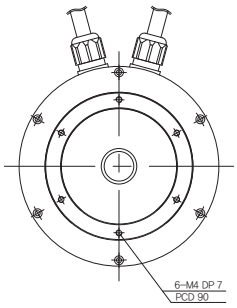
NJC-24-4-PM

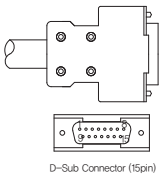
Signal		Line color	PIN NO.
LEAD WIRE	U	Red	A
	V	White	B
	W	Black	C
FG		Green	D

POWER CONNECTOR









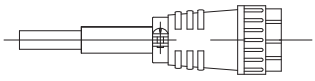
D-Sub Connector (15pin)

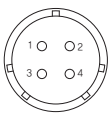
D,D SERVO ENCODER CABLE			
No.	Encoder Signal	No.	Encoder Signal
1	MA	9	+5V
2	SLO	10	–
3	–	11	–
4	0V	12	–
5	Shield	13	–
6	MA	14	–
7	SLO	15	–
8	–		

ENCODER CONNECTOR

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

MDM-DC06D, MDM-DC12D, MDM-DC18D

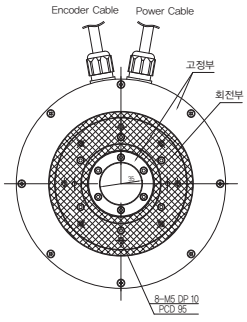


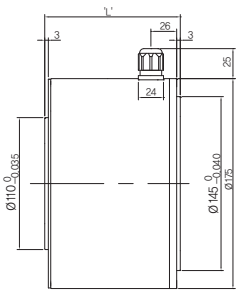


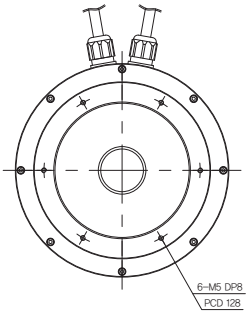
NJC-24-4-PM

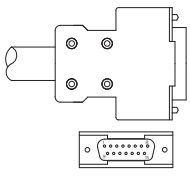
Signal		Line color	PIN NO.
LEAD WIRE	U	Red	A
	V	White	B
	W	Black	C
FG		Green	D

POWER CONNECTOR









D-sub Connector (15pin)

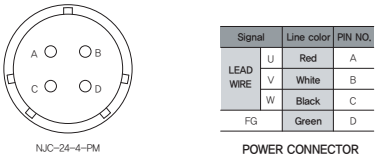
D,D SERVO ENCODER CABLE			
No.	Encoder Signal	No.	Encoder Signal
1	MA	9	+5V
2	SLO	10	–
3	–	11	–
4	0V	12	–
5	Shield	13	–
6	MA	14	–
7	SLO	15	–
8	–		

ENCODER CONNECTOR

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

External Dimensions of Direct-Drive Rotary Motor

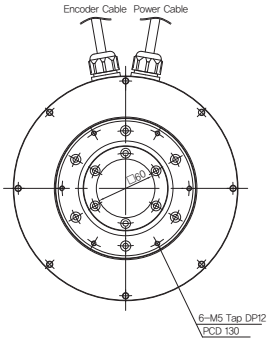
MDM-DD12D, MDM-DD22D, MDM-DD34D

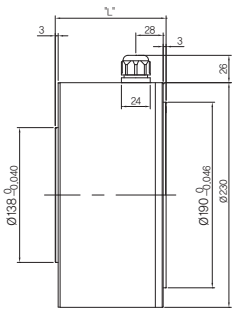


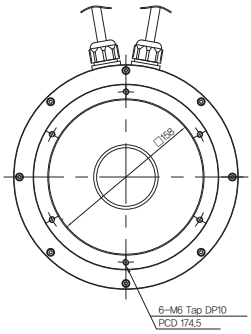
NJC-24-4-PM

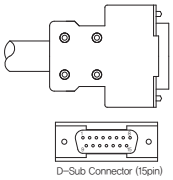
Signal		Line color	PIN NO.
LEAD WIRE	U	Red	A
	V	White	B
	W	Black	C
FG		Green	D

POWER CONNECTOR









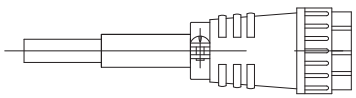
D-Sub Connector (15pin)

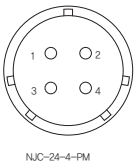
D.D SERVO ENCODER CABLE			
No.	Encoder Signal	No.	Encoder Signal
1	MA	9	+5V
2	SLO	10	–
3	–	11	–
4	0V	12	–
5	Shield	13	–
6	MA	14	–
7	SLO	15	–
8	–		

ENCODER CONNECTOR

Motor Series	External Dimensions	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

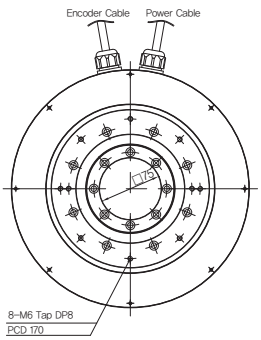


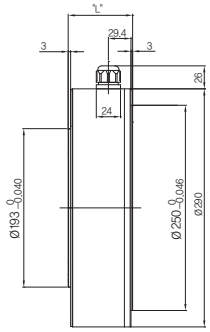


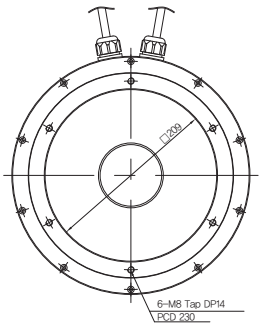
NJC-24-4-PM

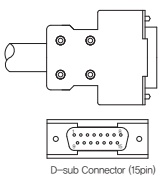
Signal		Line color	PIN NO.
LEAD WIRE	U	Red	A
	V	White	B
	W	Black	C
FG		Green	D

POWER CONNECTOR









D-sub Connector (15pin)

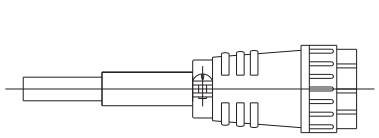
D.D SERVO ENCODER CABLE			
No.	Encoder Signal	No.	Encoder Signal
1	MA	9	+5V
2	SLO	10	–
3	–	11	–
4	0V	12	–
5	Shield	13	–
6	MA	14	–
7	SLO	15	–
8	–		

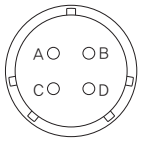
ENCODER CONNECTOR

Motor Series	External Dimensions	Weight(kg)
	L	
MDM-DE40D	95.4	28.2
MDM-DE60D	113.4	35

External Dimensions of Direct-Drive Rotary Motor

MDM-DFA1G, MDM-DFA6G

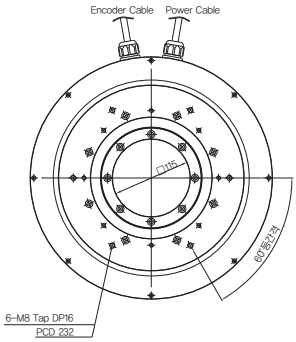


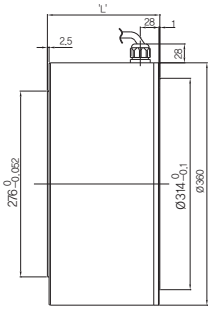


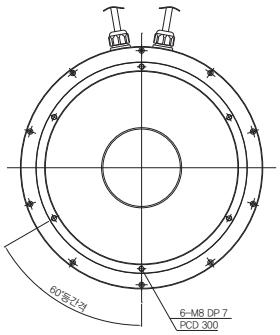
제작사: Nanaboshi Electronic
NJC-24-4-PM

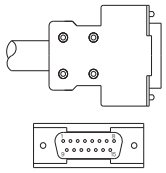
Signal		Line color	PIN NO.
LEAD WIRE	U	Red	A
	V	White	B
	W	Black	C
FG		Green	D

POWER CONNECTOR









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	MA	14	–
7	SLO	15	–
8	–		

ENCODER CONNECTOR

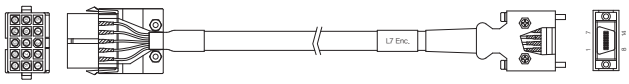
Motor Series	External Dimensions	Weight(kg)
	L	
MDM-DFA1G	131	54
MDM-DFA6G	167	70.3

Contents

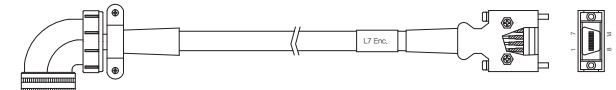
■ Options

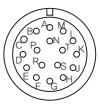
Servo Motor Option

Signal Cable [Incremental]

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name(Note1)</th><th>Applicable Drive</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td>For Signal</td><td>Parallel Encoder Cable (Small Capacity)</td><td>APCS-E□□□AS</td><td>L7SA□□□A
L7NHA□□□U
L7PA□□□U</td><td>All Models of
APM-SA
APM-SB
APM-SC
APM-HB
SERIES</td><td>
Motor Side Connector
Drive Side Connector(CN2)


<table>
<tr><th>PIN No.</th><th>Encoder Signal</th><th>PIN No.</th><th>Encoder Signal</th></tr>
<tr><td>1</td><td>A</td><td>9</td><td>V</td></tr>
<tr><td>2</td><td>$\overline{A}$</td><td>10</td><td>$\overline{V}$</td></tr>
<tr><td>3</td><td>B</td><td>11</td><td>W</td></tr>
<tr><td>4</td><td>$\overline{B}$</td><td>12</td><td>$\overline{W}$</td></tr>
<tr><td>5</td><td>Z</td><td>13</td><td>+5V</td></tr>
<tr><td>6</td><td>$\overline{Z}$</td><td>14</td><td>0V</td></tr>
<tr><td>7</td><td>U</td><td>15</td><td>SHIELD</td></tr>
<tr><td>8</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>PIN No.</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
a. Cap Spec.(15 Position) : 172163-1(AMP)
b. Socket Spec. : 170361-1(AMP)
2. Driver Side Connector(CN2)
a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone)
b. 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>Parallel Encoder Cable (Middle Capacity)</td><td>APCS-E□□□BS</td><td>L7S□□□□A
L7NH□□□U
L7PA□□□U</td><td>All Models of
APM-SE, SEP
APM-SF, SFP
APM-SG, SGP
APM-LF
APM-LG
APM-HE
SERIES</td><td>
Motor Side Connector
Drive Side Connector(CN2)



<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>PIN No.</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〉

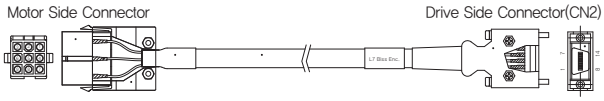
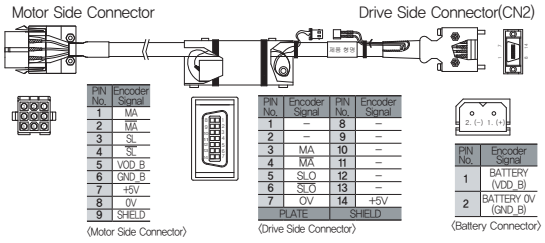
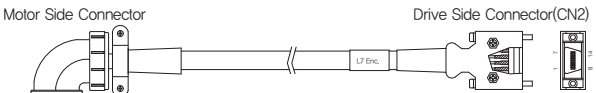
1. Motor Side Connector(MS : Military Standard)
a. Plug Spec. : MS3108B20-29S
2. Drive Side Connector(CN2)
a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone)
b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone)
3. Cable Spec. : 7P×0.2SQ or 7P×AWG24
</td></tr>
</table>

Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

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

Servo Motor Option

Signal Cable [Serial]

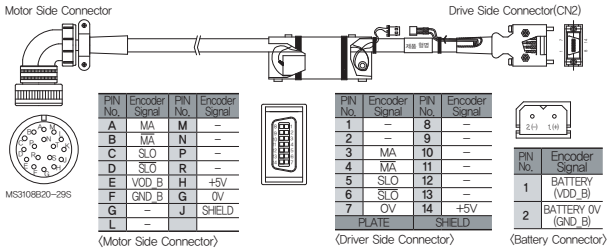
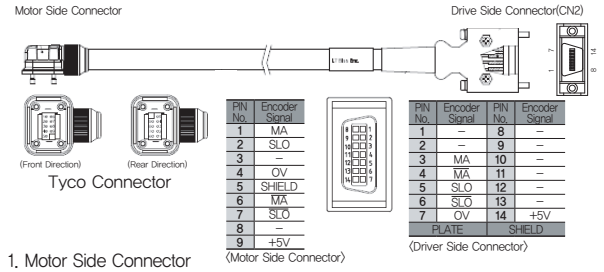
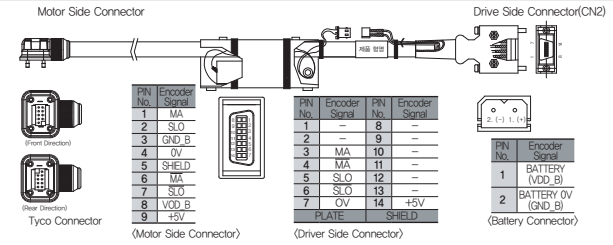
Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Signal	S Series Motor S-turn Encoder Cable (Small Capacity)	APCS-E□□□CS	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-SA APM-SB APM-SC SERIES	 1. Motor Side Connector a. Cap Spec.(9 Position) : 172161-1(AMP) b. Socket Spec. : 170361-1(AMP) 2. Drive Side Connector(CN2) a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone) b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone) 3. Cable Spec. : 3P×0.2SQ or 3P×24AWG 〈Motor Side Connector〉 〈Drive Side Connector〉
For Signal	S Series Motor M-turn Encoder Cable (Small Capacity)	APCS-E□□□CS1	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-SA APM-SB APM-SC SERIES	 1. Motor Side Connector a. CAP Spec.(9 Position) : 172161-1(AMP) b. Socket Spec. : 170361-1(AMP) 2. Drive Side Connector(CN2) a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone사) b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone사) 3. Cable Spec. : 4P×0.2SQ or 4P×24AWG 4. Battery Connector Spec. : 5267-02A(MOLEX) 〈Motor Side Connector〉 〈Drive Side Connector〉 〈Battery Connector〉
For Signal	S/F Series Motor S-turn Encoder Cable (Middle Capacity)	APCS-E□□□DS	L7S□□□□B L7NA□□□B L7NH□□□□U L7PA□□□U	All Models of APM-SE, FE, SEP, FEP APM-SF, FF SFP, FFP APM-SG, FG SGP, FGP APM-LF APM-LG SERIES	 1. Motor Side Connector(MS : Military Standard) a. Plug Spec. : MS3108B20-29S 2. Drive Side Connector(CN2) a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone) b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone) 3. Cable Spec. : 3P×0.2SQ or 3P×24AWG 〈Motor Side Connector〉 〈Drive Side Connector〉

Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

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

Servo Motor Option

Signal Cable [Serial]

Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Signal	S/F Series Motor M-turn Encoder Cable (Middle Capacity)	APCS-E□□□DS1	L7S□□□□B L7NA□□□B L7NH□□□□U L7PA□□□U	All Models of APM-SE, FE SEP,FEP APM-SF, FF SFP,FFP APM-SG, FG, SGP,FGP APM-LF APM-LG SERIES	 1. Motor Side Connector(MS : Military Standard) a. Plug Spec. : MS3108B20-29S 2. Drive Side Connector(CN2) a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone) b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone) 3. Cable Spec. : 4P×0.2SQ or 4P×24AWG 4. Battery Connector Spec. : 5267-02A(MOLEX)
For Signal	F Series Motor S-turn Encoder Cable (Small Capacity)	APCS-E□□□ES-□	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-FAL APM-FB, FBL APM-FC, FCL SERIES	 1. Motor Side Connector a. Cap Spec. : 2201825-1(Tyco) b. Socket Spec. : 2174065-4(Tyco) 2. Drive Side Connector(CN2) a. Case Spec. : 10314-52A0-008(3M) or SM-14J(Suntone) b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone) 3. Cable Spec. : 3P×0.2SQ or 3P×24AWG
For Signal	F Series Motor M-turn Encoder Cable (Small Capacity)	APCS-E□□□ES1-□	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-FAL APM-FB, FBL APM-FC, FCL SERIES	 1. Motor Side Connector a. Cap Spec. : 2201825-1(Tyco) b. Socket Spec. : 2174065-4(Tyco) 2. Drive Side Connector(CN2) a. Cap Spec. : 10314-52A0-008(3M) or SM-14J(Suntone) b. Connector Spec. : 10114-3000VE(3M) or SM-14J(Suntone) 3. Cable Spec. : 4P×0.2SQ or 4P×24AWG 4. Battery Connector Spec. : 5267-02A(MOLEX)

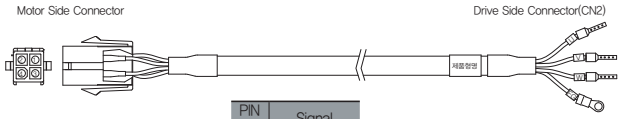
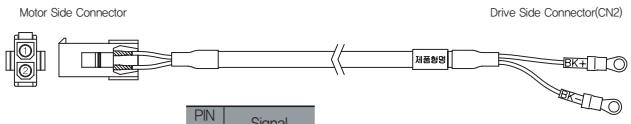
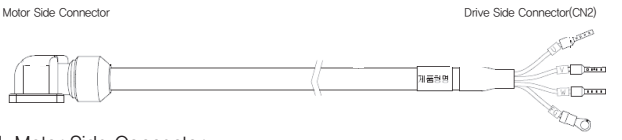
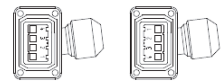
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

Note2) In case of □ marked product, the connector can draw in a direction of Front(load) / Rear(half load).
(Front Type : No mark, Rear Type : -R)

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

Servo Motor Option

Power Cable [200V]

Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	S Series Power Cable (Small Capacity)	APCS-P□□□GS	L7SA□□□A L7NHA□□□U L7PA□□□U	All Models of APM-SA APM-SB APM-SC APM-HB SERIES	 PIN No. / Signal: 1 U, 2 V, 3 W, 4 Ground 1. Motor Side Connector a. Cap Spec.(4 Position) : 172159-1(AMP) b. Socket Spec. : 170362-1(AMP) 2. Drive Side Connector(U, V, W, FG) a. U, V, W Pin Spec. : 1512 b. FG Pin Spec. : 1.54x4(Ring Terminal) 3. Cable Spec. : 4C×0.75SQ or 4C×18AWG
For Power	S Series Brake Cable (Small Capacity)	APCS-P□□□KB	L7SA□□□A L7NHA□□□U L7PA□□□U	All Models of APM-SA APM-SB APM-SC APM-HB SERIES	 PIN No. / Signal: 1 BK+, 2 BK- 1. Motor Side Connector a. Cap Spec.(2 Position) : 172157-1(AMP) b. Socket Spec. : 170362-1(AMP) 2. Drive Side Connector a. Connecting terminal Spec. : 1.5x3(Rling Terminal) 3. Cable Spec. : 2C×0.75SQ or 2C×18AWG
For Power	F Series Power Cable (Small Capacity)	APCS-P□□□FS-□	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-FB APM-FC SERIES	 1. Motor Side Connector a. Plug Spec. : KN5FT04SJ1(JAE) b. Socket Spec. : ST-KN-S-C1B-3500(JAE) 2. Drive Side Connector(U, V, W, FG) a. U, V, W Pin Spec. : 1512 b. FG Pin Spec. : 1.5×4(Ring Terminal) 3. Cable Spec. : 4C×0.75SQ or 4C×18AWG  PIN No. / Signal: 1 W, 2 V, 3 U, 4 Ground

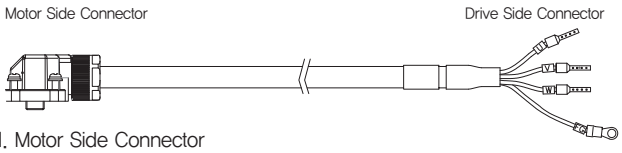
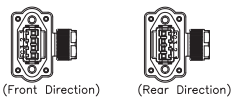
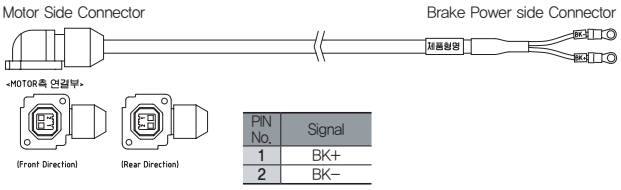
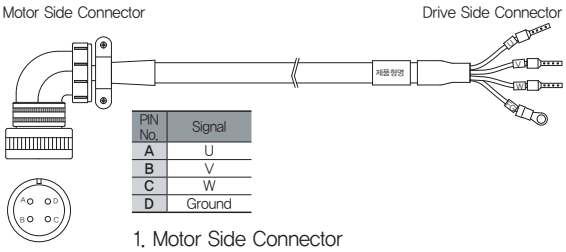
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

Note2) In case of □ marked product, the connector can draw in a direction of Front(load) / Rear(half load).
(Front Type : No mark, Rear Type : -R)

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

Servo Motor Option

Power Cable [200V]

Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	L Series Power Cable (Small Capacity)	APCS-P□□□LS-□	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APMC-FAL APMC-FBL APMC-FCL SERIES	 1. Motor Side Connector a. Plug Spec. : SM-JN8FT04(Suntone) b. Socket Spec. : SMS-201(Suntone) 2. Drive Side Connector (U,V,W,FG) a. U, V, W Pin Spec. : 1512(Ferrule) b. FG Pin Spec. : 1.5x4 (Ring Terminal) 3. Cable Spec. : 4Cx0.75SQ or 4Cx18AWG 4. In case of FAL products, Please install Power Cable first before connecting Encoder Cable.  PIN No. / Signal: 1 U, 2 V, 3 W, FG Ground
For Power	Brake Cable for Flat Motor (Small Capacity)	APCS-B□□□QS-□	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-FAL APM-FB, FBL APM-FC, FCL SERIES	 PIN No. / Signal: 1 BK+, 2 BK- 1. Motor Side Connector a. Plug Spec. : KN5FT02SJ1 b. Socket Spec. : ST-KN-S-C1B-3500 2. Drive Side Connector a. Connecting terminal Spec. : 1.5×3(Ring Terminal) 3. Cable Spec. : 2C×0.75SQ or 2C×18AWG
For Power	Power Cable (Middle Capacity)	APCS-P□□□HS	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-SE APM-FE APM-HE SERIES	 PIN No. / Signal: A U, B V, C W, D Ground 1. Motor Side Connector a. Plug Spec. : MS3108B20-4S(MS) 2. Drive Side Connector a. U, V, W Pin Spec. : 2512 b. FG Pin Spec. : 2.5×4(Ring Terminal) 3. Cable Spec. : 4C×2.5SQ or 4C×14AWG

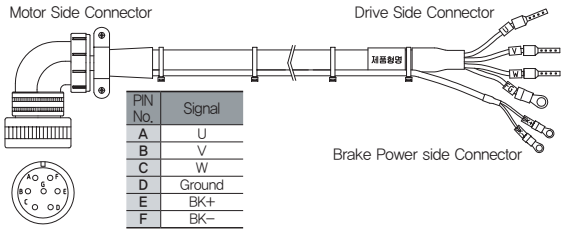
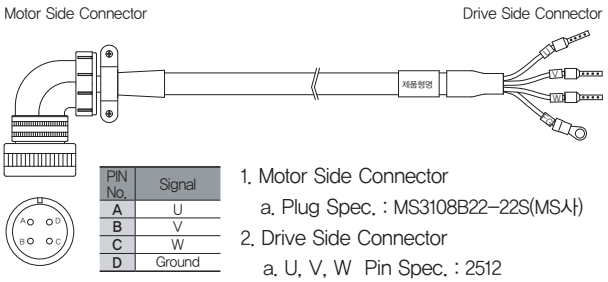
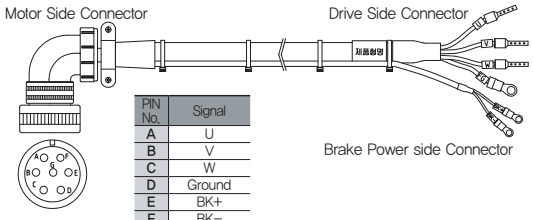
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

Note2) In case of □ marked product, the connector can draw in a direction of Front(load) / Rear(half load).
(Front Type : No mark, Rear Type : -R)

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

Servo Motor Option

Power Cable [200V]

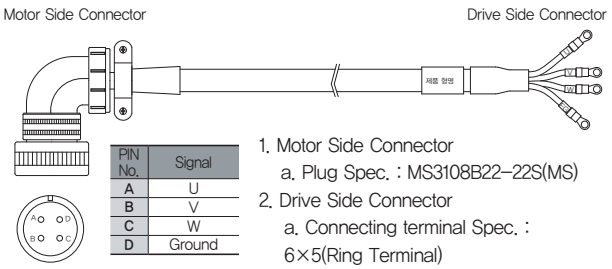
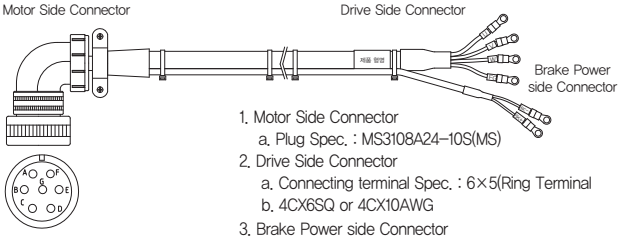
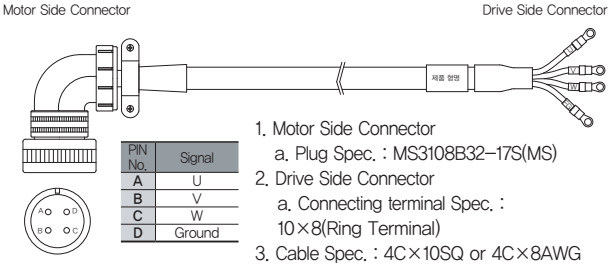
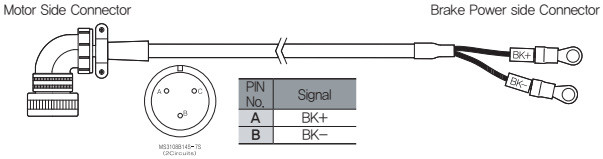
Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	Power Cable (Brake Type)	APCS-P□□□NB	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-SE APM-FE SERIES	 1. Motor Side Connector a. Plug Spec. : MS3108B20-15S(MS) 2. Drive Side Connector a. U, V, W Pin Spec. : 2012 b. Cable Spec. : 4C×2.5SQ or 4C×14AWG c. FG Pin Spec. : 2.5×4(Ring Terminal) 3. Brake Power side Connector a. BK Pin Spec. : 1.5×3(Ring Terminal) b. Cable Spec. : 2C×0.75SQ or 2C×18AWG
For Power	Power Cable (Middle Capacity)	APCS-P□□□IS	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	APM-SF30A SF22D, LF35D SF20G, LF30G SF12M, SF20M LF30M, SG22D LG35D, SG20G LG30G, SG12M SG20M, LG30M FF30A, FF22D FF35D, FF20G FF30G, FF12M FF20M, FF30M FG22D, FG35D FG20G, FG30G FG12M, FG20M FG30M	 1. Motor Side Connector a. Plug Spec. : MS3108B22-22S(MS사) 2. Drive Side Connector a. U, V, W Pin Spec. : 2512 b. FG Pin Spec. : 2.5×4(Ring Terminal) 3. Cable Spec. : 4C×2.5SQ or 4C14AWG
For Power	Power Cable (Brake Type)	APCS-P□□□PB	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	APM-SF30A SF22D, LF35D SF20G, LF30G SF12M, SF20M LF30M, FF30A FF22D, FF35D FF20G, FF30G FF12M, FF20M FF30M	 1. Motor Side Connector a. PLUG Spec. : MS3108B24-10S(MS) 2. Drive Side Connector a. U, V, W Pin Spec. : 2512 b. Cable Spec. : 4C×2.5SQ or 4C×2.5AWG c. FG Pin Spec. : 2.5×4(Ring Terminal) 3. Brake Power side Connector a. BK Pin Spec. : 1.5×3(Ring Terminal) b. Cable Spec. : 2C×0.75S or 2C×18AWG

Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

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

Servo Motor Option

Power Cable [200V]

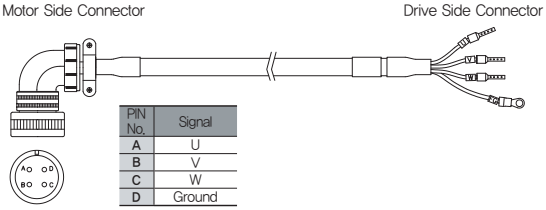
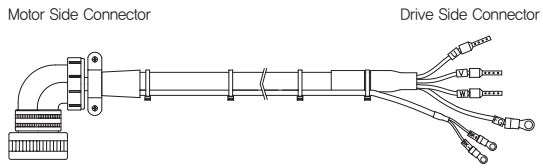
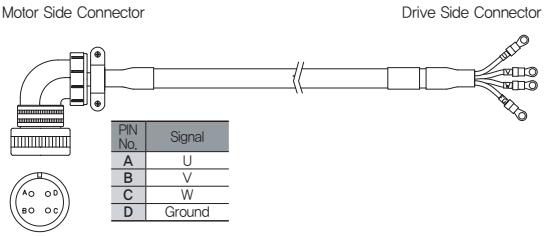
Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	Power Cable (Middle Capacity)	APCS-P□□□JS	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	APM-SF50A SF55D, SF75D SF44G, SF60G SF44M, SG55D SG75D, SG44G SG60G, SG44M FF50A, FF55D FF75D, FF44G FF60G, FF44M FG55D, FG75D FG44G, FG60G FG44M	 1. Motor Side Connector a. Plug Spec. : MS3108B22-22S(MS) 2. Drive Side Connector a. Connecting terminal Spec. : 6×5(Ring Terminal) 3. Cable Spec. : 4C×6SQ or 4C×10AWG
For Power	Power Cable (Brake Type)	APCS-P□□□LB	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	APM-SF50A SF55D, SF75D SF44G, SF60G SF44M, FF50A FF50D, FF75D FF44G, FF60G FF40M	 1. Motor Side Connector a. Plug Spec. : MS3108A24-10S(MS) 2. Drive Side Connector a. Connecting terminal Spec. : 6×5(Ring Terminal b. 4CX6SQ or 4CX10AWG 3. Brake Power side Connector a. Connecting terminal Spec. : 1.25×3(Ring Terminal) b. Cable Spec. : 2C×0.75SQ or 2C×8AWG
For Power	Power Cable (Middle Capacity)	APCS-P□□□MS	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	APM-SG60M SF75G, FF75G	 1. Motor Side Connector a. Plug Spec. : MS3108B32-17S(MS) 2. Drive Side Connector a. Connecting terminal Spec. : 10×8(Ring Terminal) 3. Cable Spec. : 4C×10SQ or 4C×8AWG
For Power	Brake Cable	APCS-P□□□SB	L7SA□□□A L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All Models of APM-SG APM-LG APM-FG SERIES	 1. Motor Side Connector a. Plug Spec. : MS3108B 14S-7S(MS) 2. Drive Side Connector a. Connecting terminal Spec. : 1.5×3(Ring Terminal) 3. Cable Spec. : 2C×0.75SQ or 2C×19AWG

Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

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

Servo Motor Option

Power Cable [400V]

Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	Power Cable	APCF–P□□□HS	L7SB□□□B L7NHB□□□U	All Models of APM–SEP APM–FEP SERIES	 PIN No. / Signal: A U, B V, C W, D Ground 1. Motor Side Connector a. Plug Spec. : MS3108A 20–4S(MS) 2. Drive Side Connector (U,V,W,FG) a. U, V, W Pin Spec. : 1512(Ferrule) b. FG Pin Spec. : 1.5x4(Ring Terminal) 3. Cable Spec. : 4Cx1.5SQ or 4Cx15AWG
For Power	Power Cable (Brake Type)	APCF–P□□□NB	L7SB□□□B L7NHB□□□U	All Models of APM–SEP APM–FEP SERIES	 1. Motor Side Connector a. Plug Spec. : MS3108A 20–15S(MS) 2. Drive Side Connector a. U, V, W Pin Spec. : 1512(Ferrule) b. FG Pin Spec. : 1.5 x 4(Ring Terminal) 3. Power Cable Spec. : 4Cx1.5SQ or 4Cx15AWG 4. Brake Power side Connector a. Connecting terminal Spec. : 1.5 x 3(Ring Terminal) 5. Brake Cable Spec. : 2Cx0.75SQ or 2Cx19AWG PIN No. / Signal: A U, B V, C W, D Ground, E BK+, F BK–
For Power	Power Cable	APCF–P□□□IS	L7SB□□□B L7NHB□□□U	APM–[S/F]FP30A [S/F]FP22D, [S/F]FP35D [S/F]FP20G, FFP30G [S/F]FP12M, [S/F]FP20M [S/F]GP22D, [S/F]GP35D [S/F]GP20G, FGP30G [S/F]GP12M, [S/F]GP20M	 PIN No. / Signal: A U, B V, C W, D Ground 1. Motor Side Connector a. Plug Spec. : MS3108A 22–22S(MS) 2. Drive Side Connector (U,V,W,FG) a. U, V, W Pin Spec : 2512(Ferrule) b. FG Pin Spec. : 2.5x4 (Ring Terminal) 3. Cable Spec. : 4Cx2.5SQ or 4Cx14AWG

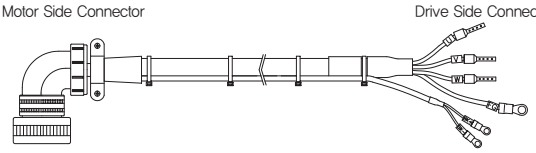
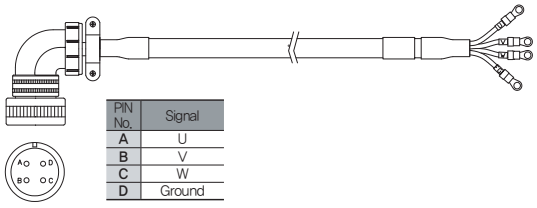
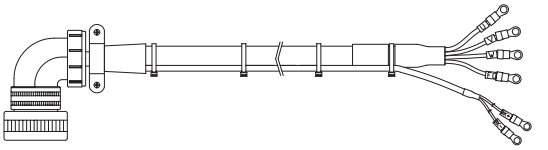
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

Note2) In case of 400V products, you can use Robotic Cable only.

Cable Length(m)	3	5	10	20
Robotic Cable(F)	F03	F05	F10	F20

Servo Motor Option

Power Cable [400V]

Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	Power Cable (Brake Type)	APCF-P□□□PB	L7SB□□□B L7NHB□□□U	APM-[S/F]FP30A [S/F]FP22D, [S/F]FP35D [S/F]FP20G, FFP30G [S/F]FP12M, [S/F]FP20M [S/F]GP22D, [S/F]GP35D [S/F]GP20G, FGP30G [S/F]GP12M, [S/F]GP20M	Motor Side Connector / Drive Side Connector   1. Motor Side Connector a. Plug Spec. : MS3108A 24-10S(MS) 2. Drive Side Connector a. U, V, W Pin Spec. : 2512(Ferrule) b. FG Pin Spec. : 2.5 x 4(Ring Terminal) 3. Power Cable Spec. : 4Cx2.5SQ or 4Cx14AWG 4. Brake Power side Connector a. Connecting terminal Spec. : 1.5 x 3(Ring Terminal) 5. Brake Cable Spec. : 2Cx0.75SQ or 2Cx19AWG PIN No. / Signal: A U, B V, C W, D Ground, E BK+, F BK-
For Power	Power Cable (Middle Capacity)	APCF-P□□□JS	L7SB□□□B L7NHB□□□U	APM-[S/F]FP50A [S/F]FP55D, [S/F]FP75D SFP30G, [S/F]FP44G [S/F]FP60G, [S/F]FP30M [S/F]FP44M, [S/F]GP55D [S/F]GP75D, SGP30G [S/F]GP44G, [S/F]GP60G [S/F]GP30M, [S/F]GP44M	Motor Side Connector / Drive Side Connector  PIN No. / Signal: A U, B V, C W, D Ground 1. Motor Side Connector a. Plug Spec. : MS3108A 22-22S(MS) 2. Drive Side Connector (U,V,W,FG) a. U, V, W Pin Spec. : 4.0x 5(Ring Terminal) 3. Cable Spec. : 4Cx4.0SQ or 4Cx11AWG
For Power	Power Cable (Brake Type)	APCF-P□□□LB	L7SB□□□B L7NHB□□□U	APM-[S/F]FP50A [S/F]FP55D, [S/F]FP75D SFP30G, [S/F]FP44G [S/F]FP60G, [S/F]FP30M [S/F]FP44M	Motor Side Connector / Drive Side Connector   1. Motor Side Connector a. Plug Spec. : MS3108A 24-10S(MS) 2. Drive Side Connector a. U, V, W Pin Spec. : 4.0X5(Ring Terminal) 3. Power Cable Spec. : 4Cx4.0SQ or 4Cx11AWG 4. Brake Power side Connector a. Connecting terminal Spec. : 1.5 x 3(Ring Terminal) 5. Brake Cable Spec. : 2Cx0.75SQ or 2Cx19AWG PIN No. / Signal: A U, B V, C W, D Ground, E BK+, F BK-

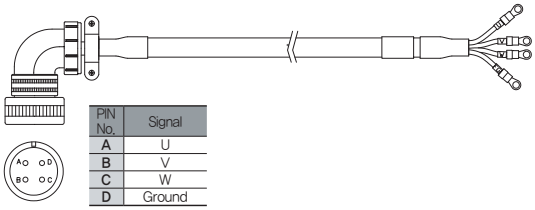
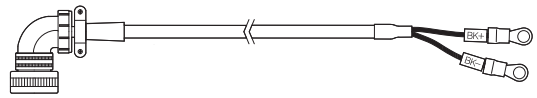
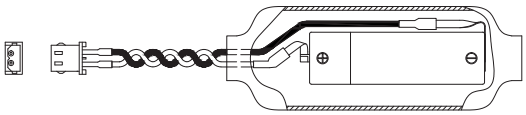
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

Note2) In case of 400V products, you can use Robotic Cable only.

Cable Length(m)	3	5	10	20
Robotic Cable(F)	F03	F05	F10	F20

Servo Motor Option

Power Cable [400V]

Type	Product Type	Model Name(Note1)	Applicable Drive	Applicable Motor	Specifications
For Power	Power Cable (Middle Capacity)	APCF-P□□□MS	L7SB□□□B L7NHB□□□U	APM-[S/F]FP75G [S/F]GP110D, [S/F]GP85G [S/F]GP110G, [S/FGP150G [S/F]GP60M	Motor Side Connector / Drive Side Connector  PIN No. / Signal: A-U, B-V, C-W, D-Ground 1. Motor Side Connector a. PLUG Spec. : MS3108A 32-17S(MS) 2. Drive Side Connector(U,V,W,FG) a. U, V, W Pin Spec. : 10x5(Ring Termianl) 3. Cable Spec. : 4Cx10SQ or 4Cx7AWG
For Power	Brake Cable (same with 200V)	APCS-P□□□SB	L7SB□□□B L7NHB□□□U	All Models of APM-SGP APM-FGP SERIES	Motor Side Connector / Drive Side Connector  PIN No. / Signal: 1-BK+, 2-BK- 1. Motor Side Connector a. Plug Spec. : MS3108B 14-7S(MS) 2. Brake Power side Connector a. Connecting terminal Spec. : 1.5x3(Ring Terminal) 3. Cable Spec. : 2Cx0.75SQ or 2Cx19AWG
Bat-tery For Encoder	Battery Ass'y	APCS-BATT36	All L7 Drives for M-turn	All Model of APM-F Series	 PIN No. / Signal / Color: 1 / + / Red, 2 / - / Black 1. PLUG Spec. : 5264-02 (Molex) 2. PLUG Pin Spec. : 5263PBT (Molex) 3. Battery Spec. : ER6V/3.6V, 2000mAh (TOSHIBA)

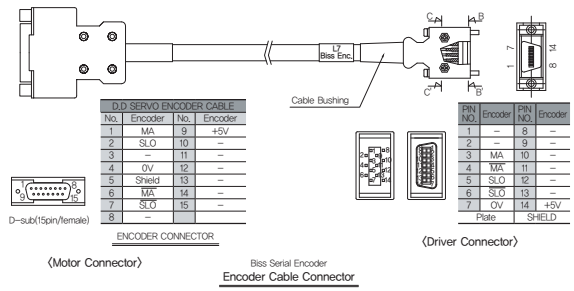
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

Note2) In case of 400V products, you can use Robotic Cable only.

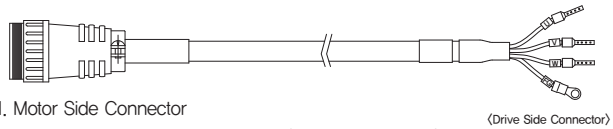
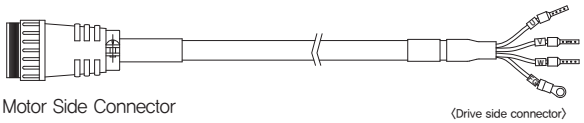
Cable Length(m)	3	5	10	20
Robotic Cable(F)	F03	F05	F10	F20

Servo Motor Option

DDMotor Signal Cable

Type	Product type	Model Name(Note1)	Applicable Motor	Specifications	Specifications
For Signal	L7 Encoder Cable	APCS-E□□ZS	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	All models of DD motor	 1. Motor Side Connector a. Connector(D-SUB) : DA-15PF-N(Female connector) b. Connector CASE(D-SUB) : SK-15H-1A 2. Drive Side Connector a. CASE Spec. : 10314-52A0-008(3M) b. Connector Spec. : 10114-3000VE(3M) 3. Cable Spec. : 3P×0.2SQ

DDMotor Power Cable

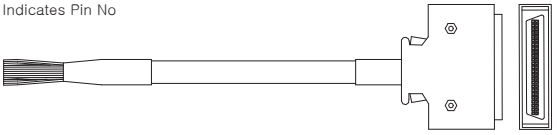
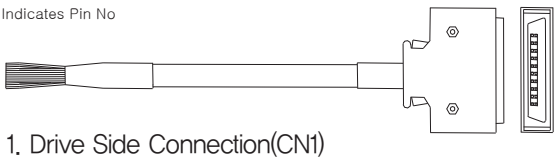
Type	Product type	Model Name(Note1)	Applicable Motor	Specifications	Specifications
For Signal	L7 Power Cable	APCS-P□□□YS	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	DB03D DB06D DB09D DC06D DC12D DC18D DD12D DD22D DD34D DE40D DE60D	 1. Motor Side Connector a. PLUG Spec. : NJC-24-4-ADF(Female connector) 2. Drive Side Connector a. U, V, W Pin PG Pin Spec. : UA-F2012(Seoil) b. FG Spec. : 1.5×4 3. Cable Spec. : 4C×1.5SQ, LAPP Cable(P/N : 00257001) Nanaboshi Electronic NJC-24-4-ADF(Female) 〈Motor side connecter〉 Motor: U Red 1, V White 2, W Black 3, Ground Green 4
For Signal	L7 Power Cable	APCS-P□□□ZS	L7SA□□□B L7NA□□□B L7NHA□□□U L7PA□□□U	DFA1G DFA6G	 1. Motor Side Connector a. PLUG Spec. : NJC-24-4-ADF(Female connector) 2. Drive Side Connector a. U, V, W Pin PG Pin Spec. : UA-F2012(Seoil) b. FG Spec. : 2.5×4 3. Cable Spec. : 4C×2.5SQ, LAPP Cable(P/N : 00257011) Nanaboshi Electronic NJC-24-4-ADF(Female) 〈Motor side connector〉 Motor: U Red 1, V White 2, W Black 3, Ground Green 4

Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

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

Servo Motor Option

Signal Cable

<table>
<tr><th>Type</th><th>Product type</th><th>Model Name(Note1)</th><th>Applicable Motor</th><th>Specifications</th></tr>
<tr><td rowspan="2">For Signal</td><td>CN1 Cable</td><td>APC-CN1□□A</td><td>L7S SERIES
L7P SERIES</td><td rowspan="2">[Upper Controller] [Drive Connection Side CN1]
Indicates Pin No
 
1. Drive Side Connection(CN1)
a. Case Spec. : 10350-52A0-008(3M)
b. Connector Spec. : 10150-3000VE(3M)
c. Cable Spec. : 20276-SB 25P(AWG28)</td></tr>
<tr><td colspan="3">〈Pin No. Display〉
<table>
<tr><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th></tr>
<tr><td>1</td><td>TRQCOM</td><td>11</td><td>PR+</td><td>21</td><td>SPD3</td><td>31</td><td>/BO</td><td>41</td><td>RDY-</td></tr>
<tr><td>2</td><td>REFCOM</td><td>12</td><td>PR-</td><td>22</td><td>SPD2</td><td>32</td><td>AO</td><td>42</td><td>TLOUT</td></tr>
<tr><td>3</td><td>PZO</td><td>13</td><td>PCON</td><td>23</td><td>SPD1</td><td>33</td><td>/AO</td><td>43</td><td>ZSPD</td></tr>
<tr><td>4</td><td>ZO</td><td>14</td><td>GAIN2(SEN)</td><td>24</td><td>GND</td><td>34</td><td>+15V</td><td>44</td><td>BRAKE</td></tr>
<tr><td>5</td><td>/ZO</td><td>15</td><td>PCLEAR</td><td>25</td><td>GND</td><td>35</td><td>-15V</td><td>45</td><td>INSPD/INPOS</td></tr>
<tr><td>6</td><td>SRO</td><td>16</td><td>TLIMIT</td><td>26</td><td>SETCOM</td><td>36</td><td>GND</td><td>46</td><td>DIR</td></tr>
<tr><td>7</td><td>/SRO</td><td>17</td><td>ALMRST</td><td>27</td><td>SPDCOM</td><td>37</td><td>GNDA</td><td>47</td><td>SVON</td></tr>
<tr><td>8</td><td>GNDA</td><td>18</td><td>EMG</td><td>28</td><td>MONIT1</td><td>38</td><td>ALARM+</td><td>48</td><td>STOP</td></tr>
<tr><td>9</td><td>RF+</td><td>19</td><td>CWLIM</td><td>29</td><td>MONIT2</td><td>39</td><td>ALARM-</td><td>49</td><td>PULCOM</td></tr>
<tr><td>10</td><td>PF-</td><td>20</td><td>CCWLIM</td><td>30</td><td>BO</td><td>40</td><td>RDY+</td><td>50</td><td>+24Vin</td></tr>
</table></td></tr>
<tr><td rowspan="2">For Signal</td><td>CN1 Cable</td><td>APCS-CN1□□A</td><td>L7N SERIES
L7NH SERIES</td><td rowspan="2">[Upper Controller] [Drive Connection Side CN1]
Indicates Pin No
 
1. Drive Side Connection(CN1)
a. Case Spec. : 10320-52A0-008(3M)
b. Connector Spec. : 10120-3000VE(3M)
c. Cable Spec. : ROW-SB0.1C×20C(AWG28)</td></tr>
<tr><td colspan="3">〈Pin No. Display〉
<table>
<tr><th>NO</th><th>Signal</th><th>NO</th><th>Signal</th><th>NO</th><th>Signal</th><th>NO</th><th>Signal</th></tr>
<tr><td>1</td><td>BRAKE+</td><td>6</td><td>24V</td><td>11</td><td>HOME</td><td>16</td><td>Spare Pin</td></tr>
<tr><td>2</td><td>BRAKE-</td><td>7</td><td>CWL</td><td>12</td><td>ALMRST</td><td>17</td><td>RDY+</td></tr>
<tr><td>3</td><td>ALARM+</td><td>8</td><td>CCWL</td><td>13</td><td>DI1</td><td>18</td><td>RDY-</td></tr>
<tr><td>4</td><td>ALARM-</td><td>9</td><td>PROBE1</td><td>14</td><td>DI2</td><td>19</td><td>DO1+</td></tr>
<tr><td>5</td><td>Spare Pin</td><td>10</td><td>PROBE2</td><td>15</td><td>Spare Pin</td><td>20</td><td>DO1-</td></tr>
</table></td></tr>
<tr><td>For Power</td><td>Communication Cable</td><td>APCS-CN5L7U</td><td>All Models of L7 SERIES</td><td>[PC - USB Port] [Servo Drive - CN5]
 
1. PC Side Connector : USB A Plug
2. Drive Side Connector(CN5) : Mini USB 5P Plug
3. Electric Requirements Spec :
Double Shielded, Twisted Pair, EMI-filter attached type
(Ex. : KU-AMB518, SANWA)
4. Only 1.8m length of cable is available to use</td></tr>
</table>

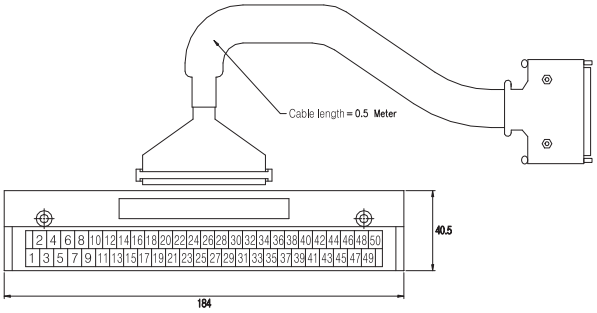
Note1) □□ of Model Name indicates the kind and length of cable And the designation is as below.

Cable Length(m)	1	2	3	5
General Cable(N)	01	02	03	05

CN1 cable : 1m, 2m, 3m and 5m are available.

Servo Drive Option

Signal Cable / Connector

<table>
<tr><th>Type</th><th>Product Type</th><th>Model Name(Note1)</th><th>Applicable Drive</th><th>Specifications</th></tr>
<tr><td rowspan="3">T/B</td><td>CN1
T/B</td><td>APC–
VSCN1T
–□□</td><td>L7S SERIES</td><td rowspan="2"> 

1. Extended CN1 T/B for VS/L7S
2. Available Cable Length : 0.5[m], 1[m], 1.5[m], 2[m], 3[m]</td></tr>
<tr><td colspan="3">〈Pin No. Display〉
<table>
<tr><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th><th>CN1</th><th>I/O Signal</th></tr>
<tr><td>1</td><td>TRQCOM</td><td>11</td><td>PR+</td><td>21</td><td>SPD3</td><td>31</td><td>/BO</td><td>41</td><td>RDY–</td></tr>
<tr><td>2</td><td>REFCOM</td><td>12</td><td>PR–</td><td>22</td><td>SPD2</td><td>32</td><td>AO</td><td>42</td><td>TLOUT</td></tr>
<tr><td>3</td><td>PZO</td><td>13</td><td>PCON</td><td>23</td><td>SPD1</td><td>33</td><td>/AO</td><td>43</td><td>ZSPD</td></tr>
<tr><td>4</td><td>ZO</td><td>14</td><td>GAIN2(SEN)</td><td>24</td><td>GND</td><td>34</td><td>+15V</td><td>44</td><td>BRAKE</td></tr>
<tr><td>5</td><td>/ZO</td><td>15</td><td>PCLEAR</td><td>25</td><td>GND</td><td>35</td><td>–15V</td><td>45</td><td>INSPD/INPOS</td></tr>
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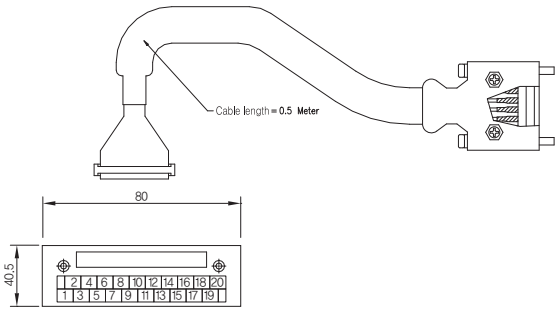
</table></td></tr>
<tr><td>CN1
T/B</td><td>APCS–
L7NCN1T
–□□</td><td>L7N SERIES</td><td> 

1. Extended CN1 T/B for L7N
2. Available Cable Length : 0.5[m], 1[m], 1.5[m], 2[m]</td></tr>
<tr><td>〈Pin No. Display〉
<table>
<tr><th>NO</th><th>Signal</th><th>NO</th><th>Signal</th><th>NO</th><th>Signal</th><th>NO</th><th>Signal</th></tr>
<tr><td>1</td><td>BRAKE+</td><td>6</td><td>24V</td><td>11</td><td>HOME</td><td>16</td><td>Spare Pin</td></tr>
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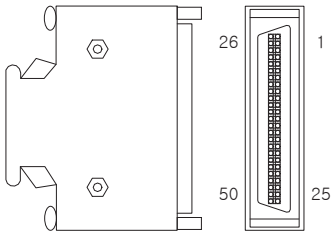
<tr><td>5</td><td>Spare Pin</td><td>10</td><td>PROBE2</td><td>15</td><td>Spare Pin</td><td>20</td><td>DO1–</td></tr>
</table></td><td colspan="3"></td></tr>
<tr><td>CN</td><td>CN1
Connector</td><td>APC–
CN1NNA</td><td>L7S SERIES</td><td> 

1. Case Spec. : 10350–52A0–008(3M)
2. Connector Spec. : 10150–3000VE(3M)</td></tr>
</table>

Note1) □□ of Model Name indicates the kind and length of cable. And the declaration is as below.

＊APC–VSCN1T

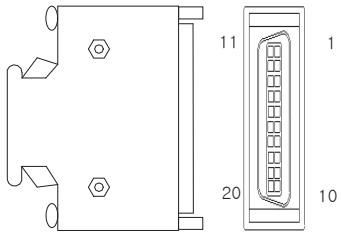
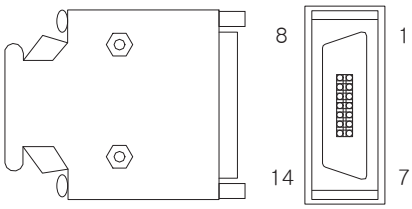
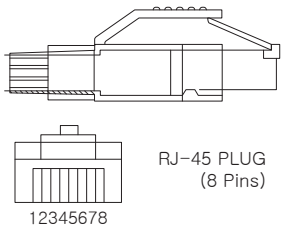
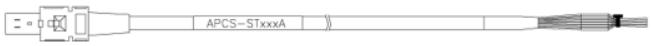
Cable Length(m)	0.5	1	1.5	2	3
Declaration	None	01	015	02	03

＊APCS–L7NCN1T

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

Servo Drive Option

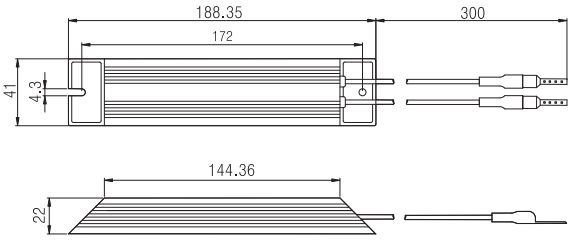
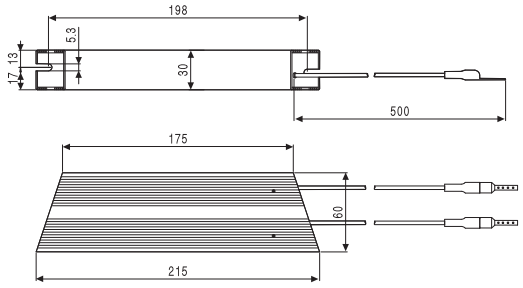
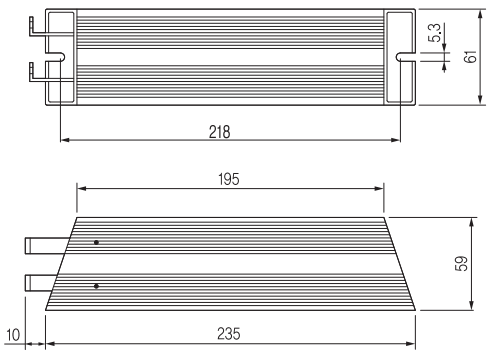
Connector

Type	Product Type	Model Name	Applicable Drive	Specifications
CN	CN1 Connector	APC-CN2NNA	L7NA□□□B L7NH□□□□U	 1. Case Spec. : 10320-52A0-008(3M) 2. Connector Spec. : 10120-3000VE(3M)
CN	CN2 Connector	APC-CN3NNA	All Models of L7 SERIES	 1. Case Spec. : 10314-52A0-008(3M) 2. Connector Spec. : 10114-3000VE(3M)
CN	CN3 CN4 EtherCAT Connector	APCS-CN4NNA	L7NA□□□B L7NH□□□□U	 RJ-45 PLUG (8 Pins) PIN No. / Signal / Color 1 TX/RX0 Plus White/Orange 2 TX/RX0 Minus Orange 3 TX/RX1 Plus White/Orange 4 TX/RX2 Plus Blue 5 TX/RX2 Minus White/Blue 6 TX/RX1 Minus Rreen 7 TX/RX3 Plus White/Brown 8 TX/RX3 Minus Brown Plate SHILDE **Note)** EtherCAT use only 4wires(1, 2, 3, 6)
CN	STO Cable	APCS-STO□□A	L7NA□□□B L7NH□□□□U	 PIN No. / IO Signal / Color 1 NC – 2 NC – 3 HWBB1 Minus Orange 4 HWBB1 Plus Orange 5 HWBB2 Minus Yellow 6 HWBB2 Plus Yellow 7 EDM Plus White 8 EDM Minus White 1. Cable Length Only 0.3[m], 1[m], 3[m] of Cable is available to use. 2. Connector Model Name : APCS-STO00A * Caution During assembly of connector, It can be broken easily without guaranty of LS Mecapion.

Other Options

200V Braking Resistor

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

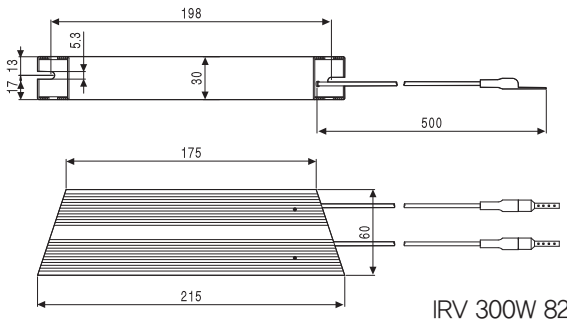
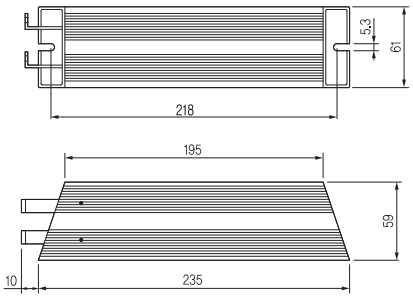
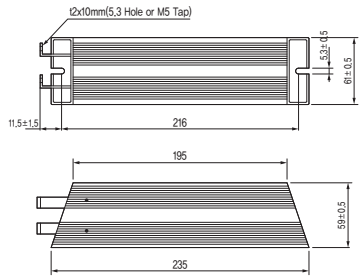
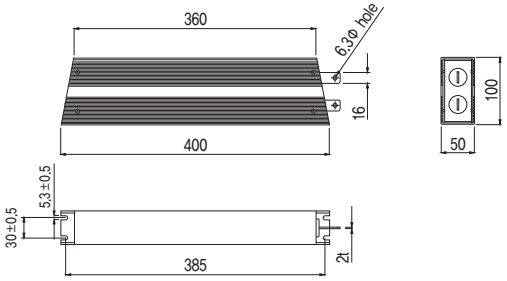
Type	Product Type	Model Name(Note1)	Applicable Drive	Specifications
Resistor	Braking Resistor	APCS–140R50	L7□A001□ L7□A002□ L7□A004□	 IRH 140W 50ohm
Resistor	Braking Resistor	APCS–300R30	L7□A008□ L7□A010□	 IRV 300W 30ohm
Resistor	Braking Resistor	APC–600R30	L7□A020□ L7□A035□	 IRV 600S 30ohm * L7□A020□ – 2pcs (Parallel Connection) L7□A035□ – 3pcs (Parallel Connection) IRV 600S 28ohm * L7□A050□ – 4pcs (Parallel Connection) **Note)** IRV 600S 30ohm and 600S 28ohm have the same external dimensions.
		APC–600R28	L7□A050□ (4P)	

Note1) L7 Series 100W~7.5kW has the internal basic braking resistor. If the machine requires short deceleration time frequently, refer to table above and apply the appropriate braking resistor.

Other Options

400V Braking Resistor

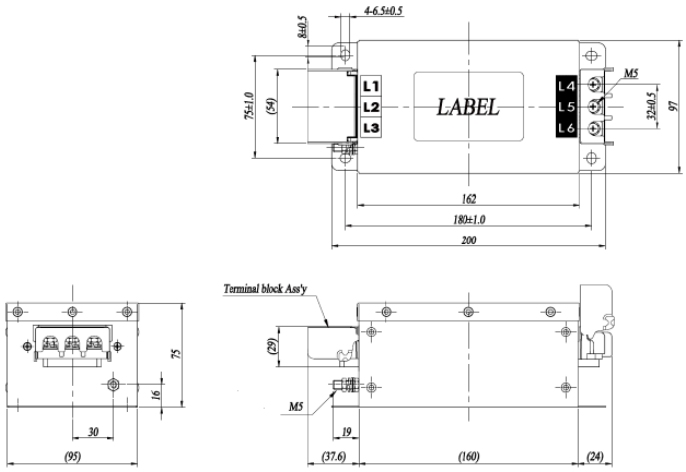
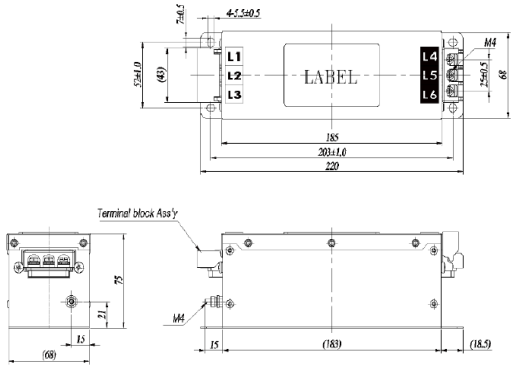
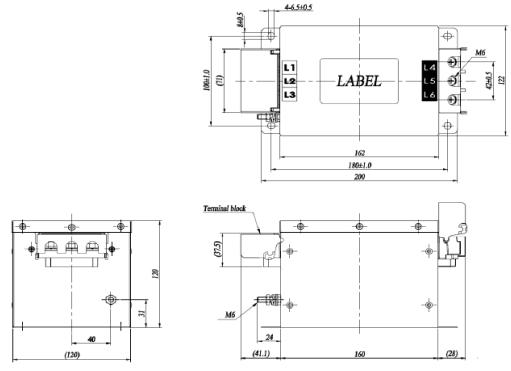
*Option braking resistors are selectable items for user's need.

Type	Product Type	Model Name(Note1)	Applicable Drive	Specifications
Resistor	Braking Resistor	APCS-300R82	L7□B010□	 IRV 300W 82ohm
Resistor	Braking Resistor	APCS-600R140	L7□B020□ L7□B035□	 IRV 600W 140ohm
Resistor	Braking Resistor	APCS-600R75	L7□B075□	 IRV 600W 75ohm (3PCS Parallel connection)
Resistor	Braking Resistor	APC-2000R13R4	L7□B150□	 IRM 2000W 13.4ohm

Note1) L7 Series 100W~7.5kW has the internal basic braking resistor. If the machine requires short deceleration time frequently, refer to table above and apply the appropriate braking resistor.

Servo Drive Option

Noise Filter

Type	Product Type	Model Name	Applicable Drive	Specifications
Resistor	Noise Filter	APCS-TB6-B010LBEI	L7□A 001□ L7□A 002□ L7□A 004□ L7□A 008□ L7□A 010□ L7□B 010□	
		APCS-TB6-B020NBDC	L7□B 020□ L7□B 035□	
		APCS-TB6-B030NBDC	L7□A 020□ L7□A 035□ L7□B 050□	
		APCS-TB6-B040AS	L7□A 050□ L7□B 075□	
		APCS-TB6-B060LAS	L7□B 150□	

Contents

■ Integrated Servo System

PEGASUS Series

Integrated Servo System (EtherCAT)

Integrated Servo System (EtherCAT)

PEGASUS Series

Servo Drive Designation

PEGA	–	A	R5	A	A	N	M	A
PEGASUS Series		Flange Size A : 40 Flange B : 60 Flange	Motor Capacity R5 : 50[W] 01 : 100[W] 02 : 200[W] 03 : 300[W]	Rated Speed A : 3000[rpm]	Drive Voltage A : 48VDC	Communication N : EtherCAT	Encoder Type M : Magnetic Encoder	Resolution A : 12Bit C : 17Bit(TBD)

* **Remark** : PEGA A 01 A A N M A is 80W with 2400rpm of rated speed.

PEGASUS Series

Characteristic

● Enhanced efficiency integrated servo system

- Cost effective from installation by integrated system of motor, encoder cable and drive
- Maximization for useful space 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
- Supporting CoE, EoE and FoE

Identifying the Part of PEGASUS Series

❶ Input / Output Signal Connector (CN1)
- This Connector is for Sequence Input / Output Signals

❷ EtherCAT Communication Output Port (OUT)

❸ Status LED
- It Indicates the current state of Ether CAT Communication

❹ Power Connector (CN3)

❺ USB Connector (CN5, Mini B type)
- This Connector is to Communicate With a PC

❻ 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

❼ EtherCAT Communication Input Port (IN)

❽ Safety Connector (CN2)
- This Connector connects Safety Devices

Specifications of PEGASUS Series

Rated Values of Servo Drive

Rated values for servo drive	□40 50W	□40 100W	□60 100W	□60 200W	□60 300W
Continuous output current [Arms]	1.77	2.38	3.62	5	6.8
Maximum output current [Arms]	3.54	3.57	7.24	10	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[℃] / -20~ +60[℃]
	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		1000 m or lower
	Other		To be free from electrostatic noise, strong electrolysis, 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℃: ± 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 [㎃] 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 communication	Connecting device		PC or USB storage medium
	Communication standard		Conform 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 and STO2
	Compatible standard		TBD

Specifications of PEGASUS Series

EtherCAT Communication Specification

Category		Details
Communication 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.

Motor Specificaion

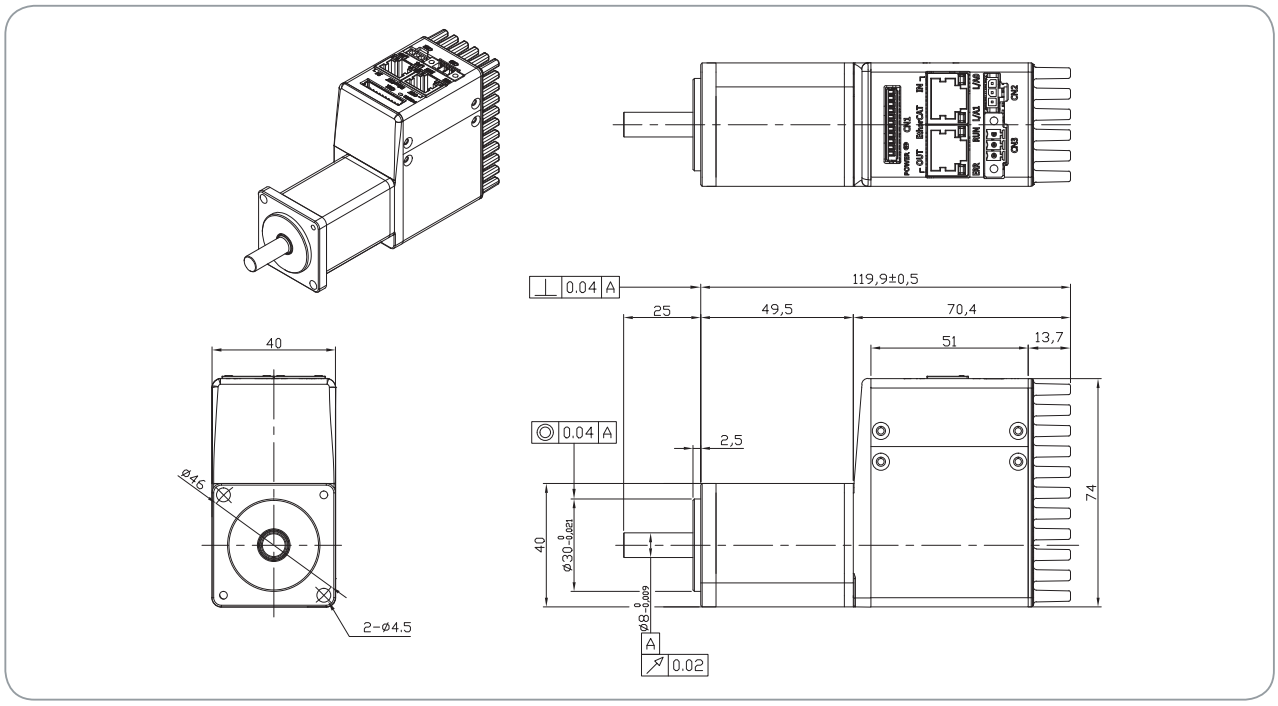
Model	Unit	SAR5A-8	SA01A-8	SB01A-6	SB02A-9	SB03A-9
Frame Size	[mm]	40	40	60	60	60
Rated Power	[W]	50	80	100	200	300
Rated Torque	[N m]	0.16	0.32	0.32	0.64	0.95
	[Kgf cm]	1.62	3.25	3.25	6.5	9.74
Rated Speed	[rpm]	3,000	2,400	3,000	3,000	3,000
Inertia	[gf cm s2]	0.02	0.0435	0.114	0.186	0.328
	[Kg m² x 10-4]	0.02	0.0426	0.116	0.182	0.321
Rated Voltage	[VDC]	Input Power : 48VDC				
Encoder Type	-	Magnetic Encoder (12bit)				

Note1) SA01A-8 can be operated at 3000rpm(100w) with 60Vdc of input power(instead of 48Vdc)

External Dimensions of PEGASUS Series

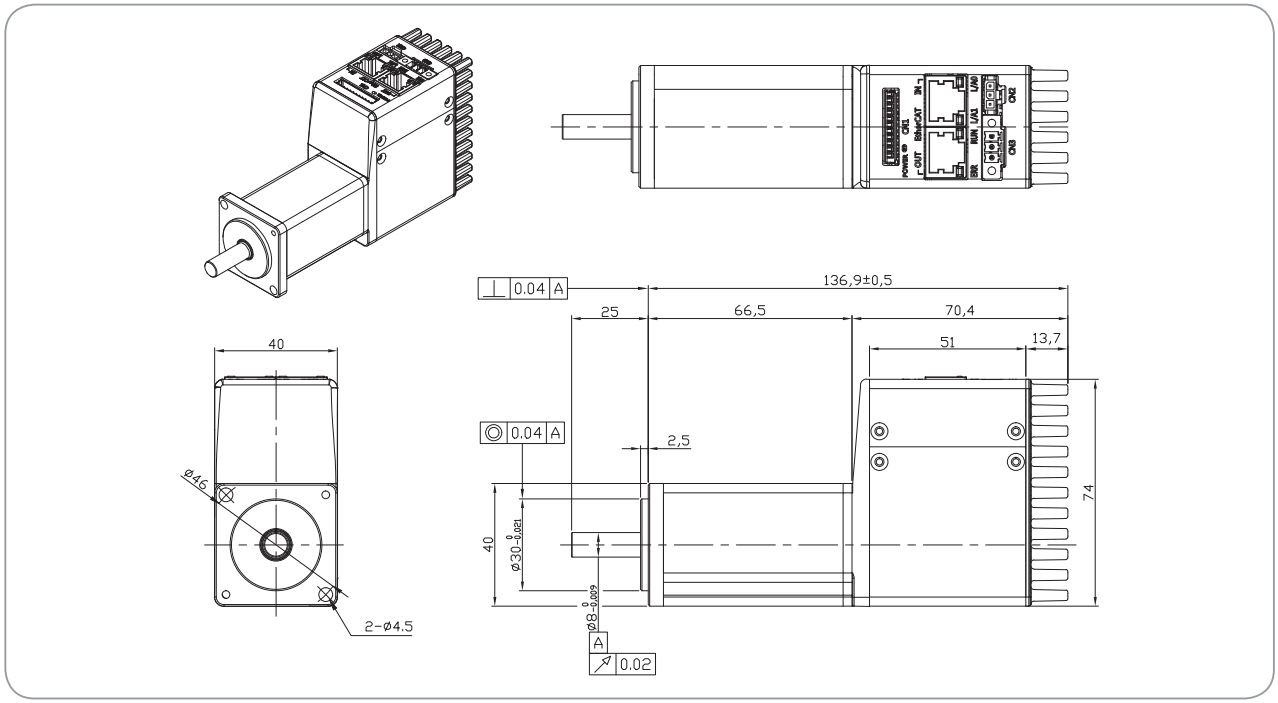
PEGA-AR5A

*Unit [mm]



PEGA-A01A

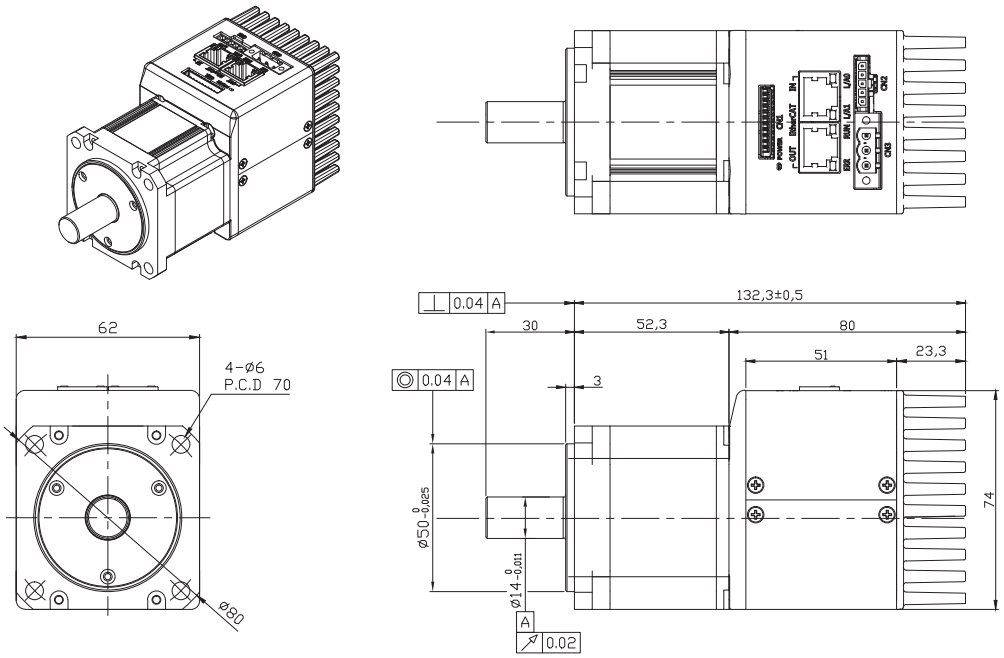
*Unit [mm]



External Dimensions of PEGASUS Series

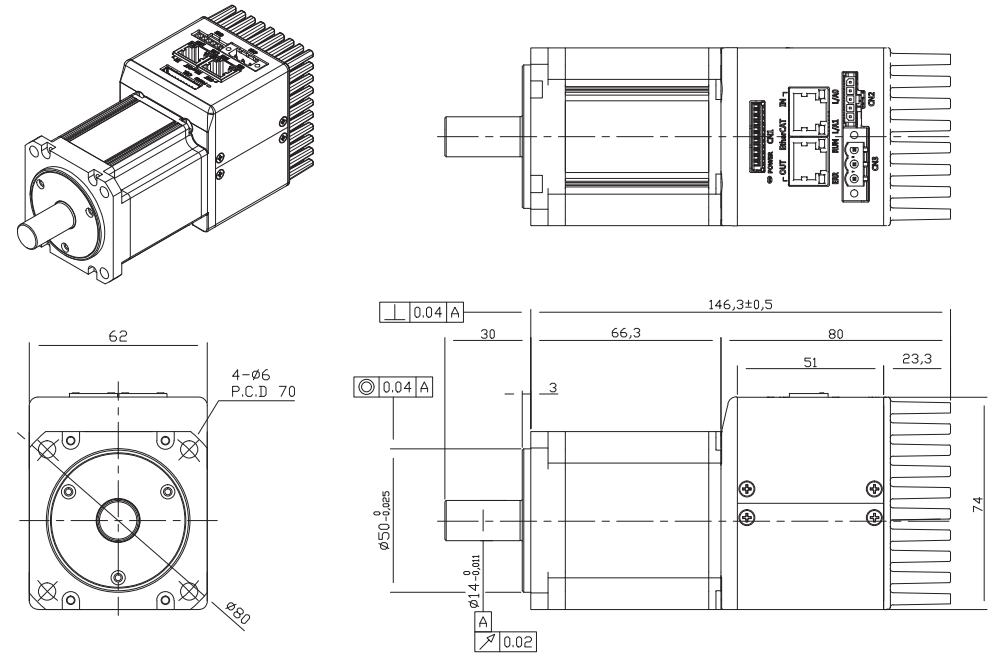
PEGA-B01A

*Unit [mm]



PEGA-B02A

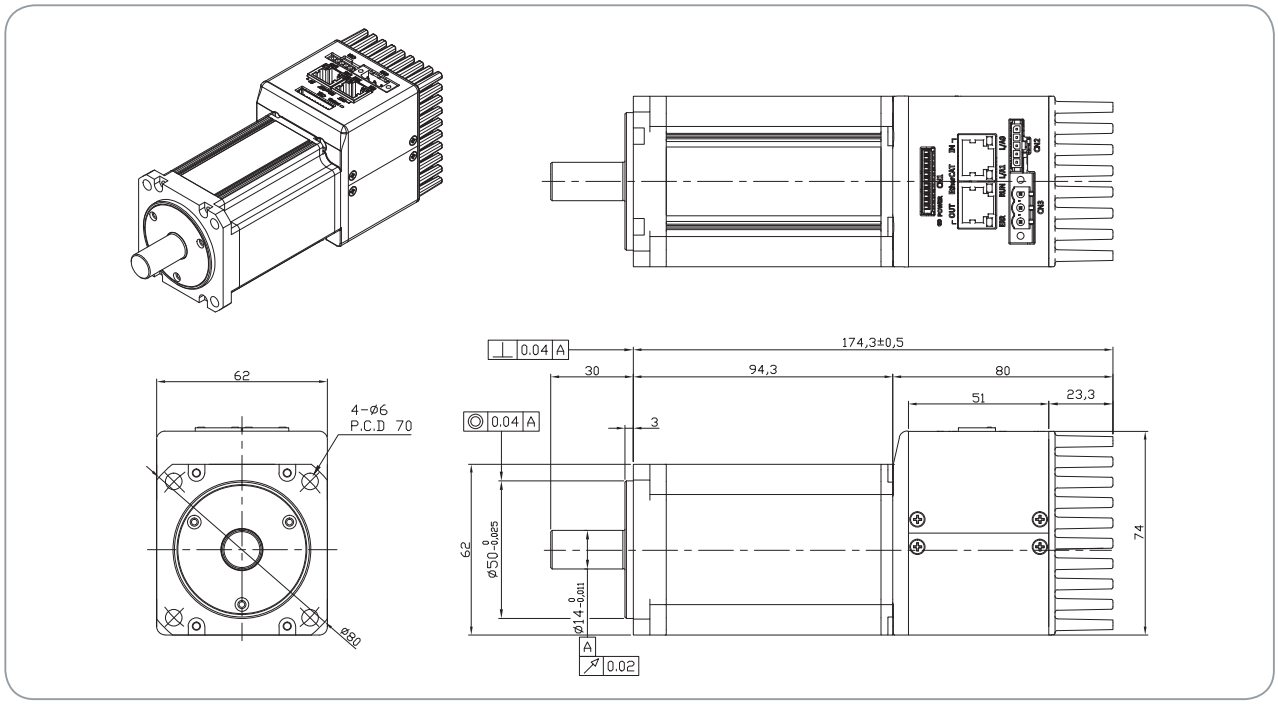
*Unit [mm]



External Dimensions of PEGASUS Series

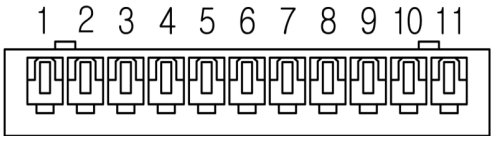
PEGA-B03A

*Unit [mm]



Accessory Kit

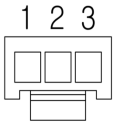
CN1 : I/O Connector



51004-1100 (MOLEX)

Pin Number	Direction	Name	Signals	Descriptions
1	VCC	+24V	+24V INPUT	+24V Vcc Input
2	Input	POT	Positive Over-Travel	Limit Sensor Input
3	Input	NOT	Negative Over Travel	
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

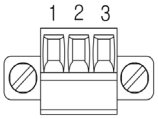
CN2 : Safe Torque Off Connector



43645-3 (MOLEX)

Pin Number	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 Number	Name	Descriptions
1	FG	Frame Ground
2	N(DC 0V)	DC 0V GND
3	VCC(DC 48V)	DC 48V input

MEMO

MEMO

MEMO

MEMO

LS Mecapion

www.lsmecapion.com

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.

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2015. 9 ※The content and specifications are subject to be changed without prior notice.