



XDL/XML Series XGT Servo System

Leading Innovation, Creating Tomorrow

LSIS goes toward a global leading company in the Industrial electric & Automation field, providing customers with the total solution. We provide customers with distinctive and eco-friendly products & Win-Win Strategy in the various fields such as Power Transmission & Distribution ; Electric Equipment; Automation Equipment & Systems and Smart Grid



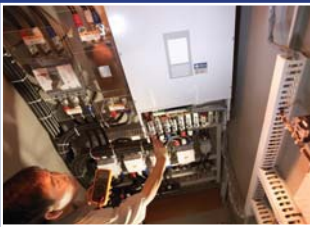
Automation & Drives

LSIS provides the highest-quality controllers, drives and process automation systems based on its high-tech technology and accumulated experience in automation system

Ever since LSIS launched PLC(Programmable Logic Controller), HMI(Human Machine Interface), Servo System(Motor, Drive) and Variable Frequency Drive(Inverter) in Korea, its automation equipment has been the most popular and leading solution in many branches of industry.

LSIS prepares excellent and reliable solutions to provide optimal automation environment for your industry.

LSIS has obtained the wide range of international Quality standard certificates such as CE and UL

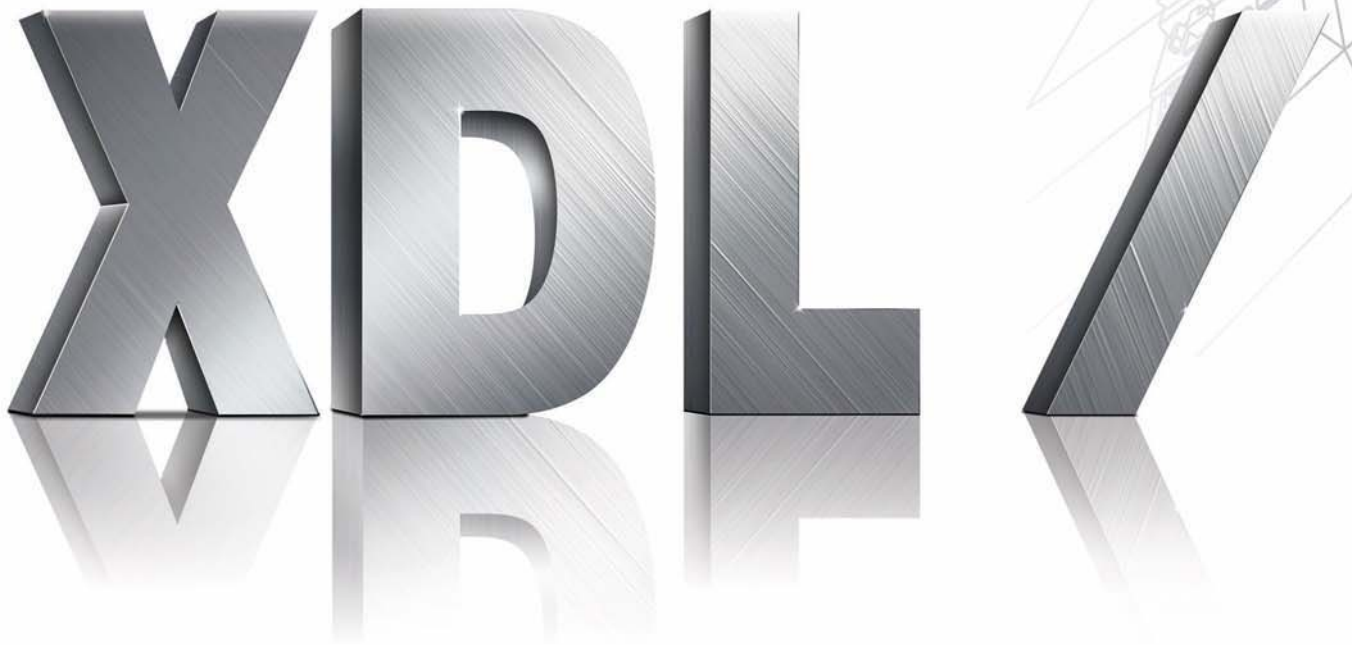


C O N T E N T S

XDL Features	06
Servo Motor & Drive Designations	12
Servo Motor & Drive Selection Table	14
Servo Drive	16
External Dimensions of Servo Drive	20
External Dimensions of Servo Motor	22
Servo Motor Characteristics	29
Options and Peripherals	40
Motor, Drive and Cable Combination Table	52
Motion Module [EtherCAT]	54
Positioning Module [Network Type]	55
Positioning Module [APM]	56
Positioning Module [XPM]	57
XG-PM	58
Positioning Module/External Device Interface	59



XGT Servo System



User-oriented XDL Series systems

LS XDL Series systems complete your optimal solution.

Your motion systems visualize the perfect solution through the LS comprehensive product ranges for the optimal drives and applications. Its high-performance vector, precision and speed control are user-friendly and cost effective.

XML Series

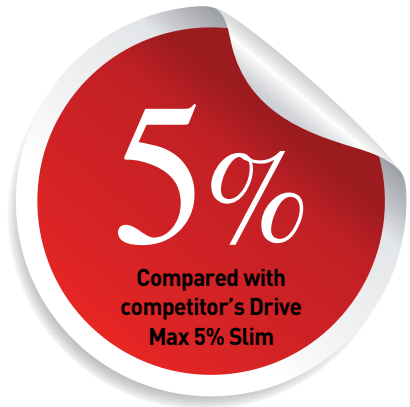
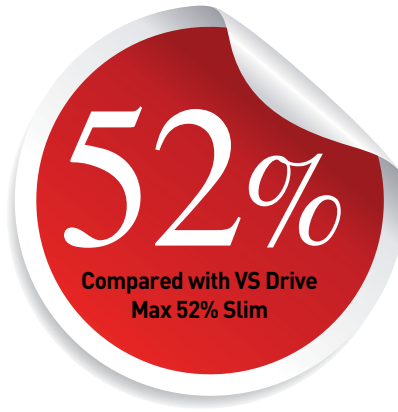




Features

Compact Size

The Minimized Width to **38mm!!!** (400W)

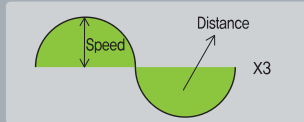


Capacity	400W (44% Down Size)			1kW (46% Down Size)			3.5kW (62% Down Size)		
	XDL	VS	Competitor	XDL	VS	Competitor	XDL	VS	Competitor
L [mm]	38	80	40	58	88	60	88	137	90
W [mm]	169	187	168	169	210	168	169	256	168
H [mm]	173	132	170	198	195	195	198	225	195

Easy to USE

Easy Gain Tuning with Automatic Inertia Estimating Function

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



Encoder with Bi-Directional High Speed Serial Communication

- Automatic Identification (Motor ID /Encoder Pulse)
- BiSS Protocol
- Easy Wiring (15 Encoder wires → 7 Encoder wires) and Anti-External Noise

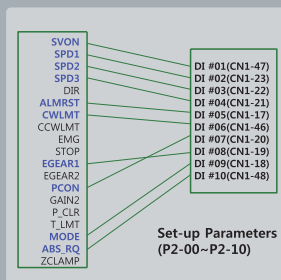


Easy Setting with Built-in Panel Operator

- 4 Built-in Operation Key (UP, DOWN, MODE/LEFT, SET/RIGHT)
- Eidetic & Convenient Parameter and Menu Editing : According to Key State and Parameter type, Easy Editing
- Parameter consists of Status Monitoring(St), Parameter Setting(P0~P4), Function(Cn)
- Monitoring Function for Many States and Variables : United State Display(St-00), Input Pulse Frequency(St-06), Operation Over Load Factor(St-09), Regenerative Over Load Factor(St-13), Mechanical Angle(St-17), Drive Internal Temperature(St-19)
- Grouping of Parameter(P0-XX ~P4-XX) : P0(System Configuration), P1(Control), P2(Input/Output), P3(Speed Model), P4(Position Model)
- Various Functions and Adjusting(Cn-XX) : Automatic Inertia Estimating Function(Cn-05), Analog Input Adjusting (Cn-10~13), Manual JOG Operation(Cn-00), Forced Input/Output Function (Cn-07.Cn-08)

Many I/O Contacts and Various Functions

- Digital Input (10 contacts, 19 functions) : SV_ON, SPD1/2/3, DIR, A_RST, CWLMT, CCWLM, EMERGENCY, STOP, EGEAR1/2, PCON, GAIN2, P_CLR, T_LMT, MODE, ABS_RQ, ZCLAMP
- Digital Output : 5 Contacts + Alarm Code (3 contacts, 9 functions) : ALARM, RDY, ZSPD, BRAKE, INPOS, INSPD, T_LMT, V_LMT, WARN
- Versatile I/O Assignment by Parameter Including contact level (A/B) setting
- Forced I/O Function for Easy I/O Setting
- Analog Input Contacts : 2 contacts (Speed, Torque)
- Analog Monitoring Output : 2 contacts (12Bit)



Regeneration Brake Resistor

- Built-in Drive for User's Convenience
- Connection of External Installation (Optional) Available
- The adoption of reinforced protect algorithm



Plug-in Type Power Connector

- Easy Wiring (Up to 3.5kW model)



400V (High Voltage) Servo

- Convenient Wiring by Using Same Voltage for Main Power and Control Power
- 1Phase 380 ~480VAC

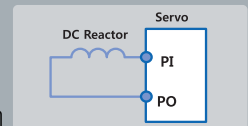
Reliability

Increased Durability of Main Capacitor

- Long Life Type Capacitor (2.5 times longer than previous one)

Convenient DC Reactor

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



Safe "Off" Function with Detecting Control Power "Off"

CE, RoHS Certified

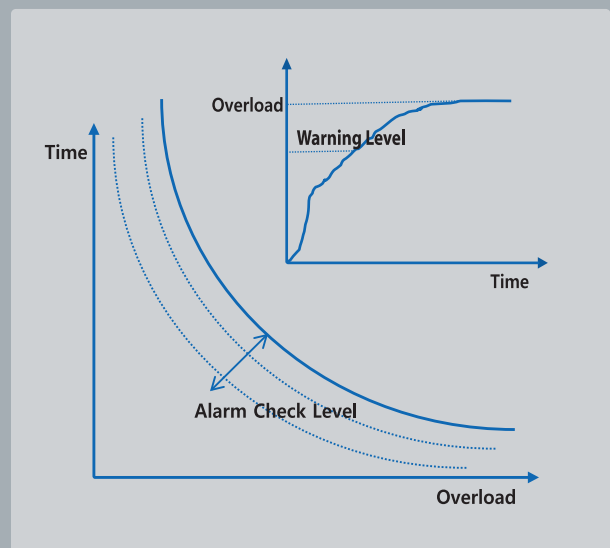


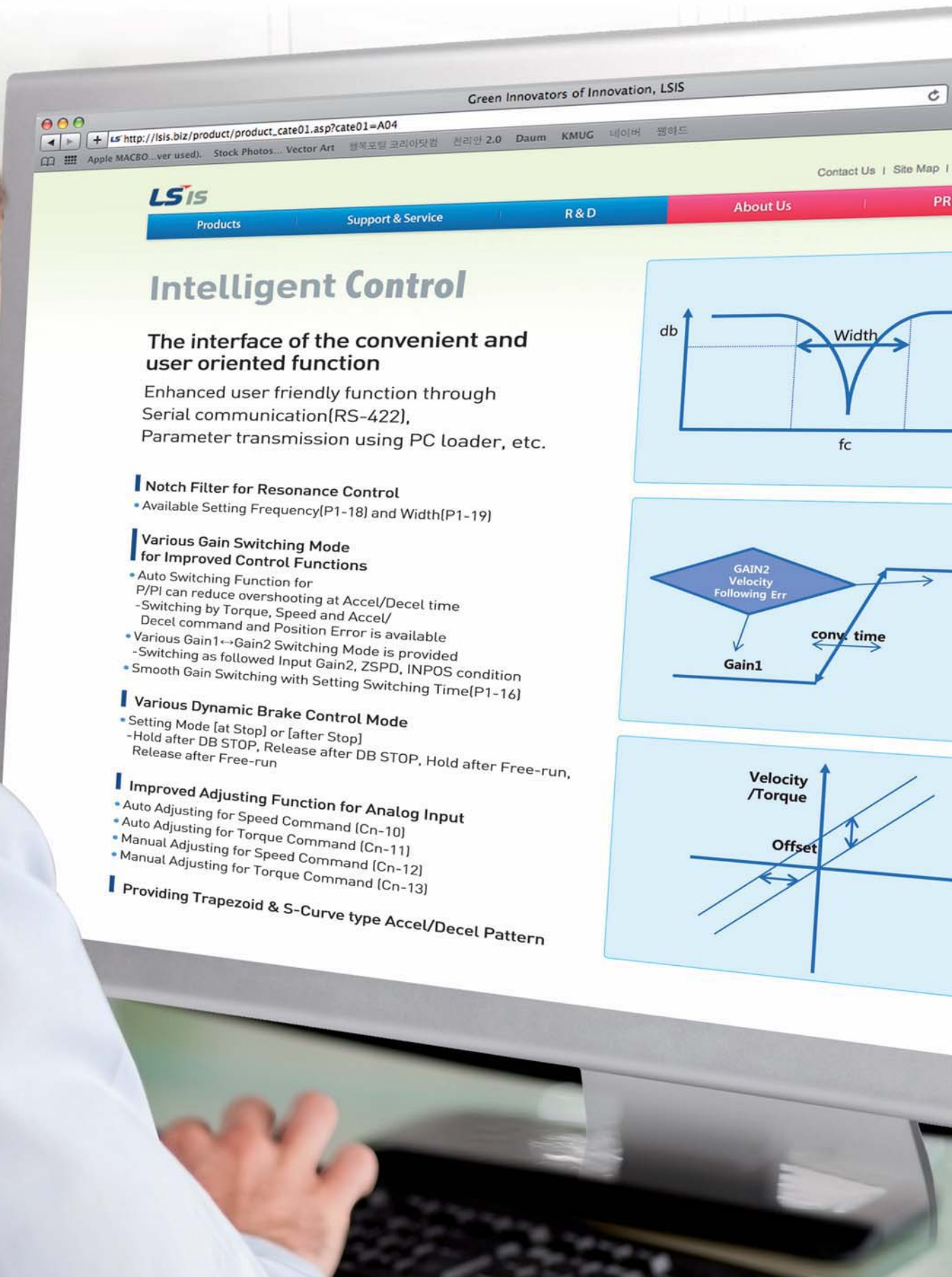
Upgraded Protection Function(I)

- Triple Protection Functions for Power Module : IPM Fault, CL Detecting, Over Current Detecting with S/W
- Main Power Mis-wiring Detecting Function : Selecting 3 Phase or Single Phase, and Alarm or Warning is available
- Protecting Overheating with Thermal Sensor in the Drive and Motor
- Alarm Code Grouping and Exclusive Output Contacts (AL00, AL01, AL02)
- Warning Function (Digital Output, Warning Output) : Mis-wiring of Power, Low voltage for Encoder Battery, Over Speed Command, Over Torque Command, Over Load, Mis-matched motor and drive

Upgrade Protection Function(II)

- Detecting Function for Accumulated Over Load of Regenerative Resistor : Protect algorithm is provided with embedded resistor characteristic : Protection by Capacity (P0-11) and Resistance (P0-10) : Providing De-rating Factor for radiant heat
- Available Continuous Overload Capacity Setting as followed Operating Condition : Protect with separated Overload table at Stall & Operation : Set Overload check level (P0-12) : Setting Warning signal output Level is available (P0-13)





Intelligent Control

The interface of the convenient and user oriented function

Enhanced user friendly function through Serial communication(RS-422), Parameter transmission using PC loader, etc.

Notch Filter for Resonance Control

- Available Setting Frequency(P1-18) and Width(P1-19)

Various Gain Switching Mode for Improved Control Functions

- Auto Switching Function for P/I can reduce overshooting at Accel/Decel time
 - Switching by Torque, Speed and Accel/Decel command and Position Error is available
- Various Gain 1 ↔ Gain 2 Switching Mode is provided
 - Switching as followed Input Gain2, ZSPD, INPOS condition
- Smooth Gain Switching with Setting Switching Time(P1-16)

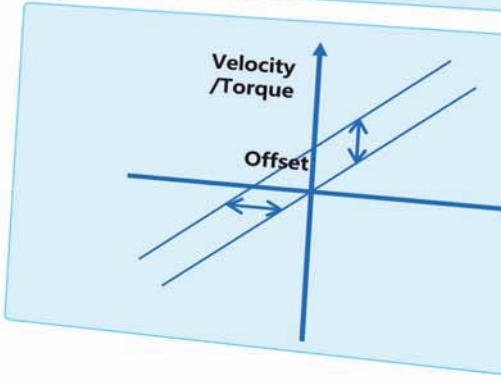
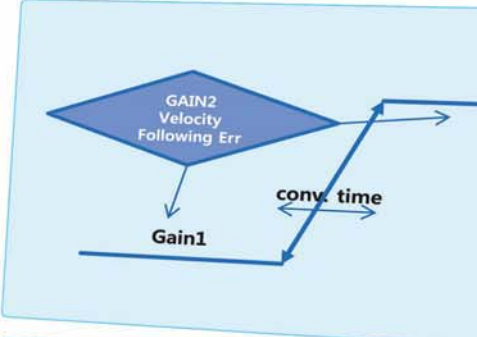
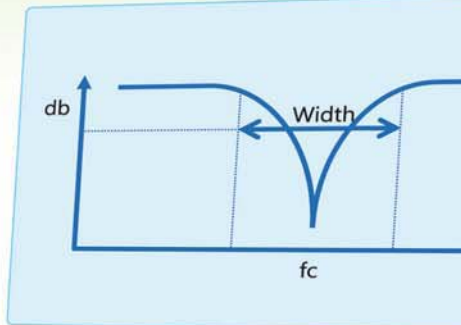
Various Dynamic Brake Control Mode

- Setting Mode [at Stop] or [after Stop]
 - Hold after DB STOP, Release after DB STOP, Hold after Free-run, Release after Free-run

Improved Adjusting Function for Analog Input

- Auto Adjusting for Speed Command (Cn-10)
- Auto Adjusting for Torque Command (Cn-11)
- Manual Adjusting for Speed Command (Cn-12)
- Manual Adjusting for Torque Command (Cn-13)

Providing Trapezoid & S-Curve type Accel/Decel Pattern



High Performance

High Resolution Serial type Encoder (16Bit~21Bit)

- Accurate Position Control and Improved Stability at Low Speed

Stable Low Speed Operation with Accurate Speed Check

- Stable Measurement at Low Speed

Absolute Encoder (Multi-turn)

- Origin Function is not needed

Improved Speed Response Frequency

- About 1kHz
- Reduced Positioning Time



XDL Series Features



Convenience

Motion Network Type(EtherCAT) - XDL N Series

High Performance

- High speed, Real-time capability and Synchronization mechanism

Open Network

- Over 1600 worldwide members

Cost Effective

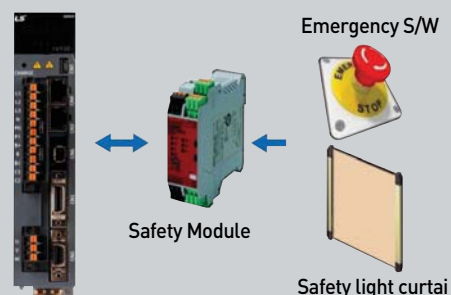
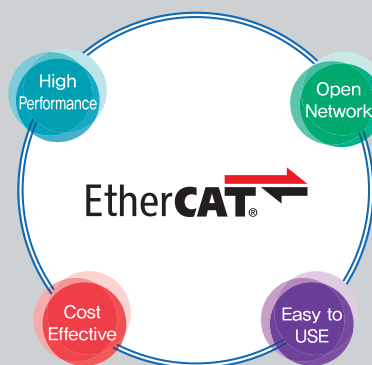
- Standard Ethernet Cabling + Connectors, Less implementation efforts for master and slave

Easy to Use

- Versatile topology and Diagnostics

XDL Drive with Built-in EtherCAT Interface

- 100BASE-TX(100Mbps) Ethernet based real-time communication
- Support CiA402(IEC61800-7) drive profile
- Interoperability
- Max. 100m between nodes
- Precise synchronization mechanism (1us)
- Freely settable process data length and mapping
- Four status indication LEDs (L/A0, L/A1, RUN, ERR)
- Standard RJ45 connector and cabling(CAT5)
- Have intrinsic functions of XDL S series (same size)
- Support various homing modes
- Support Full-Closed control (Being developed)

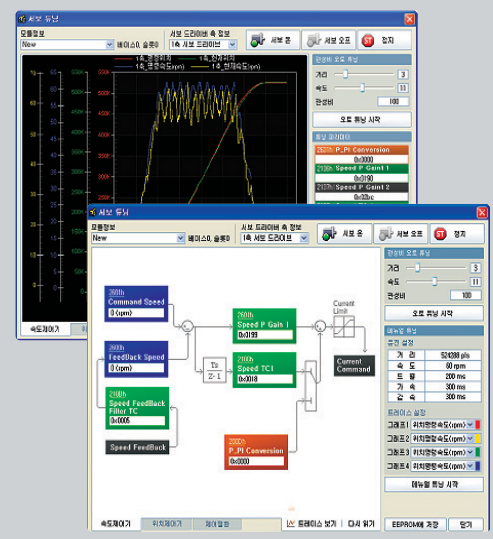




- Support various operation modes**
 - CSP, CSV, CST, PP, PV, PT, HM, IP
- Safe Torque Off function**
 - Forced torque off by HWBB signals without intervention of μ P and FPGA(ASIC), International standard (IEC61508)
- Versatile I/O assignment by parameters**
 - 6 inputs, 4 outputs
- High speed position capture function**
 - Touch probe function (PROBE1, PROBE2)
- Provide specialized commissioning tools by LSIS's XGT PLC**
 - Tune inertia ratio, velocity/position gains, gain conversion configuration
- Have conformity of EtherCAT device**
 - In-house test using CTT(Conformance Test Tool)
- Support scaling objects for position, velocity and acceleration**
 - Numerator and denominator
- Provide Gain Tuning Tools and Commissioning Packages**
 - Automatic inertia tuning and PI gains
 - Gain conversion setting
 - Manual fine gain tuning tool
 - Object save and initialization function
 - Alarm history function(recently issued 20 alarm codes)



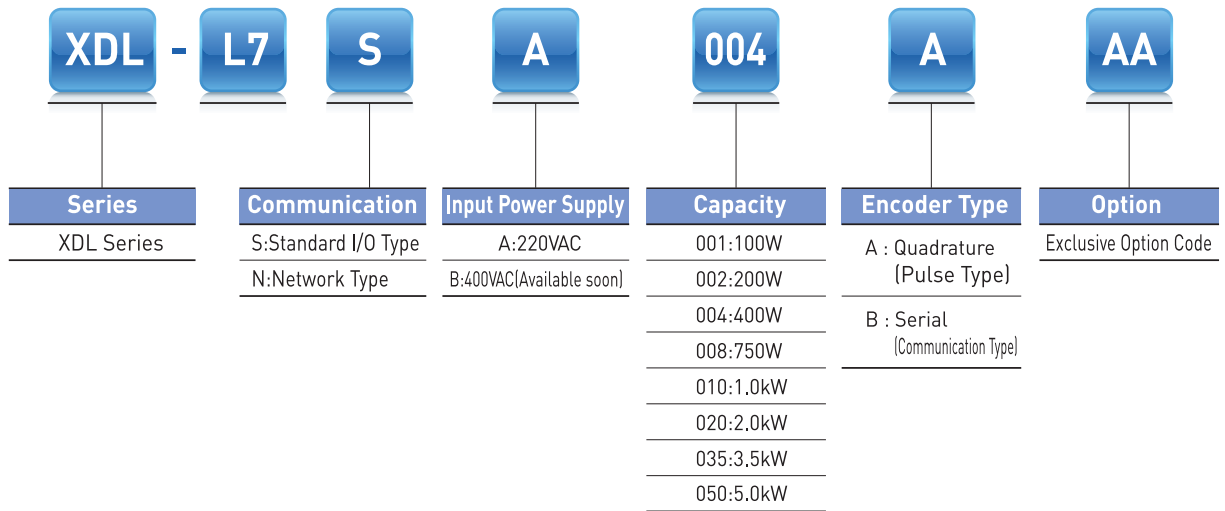
LSIS XGT PLC + PN8B



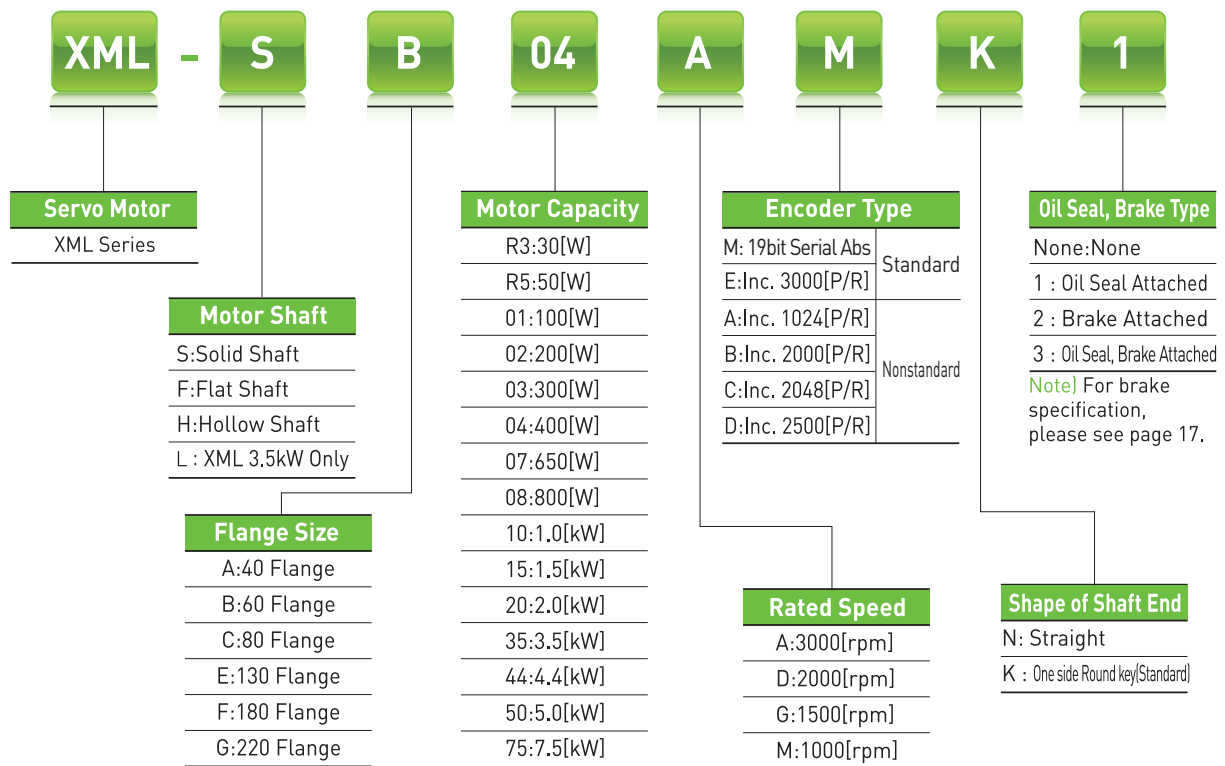


Servo Motor & Drive Designations

Servo Drive Designation



Servo Motor Designation



Note) For available motor designations, please see page 14~15.
For motor, drive and cable combination table, please see page 52~55



Servo Motor & Drive Selection Table

XML-F Series Table

Rated Speed (rpm)	Max. Speed (rpm)	Flange Size	Motor (XML)	Drive	Standard Encoder Type	IP Grade		
3,000	5,000	□ 60	FB01A	XDL-L7 □ A001B	* 19Bit Serial ABS	IP65		
		□ 60	FB02A	XDL-L7 □ A002B				
		□ 60	FB04A	XDL-L7 □ A004B				
		□ 80	FC04A	XDL-L7 □ A004B				
		□ 80	FC06A	XDL-L7 □ A008B				
		□ 80	FC08A	XDL-L7 □ A008B				
		□ 80	FC10A	XDL-L7 □ A010B				
		□ 130	FE09A	XDL-L7 □ A010B				
		□ 130	FE15A	XDL-L7 □ A020B				
		□ 130	FE22A	XDL-L7 □ A020B				
		□ 130	FE30A	XDL-L7 □ A035B				
		□ 180	FF30A	XDL-L7 □ A035B				
		□ 180	FF50A	XDL-L7 □ A050B				
2,000	3,000	□ 80	FC03D	XDL-L7 □ A004B				
		□ 80	FC05D	XDL-L7 □ A008B				
		□ 80	FC06D	XDL-L7 □ A008B				
		□ 80	FC07D	XDL-L7 □ A008B				
		□ 180	FE06D	XDL-L7 □ A008B				
		□ 180	FE11D	XDL-L7 □ A010B				
		□ 180	FE16D	XDL-L7 □ A020B				
		□ 180	FE22D	XDL-L7 □ A020B				
		□ 180	FF22D	XDL-L7 □ A020B				
		□ 180	FF35D	XDL-L7 □ A035B				
		□ 180	FF55D	XDL-L7 □ A050B				
		□ 180	FF75D	XDL-L7 □ A075B				
		□ 220	FG22D	XDL-L7 □ A020B				
		□ 220	FG35D	XDL-L7 □ A035B				
		□ 220	FG55D	XDL-L7 □ A050B				
		1,500	3,000	□ 220			FG75D	XDL-L7 □ A075B
				□ 130			FE05G	XDL-L7 □ A008B
□ 130	FE09G			XDL-L7 □ A010B				
□ 130	FE13G			XDL-L7 □ A020B				
□ 130	FE17G			XDL-L7 □ A020B				
□ 180	FF20G			XDL-L7 □ A020B				
□ 180	FF30G			XDL-L7 □ A035B				
□ 180	FF44G			XDL-L7 □ A050B				
□ 180	FF60G			XDL-L7 □ A075B				
□ 180	FF75G			XDL-L7 □ A075B				
□ 220	FG20G			XDL-L7 □ A020B				
□ 220	FG30G			XDL-L7 □ A035B				
□ 220	FG44G			XDL-L7 □ A050B				
□ 220	FG60G			XDL-L7 □ A075B				
1,000	2,000			□ 130			FE03M	XDL-L7 □ A004B
		□ 130	FE06M	XDL-L7 □ A008B				
		□ 130	FE09M	XDL-L7 □ A010B				
		□ 130	FE12M	XDL-L7 □ A020B				
		□ 180	FF12M	XDL-L7 □ A020B				
		□ 180	FF20M	XDL-L7 □ A020B				
		□ 180	FF30M	XDL-L7 □ A035B				
		□ 180	FF44M	XDL-L7 □ A050B				
		□ 220	FG12M	XDL-L7 □ A020B				
		□ 220	FG20M	XDL-L7 □ A020B				
		□ 220	FG30M	XDL-L7 □ A035B				
		□ 220	FG44M	XDL-L7 □ A050B				

XML-S/L/H Series Table

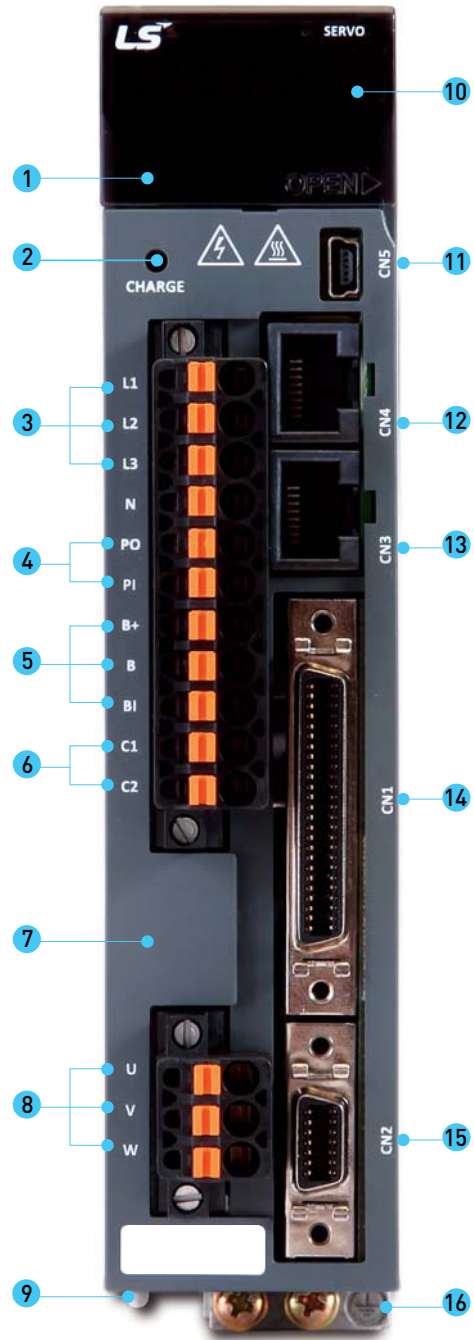
Rated Speed (rpm)	Max. Speed (rpm)	Flange Size	Motor (XML)	Drive	Standard Encoder Type	IP Grade
					Quadrature Type	
3,000	5,000	□40	SAR5A	XDL-L7 □A001 □	* 2,048P/R	IP55
		□40	SA01A	XDL-L7 □A001 □		
		□40	SA015A	XDL-L7 □A002 □		
		□60	SB01A	XDL-L7 □A002 □		
		□60	SB02A	XDL-L7 □A002 □		
		□60	SB04A	XDL-L7 □A004 □		
		□80	SC04A	XDL-L7 □A004 □		
		□80	SC06A	XDL-L7 □A008 □		
		□80	SC08A	XDL-L7 □A008 □		
		□80	SC10A	XDL-L7 □A010 □		
		□130	SE09A	XDL-L7 □A008 □		
		□130	SE15A	XDL-L7 □A020 □		
		□130	SE22A	XDL-L7 □A020 □		
		□130	SE30A	XDL-L7 □A035 □		
		□180	SF30A	XDL-L7 □A035 □		
		□180	SF50A	XDL-L7 □A050 □		
2,000	3,000	□80	SC03D	XDL-L7 □A004 □	* 3,000P/R	IP65
		□80	SC05D	XDL-L7 □A008 □		
		□80	SC06D	XDL-L7 □A008 □		
		□80	SC07D	XDL-L7 □A008 □		
		□130	SE06D	XDL-L7 □A008 □		
		□130	SE11D	XDL-L7 □A010 □		
		□130	SE16D	XDL-L7 □A020 □		
		□130	SE22D	XDL-L7 □A020 □		
		□180	SF22D	XDL-L7 □A020 □		
		2,700	□180	LF35D		
	3,000	□180	SF55D	XDL-L7 □A050 □		
	2,500	□180	SF75D	XDL-L7 □A075 □		
	3,000	□220	SG22D	XDL-L7 □A020 □		
	2,700	□220	LG35D	XDL-L7 □A035 □		
	3,000	□220	SG55D	XDL-L7 □A050 □		
	2,500	□220	SG75D	XDL-L7 □A075 □		
1,500	3,000	□130	SE05G	XDL-L7 □A008 □	* 3,000P/R	IP65
		□130	SE09G	XDL-L7 □A010 □		
		□130	SE13G	XDL-L7 □A020 □		
		□130	SE17G	XDL-L7 □A020 □		
		□180	SF20G	XDL-L7 □A035 □		
	2,700	□180	LF30G	XDL-L7 □A035 □		
	3,000	□180	SF44G	XDL-L7 □A050 □		
	2,500	□180	SF60G	XDL-L7 □A075 □		
	3,000	□220	SG20G	XDL-L7 □A020 □		
	2,700	□220	LG30G	XDL-L7 □A035 □		
	3,000	□220	SG44G	XDL-L7 □A050 □		
	2,500	□220	SG60G	XDL-L7 □A075 □		
1,000	2,000	□130	SE03M	XDL-L7 □A004 □	* 3,000P/R	IP65
		□130	SE06M	XDL-L7 □A008 □		
		□130	SE09M	XDL-L7 □A010 □		
		□130	SE12M	XDL-L7 □A020 □		
		□180	SF12M	XDL-L7 □A020 □		
		□180	SF20M	XDL-L7 □A035 □		
	1,700	□180	LF30M	XDL-L7 □A035 □		
	2,000	□180	SF44M	XDL-L7 □A050 □		
		□220	SG12M	XDL-L7 □A020 □		
	1,700	□220	SG20M	XDL-L7 □A035 □		
		□220	LG30M	XDL-L7 □A035 □		
		□220	SG44M	XDL-L7 □A050 □		
□220		SG60M	XDL-L7 □A075 □			
3,000	3,500	□60	HB01A	XDL-L7 □A002 □	* 1,024P/R	IP55
		□60	HB02A	XDL-L7 □A002 □		
		□60	HB04A	XDL-L7 □A004 □		
		□130	HE09A	XDL-L7 □A008 □		
		□130	HE15A	XDL-L7 □A020 □		
		□130	HE30A	XDL-L7 □A035 □		



Servo Drive

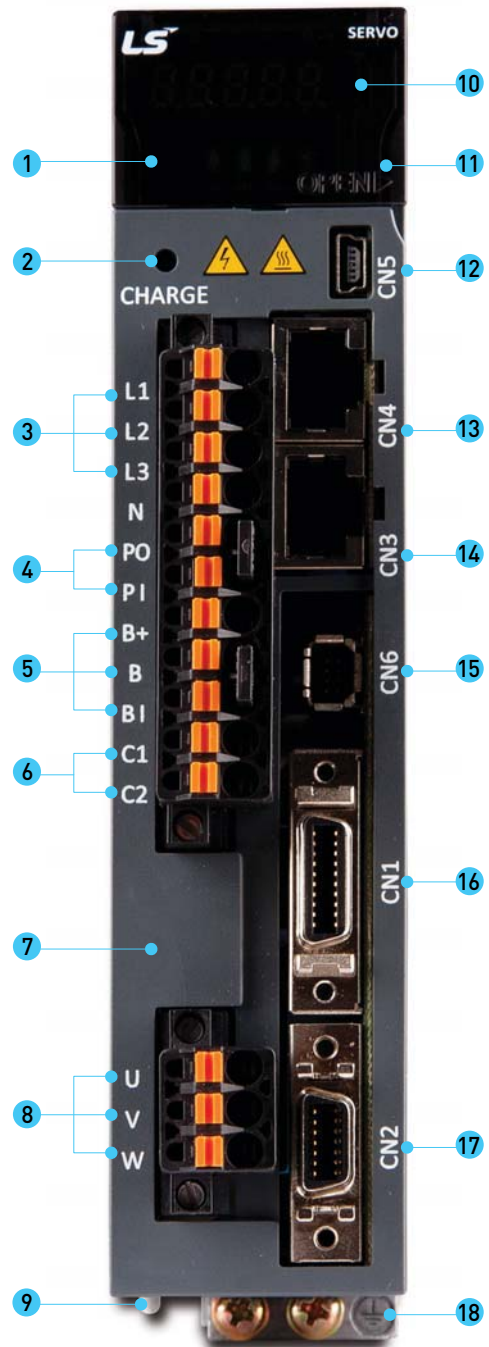
Standard type XDL-S

- 1 Operation Key (Mode, Up, Down, Set)
- 2 Charge Lamp
- 3 Main Power Connectors (L1, L2, L3)
- 4 DC Reactor Connectors (PO, PI) Short-Circuit when not used
- 5 Regenerative Resistor Connectors (B+, B, BI)
 - Short-Circuit B, BI terminals when standard type
 - Use B+, B terminals when using external resistor
- 6 Control Power Connectors (C1, C2)
- 7 Front cover
- 8 Motor Power Cable Connectors (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 Connectors
- 15 CN2 : Encoder Signal Connectors
- 16 Ground



Network type XDL-N

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





Servo Drive

Product Features

Item		Model	XDL-L7SA001 □	XDL-L7SA002 □	XDL-L7SA004 □	XDL-L7SA008 □	XDL-L7SA010 □	XDL-L7SA020 □	XDL-L7SA035 □	XDL-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 10000[P/R] Serial Type 19Bit									
Performance	Speed Control	Speed Control Position	Max. 1 : 5000								
		Frequency Response	Max. 1[kHz] or above (When using 19bit Serial Encoder)								
		Analog Speed Command	DC-10[V]~+10[V] (Reverse rotation in case of - voltage)								
		Accel/Decel Time	Linear or S-Shape Accel/Decel. [0~10,000[ms], Setting 1[ms] is possible)								
		Speed Variation Ratio	±0.01[%] or less [at Load variation 0 ~ 100%], ±0.1[%] or less [at Temp. 25±10°C]								
	Position Control	Input Frequency	1[Mpps], Line Driver / 200[kpps], Open Collector								
		Input Pulse Type	+Pulse, CW+CCW, A/B Phase								
		Electric Gear Ratio	Setting and selecting 4 digital electric gear ratio, Precise adjustment is possible								
	Torque Control	Analog Torque Command	DC -10 ~ +10[V] (Reverse rotation in case of - voltage)								
		Speed Limit	DC 0 ~ +10[V], within ±1[%] of internal speed command								
Repeatability		±1[%] or less									
Input/Output Signal	Analog Input	Input 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 inputted 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 inputted selectively for assignment Signal can be set as positive logic or negative logic									
Comm-unication	RS-422	PC Software and RS422 Server are available									
	USB	Status monitoring, JOG operation, parameter upload/download are available with PC Software									
Encoder		Compatible with Serial BiSS encoder, Quadrature encoder									
Encoder Output Type		Random pre-scale output by FPGA (Max. 6.4Mpps)									
Built-in Function	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	Loader ([SET], [MODE], [UP], [DOWN] key)									
	Additional Function	Automatic gain tuning function, Z-phase detection, manual JOG operation, program JOG operation, analog-input auto Calibration function									
Protective Function		Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem									
Operation Environment	Temperature	0 ~ 50[°C]									
	Humidity	Below 90[%]RH (avoid dew-condensation)									
	Ambient Environment	Indoor, avoid corrosive, inflammable gas or liquid and electrically conductive dust.									

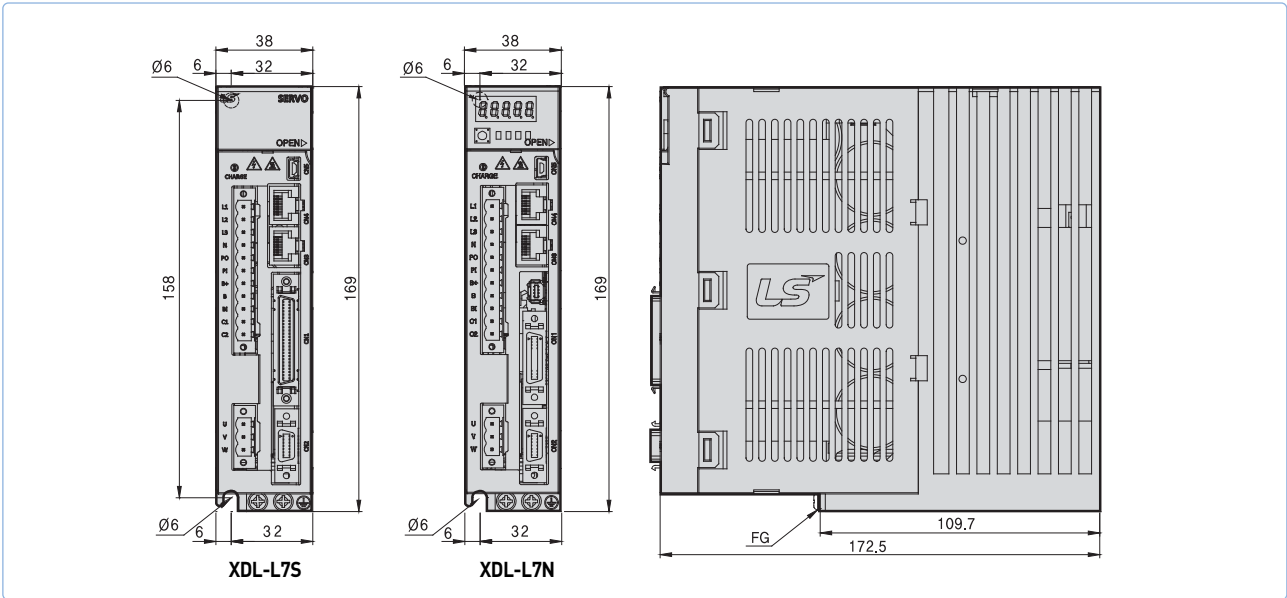
Item	Model	XDL-L7NA001B	XDL-L7NA002B	XDL-L7NA004B	XDL-L7NA008B	XDL-L7NA010B	XDL-L7NA020B	XDL-L7NA035B
Input Power	Main Power Supply	3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]						
	Control Power Supply	Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]						
Rated Current[A]		1.4	1.7	3.0	5.2	6.75	13.5	16.7
Peak Current[A]		4.2	5.1	9.0	15.6	20.25	40.5	50.1
Encoder Type		Serial 17Bit / 19Bit / 21Bit						
Performance	Speed Control Position	Max. 1 : 5000						
	Frequency Response	Max. 1[kHz] or above (When using 19bit Serial Encoder)						
	Analog Speed Command	±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						
Input/Output Signal	Digital Input	Total 6 Input Channels (assignment available) PCON, GAIN2, ALMRST, HOME, P-OT, N-OT Above 6 functions can be inputted selectively for assignment Signal can be set as positive logic or negative logic						
	Touch Probe Digital Input	2 input channels Providing rising and falling edge detection functions for each channel.						
	Digital Output	Total 4 Channels (assignment available) ALARM, READY, ZSPD, BRAKE, INPOS, INSPD, WARN 7 outputs can be inputted selectively for assignment Signal can be set as positive logic or negative logic						
Communication	USB	Program download is available with USB Communication.						
Built-in Function	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	The [MODE] key changes the content displayed in 7 segments.						
	Additional Function	Auto gain tuning function						
	Protective Function	Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem						
Operation Environment	Temperature	0 ~ 50[°C]						
	Humidity	Below 90[%]RH (avoid dew-condensation)						
	Ambient Environment	Indoor, avoid corrosive, inflammable gas or liquid and electrically conductive dust.						



External Dimensions of Servo Drive

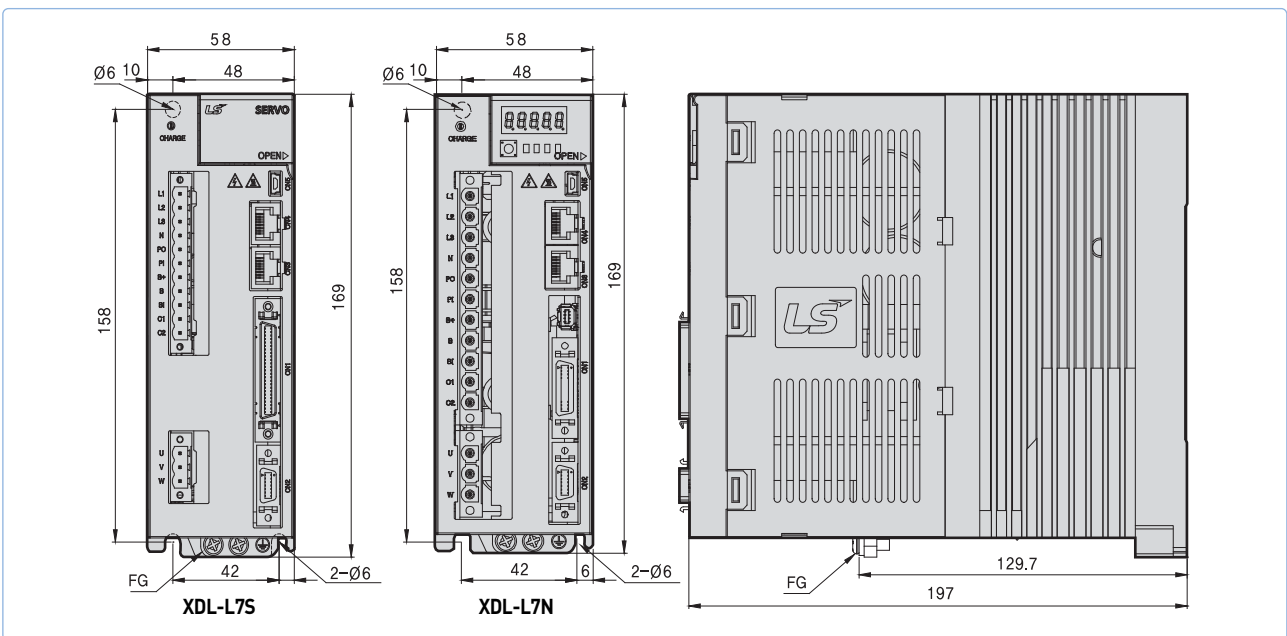
XDL-L7SA001 ~ XDL-L7SA004 [Weight : 1.2kg]

Unit : mm



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

Unit : mm





External Dimensions of Servo Motor

SA Series

Plug Specification



Spec. : 172167-1
(Made by AMP)

Power

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

(Power Connector Pin Table)

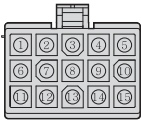


Spec. : 172165-1
(Made by AMP)

Brake

Pin No.	Phase
1	BK+
2	BK-

(Brake Connector Pin Table)



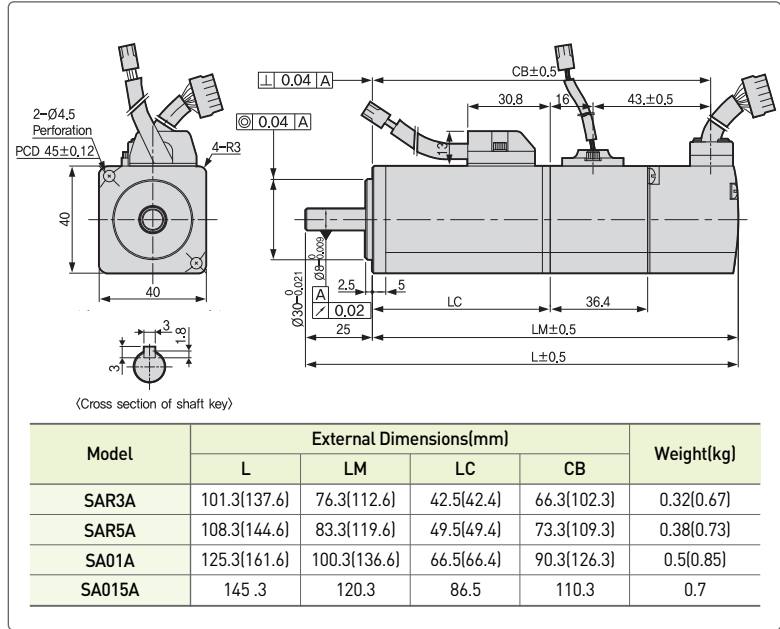
Spec. : 172171-1
(Made by AMP)

Encoder

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	A	10	V
3	B	11	W
4	B	12	W
5	Z	13	+5V
6	Z	14	0V
7	U	15	SHIELD
8	U		

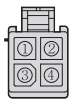
(Incremental Encoder Connector Pin Table)

Note 1. Use DC[24] for brake input power supply. 2. The () is for brake-attached type. 3. SA015A not providing braking.
4. For a serial encoder pin table, refer to page 28.



SB Series

Plug Specification



Spec. : 172167-1
(Made by AMP)

Power

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

(Power Connector Pin Table)

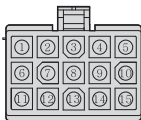


Spec. : 172165-1
(Made by AMP)

Brake

Pin No.	Phase
1	BK+
2	BK-

(Brake Connector Pin Table)



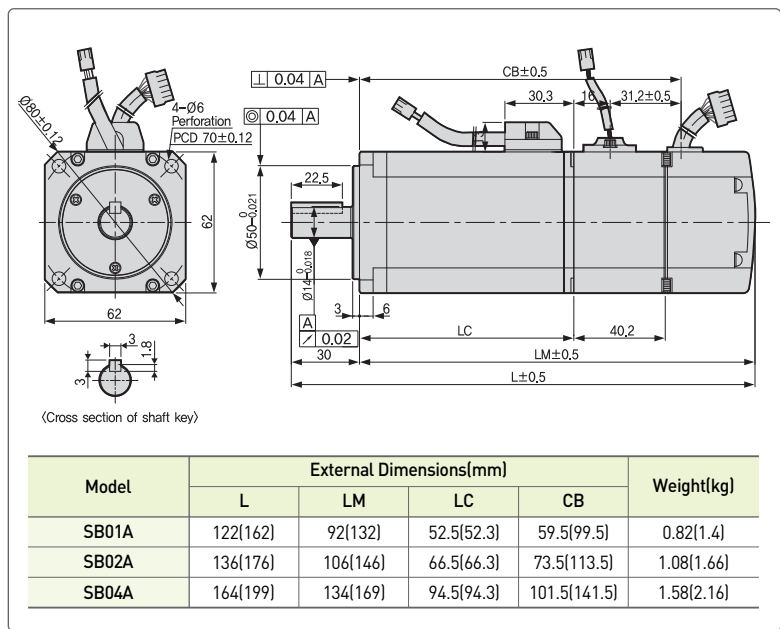
Spec. : 172171-1
(Made by AMP)

Encoder

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	A	10	V
3	B	11	W
4	B	12	W
5	Z	13	+5V
6	Z	14	0V
7	U	15	SHIELD
8	U		

(Incremental Encoder Connector Pin Table)

Note 1. Use DC[24] for brake input power supply. 2. The () is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately.
4. For a serial encoder pin table, refer to page 28.



SC Series

Plug Specification



Spec. : 172167-1
(Made by AMP)

Power

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

(Power Connector Pin Table)

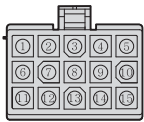


Spec. : 172165-1
(Made by AMP)

Brake

Pin No.	Phase
1	BK+
2	BK-

(Brake Connector Pin Table)

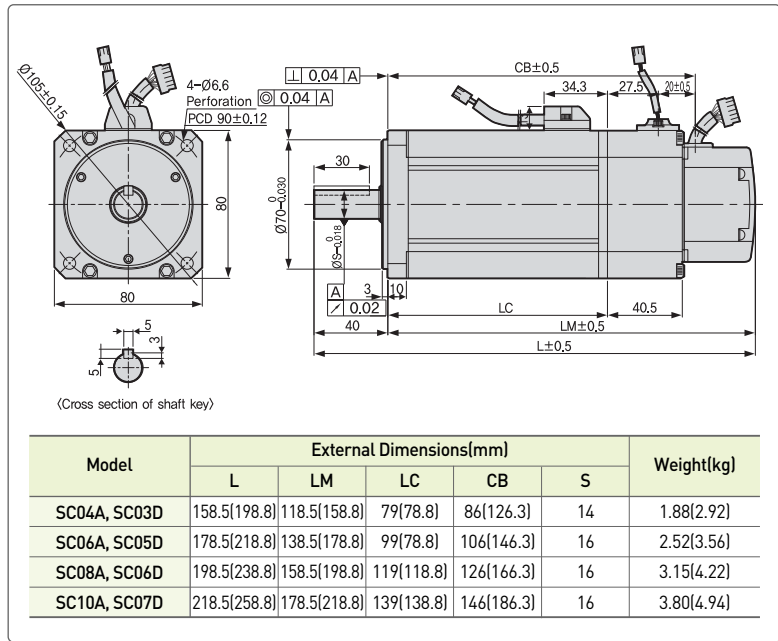


Spec. : 172171-1
(Made by AMP)

Encoder

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	Ā	10	V̄
3	B	11	W
4	B̄	12	W̄
5	Z	13	+5V
6	Z̄	14	0V
7	U	15	SHIELD
8	Ū		

(Incremental Encoder Connector Pin Table)



Note 1. Use DC[24] for brake input power supply. 2. The () is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately. 4. For a serial encoder pin table, refer to page 28.

SE Series

Plug Specification



Spec. : MS3102A20-4P
(Standard)

Power

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



Spec. : 3102A20-15P
(Brake-attached type)

Brake

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

1. Incremental type

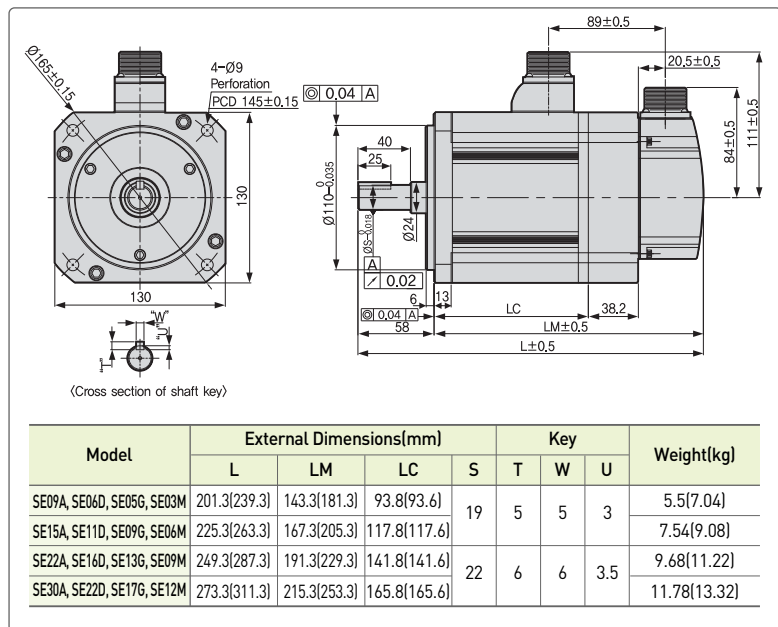


Spec. : MS3102A20-29P

Encoder

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	Ā	N	V̄
C	B	P	W
D	B̄	R	W̄
E	Z	H	+5V
F	Z̄	G	0V
K	U	J	SHIELD
L	Ū		

(Incremental Encoder Connector Pin Table)



Note 1. Use DC[24] for brake input power supply. 2. The () is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately. 4. For a serial encoder pin table, refer to page 28.

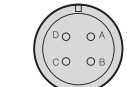
[Brake-attached type]



External Dimensions of Servo Motor

SF, LF Series

Plug Specification



Spec.: MS3102A22-22P
(Standard)

Power

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



Spec.: 3102A24-10P
(Brake-attached type)

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

1. Incremental type

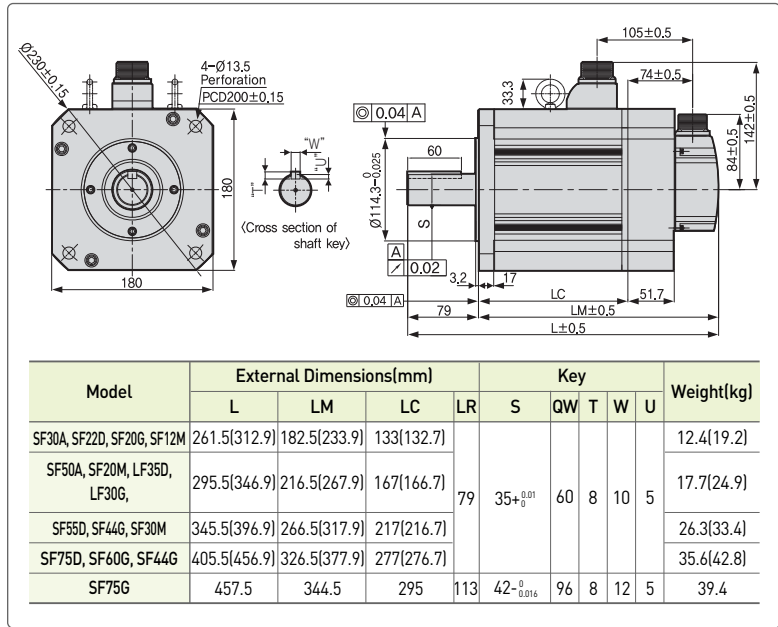


Spec.: MS3102A20-29P

Encoder

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	A	N	V
C	B	P	W
D	B	R	W
E	Z	H	+5V
F	Z	G	0V
K	U	J	SHIELD
L	U		

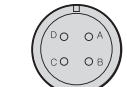
(Incremental Encoder Connector Pin Table)



Note 1. Use DC[90] for brake input power supply. 2. The [] is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately. 4. For a serial encoder pin table, refer to page 28. 5. For a FF75G power cable connector, use MS3102A32-17

SG, LG Series

Plug Specification



Spec.: MS3102A22-22P
(Standard)

Power

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



Spec.: 3102A14S-7P
(Brake-attached type)

Brake

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

1. Incremental type

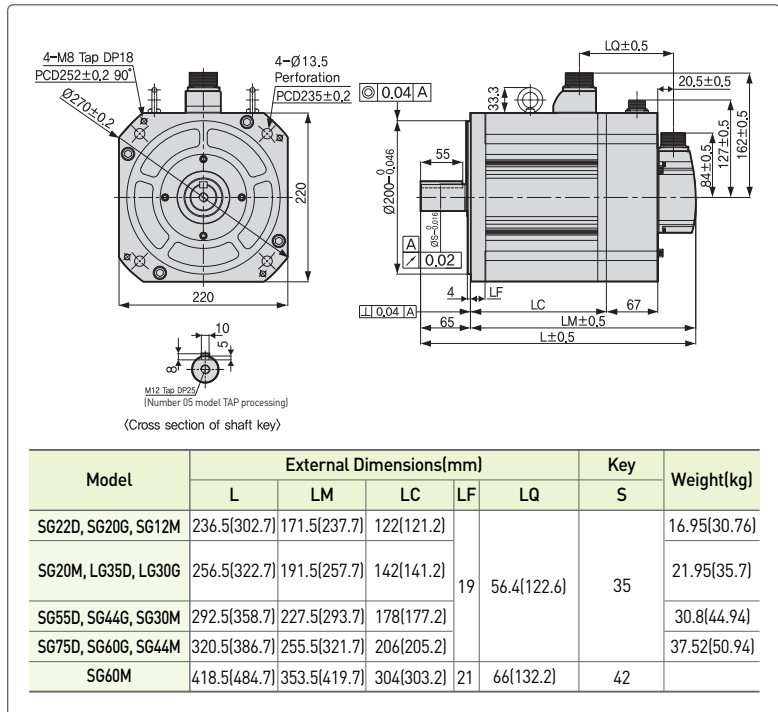


Spec.: MS3102A20-29P

Encoder

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	A	N	V
C	B	P	W
D	B	R	W
E	Z	H	+5V
F	Z	G	0V
K	U	J	SHIELD
L	U		

(Incremental Encoder Connector Pin Table)



Note 1. Use DC[90] for brake input power supply. 2. The [] is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately. 4. For a serial encoder pin table, refer to page 28. 5. For a SG60M power cable connector, use MS3102A32-17

HB Series [Hollow Shaft type]

Plug Specification



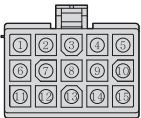
Spec. : 172167-1
(Made by AMP)

Power

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

(Power Connector Pin Type)

1. Incremental type

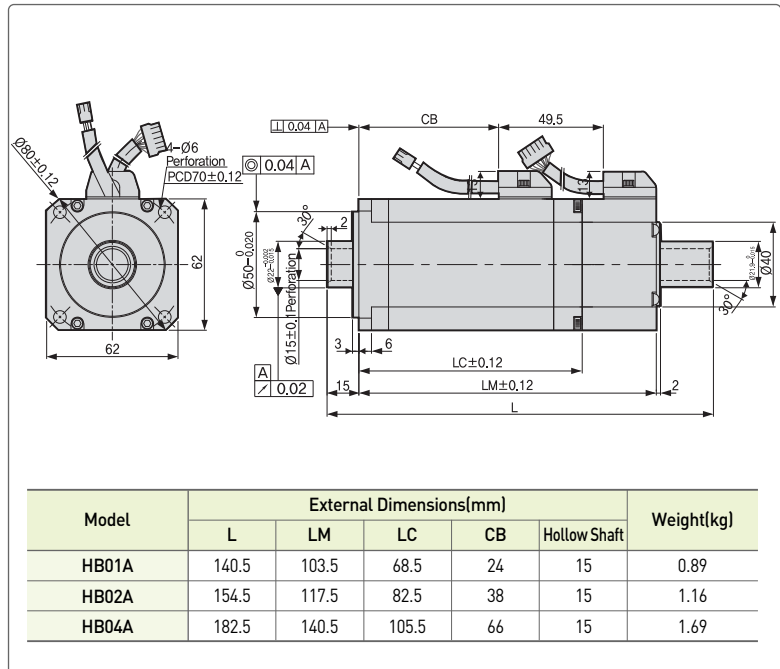


Spec. : 172171-1
(Made by AMP)

Encoder

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	A̅	10	V̅
3	B	11	W
4	B̅	12	W̅
5	Z	13	+5V
6	Z̅	14	0V
7	U	15	SHIELD
8	U̅		

(Incremental Encoder Connector Pin Table)



Model	External Dimensions(mm)					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 Specification



Spec. : MS3102A20-4P
(Standard)

Power

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

(Power Connector Pin Type)

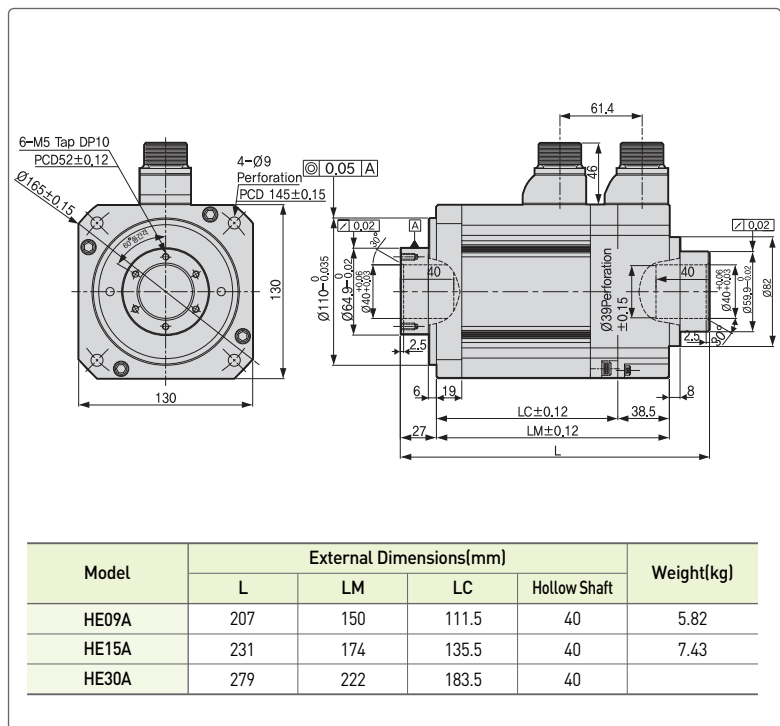


Spec. : MS3102A20-29P

Encoder

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	A̅	N	V̅
C	B	P	W
D	B̅	R	W̅
E	Z	H	+5V
F	Z̅	G	0V
K	U	J	SHIELD
L	U̅		

(Incremental Encoder Connector Pin Table)



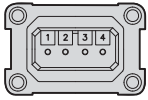
Model	External Dimensions(mm)				Weight(kg)
	L	LM	LC	Hollow Shaft	
HE09A	207	150	111.5	40	5.82
HE15A	231	174	135.5	40	7.43
HE30A	279	222	183.5	40	



External Dimensions of Servo Motor

FB Series

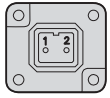
Plug Specification



Power

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

(Power Connector Pin Type)



Brake

Pin No.	Phase
1	BK+
2	BK-

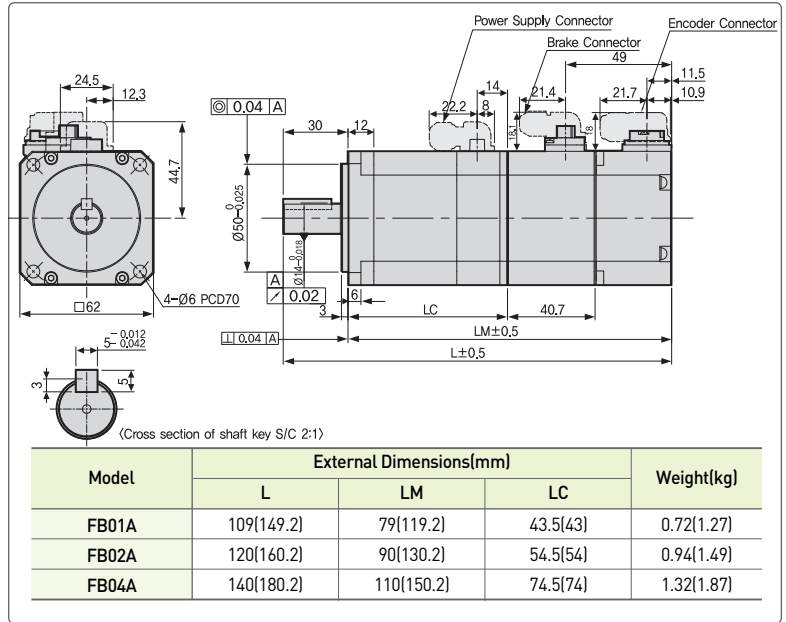
(Brake Connector Pin Table)



Encoder

Single Turn (N)		Multi Turn (M)	
Pin No.	Phase	Pin No.	Phase
1	MA	1	MA
2	SLO	2	SLO
3	-	3	GND_B
4	OV	4	OV
5	SHIELD	5	SHIELD
6	MA	6	MA
7	SLO	7	SLO
8	-	8	VDD_B
9	+5V	9	+5V

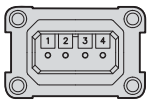
(Encoder Connector Pin Table)



Note 1. Use DC[24] for brake input power supply. 2. The () is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately.

FC Series

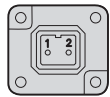
Plug Specification



Power

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

(Power Connector Pin Type)



Brake

Pin No.	Phase
1	BK+
2	BK-

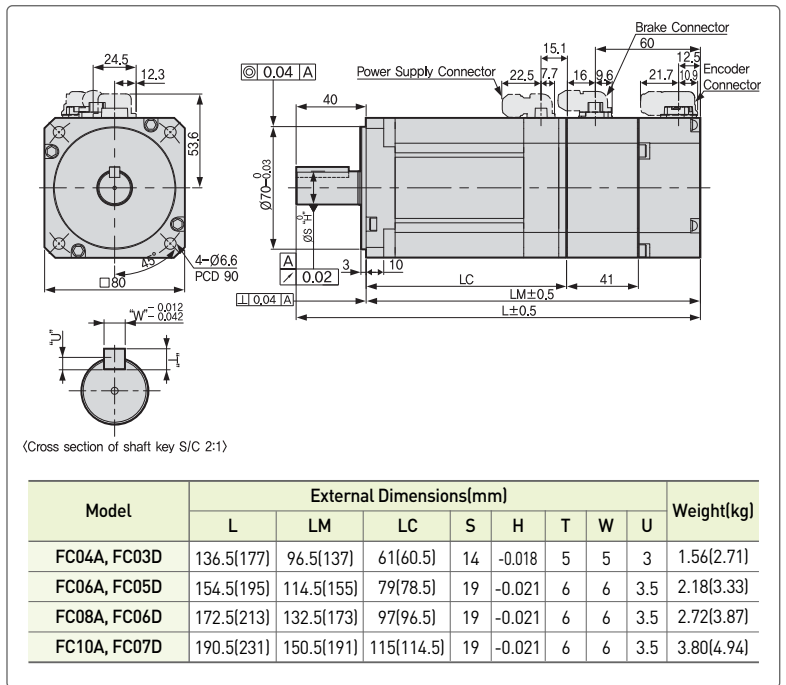
(Brake Connector Pin Table)



Encoder

Single Turn (N)		Multi Turn (M)	
Pin No.	Phase	Pin No.	Phase
1	MA	1	MA
2	SLO	2	SLO
3	-	3	GND_B
4	OV	4	OV
5	SHIELD	5	SHIELD
6	MA	6	MA
7	SLO	7	SLO
8	-	8	VDD_B
9	+5V	9	+5V

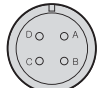
(Encoder Connector Pin Table)



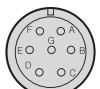
Note 1. Use DC[24] for brake input power supply. 2. The () is for brake-attached type. 3. For external dimensions for oil-sealed type, please kindly contact us separately.

FE Series

Plug Specification

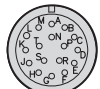


Spec.: MS3102A20-4P (Standard)



Spec.: 3102A20-15P (Brake-attached type)

2. Serial type



Spec.: MS3102A20-29P

Power

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

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

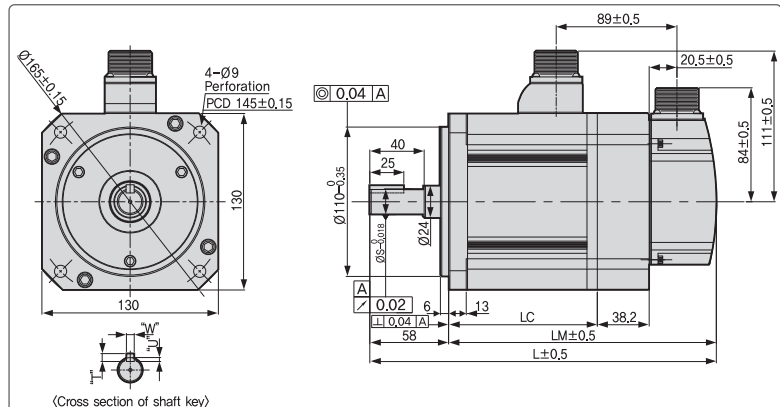
Encoder

Pin No.	Phase	Pin No.	Phase
A	MA	M	-
B	MA	N	-
C	SLO	P	-
D	SLO	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-	-	-

(Incremental Encoder Connector Pin Table)

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

(Incremental Encoder Connector Pin Table)



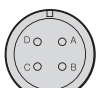
(Cross section of shaft key)

Model	External Dimensions(mm)				Key				Weight(kg)
	L	LM	LC	S	T	W	U		
FE09A, FE04D, FE05G, FE03M	197.3(235.3)	139.3(177.3)	89.8(89.6)	19	5	5	3	5.04(6.58)	
FE15A, FE11D, FE09G, FE06M	217.3(255.3)	159.3(197.3)	109.8(109.6)	19	5	5	3	6.74(8.28)	
FE22A, FE16D, FE13G, FE09M	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	255.3(235.3)	197.3(235.3)	147.8(147.6)	24	7	8	4	10.05(11.59)	

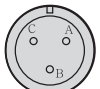
Note 1. Use DC[24] for brake input power supply. 2. The [] is for brake-attached type.

FF Series

Plug Specification

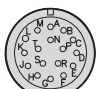


Spec.: MS3102A22-22P (Standard)



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

2. Serial type



Spec.: MS3102A20-29P

Power

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

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

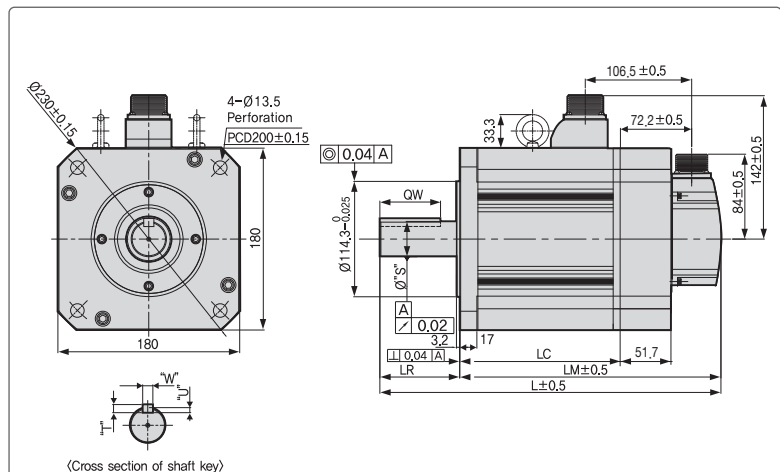
Encoder

Pin No.	Phase	Pin No.	Phase
A	MA	M	-
B	MA	N	-
C	SLO	P	-
D	SLO	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-	-	-

(Incremental Encoder Connector Pin Table)

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

(Incremental Encoder Connector Pin Table)



(Cross section of shaft key)

Model	External Dimensions(mm)				Key				Weight(kg)	
	L	LM	LC	LR	S	QW	T	W		U
FF30A, FF22D, FF20G, FF12M	257.5(308.9)	178.5(229.9)	129(128.7)	79	35+0.01	60	8	10	5	12.5(19.7)
FF50A, FF35D, FF30G, FF20M	287.5(338.9)	208.5(259.9)	159(158.7)							17.4(24.6)
FF55D, FF44G, FF30M	331.5(382.9)	252.5(303.9)	203(202.7)							25.2(32.4)
FF75D, FF60G, FF44M	384.5(435.9)	305.5(356.9)	256(255.7)	113	42-0.016	96	12		33.8(41.0)	
FF75G ^(note 4)	439.5	326.5	277						38.5(45.7)	

Note 1. FF30M or above models have eye bolts. 2. Use DC[24] for brake input power supply. 3. The [] is for brake-attached type. 4. For a FF75G power cable connector, use MS3102A32-17 5. For a FF75G power cable connector, use MS3102A32-17



External Dimensions of Servo Motor

FG Series

Plug Specification



Spec.: MS3102A22-22P (Standard)



Spec.: 3102A14-7P (Brake-attached type)

2. Serial type



Spec.: MS3102A20-29P

Power

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

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

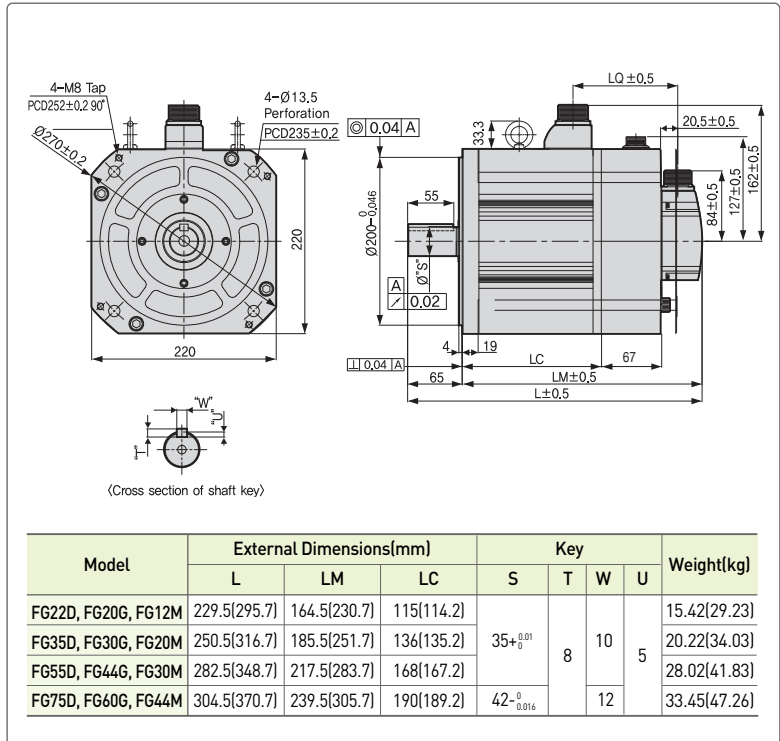
Encoder

Pin No.	Phase	Pin No.	Phase
A	MA	M	-
B	MA	N	-
C	SLO	P	-
D	SLO	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	SHIELD
L	-		

(Incremental Encoder Connector Pin Table)

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

(Incremental Encoder Connector Pin Table)



Model	External Dimensions(mm)			Key				Weight(kg)
	L	LM	LC	S	T	W	U	
FG22D, FG20G, FG12M	229.5(295.7)	164.5(230.7)	115(114.2)	35 ^{+0.01}	8	10	5	15.42(29.23)
FG35D, FG30G, FG20M	250.5(316.7)	185.5(251.7)	136(135.2)					20.22(34.03)
FG55D, FG44G, FG30M	282.5(348.7)	217.5(283.7)	168(167.2)					28.02(41.83)
FG75D, FG60G, FG44M	304.5(370.7)	239.5(305.7)	190(189.2)	42 ^{-0.016}	12			33.45(47.26)

Note) 1. In case of SG, use DC[90V] for brake input power supply. 2. The () is for brake-attached type.

S Series Encoder Pin Table

SA, SB, SC Series



PlugSpec.: 172169-1 (AMP)

Single Turn (N)		Multi Turn (M)	
Pin No.	Phase	Pin No.	Phase
1	MA	1	MA
2	MA	2	MA
3	SLO	3	SLO
4	SLO	4	SLO
5	-	5	VDD_B
6	-	6	GND_B
7	+5V	7	+5V
8	0V	8	0V
9	SHIELD	9	SHIELD

(Encoder Connector Pin Table)

SE, SF, SG Series



17 Pole Plug (MS3102A20-29P)

Single Turn (N)			
Pin No.	Phase	Pin No.	Phase
A	MA	M	-
B	MA	N	-
C	SLO	P	-
D	SLO	R	-
E	-	H	+5V
F	-	G	0V
K	-	J	MA
L	-		

(Encoder Connector Pin Table)

Multi Turn (M)			
Pin No.	Phase	Pin No.	Phase
A	MA	M	-
B	MA	N	-
C	SLO	P	-
D	SLO	R	-
E	VDD_B	H	+5V
F	GND_B	G	0V
K	-	J	MA
L	-		

Test Standard for Heat Sink

Flange	Standard(mm)	Division
40	250X250X6	Aluminum
60	250X250X6	
80	250X250X12	
130	350X350X20	
180	550X550X30	
220	650X650X35	
250	950X950X35	
280	950X950X35	

Note)

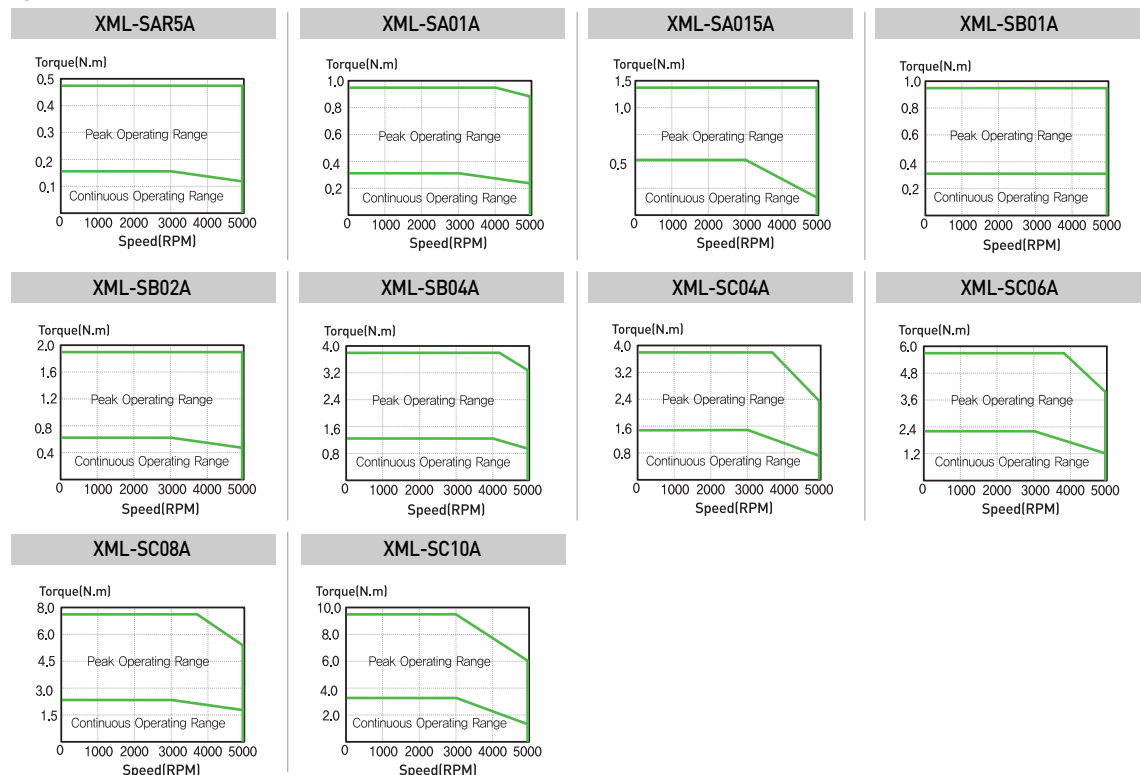
Those heat sinks are the same as the heat sinks applied for servo motor torque test.

Servo Motor Characteristics

Motor Specification [Rated 3000r/min]

Servo Motor [XML-□□□□]	SAR5A	SAR01A	SA015A	SB01A	SB02A	SB04A	SC04A	SC06A	SC08A	SC10A	
Applicable Drive [XDL-L75(N)□□□□]	A001		A002			A004		A008		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	1.0
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	19.50	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 Speed	[r/min]	3000									
Max.Speed	[r/min]	5000									
Inertia	[kg·m ² X10 ⁻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	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(excluding the shaft-through section)						Fully closed · Self cooling IP65(excluding the shaft-through section)			
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]									
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)									
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.									
E/V		Elevation/vibration 49[m/s ²][5G]									
Weight	[kg]	0.38	0.5	0.7	0.82	1.08	1.58	1.88	2.52	3.15	3.80

Speed-Torque Characteristics



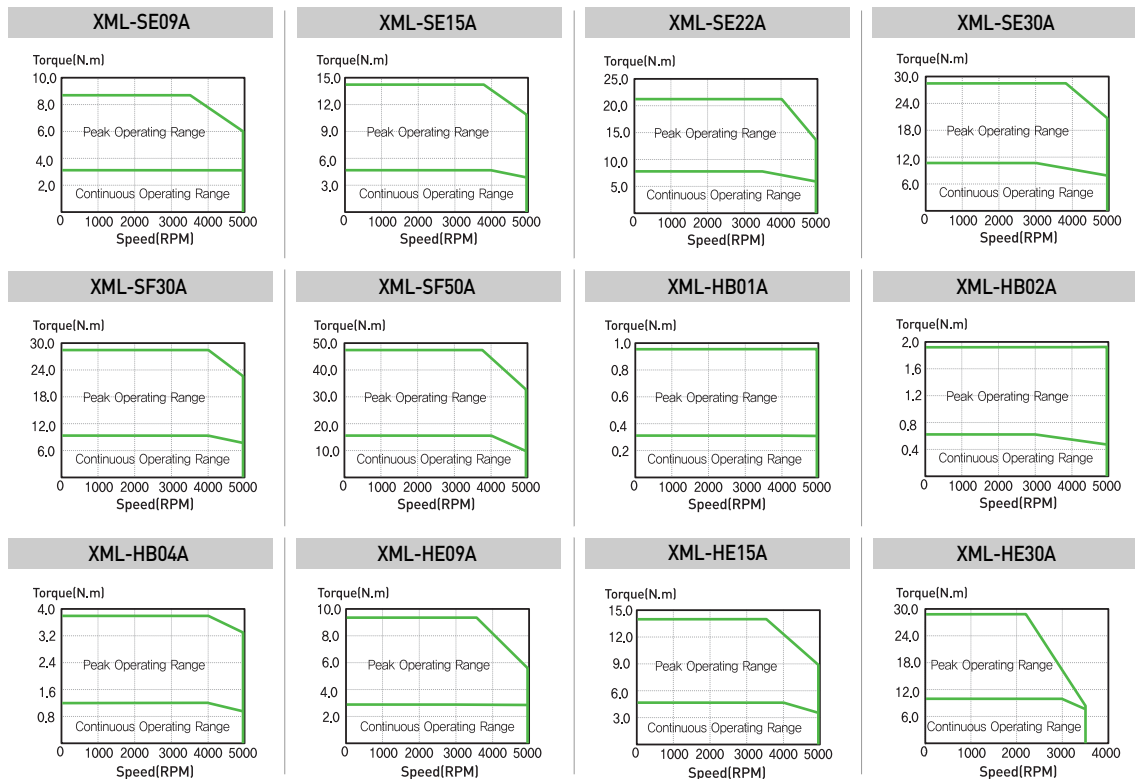


Servo Motor Characteristics

Motor Specification [Rated 3000r/min]

Servo Motor [XML-□□□□]	SE09A	SE15A	SE22A	SE30A	SF30A	SF50A	HB01A	HB02A	HB04A	HE09A	HE15A	HE30A
Applicable Drive [XDL-L7S(N)□□□□]	A010	A020		A035		A050	A002		A004	A010	A020	A035
Flange Size(□)	□130				□80		□60			□130		
Rated Output [kW]	0.9	1.5	2.2	3.0	3.0	5.0	0.1	0.2	0.4	0.9	1.5	3.0
Rated Torque [N·m]	2.86	4.77	7.00	9.55	9.55	15.91	0.32	0.64	1.27	2.86	4.77	9.55
	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
	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 Speed [r/min]	3000											
Max.Speed [r/min]	5000				3500				3500			
Inertia [kg·m ² X10 ⁻⁴]	6.66	12.00	17.34	22.68	30.74	52.13	0.27	0.33	0.46	19.56	22.27	31.81
	6.80	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	Quande.Type Incremental 3000[P/R]					Quande.Type Incremental 1024[P/R]			Quande.Type Incremental 2048[P/R]		
	Option	Serial Type 19[Bit]					X					
Specifications & Features	Structure	Fully closed·Self cooling IP65(excluding the shaft-through section)					Fully closed·Self cooling IP55(excluding the shaft-through section)					
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]				Operating : 0~40[°C] Storage : -10~60[°C]						
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)										
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.										
	E/V	Elevation/vibration 49[m/s ²][5G]										
Weight [kg]	5.5	7.54	9.68	11.78	12.4	17.7	0.89	1.16	1.69	5.82	7.43	

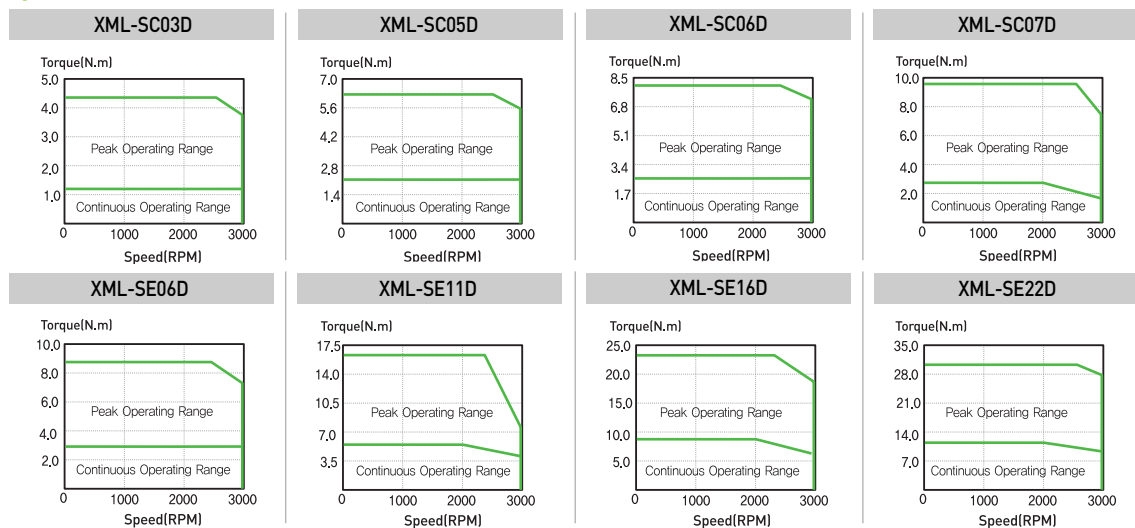
Speed-Torque Characteristics



Motor Specification [Rated 2000r/min]

Servo Motor [XML-□□□□]	SC03D	SC05D	SC06D	SC07D	SE06D	SE11D	SE16D	SE22D	
Applicable Drive [XDL-L7S(N)□□□□]	A004	A008			A008	A010	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	3.10	2.86	5.25	7.64	10.50
	[kgf · cm]	14.61	21.92	26.79	31.66	29.23	53.59	77.94	107.17
Max. Instantaneous	[N · m]	4.30	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 Speed [r/min]	2000								
Max.Speed [r/min]	3000								
Inertia	[kg · m ² X10 ⁻⁴]	0.67	1.09	1.51	1.93	6.66	12.00	17.34	22.68
	[gf · cm · s ²]	0.69	1.11	1.54	1.97	6.80	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	Quad.Type Incremental 3000[P/R]							
	Option	Serial Type 19[Bit]							
Specifications & Features	Structure	Fully closed · Self cooling IP65(excluding the shaft-through section)							
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]							
	Ambient Humidity	Below 20~80[%] [avoid dew-condensation]							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s ²][5G]							
Weight [kg]	1.88	2.52	3.15	3.80	5.5	7.54	9.68	11.78	

Speed-Torque Characteristics



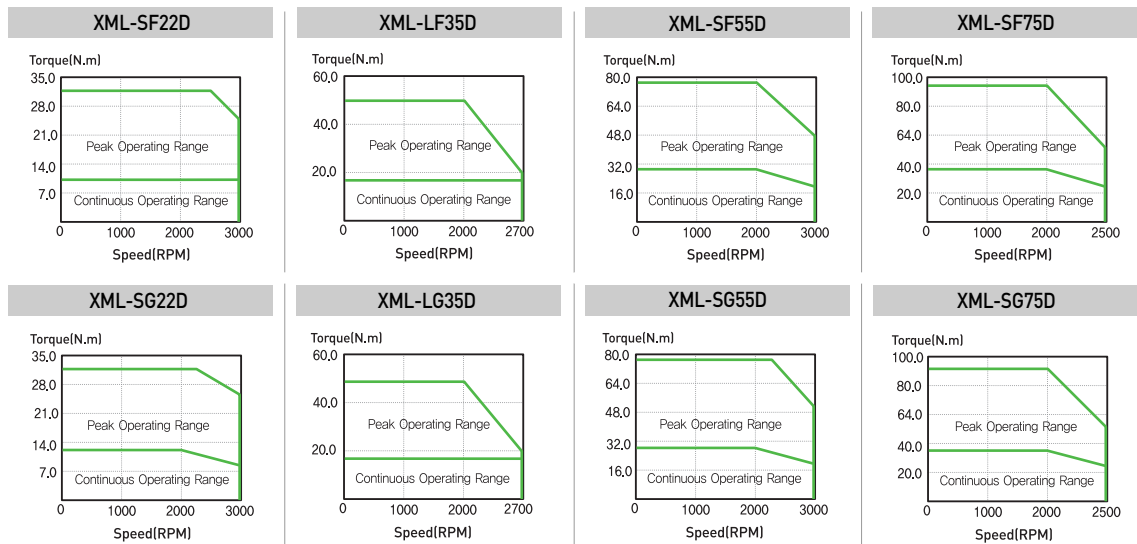


Servo Motor Characteristics

Motor Specification [Rated 2000r/min]

Servo Motor [XML-□□□□]	SF22D	LF35D	SF55D	SF75D	SG22D	LG35D	SG55D	SG75D	
Applicable Drive [XL-L7S(N)□□□□]	A020	A035	A050	A075	A020A	A035A	A050A	A075A	
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]	10.50	16.71	26.26	35.81	10.50	16.71	26.26	35.81
	[kgf · cm]	107.17	170.50	267.93	365.36	107.20	170.52	267.90	365.40
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	803.80	913.41	321.52	511.51	803.80	913.41
Rated Speed	[r/min]	2000							
Max.Speed	[r/min]	3000	2700	3000	2500	3000	2700	3000	2500
Inertia	[kg · m ² X10 ⁻⁴]	30.74	52.13	83.60	121.35	51.42	80.35	132.41	172.91
	[gf · cm · s ²]	31.35	53.16	85.24	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	Quande.Type Incremental 3000[P/R]							
	Option	Serial Type 19[Bit]							
Specifications & Features	Structure	Fully closed · Self cooling IP65(excluding the shaft-through section)							
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]							
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s ²][5G]							
Weight	[kg]	12.4	17.7	26.3	35.6	16.95	21.95	30.8	37.52

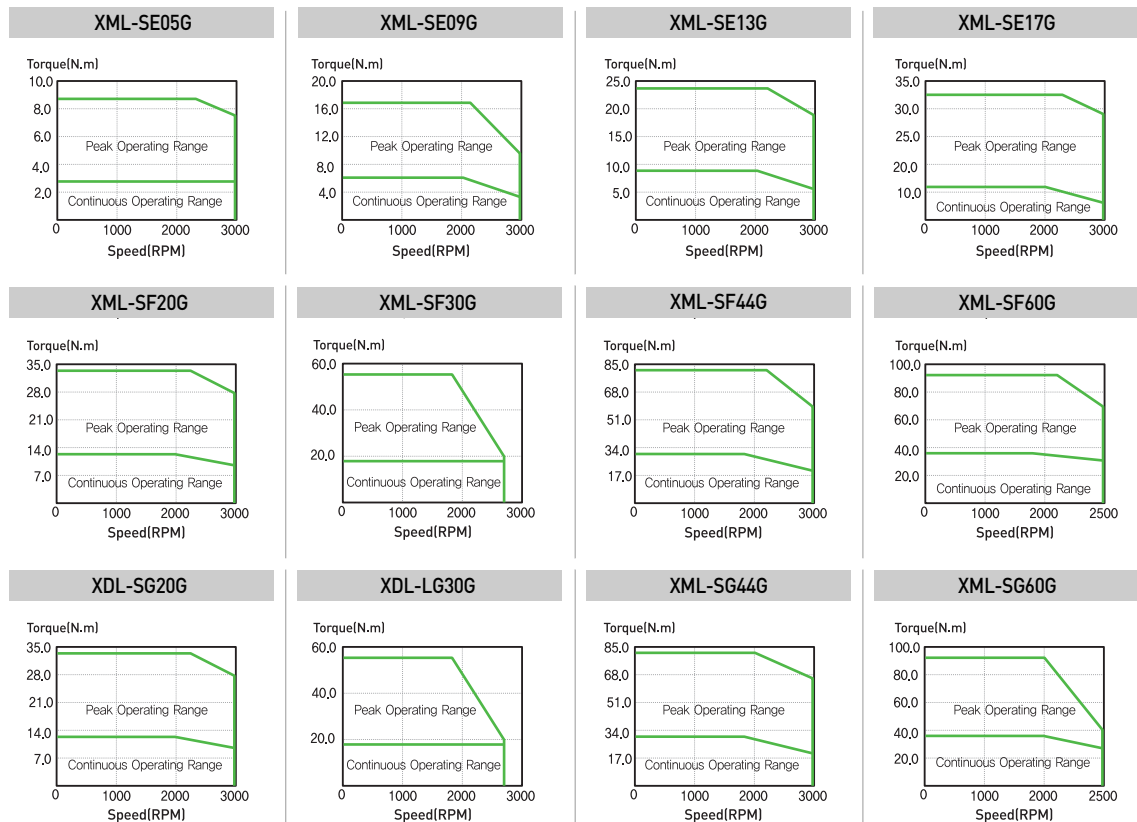
Speed-Torque Characteristics



Motor Specification [Rated 1500r/min]

Servo Motor [XML-□□□□]	SE05G	SE09G	SE13G	SE17G	SF20G	LF30G	SF44G	SF60G	SG20G	LG30G	SG44G	SG60G	
Applicable Drive [XDL-L7S(N)□□□□]	A008	A010	A020		A035		A050	A075	A020	A035	A050	A075	
Flange Size[□]	□130				□180				□220				
Rated Output	[kW]	0.45	0.85	1.3	1.7	1.8	2.9	4.4	6.0	1.8	2.9	4.4	6.0
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	285.80	389.72	116.92	188.37	285.80	389.72
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	565.10	857.39	974.90	350.80	565.10	857.39	974.31
Rated Speed	[r/min]	1500											
Max.Speed	[r/min]	3000				3000	2700	3000	2500	3000	2700	3000	2500
Inertia	[kg·m ² X10 ⁻⁴]	6.66	12.00	17.34	22.68	30.74	52.13	83.60	121.35	51.42	80.35	132.41	172.91
	[gf·cm·s ²]	6.80	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	24.40	39.49	51.63	42.71	65.37	93.83	120.21	25.53	42.41	59.24	84.36
Speed/Position Detector	Standard	Quande.Type Incremental 3000[P/R]											
	Option	Serial Type 19[Bit]											
Specifications & Features	Structure	Fully closed·Self cooling IP65(excluding the shaft-through section)											
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]											
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)											
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.											
	E/V	Elevation/vibration 49[m/s ²][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

Speed-Torque Characteristics



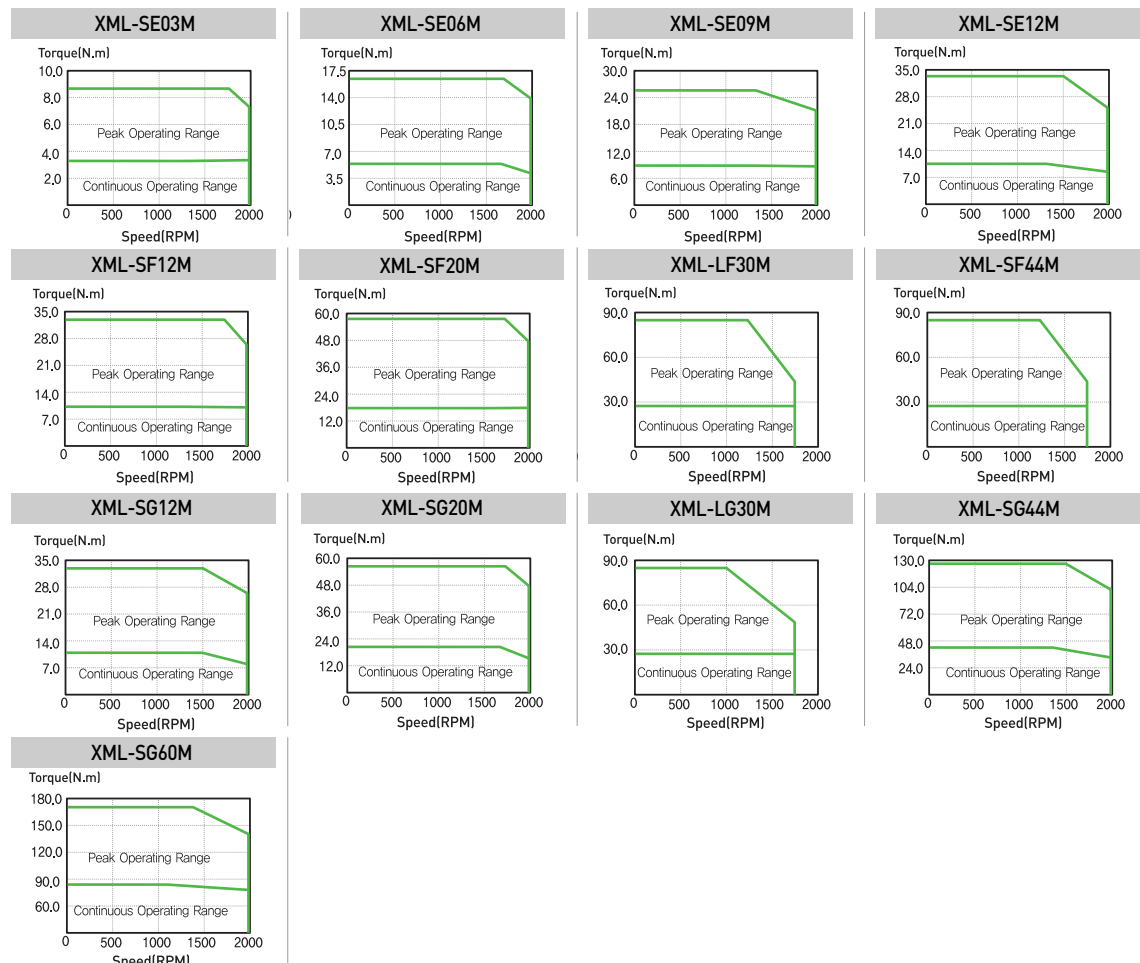


Servo Motor Characteristics

Motor Specification [Rated 1000r/min]

Servo Motor [XML-□□□□]	SE03M	SE06M	SE09M	SE12M	SF12M	SF20M	LF30M	SF44M	SG12M	SG20M	LG30M	SG44M	SG60M
Applicable Drive [XDL-L7S(N)□□□□]	A004	A008	A010	A020		A035		A050	A020	A035		A050	A075
Flange Size(□)	□130				□180				□220				
Rated Output [kW]	0.3	0.6	0.9	1.2	1.2	2.0	3.0	4.4	1.2	2.0	3.0	4.4	6.0
Rated Torque	[N · m]												
	2.86	5.73	8.59	11.46	11.46	19.10	28.64	42.01	11.46	19.10	28.64	42.01	57.29
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
Rated Speed [r/min]	1000												
Max.Speed [r/min]	2000					1700	2000			1700	2000		
Inertia	[kg · m ² X10 ⁻⁴]												
	6.66	12.00	17.34	22.68	30.74	52.13	83.60	121.35	51.42	80.35	132.41	172.91	291.36
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												
	Option												
Specifications & Features	Structure												
	Ambient Temp												
	Ambient Humidity												
	Atmosphere												
	E/V												
Weight [kg]	5.5	7.54	9.68	11.78	12.4	17.7	26.3	35.6	17.0	22.0	30.8	37.5	66.2

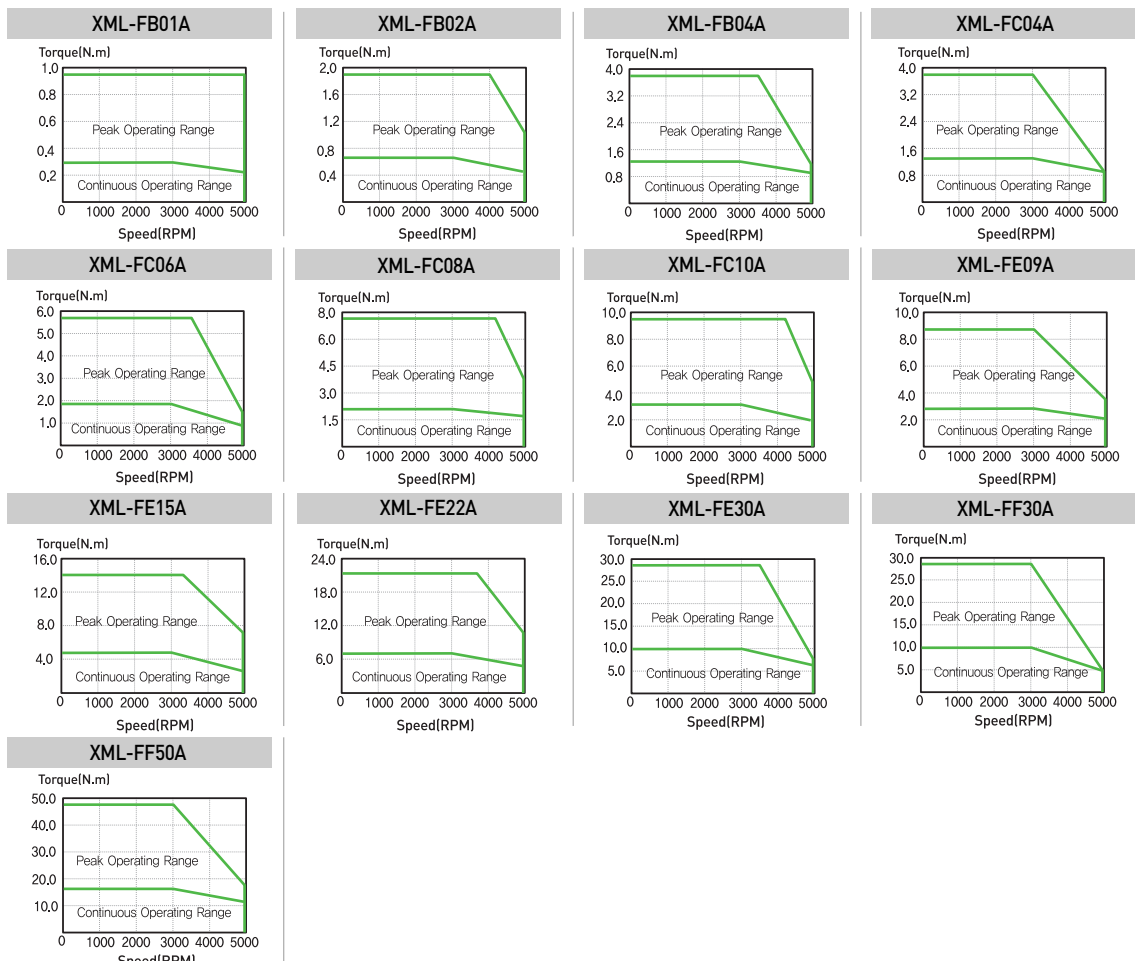
Speed-Torque Characteristics



Motor Specification [Rated 3000r/min]

Servo Motor (XML-□□□□)	FB01A	FB02A	FB04A	FC04A	FC06A	FC08A	FC10A	FE09A	FE15A	FE22A	FE30A	FF32A	FF50A	
Applicable Drive [XDL-L7S(N)□□□□]	A001	A002	A004		A008		A010		A020		A035		A050	
Flange Size(□)	□60			□80				□130			□180			
Rated Output [kW]	0.1	0.2	0.4	0.4	0.6	0.75	1.0	0.9	1.5	2.2	3.0	3.0	5.0	
Rated Torque	[N·m]	0.32	0.64	1.27	1.27	1.91	2.39	3.18	2.86	4.77	7.00	9.55	9.55	15.91
	[kgf·cm]	3.25	6.50	12.99	13.00	19.50	24.36	32.50	29.20	48.70	71.40	97.40	97.40	162.30
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	87.70	146.10	214.30	292.20	292.30	487.00
Rated Speed [r/min]	3000													
Max.Speed [r/min]	5000													
Inertia	[kg·m ² X10 ⁻⁴]	0.09	0.15	0.25	0.50	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	Serial Type 19[Bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65(excluding the shaft-through section)												
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]												
	Ambient Humidity	Below 20~80[%] [avoid dew-condensation]												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 49[m/s ²][5G]												
Weight [kg]	0.72	0.94	1.32	1.56	2.18	2.72	3.80	5.04	6.74	8.48	10.05	12.5	17.4	

Speed-Torque Characteristics



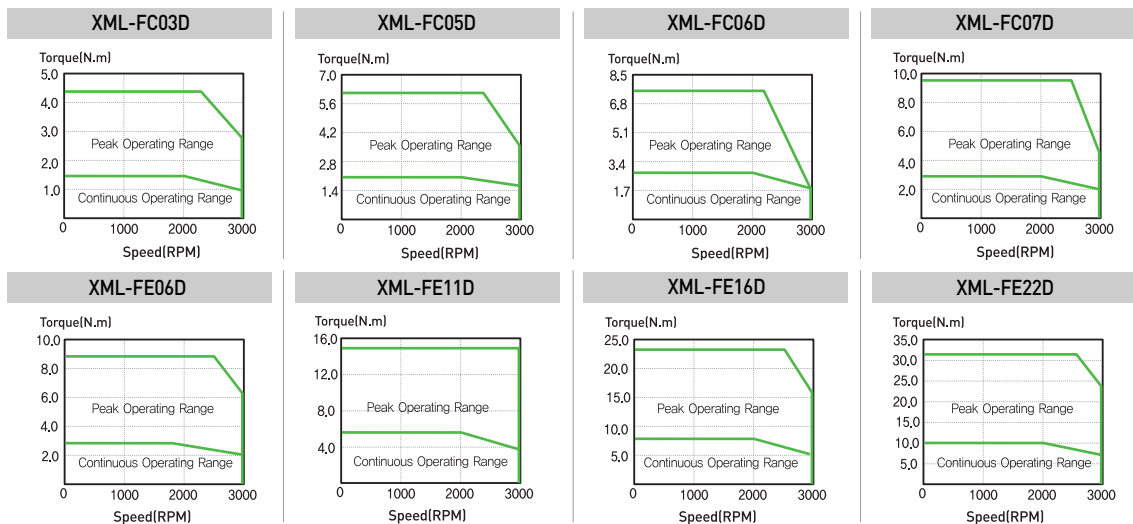


Servo Motor Characteristics

Motor Specification [Rated 2000r/min]

Servo Motor [XML-□□□□]	FC03D	FC05D	FC06D	FC07D	FE06D	FE11D	FE16D	FE22D	
Applicable Drive [XDL-L7S(N)□□□□]	A004	A008			A010		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	2.60	3.10	2.86	5.25	7.63	10.50
	[kgf·cm]	14.61	21.90	26.80	31.70	29.20	53.60	77.90	107.10
Max. Instantaneous	[N·m]	4.30	6.45	7.88	9.31	8.59	15.75	22.92	31.51
	[kgf·cm]	43.80	65.80	80.40	95.00	87.70	160.70	233.80	321.40
Rated Speed [r/min]	2000								
Max. Speed [r/min]	3000								
Inertia	[kg·m ² X10 ⁻⁴]	0.50	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	Serial Type 19[Bit]							
	Option	X							
Specifications & Features	Structure	Fully closed · Self cooling IP65(excluding the shaft-through section)							
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]							
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s ²][5G]							
Weight [kg]	1.56	2.18	2.72	3.8	5.04	6.74	8.48	10.05	

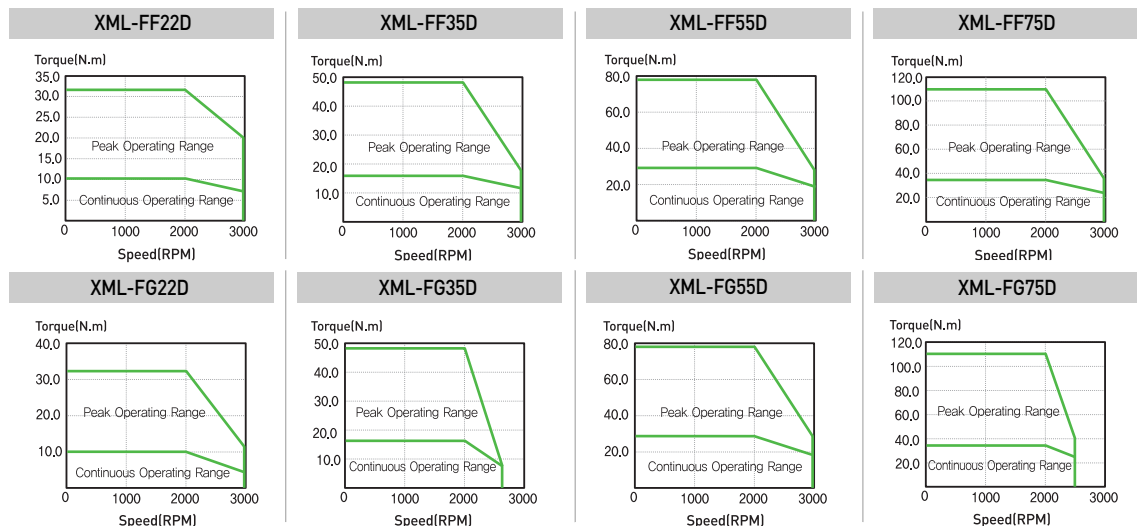
Speed-Torque Characteristics



Motor Specification [Rated 2000r/min]

Servo Motor (XML-□□□□)	FF22D	FF35D	FF55D	FF75D	FG22D	FG35D	FG55D	FF75D	
Applicable Drive [XDL-L75(N)□□□□]	A020	A035	A050	A075	A020	A035	A050	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]	10.50	16.70	26.26	35.81	10.50	16.71	26.25	35.81
	[kgf · cm]	107.10	170.40	267.80	365.40	107.10	170.40	267.80	365.40
Max. Instantaneous	[N · m]	31.50	50.10	78.76	89.53	31.51	50.12	78.76	89.53
	[kgf · cm]	321.30	511.40	803.40	913.50	321.30	511.30	803.40	913.50
Rated Speed	[r/min]	2000							
Max.Speed	[r/min]	3000			2500	3000	2700	3000	2500
Inertia	[kg · m ² X10 ⁻⁴]	27.96	46.56	73.85	106.70	41.13	71.53	117.72	149.40
	[gf · cm · s ²]	28.53	47.51	75.36	108.90	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	Serial Type 19[Bit]							
	Option	X							
Specifications & Features	Structure	Fully closed · Self cooling IP65(excluding the shaft-through section)							
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]							
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.							
	E/V	Elevation/vibration 49[m/s ²][5G]							
Weight	[kg]	12.5	17.4	25.2	33.8	15.42	20.22	28.02	33.45

Speed-Torque Characteristics



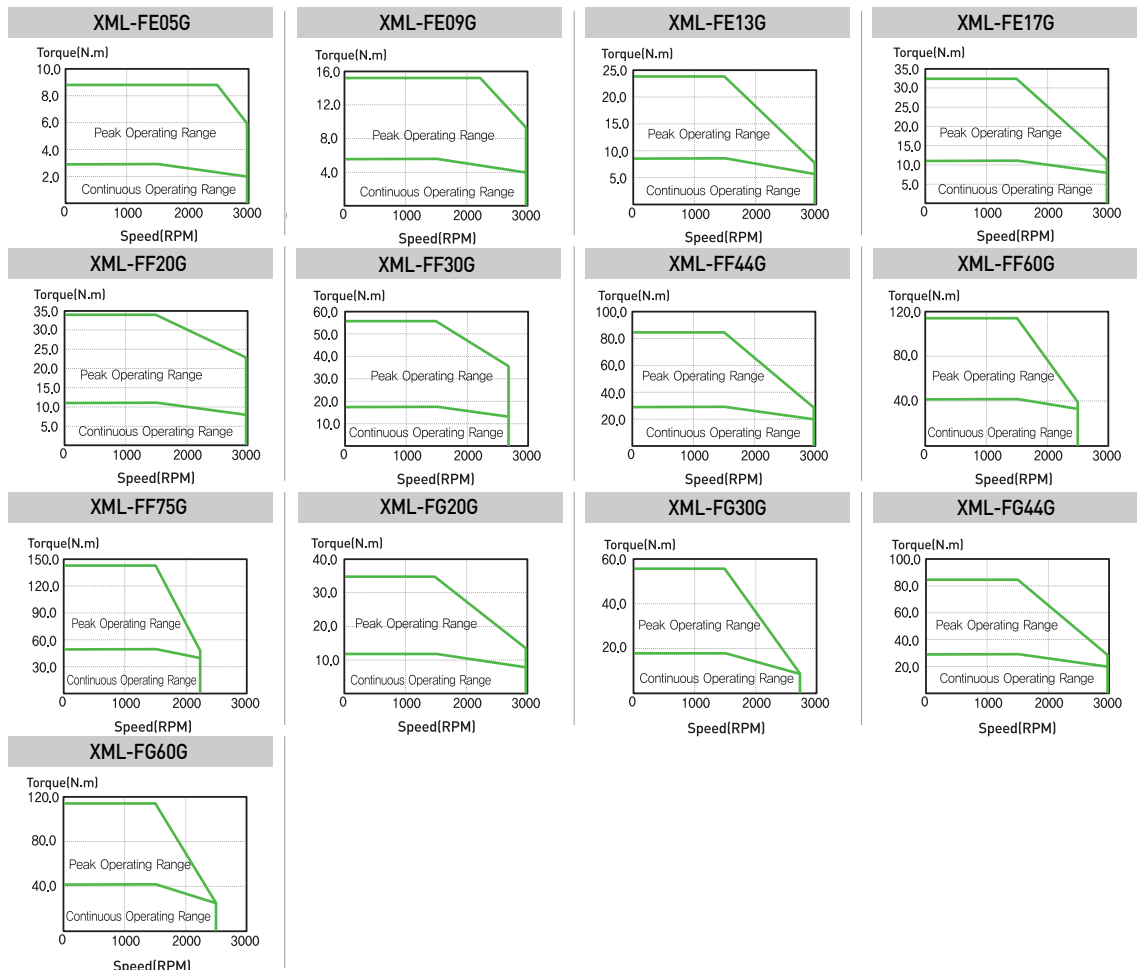


Servo Motor Characteristics (F Series)

Motor Specification [Rated 1500r/min]

Servo Motor [XML-□□□□]	FE05G	FE09G	FE13G	FE17G	FF20G	FF30G	FF44G	FF60G	FF75G	FG20G	FG30G	FG44G	FG60G
Applicable Drive [XDL-L7S(N)□□□□]	A008	A010	A020		A020	A035	A050	A075		A020	A035	A050	A075
Flange Size[□]	□130				□180				□220				
Rated Output [kW]	0.45	0.85	1.3	1.7	1.8	2.9	4.4	6.0	7.5	1.8	2.9	4.4	6.0
Rated Torque	[N · m]												
	2.86	5.41	8.27	10.82	11.45	18.46	28.00	38.20	47.70	11.50	18.50	28.00	38.20
Max. Instantaneous	[N · m]												
	8.59	16.23	24.82	32.46	34.35	55.38	84.03	95.50	143.20	34.40	55.40	84.00	95.50
Rated Speed	[r/min]												
	1500												
Max. Speed	[r/min]												
	3000				2700		3000	2500	2200	3000	2700	3000	2500
Inertia	[kg · m ² X10 ⁻⁴]												
	5.66	10.18	14.62	19.04	27.96	46.56	73.85	106.70	131.30	41.97	71.53	117.72	149.40
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												
	Serial Type 19[Bit]												
Specifications & Features	Option												
	X												
Specifications & Features	Structure												
	Fully closed · Self cooling IP65(excluding the shaft-through section)												
	Ambient Temp												
	Operating : 0~40[°C] Storage : -10~60[°C]												
Specifications & Features	Ambient Humidity												
	Below 20~80[%] (avoid dew-condensation)												
Specifications & Features	Atmosphere												
	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
Weight	E/V												
	Elevation/vibration 49[m/s ²][5G]												
Weight	[kg]												
	5.04	6.74	8.48	10.05	12.5	17.4	25.2	33.8	38.5	15.42	20.22	28.02	33.45

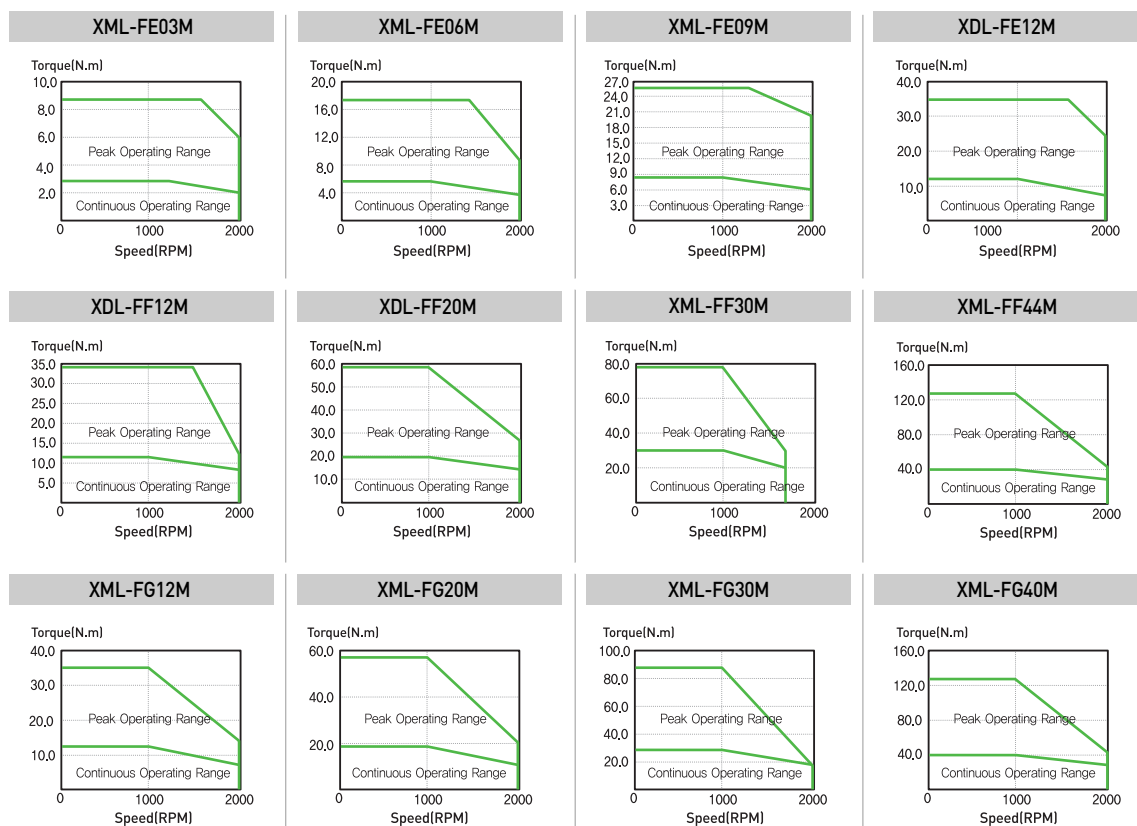
Speed-Torque Characteristics



Motor Specification [Rated 1000r/min]

Servo Motor (XML-□□□□)	FE03M	FE06M	FE09M	FE12M	FF12M	FF20M	FF30M	FF44M	FG12M	FG20M	FG30M	FG44M		
Applicable Drive [XDL-L7S(N)□□□□]	A004	A008	A008		A020		A035	A050		A020	A035	A050		
Flange Size(□)	□130				□180				□220					
Rated Output [kW]	0.3	0.6	0.9	1.2	1.2	2.0	3.0	4.4	1.2	2.0	3.0	4.4		
Rated Torque	[N·m]	2.86	5.72	8.59	11.46	11.46	19.09	28.64	42.02	11.50	19.10	28.60	42.00	
	[kgf·cm]	29.22	58.40	87.70	116.90	116.90	194.80	292.20	428.70	116.90	194.90	292.30	428.70	
Max. Instantaneous	[N·m]	8.59	17.18	25.77	34.22	34.38	57.29	85.94	126.10	34.40	57.30	85.90	126.00	
	[kgf·cm]	87.66	175.30	262.90	349.10	350.70	584.40	876.60	1286.00	350.80	584.60	876.90	1286.10	
Rated Speed [r/min]	1000													
Max.Speed [r/min]	2000				1700				2000				1700	2000
Inertia	[kg·m ² X10 ⁻⁴]	5.66	10.18	14.62	19.04	27.96	46.56	73.85	106.70	41.13	71.53	117.72	149.40	
	[gf·cm·s ²]	5.77	10.39	14.92	19.43	28.53	47.51	75.36	108.90	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	32.22	50.48	68.91	46.94	78.27	111.04	165.38	31.91	51	69.7	118.14		
Speed/Position Detector	Standard	Serial Type 19[Bit]												
	Option	X												
Specifications & Features	Structure	Fully closed · Self cooling IP65(excluding the shaft-through section)												
	Ambient Temp	Operating : 0~40[°C] Storage : -10~60[°C]												
	Ambient Humidity	Below 20~80[%] (avoid dew-condensation)												
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust.												
	E/V	Elevation/vibration 49[m/s ²][5G]												
Weight [kg]	5.04	6.74	8.48	10.05	12.5	17.4	25.2	33.8	15.4	20.22	28.02	33.45		

Speed-Torque Characteristics





Options and Peripherals

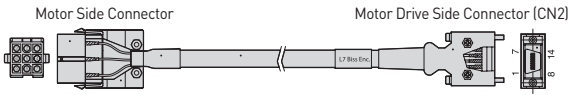
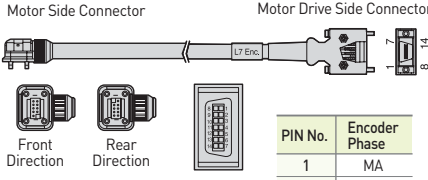
Specifications for Options [Incremental Encoder Cable]

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications																																																																								
For Signal	Quadrature Type Incremental Encoder Cable (for small power motor)	XLCS - E□□□AS	All models of XML - SA XML - SB XML - SC XML - HB SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>A</td><td>9</td><td>V</td><td>1</td><td>W</td><td>8</td><td>Z</td></tr> <tr><td>2</td><td>\bar{A}</td><td>10</td><td>\bar{V}</td><td>2</td><td>\bar{W}</td><td>9</td><td>\bar{Z}</td></tr> <tr><td>3</td><td>B</td><td>11</td><td>W</td><td>3</td><td>V</td><td>10</td><td>\bar{B}</td></tr> <tr><td>4</td><td>\bar{B}</td><td>12</td><td>\bar{W}</td><td>4</td><td>\bar{V}</td><td>11</td><td>B</td></tr> <tr><td>5</td><td>Z</td><td>13</td><td>+5V</td><td>5</td><td>U</td><td>12</td><td>\bar{A}</td></tr> <tr><td>6</td><td>\bar{Z}</td><td>14</td><td>OV</td><td>6</td><td>\bar{U}</td><td>13</td><td>A</td></tr> <tr><td>7</td><td>U</td><td>15</td><td>SHIELD</td><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr> <tr><td>8</td><td>\bar{U}</td><td></td><td></td><td></td><td>PLATE</td><td></td><td>SHIELD</td></tr> </tbody> </table> <p>[Motor side connector] [Motor side connector]</p> <ol style="list-style-type: none"> Motor Side Connector <ul style="list-style-type: none"> • CAP Spec. (15 Position) : 172163-1(Made by AMP) • SOCKET Spec. : 170361-1(Made by AMP) Drive Side Connector (CN2) <ul style="list-style-type: none"> • CASE Spec. : 10314-52A0-008 (Made by 3M) or SM-14J(Made by Suntone) • CONNECTOR Spec. : 10114-3000VE (Made by 3M) or SM-14J(Made by Suntone) Cable Spec. : 7P×0.25Q or 7P×AWG24 	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	1	A	9	V	1	W	8	Z	2	\bar{A}	10	\bar{V}	2	\bar{W}	9	\bar{Z}	3	B	11	W	3	V	10	\bar{B}	4	\bar{B}	12	\bar{W}	4	\bar{V}	11	B	5	Z	13	+5V	5	U	12	\bar{A}	6	\bar{Z}	14	OV	6	\bar{U}	13	A	7	U	15	SHIELD	7	OV	14	+5V	8	\bar{U}				PLATE		SHIELD
				PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																																	
1	A	9	V	1	W	8	Z																																																																					
2	\bar{A}	10	\bar{V}	2	\bar{W}	9	\bar{Z}																																																																					
3	B	11	W	3	V	10	\bar{B}																																																																					
4	\bar{B}	12	\bar{W}	4	\bar{V}	11	B																																																																					
5	Z	13	+5V	5	U	12	\bar{A}																																																																					
6	\bar{Z}	14	OV	6	\bar{U}	13	A																																																																					
7	U	15	SHIELD	7	OV	14	+5V																																																																					
8	\bar{U}				PLATE		SHIELD																																																																					
For Signal	Quadrature Type Cable for Incremental Encoder (for middle power motor)	XLCS- E□□□BS	All models of XML-SE XML-SF XML-SG XML-LF XML-LG XML-HE SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>A</td><td>A</td><td>M</td><td>V</td><td>1</td><td>W</td><td>8</td><td>\bar{Z}</td></tr> <tr><td>B</td><td>\bar{A}</td><td>N</td><td>\bar{V}</td><td>2</td><td>\bar{W}</td><td>9</td><td>Z</td></tr> <tr><td>C</td><td>B</td><td>P</td><td>W</td><td>3</td><td>V</td><td>10</td><td>\bar{B}</td></tr> <tr><td>D</td><td>\bar{B}</td><td>R</td><td>\bar{W}</td><td>4</td><td>\bar{V}</td><td>11</td><td>B</td></tr> <tr><td>E</td><td>Z</td><td>H</td><td>+5V</td><td>5</td><td>U</td><td>12</td><td>\bar{A}</td></tr> <tr><td>F</td><td>\bar{Z}</td><td>G</td><td>OV</td><td>6</td><td>\bar{U}</td><td>13</td><td>A</td></tr> <tr><td>K</td><td>U</td><td>J</td><td>SHIELD</td><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr> <tr><td>L</td><td>\bar{U}</td><td></td><td></td><td></td><td>PLATE</td><td></td><td>SHIELD</td></tr> </tbody> </table> <p>[Motor side connector] [Motor side connector]</p> <ol style="list-style-type: none"> Motor Side Connector (MS : Military Standard) <ul style="list-style-type: none"> • PLUG Spec. : MS3108A20-29S Drive Side Connector (CN2) <ul style="list-style-type: none"> • CASE Spec. : 10314-52A0-008 (Made by 3M) or SM-14J(Made by Suntone) • CONNECTOR Spec. : 10114-3000VE (Made by 3M) or SM-14J(Made by Suntone) Cable Spec. : 7P×0.25Q (AWG24) 	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	A	A	M	V	1	W	8	\bar{Z}	B	\bar{A}	N	\bar{V}	2	\bar{W}	9	Z	C	B	P	W	3	V	10	\bar{B}	D	\bar{B}	R	\bar{W}	4	\bar{V}	11	B	E	Z	H	+5V	5	U	12	\bar{A}	F	\bar{Z}	G	OV	6	\bar{U}	13	A	K	U	J	SHIELD	7	OV	14	+5V	L	\bar{U}				PLATE		SHIELD
PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																																					
A	A	M	V	1	W	8	\bar{Z}																																																																					
B	\bar{A}	N	\bar{V}	2	\bar{W}	9	Z																																																																					
C	B	P	W	3	V	10	\bar{B}																																																																					
D	\bar{B}	R	\bar{W}	4	\bar{V}	11	B																																																																					
E	Z	H	+5V	5	U	12	\bar{A}																																																																					
F	\bar{Z}	G	OV	6	\bar{U}	13	A																																																																					
K	U	J	SHIELD	7	OV	14	+5V																																																																					
L	\bar{U}				PLATE		SHIELD																																																																					

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	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

Specifications for Options [Serial Encoder Cable]

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications																																																												
For Signal	Cable for Serial Type Encoder (For small power motor)	XLCS-E□□□CS	All models of XML-SA XML-SB XML-SC SERIES	 <table border="1" data-bbox="805 649 1197 907"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>MA</td><td>1</td><td>-</td><td>8</td><td>-</td></tr> <tr><td>2</td><td>MĀ</td><td>2</td><td>-</td><td>9</td><td>-</td></tr> <tr><td>3</td><td>SLO</td><td>3</td><td>MA</td><td>10</td><td>-</td></tr> <tr><td>4</td><td>SLŌ</td><td>4</td><td>MĀ</td><td>11</td><td>-</td></tr> <tr><td>5</td><td>-</td><td>5</td><td>SLO</td><td>12</td><td>-</td></tr> <tr><td>6</td><td>-</td><td>6</td><td>SLŌ</td><td>13</td><td>-</td></tr> <tr><td>7</td><td>+5V</td><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr> <tr><td>8</td><td>OV</td><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr> <tr><td>9</td><td>SHIELD</td><td colspan="4">[Motor side connector]</td></tr> </tbody> </table> <p data-bbox="805 896 925 913">[Motor side connector]</p> <p data-bbox="805 963 1324 1164"> 1. Motor Side Connector • CAP Spec. (9 Position) : 172161-1 (Made by AMP) • SOCKET Spec: 170361-1 (Made by AMP) 2. Drive Side Connector (CN2) • CASE Spec: 10314-52A0-008(3M) or SM-14J (Made by Suntone) • CONNECTOR Spec: 10114-3000VE(3M) or SM-14J (Made by Suntone) 3. Cable Spec. : 3P×0.25Q or 3P×24AWG </p>	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	1	MA	1	-	8	-	2	MĀ	2	-	9	-	3	SLO	3	MA	10	-	4	SLŌ	4	MĀ	11	-	5	-	5	SLO	12	-	6	-	6	SLŌ	13	-	7	+5V	7	OV	14	+5V	8	OV	PLATE		SHIELD		9	SHIELD	[Motor side connector]			
				PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																							
1	MA	1	-	8	-																																																											
2	MĀ	2	-	9	-																																																											
3	SLO	3	MA	10	-																																																											
4	SLŌ	4	MĀ	11	-																																																											
5	-	5	SLO	12	-																																																											
6	-	6	SLŌ	13	-																																																											
7	+5V	7	OV	14	+5V																																																											
8	OV	PLATE		SHIELD																																																												
9	SHIELD	[Motor side connector]																																																														
For Signal	Flat Motor Encoder Cable (For small power motor)	XLCS-E□□□ES-□ ^{Note)} Model name for direction of Connector Front : XLCS-E□□□ES Rear : XLCS-E□□□ES-R	All models of XML-FB XML-FC SERIES	 <table border="1" data-bbox="1053 1355 1444 1624"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>MA</td><td>1</td><td>-</td><td>8</td><td>-</td></tr> <tr><td>2</td><td>SLO</td><td>2</td><td>-</td><td>9</td><td>-</td></tr> <tr><td>3</td><td>-</td><td>3</td><td>MA</td><td>10</td><td>-</td></tr> <tr><td>4</td><td>OV</td><td>4</td><td>MĀ</td><td>11</td><td>-</td></tr> <tr><td>5</td><td>SHIELD</td><td>5</td><td>SLO</td><td>12</td><td>-</td></tr> <tr><td>6</td><td>MA</td><td>6</td><td>SLŌ</td><td>13</td><td>-</td></tr> <tr><td>7</td><td>SLŌ</td><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr> <tr><td>8</td><td>-</td><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr> <tr><td>9</td><td>+5V</td><td colspan="4">[Motor side connector]</td></tr> </tbody> </table> <p data-bbox="1053 1601 1173 1619">[Motor side connector]</p> <p data-bbox="782 1646 1388 1848"> 1. Motor Side Connector • Cap Spec. : 2201825-1 (Made by Tyco) • Socket Spec. : 2174065-4 (Made by Tyco) 2. Drive Side Connector (CN2) • CASE Spec. : 10314-52A0-008 (Made by 3M) or SM-14J (Made by Suntone) • CONNECTOR Spec. : 10114-3000VE (Made by 3M) or SM-14J (Made by Suntone) 3. Cable Spec. : 4P×0.25Q (AWG24) </p>	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	1	MA	1	-	8	-	2	SLO	2	-	9	-	3	-	3	MA	10	-	4	OV	4	MĀ	11	-	5	SHIELD	5	SLO	12	-	6	MA	6	SLŌ	13	-	7	SLŌ	7	OV	14	+5V	8	-	PLATE		SHIELD		9	+5V	[Motor side connector]			
PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																											
1	MA	1	-	8	-																																																											
2	SLO	2	-	9	-																																																											
3	-	3	MA	10	-																																																											
4	OV	4	MĀ	11	-																																																											
5	SHIELD	5	SLO	12	-																																																											
6	MA	6	SLŌ	13	-																																																											
7	SLŌ	7	OV	14	+5V																																																											
8	-	PLATE		SHIELD																																																												
9	+5V	[Motor side connector]																																																														

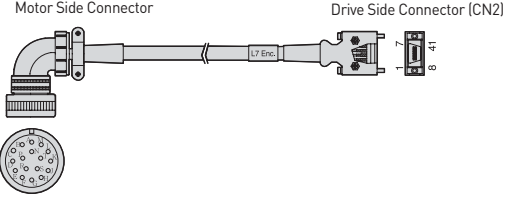
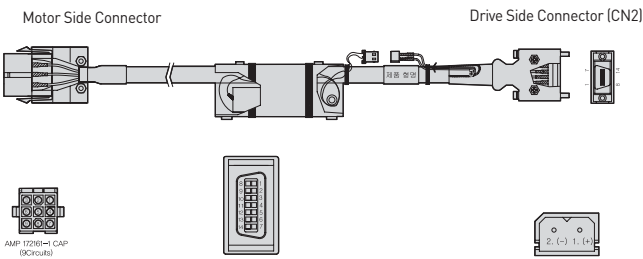
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

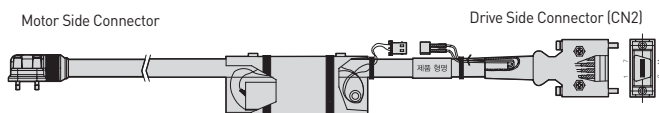
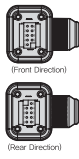

Cable Length(m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

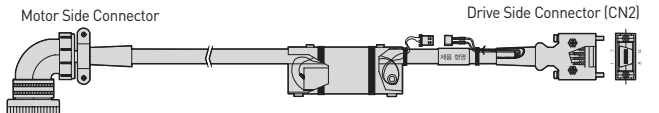




Options and Peripherals

Specifications for Options [Serial Encoder Cable]

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications																																																																																
For Signal	Cable for Serial Type Encoder (For middle power motor)	XLCS- E □□□DS	All models of XML-SE XML-SF XML-SG XML-LF XML-LG XML-FE XML-FF XML-FG SERIES	 <table border="1" data-bbox="890 761 1356 985"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>MA</td> <td>M</td> <td>-</td> <td>1</td> <td>-</td> <td>8</td> <td>-</td> </tr> <tr> <td>B</td> <td>MA</td> <td>N</td> <td>-</td> <td>2</td> <td>-</td> <td>9</td> <td>-</td> </tr> <tr> <td>C</td> <td>SLO</td> <td>P</td> <td>-</td> <td>3</td> <td>MA</td> <td>10</td> <td>-</td> </tr> <tr> <td>D</td> <td>SLO</td> <td>R</td> <td>-</td> <td>4</td> <td>MA</td> <td>11</td> <td>-</td> </tr> <tr> <td>E</td> <td>-</td> <td>H</td> <td>+5V</td> <td>5</td> <td>SLO</td> <td>12</td> <td>-</td> </tr> <tr> <td>F</td> <td>-</td> <td>G</td> <td>OV</td> <td>6</td> <td>SLO</td> <td>13</td> <td>-</td> </tr> <tr> <td>K</td> <td>-</td> <td>J</td> <td>SHIELD</td> <td>7</td> <td>OV</td> <td>14</td> <td>+5V</td> </tr> <tr> <td>L</td> <td>-</td> <td></td> <td></td> <td></td> <td>PLATE</td> <td></td> <td>SHIELD</td> </tr> </tbody> </table> <p data-bbox="782 1041 1388 1220"> 1. Motor Side Connector (MS : Military Standard) • PLUG Spec. : MS3108B20-29S 2. Drive Side Connector (CN2) • CASE Spec. : 10314-52A0-008 (Made by 3M) or SM-14J(Made by Suntone) • CONNECTOR Spec. : 10114-3000VE (Made by 3M) or SM-14J(Made by Suntone) 3. Cable Spec. : 4Px0.25Q(AWG24) </p>	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	A	MA	M	-	1	-	8	-	B	MA	N	-	2	-	9	-	C	SLO	P	-	3	MA	10	-	D	SLO	R	-	4	MA	11	-	E	-	H	+5V	5	SLO	12	-	F	-	G	OV	6	SLO	13	-	K	-	J	SHIELD	7	OV	14	+5V	L	-				PLATE		SHIELD								
				PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																																									
A	MA	M	-	1	-	8	-																																																																													
B	MA	N	-	2	-	9	-																																																																													
C	SLO	P	-	3	MA	10	-																																																																													
D	SLO	R	-	4	MA	11	-																																																																													
E	-	H	+5V	5	SLO	12	-																																																																													
F	-	G	OV	6	SLO	13	-																																																																													
K	-	J	SHIELD	7	OV	14	+5V																																																																													
L	-				PLATE		SHIELD																																																																													
For Signal	Encoder Cable for Multi-turn Serial Type (AMP Type-Small Capacity)	XLCS- E □□□CS1	All models of XML-SA Available soon XML-SB XML-SC SERIES	 <table border="1" data-bbox="790 1601 1412 1825"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>MA</td> <td>1</td> <td>-</td> <td>8</td> <td>-</td> <td>1</td> <td>BATTERY (VDD_B)</td> </tr> <tr> <td>2</td> <td>MA</td> <td>2</td> <td>-</td> <td>9</td> <td>-</td> <td>2</td> <td>BATTERY OV (GND_B)</td> </tr> <tr> <td>3</td> <td>SL</td> <td>3</td> <td>MA</td> <td>10</td> <td>-</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>SL</td> <td>4</td> <td>MA</td> <td>11</td> <td>-</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>VOD_B</td> <td>5</td> <td>SLO</td> <td>12</td> <td>-</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>GND_B</td> <td>6</td> <td>SLO</td> <td>13</td> <td>-</td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>+5V</td> <td>7</td> <td>OV</td> <td>14</td> <td>+5V</td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>OV</td> <td></td> <td>PLATE</td> <td></td> <td>SHIELD</td> <td></td> <td></td> </tr> <tr> <td>9</td> <td>SHIELD</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p data-bbox="790 1870 1388 2072"> 1. Motor Side Connector • CAP Spec.(9 Position) : 172161-1(Made by AMP) • SOCKET Spec. : 170361-1(Made by AMP) 2. Drive Side Connector(CN2) • CASE Spec. : 10314-52A0-008(Made by 3M) or SM-14J(Made by Suntone) • CONNECTOR Spec. : 10114-3000VE(Made by 3M) or SM-14J(Made by Suntone) 3. Cable Spec. : 4P×0.25Q or 4P×24AWG 4. BATTERY CONNECTOR Spec. : 5267-02A(Made by MOLEX) </p>	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	1	MA	1	-	8	-	1	BATTERY (VDD_B)	2	MA	2	-	9	-	2	BATTERY OV (GND_B)	3	SL	3	MA	10	-			4	SL	4	MA	11	-			5	VOD_B	5	SLO	12	-			6	GND_B	6	SLO	13	-			7	+5V	7	OV	14	+5V			8	OV		PLATE		SHIELD			9	SHIELD						
PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																																													
1	MA	1	-	8	-	1	BATTERY (VDD_B)																																																																													
2	MA	2	-	9	-	2	BATTERY OV (GND_B)																																																																													
3	SL	3	MA	10	-																																																																															
4	SL	4	MA	11	-																																																																															
5	VOD_B	5	SLO	12	-																																																																															
6	GND_B	6	SLO	13	-																																																																															
7	+5V	7	OV	14	+5V																																																																															
8	OV		PLATE		SHIELD																																																																															
9	SHIELD																																																																																			

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications																																																														
For Signal	Encoder Cable for Multi-turn Serial Type (Small Capacity)	XLCS-E□□□ ES1-□ Note) Model name for direction of Connector Front : XLCS-E□□□ES1 Rear : XLCS-E□□□ES1-R	All models of XML-FB XML-FC SERIES	  <table border="1" data-bbox="861 705 997 952"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>MA</td></tr> <tr><td>2</td><td>SLO</td></tr> <tr><td>3</td><td>GND_B</td></tr> <tr><td>4</td><td>OV</td></tr> <tr><td>5</td><td>SHELD</td></tr> <tr><td>6</td><td>MA</td></tr> <tr><td>7</td><td>SLO</td></tr> <tr><td>8</td><td>VOD_B</td></tr> <tr><td>9</td><td>+5V</td></tr> </tbody> </table> <table border="1" data-bbox="1077 705 1300 929"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>-</td><td>8</td><td>-</td></tr> <tr><td>2</td><td>-</td><td>9</td><td>-</td></tr> <tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr> <tr><td>4</td><td>MA</td><td>11</td><td>-</td></tr> <tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr> <tr><td>6</td><td>SLO</td><td>13</td><td>-</td></tr> <tr><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr> <tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr> </tbody> </table>  <table border="1" data-bbox="1324 750 1436 907"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>BATTERY (VDD_B)</td></tr> <tr><td>2</td><td>BATTERY OV (GND_B)</td></tr> </tbody> </table> (Battery Connector)	PIN No.	Encoder Phase	1	MA	2	SLO	3	GND_B	4	OV	5	SHELD	6	MA	7	SLO	8	VOD_B	9	+5V	PIN No.	Encoder Phase	PIN No.	Encoder Phase	1	-	8	-	2	-	9	-	3	MA	10	-	4	MA	11	-	5	SLO	12	-	6	SLO	13	-	7	OV	14	+5V	PLATE		SHIELD		PIN No.	Encoder Phase	1	BATTERY (VDD_B)	2	BATTERY OV (GND_B)
				PIN No.	Encoder Phase																																																													
1	MA																																																																	
2	SLO																																																																	
3	GND_B																																																																	
4	OV																																																																	
5	SHELD																																																																	
6	MA																																																																	
7	SLO																																																																	
8	VOD_B																																																																	
9	+5V																																																																	
PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																															
1	-	8	-																																																															
2	-	9	-																																																															
3	MA	10	-																																																															
4	MA	11	-																																																															
5	SLO	12	-																																																															
6	SLO	13	-																																																															
7	OV	14	+5V																																																															
PLATE		SHIELD																																																																
PIN No.	Encoder Phase																																																																	
1	BATTERY (VDD_B)																																																																	
2	BATTERY OV (GND_B)																																																																	
<ol style="list-style-type: none"> Motor Side Connector <ul style="list-style-type: none"> Cap Spec. : 2201825-1(Made by Tyco) Socket Spec. : 2174065-4(Made by Tyco) Drive Side Connector(CN2) <ul style="list-style-type: none"> CASE Spec. : 10314-52A0-008 (Made by 3M) or SM-14J(Made by Suntone) CONNECTOR Spec. : 10114-3000VE (Made by 3M) or SM-14J(Made by Suntone) Cable Spec. : 4P×0.25Q or 4P×24AWG BATTERY CONNECTOR Spec. : 5267-02A(Made by MOLEX) 																																																																		

For Signal	Encoder Cable for Multi-turn Serial Type (Middle Capacity)	XLCS-E□□□DS1	All models of XML-SE XML-SF XML-SG XML-LF XML-LG XML-FE XML-FF XML-FG SERIES	  <table border="1" data-bbox="774 1467 925 1691"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>A</td><td>MA</td><td>M</td><td>-</td></tr> <tr><td>B</td><td>MA</td><td>N</td><td>-</td></tr> <tr><td>C</td><td>SLO</td><td>P</td><td>-</td></tr> <tr><td>D</td><td>SLO</td><td>R</td><td>-</td></tr> <tr><td>E</td><td>VOD_B</td><td>H</td><td>+5V</td></tr> <tr><td>F</td><td>GND_B</td><td>G</td><td>OV</td></tr> <tr><td>G</td><td>-</td><td>J</td><td>SHELD</td></tr> <tr><td>L</td><td>-</td><td></td><td></td></tr> </tbody> </table> <table border="1" data-bbox="1005 1467 1236 1691"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>-</td><td>8</td><td>-</td></tr> <tr><td>2</td><td>-</td><td>9</td><td>-</td></tr> <tr><td>3</td><td>MA</td><td>10</td><td>-</td></tr> <tr><td>4</td><td>MA</td><td>11</td><td>-</td></tr> <tr><td>5</td><td>SLO</td><td>12</td><td>-</td></tr> <tr><td>6</td><td>SLO</td><td>13</td><td>-</td></tr> <tr><td>7</td><td>OV</td><td>14</td><td>+5V</td></tr> <tr><td colspan="2">PLATE</td><td colspan="2">SHIELD</td></tr> </tbody> </table>  <table border="1" data-bbox="1300 1467 1428 1624"> <thead> <tr> <th>PIN No.</th> <th>Encoder Phase</th> </tr> </thead> <tbody> <tr><td>1</td><td>BATTERY (VDD_B)</td></tr> <tr><td>2</td><td>BATTERY OV (GND_B)</td></tr> </tbody> </table> (Battery Connector)	PIN No.	Encoder Phase	PIN No.	Encoder Phase	A	MA	M	-	B	MA	N	-	C	SLO	P	-	D	SLO	R	-	E	VOD_B	H	+5V	F	GND_B	G	OV	G	-	J	SHELD	L	-			PIN No.	Encoder Phase	PIN No.	Encoder Phase	1	-	8	-	2	-	9	-	3	MA	10	-	4	MA	11	-	5	SLO	12	-	6	SLO	13	-	7	OV	14	+5V	PLATE		SHIELD		PIN No.	Encoder Phase	1	BATTERY (VDD_B)	2	BATTERY OV (GND_B)
				PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																																											
A	MA	M	-																																																																															
B	MA	N	-																																																																															
C	SLO	P	-																																																																															
D	SLO	R	-																																																																															
E	VOD_B	H	+5V																																																																															
F	GND_B	G	OV																																																																															
G	-	J	SHELD																																																																															
L	-																																																																																	
PIN No.	Encoder Phase	PIN No.	Encoder Phase																																																																															
1	-	8	-																																																																															
2	-	9	-																																																																															
3	MA	10	-																																																																															
4	MA	11	-																																																																															
5	SLO	12	-																																																																															
6	SLO	13	-																																																																															
7	OV	14	+5V																																																																															
PLATE		SHIELD																																																																																
PIN No.	Encoder Phase																																																																																	
1	BATTERY (VDD_B)																																																																																	
2	BATTERY OV (GND_B)																																																																																	
<ol style="list-style-type: none"> Motor Side Connector (MS : Military Standard) <ul style="list-style-type: none"> PLUG Spec. : MS3108B20-29S Drive Side Connector(CN2) <ul style="list-style-type: none"> CASE Spec. : 10314-52A0-008 (Made by 3M) or SM-14J(Made by Suntone) CONNECTOR Spec. : 10114-3000VE (Made by 3M) or SM-14J(Made by Suntone) Cable Spec. : 4P×0.25Q(AWG24) BATTERY CONNECTOR Spec. : 5267-02A(Made by MOLEX) 																																																																																		

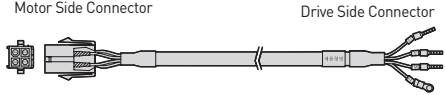
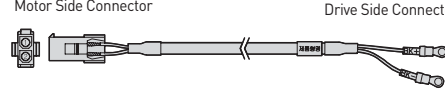
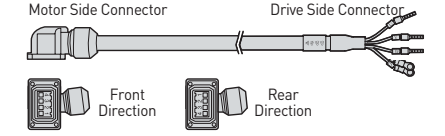
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

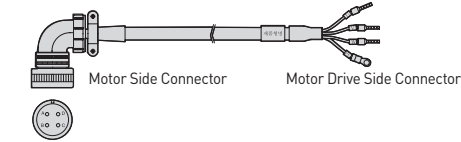
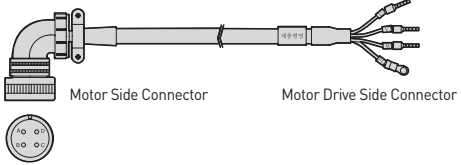
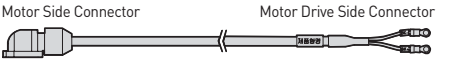
Cable Length(m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20



Options and Peripherals

Specifications for Options [Power Cable]

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications										
For Power	Power Cable (for small power motor)	XLCS- P□□□GS	All models of XML-SA XML-SB XML-SC XML-HB SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>U</td> </tr> <tr> <td>2</td> <td>V</td> </tr> <tr> <td>3</td> <td>W</td> </tr> <tr> <td>4</td> <td>Ground</td> </tr> </tbody> </table> <ol style="list-style-type: none"> Motor Side Connector <ul style="list-style-type: none"> CAP Spec.(4 Position) : 172159-1 (Made by AMP) SOCKET Spec. : 170362-1 (Made by AMP) Drive Side Connector (U, V, W, FG) <ul style="list-style-type: none"> U, V, W Pin Spec. : F1512 FG Pin Spec. : 1.5X4(Ring Terminal) Cable Spec. : 4C×0.75SQ or 4C×18AWG 	PIN No.	Phase	1	U	2	V	3	W	4	Ground
PIN No.	Phase													
1	U													
2	V													
3	W													
4	Ground													
For Power	Brake Cable (for small power motor)	XLCS- P□□□KB	All models of XML-SA XML-SB XML-SC SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>BK+</td> </tr> <tr> <td>2</td> <td>BK-</td> </tr> </tbody> </table> <ol style="list-style-type: none"> Motor Side Connector <ul style="list-style-type: none"> CAP Spec.(2 Position) : 172157-1 (Made by AMP) SOCKET Spec. : 170362-1 (Made by AMP) Drive Side Connector <ul style="list-style-type: none"> CONNECTOR Spec. : 1.5-3(Ring Terminal) Cable Spec. : 2C×0.75SQ or 2C×18AWG 	PIN No.	Phase	1	BK+	2	BK-				
PIN No.	Phase													
1	BK+													
2	BK-													
For Power	Flat Motor Brake Cable (for small power motor)	XLCS- P□□□FS-□ ^{Note)} Model name for direction of Connector Front : XLCS-P □□□FS Rear : XLCS-P □□□FS-R	All models of XML-FB XML-FC SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>W</td> </tr> <tr> <td>2</td> <td>V</td> </tr> <tr> <td>3</td> <td>U</td> </tr> <tr> <td>4</td> <td>Ground</td> </tr> </tbody> </table> <ol style="list-style-type: none"> Motor Side Connector <ul style="list-style-type: none"> PLUG Spec. : KN5FT04SJ1 (Made by JAE) SOCKET Spec. : ST-KN-S-C1B-3500 (Made by JAE) Drive Side Connector (U, V, W, FG) <ul style="list-style-type: none"> U, V, W Pin Spec. : F1512 FG Pin Spec. : 1.5X4(Ring Terminal) Cable Spec. : 4CX0.75SQ or 4C 18AWG 	PIN No.	Phase	1	W	2	V	3	U	4	Ground
PIN No.	Phase													
1	W													
2	V													
3	U													
4	Ground													

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications										
For Power	Power Cable (for middle power motor)	XLCS-P□□□HS	All models of XML-SE XML-FE XML-HE SERIES	 <table border="1" data-bbox="946 667 1410 775"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>U</td> </tr> <tr> <td>B</td> <td>V</td> </tr> <tr> <td>C</td> <td>W</td> </tr> <tr> <td>D</td> <td>Ground</td> </tr> </tbody> </table> <p>1. Motor Side Connector</p> <ul style="list-style-type: none"> • PLUG Spec. : MS3108B20-4S (Made by MS) <p>2. Drive Side Connector</p> <ul style="list-style-type: none"> • U, V, W Pin Spec. : F2512 • FG Pin Spec. : 2.5×4 (Ring Terminal) <p>3. Cable Spec. : 4C×2.55SQ or 4C14AWG</p>	PIN No.	Phase	A	U	B	V	C	W	D	Ground
PIN No.	Phase													
A	U													
B	V													
C	W													
D	Ground													
For Power	Power Cable (for middle power motor)	XLCS-P□□□IS	XML-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	 <table border="1" data-bbox="946 1167 1410 1283"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>U</td> </tr> <tr> <td>B</td> <td>V</td> </tr> <tr> <td>C</td> <td>W</td> </tr> <tr> <td>D</td> <td>Ground</td> </tr> </tbody> </table> <p>1. Motor Side Connector</p> <ul style="list-style-type: none"> • PLUG Spec. : MS3108B22-22S (Made by MS) <p>2. Drive Side Connector</p> <ul style="list-style-type: none"> • U, V, W Pin Spec. : F2512 • FG Pin Spec. : 2.5×4(Ring Terminal) <p>3. Cable Spec. :4C×2.55SQ or 4C14AWG</p>	PIN No.	Phase	A	U	B	V	C	W	D	Ground
PIN No.	Phase													
A	U													
B	V													
C	W													
D	Ground													
For Power	Flat Motor Brake Cable (for small power motor)	XLCS-B□□□QS-□	All models of XML-FB XML-FC SERIES Note1) Model name for direction of Connector Front : XLCS-B□□□QS Rear : XLCS-B□□□QS-R	 <table border="1" data-bbox="1123 1597 1441 1671"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>BK+</td> </tr> <tr> <td>2</td> <td>BK-</td> </tr> </tbody> </table> <p>1. Motor Side Connector</p> <ul style="list-style-type: none"> • PLUG Spec. : KN5FT02SJ1 • SOCKET Spec. : ST-KN-S-C1B-3500 <p>2. Drive Side Connector</p> <ul style="list-style-type: none"> • CONNECTOR Spec. : 1.5×3 <p>3. Cable Spec. : 2C×0.75SQ or 2C×18AWG</p>	PIN No.	Phase	1	BK+	2	BK-				
PIN No.	Phase													
1	BK+													
2	BK-													

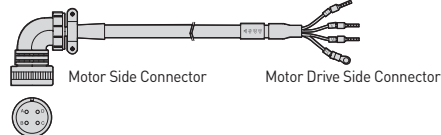
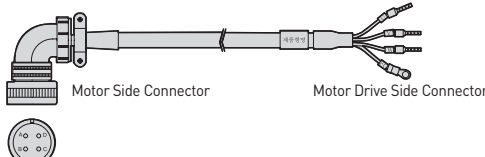
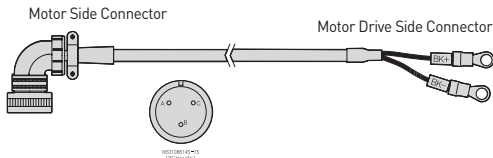
Note1) □□□ of Model Name indicates the kind and length of cable. And the declaration is as below.

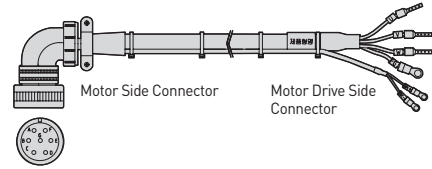
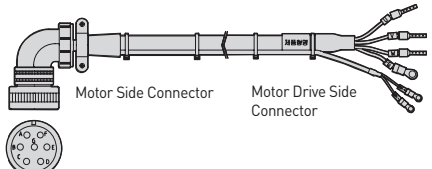
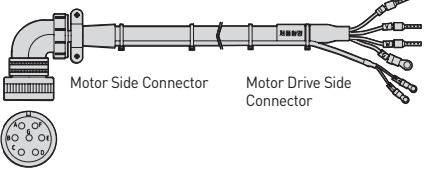
Cable Length(m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20



Options and Peripherals

Specifications for Options [Power Cable]

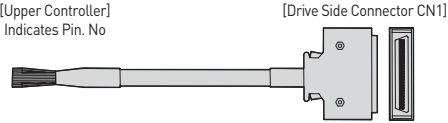
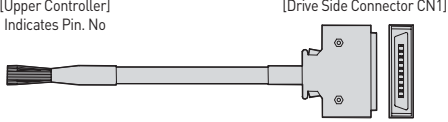
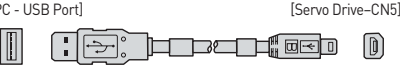
Type	Product Type	Model Name ^[Note1]	Applicable Motor	Specifications										
For Power	Power Cable (for middle power motor)	XLCS- P□□□JS	XML-SF50A SF55D, SF75D SF44G, SF60G SF44M, SG55D SG75D, SG44G SG60G, SG44M FF50A, FF55D FF75D, FF44G FF60G, FF44M FG55D, FG75D FG44G, FG60G FG44M	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>U</td> </tr> <tr> <td>2</td> <td>V</td> </tr> <tr> <td>3</td> <td>W</td> </tr> <tr> <td>4</td> <td>Ground</td> </tr> </tbody> </table> <p>1. Motor Side Connector • PLUG 사양 : MS3108A22-17S(MS사)</p> <p>2. Drive Side Connector • FG Pin Spec. : 5.5×5(KEP GP110026)</p> <p>3. Cable Spec. : 4C×5.5SQ or 4C14AWG</p>	PIN No.	Phase	1	U	2	V	3	W	4	Ground
PIN No.	Phase													
1	U													
2	V													
3	W													
4	Ground													
For Power	Power Cable (for middle power motor)	XLCS- P□□□MS	XML-SG60M SF75G, FF75G	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>U</td> </tr> <tr> <td>2</td> <td>V</td> </tr> <tr> <td>3</td> <td>W</td> </tr> <tr> <td>4</td> <td>Ground</td> </tr> </tbody> </table> <p>1. Motor Side Connector • PLUG Spec. : MS3108A22-17S(Made by MS)</p> <p>2. Drive Side Connector • FG Pin Spec. : 8.0×8(KEP GP140641)</p> <p>3. Cable Spec. : 4C×8.0SQ or 4C8AWG</p>	PIN No.	Phase	1	U	2	V	3	W	4	Ground
PIN No.	Phase													
1	U													
2	V													
3	W													
4	Ground													
For Power	Power Cable (Battery Connector Type)	XLCS- P□□□SB	All models of XML-SG XML-LG XML-FG SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>BK+</td> </tr> <tr> <td>2</td> <td>BK-</td> </tr> </tbody> </table> <p>1. Motor Side Connector • PLUG Spec. : MS3108B 14S-7S(Made by MS)</p> <p>2. Drive Side Connector • FG Pin Spec. : 1.5×3(Ring Terminal)</p> <p>3. Cable Spec. : 2C×0.75SQ or 2C×19AWG</p>	PIN No.	Phase	1	BK+	2	BK-				
PIN No.	Phase													
1	BK+													
2	BK-													

Type	Product Type	Model Name ^{Note1}	Applicable Motor	Specifications																
For Power	Power Cable (Battery Connector Type)	XLCS- P□□□NB	All models of XML-SE XML-FE SERIES	 <table border="1" data-bbox="954 683 1423 779"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>U</td> <td>D</td> <td>Ground</td> </tr> <tr> <td>B</td> <td>V</td> <td>E</td> <td>BK+</td> </tr> <tr> <td>C</td> <td>W</td> <td>F</td> <td>BK-</td> </tr> </tbody> </table> <p>1. Motor Side Connector</p> <ul style="list-style-type: none"> • PLUG Spec. : MS3108B20-15S (Made by MS) <p>2. Drive Side Connector</p> <ul style="list-style-type: none"> • U, V, W Pin Spec. : F2012 • Cable Spec. : 4C×2.5SQ or 4C×14AWG • FG Pin Spec. : 2.5×4(Ring Terminal) <p>3. Break the power connection. :</p> <ul style="list-style-type: none"> • BK Pin Spec. : 1.5×3 (Ring Terminal) • Cable Spec. : 2C×0.75SQ or 2C×18AWG 	PIN No.	Phase	PIN No.	Phase	A	U	D	Ground	B	V	E	BK+	C	W	F	BK-
PIN No.	Phase	PIN No.	Phase																	
A	U	D	Ground																	
B	V	E	BK+																	
C	W	F	BK-																	
For Power	Power Cable (Battery Connector Type)	XLCS- P□□□PB	XML-SF30A SF22D, LF35D SF20G, LF30G SF12M, SF20M LF30M, FF30A FF22D, FF35D FF20G, FF30G FF12M, FF20M FF30M	 <table border="1" data-bbox="954 1198 1423 1294"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>U</td> <td>D</td> <td>Ground</td> </tr> <tr> <td>B</td> <td>V</td> <td>E</td> <td>BK+</td> </tr> <tr> <td>C</td> <td>W</td> <td>F</td> <td>BK-</td> </tr> </tbody> </table> <p>1. Motor Side Connector</p> <ul style="list-style-type: none"> • PLUG Spec. : MS3108B24-10S (Made by MS) <p>2. Drive Side Connector</p> <ul style="list-style-type: none"> • U, V, W Pin Spec. : F2512 • Cable Spec. : 4C×2.5SQ or 4C×2.5AWG • FG Pin Spec. : 2.5×4(Ring Terminal) <p>3. Break the power connection. :</p> <ul style="list-style-type: none"> • BK Pin Spec. : 1.5×3 (Ring Terminal) • Cable Spec. : 2C×0.75SQ or 2C×18AWG 	PIN No.	Phase	PIN No.	Phase	A	U	D	Ground	B	V	E	BK+	C	W	F	BK-
PIN No.	Phase	PIN No.	Phase																	
A	U	D	Ground																	
B	V	E	BK+																	
C	W	F	BK-																	
For Power	Power Cable (Battery Connector Type)	XLCS- P□□□LB	XML-SF50A SF55D, SF75D SF44G, SF60G SF44M, FF50A FF50D, FF75D FF44G, FF60G FF40M	 <table border="1" data-bbox="1244 1680 1444 1848"> <thead> <tr> <th>PIN No.</th> <th>Phase</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>U</td> </tr> <tr> <td>B</td> <td>V</td> </tr> <tr> <td>C</td> <td>W</td> </tr> <tr> <td>D</td> <td>Ground</td> </tr> <tr> <td>E</td> <td>BK+</td> </tr> <tr> <td>F</td> <td>BK-</td> </tr> </tbody> </table> <p>1. Motor Side Connector</p> <ul style="list-style-type: none"> • PLUG Spec. : MS3108A24-10S(Made by MS) <p>2. Drive Side Connector</p> <ul style="list-style-type: none"> • FG Pin Spec. : 5.5×5(KEP GP110028) • 4C×5.5SQ or 4C×10AWG <p>3. Break the power connection. :</p> <ul style="list-style-type: none"> • FG Pin Spec. : 1.25×3(KEP GP110012) • Cable Spec. : 2C×0.75SQ or 2C8AWG 	PIN No.	Phase	A	U	B	V	C	W	D	Ground	E	BK+	F	BK-		
PIN No.	Phase																			
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.

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

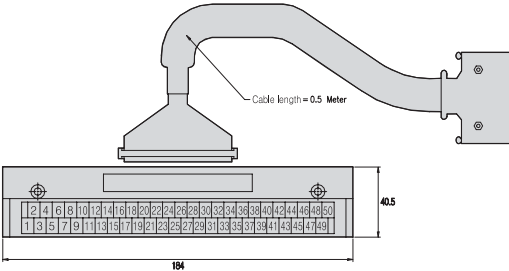
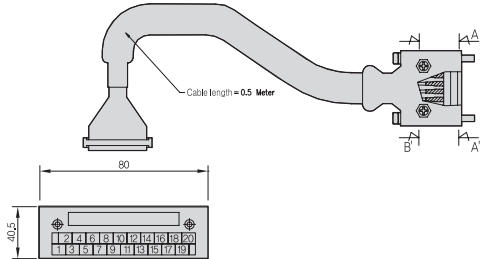
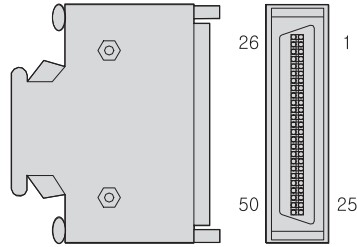
Specifications for Options [Signal Cable]

Type	Product Type	Model Name ^[Note1]	Applicable Motor	Specifications							
For Signal	CN1 Cable	XLC- CN1 □□A	XDL-S SERIES	 <p>[Upper Controller] Indicates Pin. No</p> <p>[Drive Side Connector CN1]</p> <p>Drive Side Connector (CN1)</p> <ul style="list-style-type: none"> • CASE Spec. : 10350-52A0-008 (Made by 3M) • CONNECTOR Spec. : 10150-3000VE (Made by 3M) • CABLE Spec. : 20276-SB 25P(AWG28) 							
	Pin Number										
	NO	I/O Signal	NO		I/O Signal	NO	I/O Signal	NO	I/O Signal	NO	I/O Signal
	1	TRQCOM	11		PR+	21	SPD3	31	/BO	41	RDY-
	2	REFCOM	12		PR-	22	SPD2	32	AO	42	TLOUT
	3	PZO	13		PCON	23	SPD1	33	/AO	43	ZSPD
	4	ZO	14		GAIN2[SEN]	24	GND	34	+15V	44	BRAKE
	5	/ZO	15		PCLEAR	25	GND	35	-15V	45	INSPD/INPOS
	6	SRO	16		TLIMIT	26	SETCOM	36	GND	46	DIR
	7	/SRO	17		ALMRST	27	SPDCOM	37	GND	47	SVON
	8	GND	18		EMG	28	MONIT1	38	ALARM+	48	STOP
9	RF+	19	CWLIM	29	MONIT2	39	ALARM-	49	PULCOM		
10	PF-	20	CCWLIM	30	BO	40	RDY+	50	+24Vin		
For Signal	CN1 Cable	XLCS- CN1 □□A	XDL-N SERIES	 <p>[Upper Controller] Indicates Pin. No</p> <p>[Drive Side Connector CN1]</p> <p>Drive Side Connector (CN1)</p> <ul style="list-style-type: none"> • CASE Spec. : 10320-52A0-008 (Made by 3M) • CONNECTOR Spec. : 10120-3000VE (Made by 3M) 							
	Pin Number										
	NO	PIN Function	NO		PIN Function	NO	PIN Function	NO	PIN Function		
	1	BRAKE+	6		24V	11	HOME	16	Spare Pin		
	2	BRAKE-	7		CWL	12	ALMRST	17	RDY+		
	3	ALARM+	8		CCWL	13	DI1	18	RDY-		
4	ALARM-	9	PROBE1	14	DI2	19	DO1+				
5	Spare Pin	10	PROBE2	15	Spare Pin	20	DO1-				
For Signal	Communication Cable	XLC-CN5L7U	All models of XDL-S, XDL-N, SERIES	 <p>[PC - USB Port]</p> <p>[Servo Drive-CN5]</p> <ol style="list-style-type: none"> 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, Made by SANWA) 4. Available Cable Length : 1.8m 							

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

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

Specifications for Options [Connector]

Type	Product Type	Model Name ^(Note1)	Applicable Motor	Specifications
T/B	CN1 T/B	XLC-VSCN1T-□□	XDL-S SERIES	 <p>• 1. Extended CN1 T/B for VS/L7S • Available Cable Length : 0.5[m], 1[m], 1.5[m], 2[m], 3[m]</p>
	CN1 T/B	XLCS-L7NCN1T-□□	XDL-N SERIES	 <p>• Extended CN1 T/B for L7N • Available Cable Length : 0.5[m], 1[m], 1.5[m], 2[m]</p>
CN	CN1 Connector	XLC-CN1NNA	All models of XDL-S SERIES	 <p>• Case Spec. : 10350-52A0-008(Made by 3M) • Connector Spec. : 10150-3000VE(Made by 3M)</p>

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

XLC-VSCN1T

Cable Length(m)	0.5	1	1.5	2	3
Declaration	No	03	04	01	02

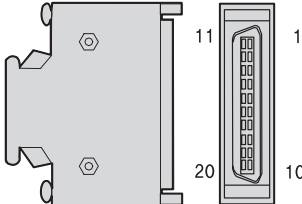
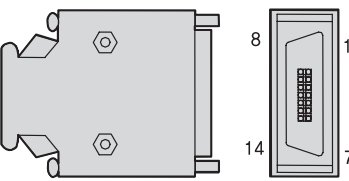
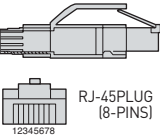
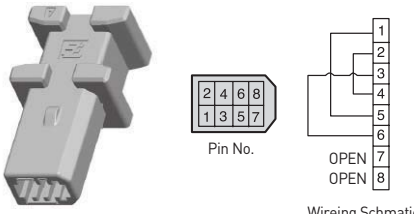
XLCS-L7NCN1T

Cable Length(m)	0.5	1	1.5	2
Declaration	01	02	03	04



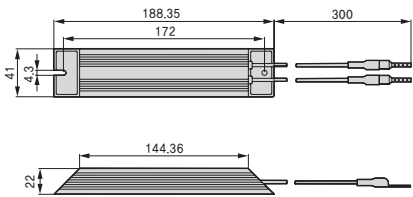
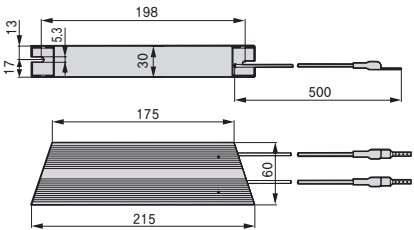
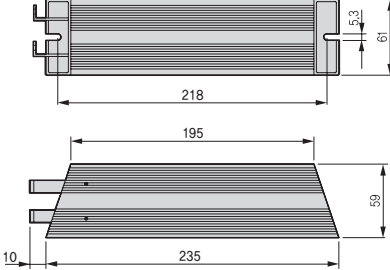
Options and Peripherals

Specifications for Options [Connector]

Type	Product Type	Model Name ^(Note1)	Applicable Motor	Specifications																														
CN	CN1 Connector	XLC- CN2NNA	XDL-N SERIES	 <ul style="list-style-type: none"> • CASE Spec. : 10320-52A0-008 (Made by 3M) • CONNECTOR Spec. : 10120-3000VE (Made by 3M) 																														
CN	CN2 Connector	XLC- CN3NNA	All models of XDL-S, XDL-N SERIES	 <ul style="list-style-type: none"> • CASE Spec. : 10314-52A0-008 (Made by 3M) • CONNECTOR Spec. : 10114-3000VE (Made by 3M) 																														
CN	CN3 CN4 EtherCAT Connector	XLCS- CN4NNA	All models of XDL-S, XDL-N SERIES	 <table border="1"> <thead> <tr> <th>PIN No.</th> <th>Signal</th> <th>Color</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TX/RX0 Plus</td> <td>White/Orange</td> </tr> <tr> <td>2</td> <td>TX/RX0 Minus</td> <td>Orange</td> </tr> <tr> <td>3</td> <td>TX/RX1 Plus</td> <td>White/Green</td> </tr> <tr> <td>4</td> <td>TX/RX2 Plus</td> <td>Blue</td> </tr> <tr> <td>5</td> <td>TX/RX2 Minus</td> <td>White/Blue</td> </tr> <tr> <td>6</td> <td>TX/RX1 Minus</td> <td>Green</td> </tr> <tr> <td>7</td> <td>TX/RX3 Plus</td> <td>White/Brown</td> </tr> <tr> <td>8</td> <td>TX/RX3 Minus</td> <td>Brown</td> </tr> <tr> <td colspan="2">Plate</td> <td>SHILDE</td> </tr> </tbody> </table> <p>Note1) EtherCAT use only 4wires (1, 2, 3, 6)</p>	PIN No.	Signal	Color	1	TX/RX0 Plus	White/Orange	2	TX/RX0 Minus	Orange	3	TX/RX1 Plus	White/Green	4	TX/RX2 Plus	Blue	5	TX/RX2 Minus	White/Blue	6	TX/RX1 Minus	Green	7	TX/RX3 Plus	White/Brown	8	TX/RX3 Minus	Brown	Plate		SHILDE
PIN No.	Signal	Color																																
1	TX/RX0 Plus	White/Orange																																
2	TX/RX0 Minus	Orange																																
3	TX/RX1 Plus	White/Green																																
4	TX/RX2 Plus	Blue																																
5	TX/RX2 Minus	White/Blue																																
6	TX/RX1 Minus	Green																																
7	TX/RX3 Plus	White/Brown																																
8	TX/RX3 Minus	Brown																																
Plate		SHILDE																																
CN	CN6 Connector	XLCS-CN6J	XDL-N SERIES	 <ul style="list-style-type: none"> • MINI I/O By-pass Connector : 1971153(Made by TE) 																														

Specifications for Options [Braking Resistor]

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

Type	Product Type	Model Name ^{Note1)}	Applicable Motor	Specifications
Resistance	Braking Resistor	XLCS-140R50	XDL-L7 □A001 □ XDL-L7 □A002 □ XDL-L7 □A004 □	 <p>• IRH 140W 50ohm</p>
Resistance	Braking Resistor	XLCS-300R30	XDL-L7 □A008 □ XDL-L7 □A010 □	 <p>• IRV 300W 30ohm</p>
Resistance	Braking Resistor	XLC- 600R30	XDL-L7 □A020 □ XDL-L7 □A035 □	 <p>• IRV 600S 30Ω</p>
		XLC- 600R28	XDL-L7 □A050 □	<p>IRV 600S 30ohm L7 □A020 □ - 2pcs (Parallel Connection) L7 □A030 □ - 3pcs (Parallel Connection)</p> <p>IRV 600S 28ohm L7 □A050 □ - 4pcs (Parallel Connection)</p> <p>Note) IRV 600S 30ohm and 600S 28ohm have the same external dimensions.</p>

Note1) XDL/XML 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.



Motor, Drive and Cable Combination Table

XML-F Series Type

Flange Size	Motor (XML)	Drive	Serial Cable		Power Cable			Standard Encoder Type		
			INC	ABS	Power	Power + Brake	Brake			
□60	FB01A	L7□A001B	XLCS-E□□□ES-□	XLCS-E□□□ES1-□	XLCS-P□□□FS-□		XLCS-B□□□QS-□			
□60	FB02A	L7□A002B								
□60	FB04A	L7□A004B								
□80	FC04A	L7□A004B								
□80	FC06A	L7□A008B								
□80	FC08A	L7□A008B								
□80	FC10A	L7□A010B	XLCS-E□□□DS	XLCS-E□□□DS1	XLCS-P□□□HS	XLCS-P□□□NB				
□130	FE09A	L7□A010B								
□130	FE15A	L7□A020B								
□130	FE22A	L7□A020B			XLCS-P□□□IS	XLCS-P□□□PB				
□180	FF30A	L7□A035B			XLCS-P□□□IS	XLCS-P□□□PB				
□180	FF50A	L7□A050B			XLC-P□□□GS	XLC-P□□□LB				
□80	FC03D	L7□A004B	XLCS-E□□□ES-□	XLCS-E□□□ES1-□	XLCS-P□□□FS-□		XLCS-B□□□QS-□			
□80	FC05D	L7□A008B								
□80	FC06D	L7□A008B								
□80	FC07D	L7□A008B								
□180	FE06D	L7□A008B								
□180	FE11D	L7□A010B							XLCS-E□□□DS	XLCS-E□□□DS1
□180	FE16D	L7□A020B								
□180	FE22D	L7□A020B								
□180	FF22D	L7□A020B	XLCS-P□□□IS	XLCS-P□□□PB						
□180	FF35D	L7□A035B	XLCS-P□□□IS	XLCS-P□□□PB						
□180	FF55D	L7□A050B	XLC-P□□□GS	XLC-P□□□LB						
□180	FF75D	L7□A075B	XLC-P□□□GS	XLC-P□□□LB						
□220	FG22D	L7□A020B	XLCS-P□□□IS		XLC-P□□□SB					
□220	FG35D	L7□A035B	XLC-P□□□GS							
□220	FG55D	L7□A050B	XLCS-P□□□IS		XLC-P□□□SB					
□220	FG75D	L7□A075B	XLC-P□□□GS							
□130	FE05G	L7□A008B	XLCS-E□□□DS	XLCS-E□□□DS1	XLCS-P□□□HS	XLCS-P□□□NB				
□130	FE09G	L7□A010B								
□130	FE13G	L7□A020B								
□130	FE17G	L7□A020B			XLCS-P□□□IS	XLCS-P□□□PB				
□180	FF20G	L7□A020B			XLCS-P□□□IS	XLCS-P□□□PB				
□180	FF30G	L7□A035B			XLC-P□□□GS	XLC-P□□□LB				
□180	FF44G	L7□A050B			XLC-P□□□GS	XLC-P□□□LB				
□180	FF60G	L7□A075B			XLCS-P□□□MS	No brake				
□180	FF75G	L7□A075B			XLCS-P□□□IS			XLC-P□□□SB		
□220	FG20G	L7□A020B			XLCS-P□□□IS					
□220	FG30G	L7□A035B			XLC-P□□□GS			XLC-P□□□SB		
□220	FG44G	L7□A050B			XLC-P□□□GS					
□220	FG60G	L7□A075B			XLCS-P□□□IS			XLC-P□□□SB		
□130	FE03M	L7□A004B			XLCS-P□□□HS	XLCS-P□□□NB				
□130	FE06M	L7□A008B			XLCS-E□□□DS	XLCS-E□□□DS1		XLCS-P□□□HS	XLCS-P□□□NB	
□130	FE09M	L7□A010B								
□130	FE12M	L7□A020B								
□180	FF12M	L7□A020B						XLCS-P□□□IS	XLCS-P□□□PB	
□180	FF20M	L7□A020B	XLCS-P□□□IS	XLCS-P□□□PB						
□180	FF30M	L7□A035B	XLC-P□□□GS	XLC-P□□□LB						
□180	FF44M	L7□A050B	XLC-P□□□GS	XLC-P□□□LB						
□220	FG12M	L7□A020B	XLCS-P□□□IS				XLC-P□□□SB			
□220	FG20M	L7□A020B	XLCS-P□□□IS							
□220	FG30M	L7□A035B	XLC-P□□□GS				XLC-P□□□SB			
□220	FG44M	L7□A050B	XLC-P□□□GS							

Note) □□□ 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	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

XML-S/L/H Series Type

Flange Size	Motor (XML)	Drive	Quadrature Cable	Serial Cable		Power Cable			Standard Encoder Type	
			INC	INC	ABS	Power	Power + Brake	Brake	Quadrature Type	Serial Type
□40	SAR5A	XDL-L7□A001□	XLCS-E□□□AS	XLCS-E□□□CS	XLCS-E□□□CS1	XLCS-P□□□GS	XLCS-P□□□NB	XLCS-P□□□KB	* 2,048 P/R	* 18Bit Serial Abs
□40	SA01A	XDL-L7□A001□								
□40	SA015A	XDL-L7□A002□								
□60	SB01A	XDL-L7□A002□								
□60	SB02A	XDL-L7□A002□								
□60	SB04A	XDL-L7□A004□								
□80	SC04A	XDL-L7□A004□								
□80	SC06A	XDL-L7□A008□								
□80	SC08A	XDL-L7□A008□								
□80	SC10A	XDL-L7□A010□								
□130	SE09A	XDL-L7□A008□	XLCS-E□□□BS	XLCS-E□□□DS	XLCS-E□□□DS1	XLCS-P□□□HS	XLCS-P□□□NB	XLCS-P□□□KB	* 3,000 P/R	* 19Bit Serial Abs
□130	SE15A	XDL-L7□A020□								
□130	SE22A	XDL-L7□A020□								
□130	SE30A	XDL-L7□A035□								
□180	SF30A	XDL-L7□A035□								
□180	SF50A	XDL-L7□A050□								
□80	SC03D	XDL-L7□A004□	XLCS-E□□□AS	XLCS-E□□□CS	XLCS-E□□□CS1	XLCS-P□□□GS	XLCS-P□□□NB	XLCS-P□□□KB	* 3,000 P/R	* 19Bit Serial Abs
□80	SC05D	XDL-L7□A008□								
□80	SC06D	XDL-L7□A008□								
□80	SC07D	XDL-L7□A008□								
□130	SE06D	XDL-L7□A008□								
□130	SE11D	XDL-L7□A010□								
□130	SE16D	XDL-L7□A020□								
□130	SE22D	XDL-L7□A020□								
□180	SF22D	XDL-L7□A020□								
□180	LF35D	XDL-L7□A035□								
□180	SF55D	XDL-L7□A050□	XLCS-E□□□BS	XLCS-E□□□DS	XLCS-E□□□DS1	XLCS-P□□□IS	XLCS-P□□□PB	XLCS-P□□□KB	* 3,000 P/R	* 19Bit Serial Abs
□180	SF75D	XDL-L7□A075□								
□220	SG22D	XDL-L7□A020□								
□220	LG35D	XDL-L7□A035□								
□220	SG55D	XDL-L7□A050□								
□220	SG75D	XDL-L7□A075□								
□130	SE05G	XDL-L7□A008□								
□130	SE09G	XDL-L7□A010□								
□130	SE13G	XDL-L7□A020□								
□130	SE17G	XDL-L7□A020□								
□180	SF20G	XDL-L7□A035□	XLCS-E□□□BS	XLCS-E□□□DS	XLCS-E□□□DS1	XLCS-P□□□IS	XLCS-P□□□PB	XLCS-P□□□KB	* 3,000 P/R	* 19Bit Serial Abs
□180	LF30G	XDL-L7□A035□								
□180	SF44G	XDL-L7□A050□								
□180	SF60G	XDL-L7□A075□								
□220	SG20G	XDL-L7□A020□								
□220	LG30G	XDL-L7□A035□								
□220	SG44G	XDL-L7□A050□								
□220	SG60G	XDL-L7□A075□								
□130	SE03M	XDL-L7□A004□								
□130	SE06M	XDL-L7□A008□								
□130	SE09M	XDL-L7□A010□	XLCS-E□□□AS	XLCS-E□□□CS	XLCS-E□□□CS1	XLCS-P□□□GS	XLCS-P□□□NB	XLCS-P□□□KB	* 1,048 P/R	* No applied
□130	SE12M	XDL-L7□A020□								
□180	SF12M	XDL-L7□A020□								
□180	SF20M	XDL-L7□A035□								
□180	LF30M	XDL-L7□A035□								
□180	SF44M	XDL-L7□A050□								
□220	SG12M	XDL-L7□A020□								
□220	SG20M	XDL-L7□A035□								
□220	LG30M	XDL-L7□A035□								
□220	SG44M	XDL-L7□A050□								
□220	SG60M	XDL-L7□A075□	XLCS-E□□□BS	XLCS-E□□□CS	XLCS-E□□□CS1	XLCS-P□□□IS	XLCS-P□□□PB	XLCS-P□□□KB	* 2,048 P/R	* No applied
□60	HB01A	XDL-L7□A002□								
□60	HB02A	XDL-L7□A002□	XLCS-E□□□BS	XLCS-E□□□CS	XLCS-E□□□CS1	XLCS-P□□□GS	XLCS-P□□□NB	XLCS-P□□□KB	* 2,048 P/R	* No applied
□60	HB04A	XDL-L7□A004□								
□130	HE09A	XDL-L7□A008□	XLCS-E□□□BS	XLCS-E□□□CS	XLCS-E□□□CS1	XLCS-P□□□IS	XLCS-P□□□PB	XLCS-P□□□KB	* 2,048 P/R	* No applied
□130	HE15A	XDL-L7□A020□								
□130	HE30A	XDL-L7□A035□								



Motion Module [EtherCAT]

Features

- 32 axes (master) and 4 axes (virtual) control
- EtherCAT CoE supported servo drive
- Communication cycle : 1ms
- Built-in DI/DO 8 points each and EtherCAT I/O 512 points
- Program 2MB
- External encoder input 2ch (line drive)
- Max. transmission distance : 100m



Specifications

Item		XGF-M32E
Communication		EtherCAT (CoE : CANopen over EtherCAT)
Number of axis	Real	32 axes
	Virtual	4axes
	I/O	Input/output 8 points each (built-in) EtherCAT I/O connection available
Control period		1ms, 2ms, 4ms (same as main task period)
Control unit		Pulse, mm, inch, degree
I/O	Internal	Input 8 points, output 8 points
	External	EtherCAT I/O 4 ea(max. 256 points)
Motion Program	No. of program	Max. 256 ea
	Capacity	Max. 2Mbyte
	Language	LD(FB), ST
	Position data	6400 points/all aixs
Control method		Position, Velocity, Torque(Servo drivers support) control, Synchronous control, Interpolation control
Range of position/velocity		± LREAL, 0
Acc. Dec. process		Trapezoid type, S-type (Setting to specify the Jerk at function block)
Acc. Dec. time		1 ~ 2, 147, 483, 647ms
Manual operation		JOG operation
Torque unit		Rated torque % designation
Encoder input	Channel	2 chennels
	Max. input	Max. 500Kpps
	Input method	Line drive input (RS-422A IEC specification) Open collector output type encoder
	Input type	CW/CCW, Pulse/Dir, Phase A/B
Max. distance		100m
Communication cable		Over CAT.5 STP(Shielded Twisted-pair) cable
Error indication		Indicated by LED
Communication status indication		Indicated by LED
Occupied point I/O		Variable: 16 point, Fixed: 64 point
Communication physical layer		100BASE-TX
Consumable current(mA)		900mA
Weight		122g

Positioning Module [Network Type]

Features

- XGF-PN8A : Dedicated LSIS EtherCAT Network Support (XGT Servo N Series)
- XGF-PN8B : Standard EtherCAT Network Support(XGT Servo XDL Series)
- Direct connect with servo driver Max 8
- 2~8 axis linear interpolation, 2axis circular interpolation, 3axis helical interpolation
- Position, speed, feed control is possible through the various operation
- Parameters, the operation data stored in the FRAM(without Battery)
- CAM for controlling up to eight different types of CAM data



Specifications

Item		XGF-PN8A/PN8B			
Number of axis		8 axis			
Interpolation		2-8 axis linear, 2axis circular, 3axis helical interpolation			
Control method		Position, speed, Speed/position, position/speed position/torque, Feed control			
Setting unit		pulse, mm, inch, degree			
Positioning data		Each axis has 400 data items (Operation step number 1~400). It is available to set with software package or programming.			
XG-PM	Port	RS-232C, USB			
	Data	Basic, expansion, manual, servo parameter, operation data, cam data, command information			
	Monitor	Operation, trace, input sort, error information			
Back-up		FRAM(parameter, operation data) no battery			
Positioning	Positioning method	Absolute/Incremental			
	Position address range		Absolute	Incremental	Speed/position, position/speed conversion control
		mm	-214748364.8 ~ 214748364.7[μ m]	-214748364.8 ~ 214748364.7[μ m]	-214748364.8 ~ 214748364.7[μ m]
		inch	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647
		degree	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647
		pulse	-2147483648 ~ 2147483647	-2147483648 ~ 2147483647	-2147483648 ~ 2147483647
	Position speed range	mm	0.01 ~ 20000000.00(mm/Min)		
		inch	0.001 ~ 2000000.000(inch/Min)		
		degree	0.001 ~ 2000000.000(degree/Min)		
		pulse	1 ~ 20.000.000(pulse/Sec)		
RPM		0.1 ~ 100000.0(RPM)			
Accel/Decel pattern	Trapezoidal & S-curve acceleration/deceleration				
Accel/Decel time	1~2.147.483.647 ms				
Manual		Jog/ MPG/ inching			
Homing method		Max+Z(Forward), Min+Z(Backward), Near-point+Z(Forward, Backward), Max+near-point+Z(Forward), Min+near-point+Z(Backward), Z(Forward, Backward), near-point(Forward, Backward)			
The ability to Change speed		Absolute/Percent			
Torque		Rated torque %			
Absolute position System		0 (Absolute encoder type servo)			
Encoder input	Channel	2 Channel			
	Max. Input	Max. 200 Kpps			
	Input method	line-drive input(RS-422A IEC), open collector output type			
	Type	CW/CCW, Pulse/Dir, Phase A/B			
Connector		12 Pin connector			
Communication Cycle		800 μ s			
Max. distance		100 m			
Cable		STP(Shielded Twisted-pair) cable			
Error display		LED			
Operation display		LED			
Occupied points of I/O		64points(Fixed type), 16points(Variable type)			
Current consumption (mA)		500 mA			
Weight(kg)		115 g			



Positioning Module [APM]

Features

- Highly reliable position control with LSIS ASIC-embedded processor
- Enhanced control with fast control processing speed
- High-speed motor control (Max. pulse output: 1Mbps)
- Circular/linear interpolation, separate/synchronous operation
- Trapezoidal & S-curve acceleration/deceleration
- Easy and quick control through external input (JOG operation included)
- Encoder input support
- High-speed processing of command (4ms)
- Easy to set positioning parameters (Windows)
- Monitoring/Tracking/Simulation
- Available to edit operation parameter data in EXCEL
- Self-diagnosis
- Real-time information and solution for each error



Specifications

Item	Specifications			
	XGF-PO1A, XGF-PD1A	XGF-PO2A, XGF-PD2A	XGF-PO3A, XGF-PD3A	
Number of axis	1	2	3	
Interpolation		2-axis linear interpolation, 2-axis circular interpolation	2/3-axis linear interpolation, 2-axis circular interpolation	
Control method	Position control, speed control, speed/position control, position/speed control			
Setting unit	Pulse, mm, inch, degree			
Positioning data	Each axis has 400 data items (Operation step number 1~400). It is available to set with software package or programming.			
Software package	Available (Connected with RS-232C Port of CPU module)			
Data backup	Flash memory (No battery)			
Positioning	Positioning method		Absolute / relative method	
	Position speed range	mm	-214748364.8 ~ 214748364.7 (μm)	
		Inch	-21474.83648 ~ 21474.83647	
		Degree	-21474.83648 ~ 21474.83647	
		Pulse	-2147483648 ~ 2147483647	
	Type		XGF-PO□A: Open collector, XGF-PD□A: Line Driver	
	Position speed range	mm	0.01 ~ 20000000.00 (mm/min)	
		Inch	0.001 ~ 2000000.000 (inch/min)	
		Degree	0.001 ~ 2000000.000 (degree/min)	
		Pulse	XGF-PO□A: 1~200,000 (pulse/sec), XGF-PD□A: 1~1,000,000 (pulse/sec)	
Accel/Decel pattern		Trapezoidal & S-curve acceleration/deceleration		
Accel/Decel time		1 ~ 65,535mm		
Max. output pulse		XGF-PO□A: 200Kpps / XGF-PD□A: 1Mpps		
Max. distance		XGF-PO□A: 2m / XGF-PD□A: 10m		
Max. encoder input		200 Kpps		
Error display		LED		
Operation display		LED		
Connection connector		40 Pin connector		
Size of cable		AWG #24		
Occupied points of I/O		64 points (Fixed type), 16 points (Variable type)		
Current consumption (mA)		XGF-PO1A: 340	XGF-PO2A: 360	XGF-PO3A: 400
		XGF-PD1A: 510	XGF-PD2A: 790	XGF-PD3A: 860
Weight (kg)		0.12	0.13	0.135

*XGF-PO□O: Open Collector type, □: Number of axis
 XGF-PD□D: Line Drive type, □: Number of axis

Positioning Module [XPM]

Features

- Max 4Axis, Max pulse output 4Mpps
- Circular/linear/ellipse/helical interpolation
- Asymmetric acceleration and deceleration driving
- FRAM parameter
- XG-PM monitoring, simulation, trace
- CAM profile program



Specifications

Item		XGF-PO1H XGF-PD1H	XGF-PO2H XGF-PD2H	XGF-PO3H XGF-PD3H	XGF-PO4H XGF-PD4H
Number of axis		1 axis	2 axis	3 axis	4 axis
Interpolation		-	Circular, linear, ellipse	Circular, linear, helical, ellipse	
Control method		Position control, speed control, speed/position control, position/speed control, FEED			
Positioning data		Each axis has 400 data items (Operation step number 1~400). It is available to set with XG-PM or programming.			
Configuration Tool		XG-PM (Connected with USB or RS-232C Port of CPU module)			
Data backup		FRAM (Parameter, Operation data), Flash memory (CAM Data), No battery			
Pulse output		XGF-POxH: Open collector, XGF-PDxH: line driver			
Positioning	Positioning method		Absolute / Incremental		
	Position address range	mm	-214,748,364.8 ~ 214,748,364.7(μm)		
		inch	-21,474.83648 ~ 21,474.83647		
		degree	-21,474.83648 ~ 21,474.83647		
		pulse	-2,147,483,648 ~ 2,147,483,647		
	Position address speed	mm	0.01 ~ 20,000,000.00 (mm/min)		
		inch	0.001 ~ 2,000,000.000 (inch/min)		
		degree	0.001 ~ 2,000,000.000 (degree/min)		
		pulse	1 ~ 500,000 (pulse/sec): Open collector, 1 ~ 4,000,000 (pulse/sec): line driver		
RPM		0.1 ~ 100,000.0 (RPM)			
Accel/Decel pattern		Trapezoidal & S-curve acceleration/deceleration			
Accel/Decel time		0~2,147,483,647ms			
Max. output pulse		Open collector: 500kpps, line driver: 4Mpps			
Max. distance		Open collector: 5m, line driver: 10m			
Max. encoder input		500kpps			
Error display		LED			
Size of cable		AWG #24			
Occupied points of I/O		64 points (Fixed type), 16 points (Variable type)			
Connection connector		40Pin		80Pin	
Current consumption (mA)		XGF-PO1H:400mA	XGF-PO2H:410mA	XGF-PO3H:420mA	XGF-PO4H:430mA
		XGF-PD1H:520mA	XGF-PD2H:600mA	XGF-PD3H:850mA	XGF-PD4H:890mA
Weight (kg)		120		130	



XG-PM

Features

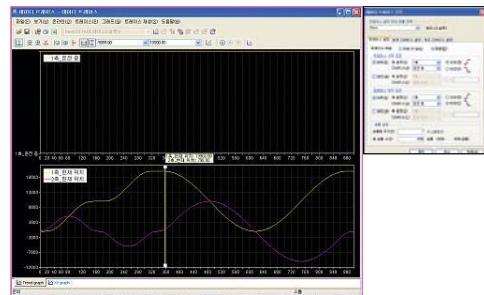
- Configuration tool with updated APM software package
- All models can be used for XGT Positioning module (APM, XPM)
- Simultaneous communications can be accessed with XG5000
- Powerful simulation, trace, monitoring



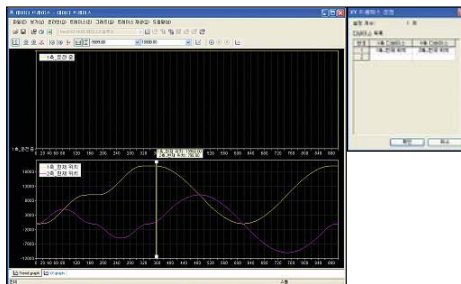
System View



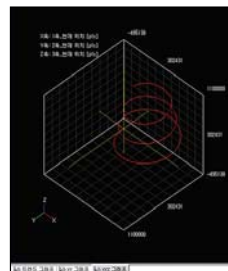
Data trace(trend graph)



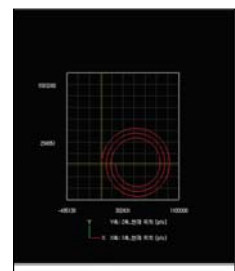
Data trace(XY graph)



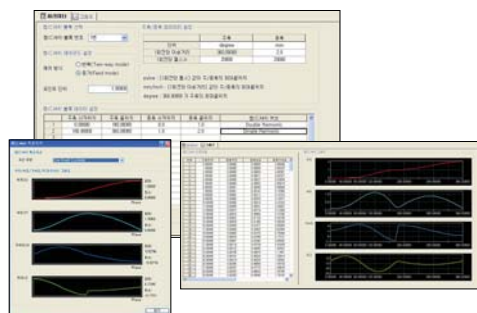
XYZ trend(3D View)



XYZ monitor(2D View)



CAM control profile

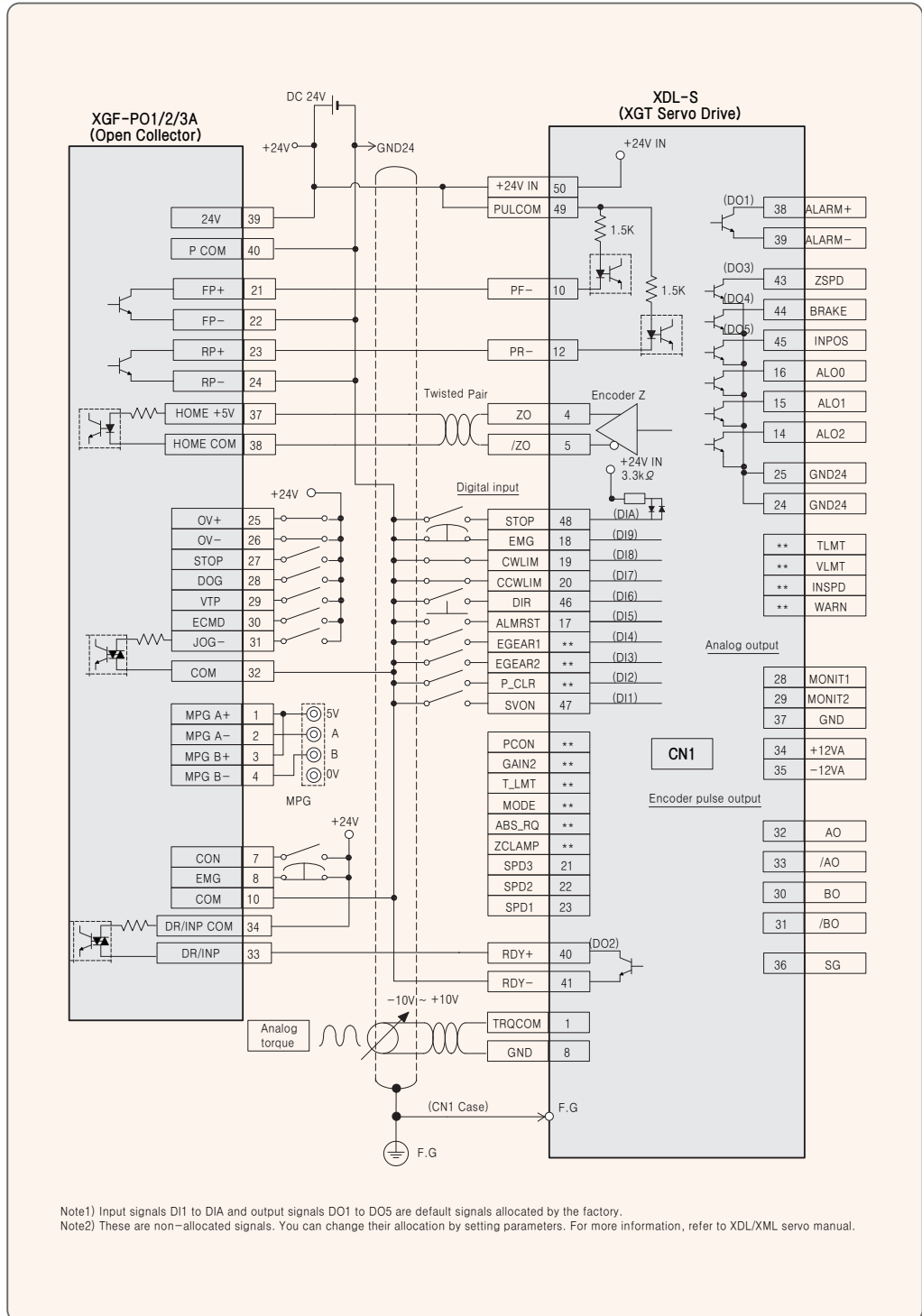


Simulation



Positioning Module / External Device Interface

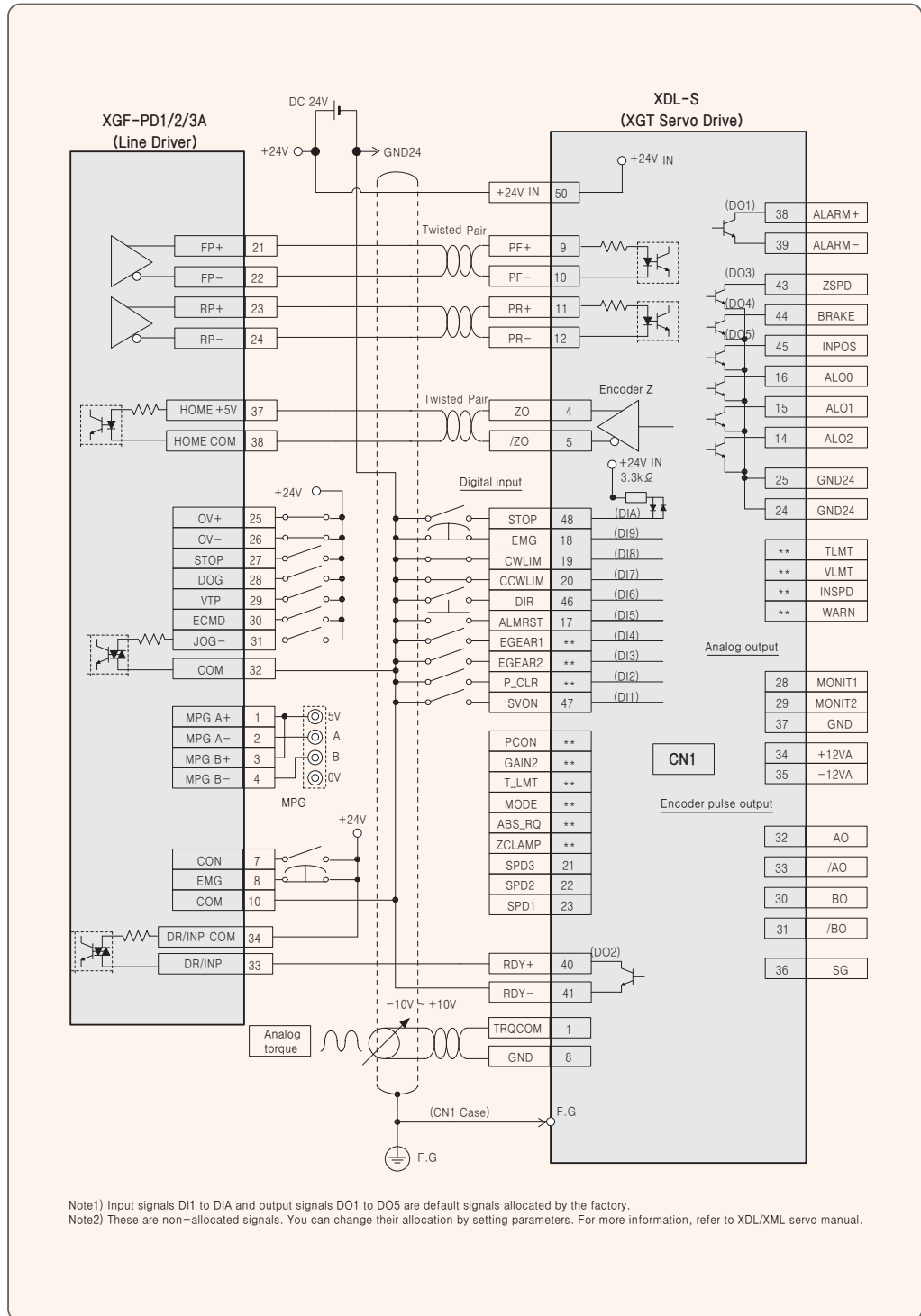
XGF-P01/2/3A (Open Collector)



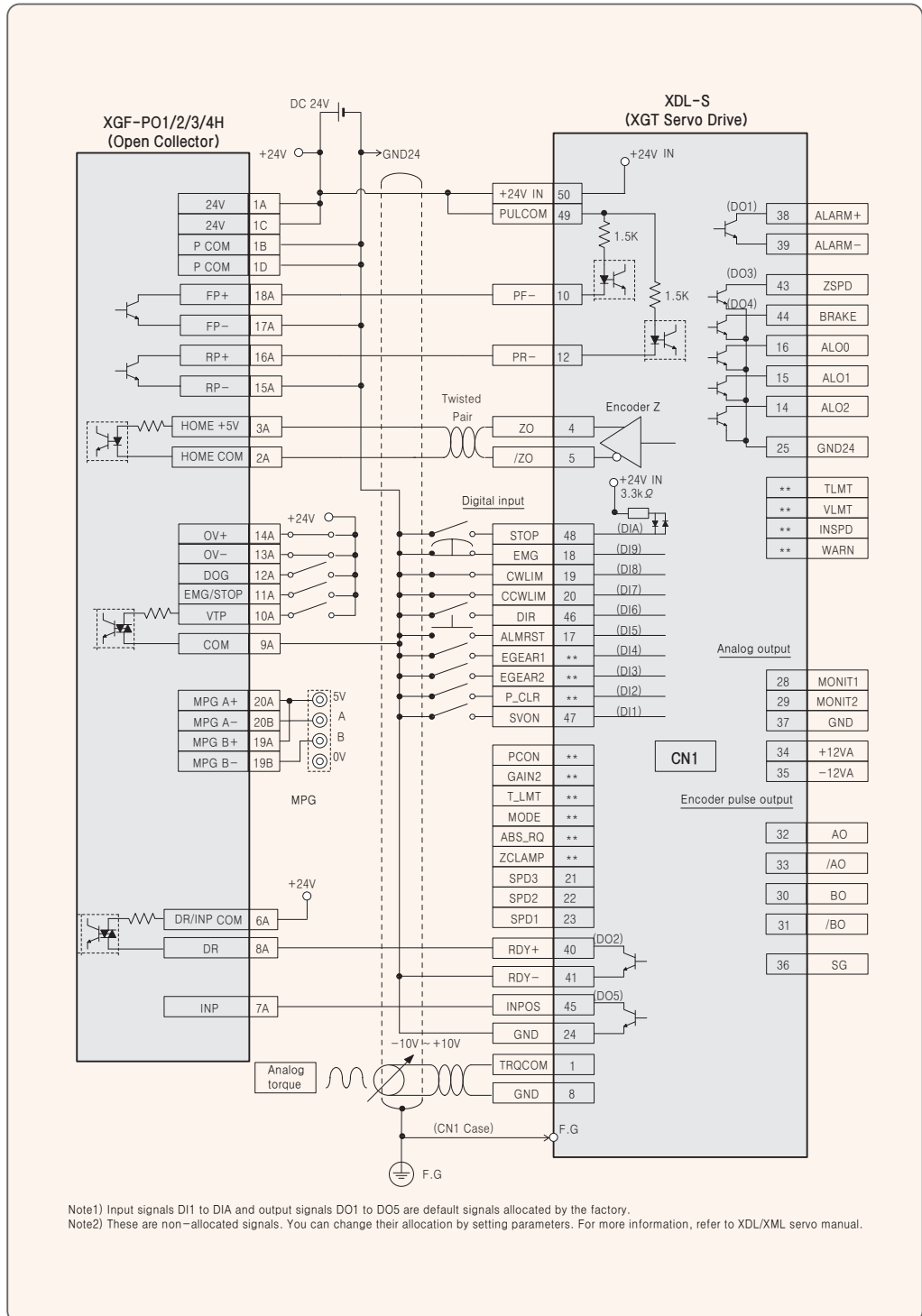


Positioning Module / External Device Interface

XGF-PD1/2/3A (Line Driver)



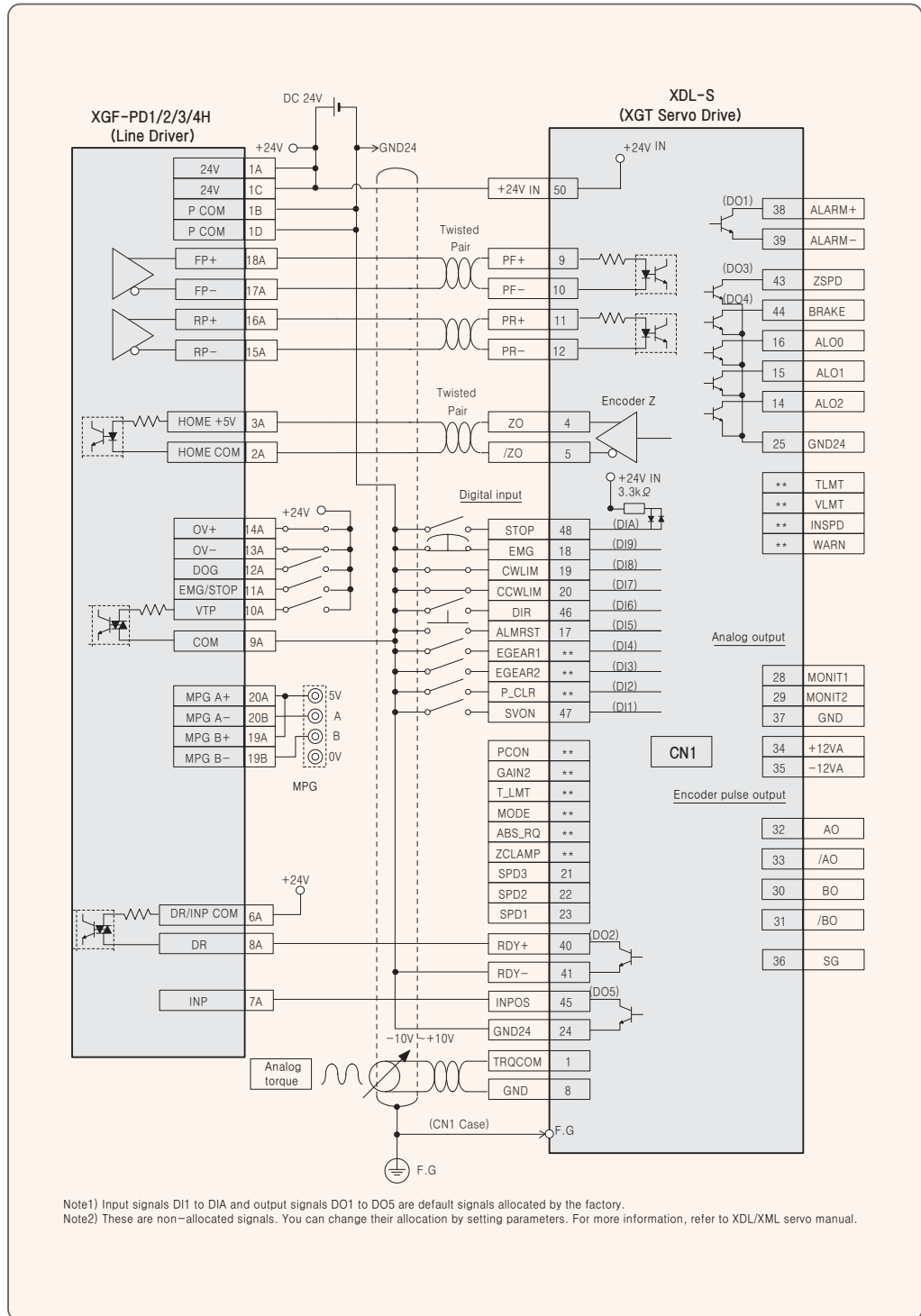
**XGF-PO1/2/3/4H
(Open Collector)**





Positioning Module / External Device Interface

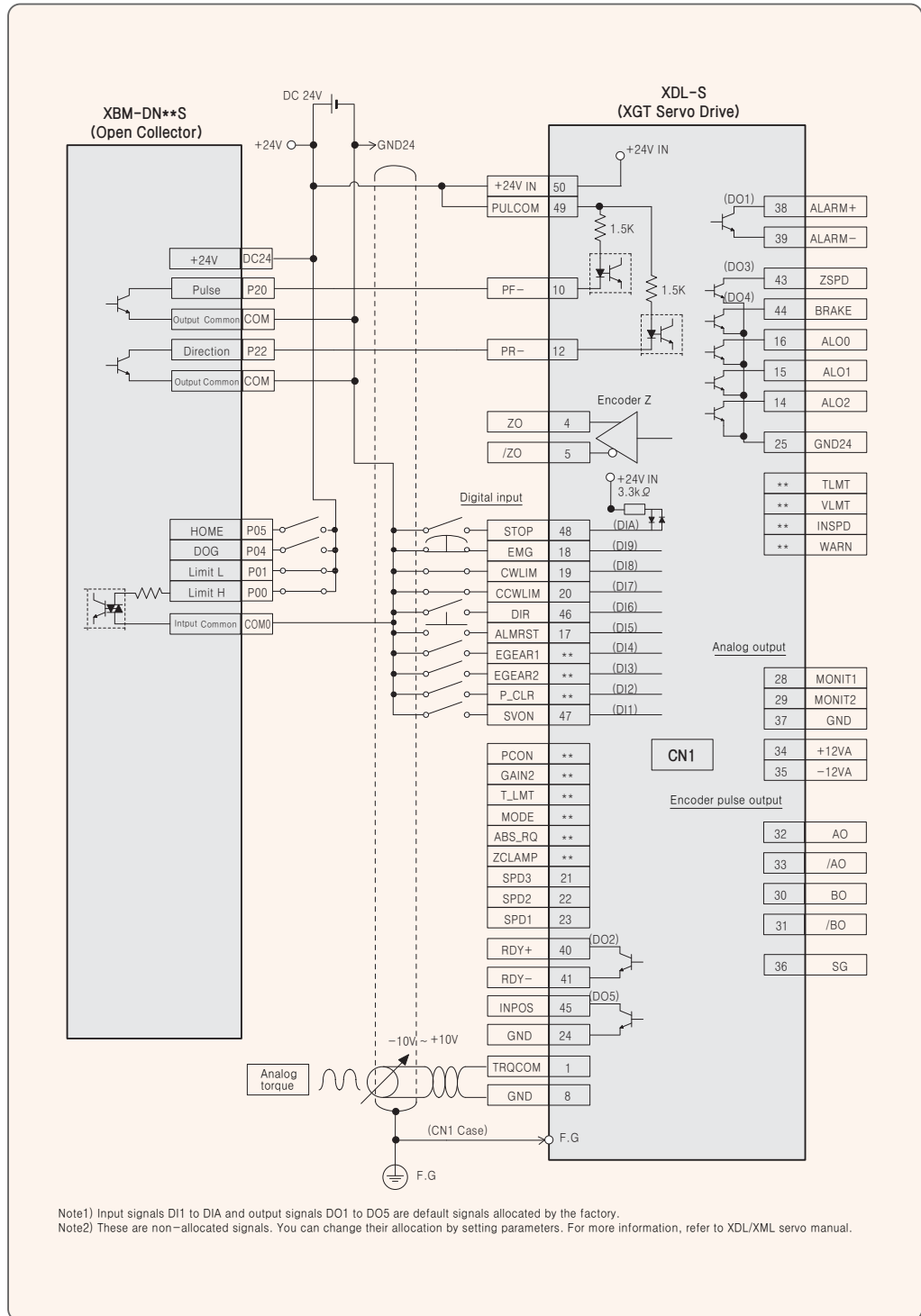
XGF-PD1/2/3/4H (Line Driver)



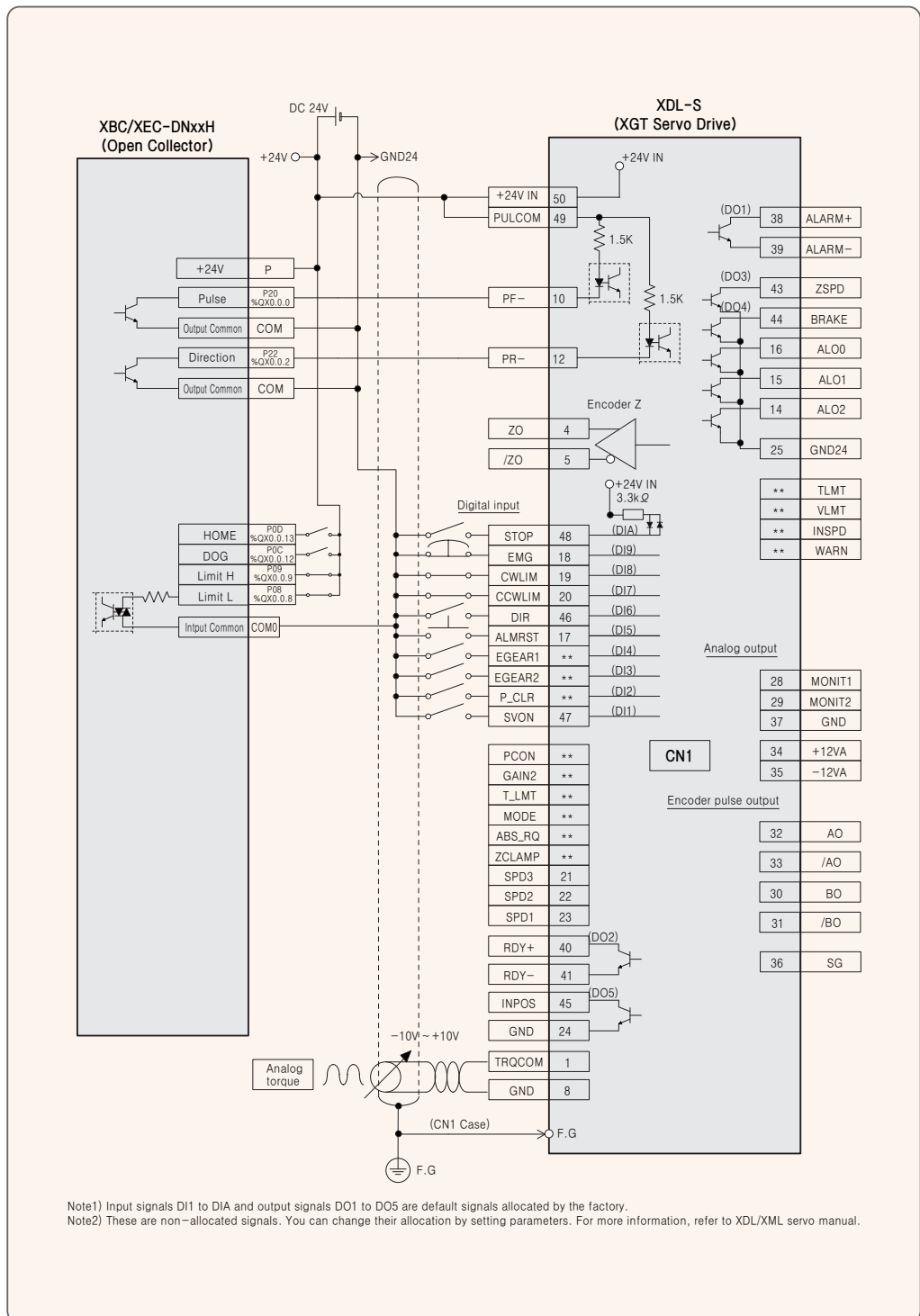


Positioning Module / External Device Interface

XBM-DN**S (Open Collector)



XBC/XEC-DNH
(Open Collector)**

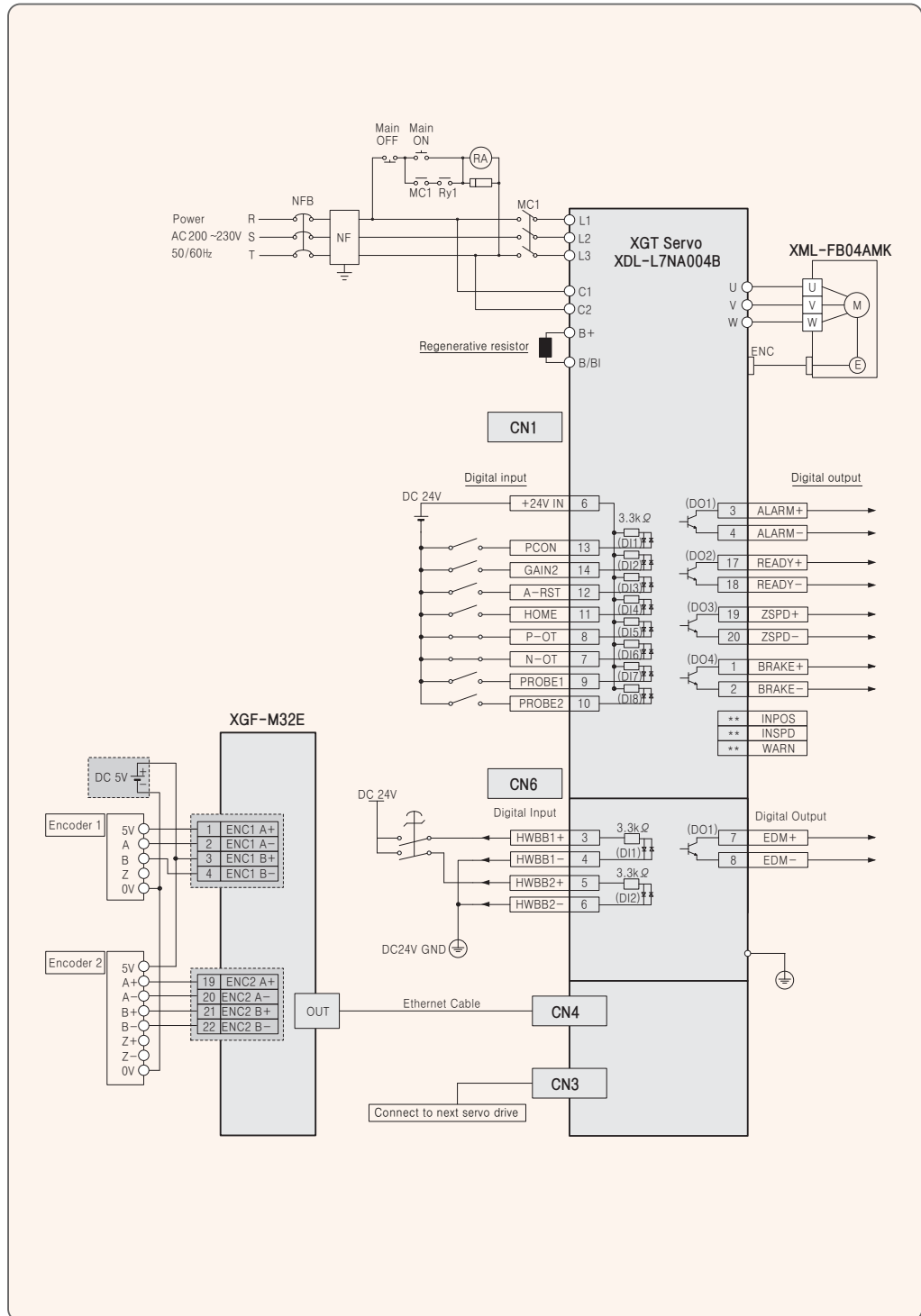


Note1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
 Note2) These are non-allocated signals. You can change their allocation by setting parameters. For more information, refer to XDL/XML servo manual.

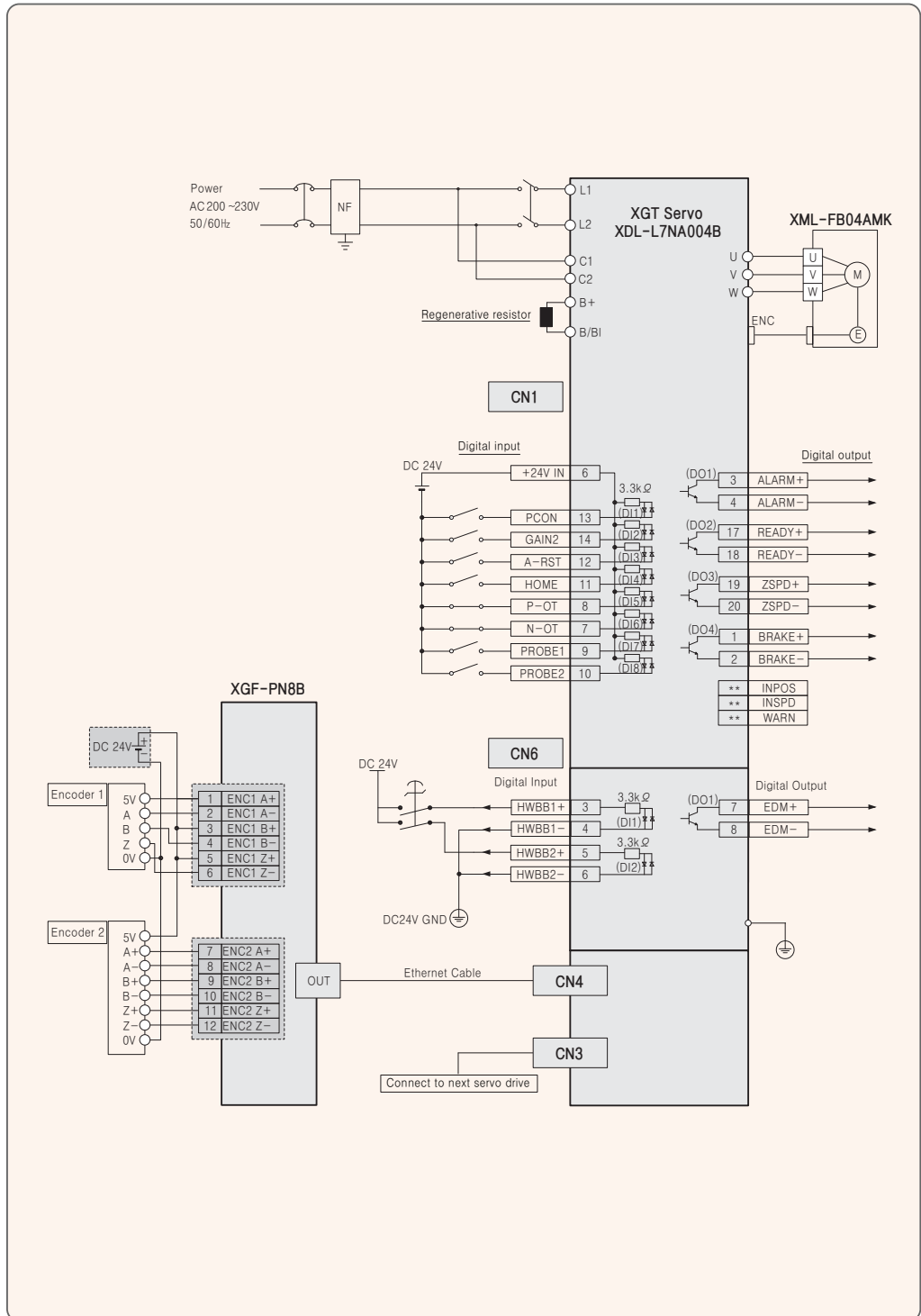


Positioning Module / External Device Interface

XGF-M32E



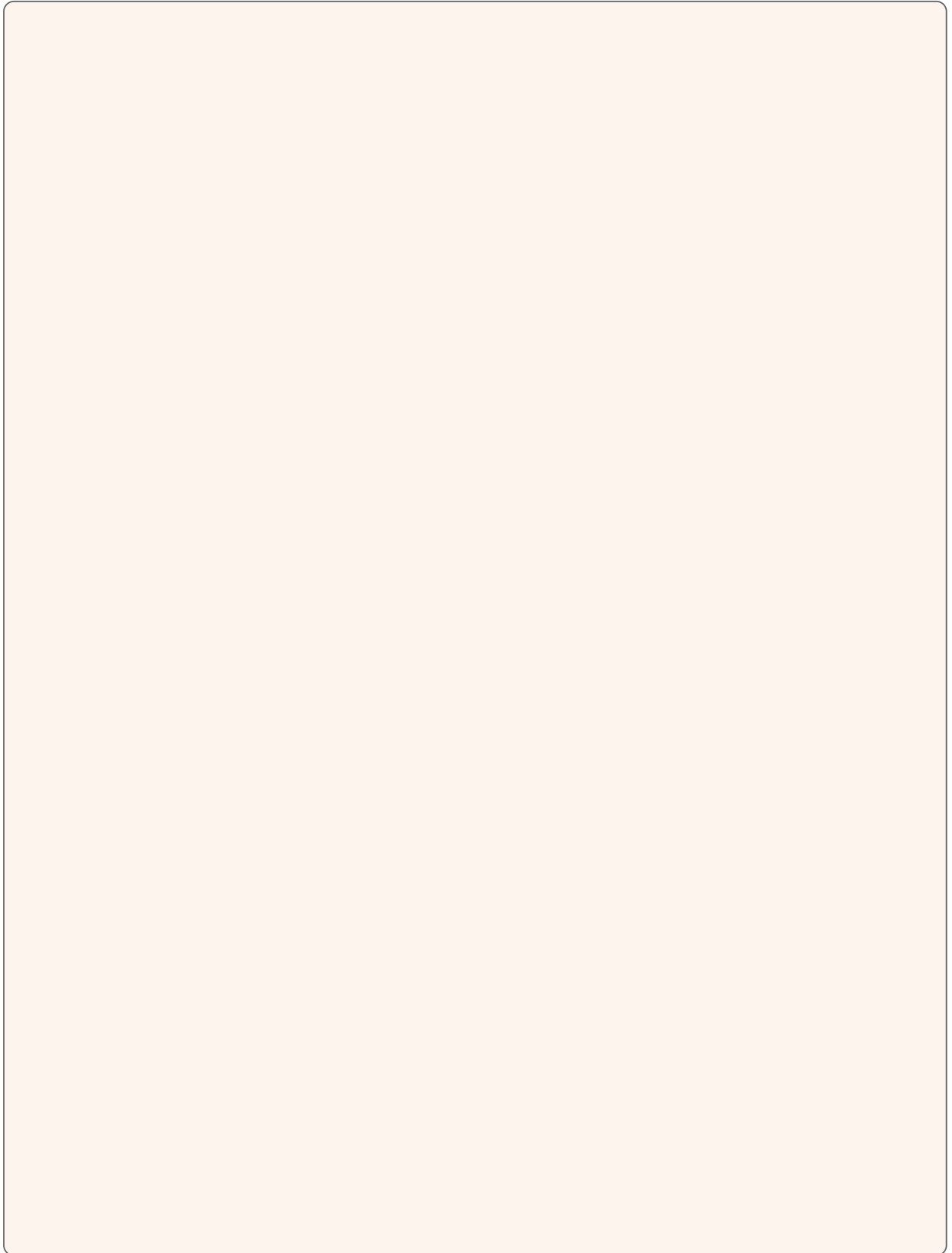
XGF-PN8B





Memo

A large, empty rectangular box with a light beige background and a thin black border, intended for writing a memo.



Worldwide Network

Head Office and Domestic Factories (Cheongju, Cheonan, Busan)

Domestic Factories

- **Head Office**
LS Tower, 127, LS-ro, Dongan-gu, Anyang-si, Gyeonggi-Do, 431-848, Korea
Tel : 82-2-2034-4870 Fax : 82-2-2034-3660-7021
- **Cheongju Factory**
1 Songjeong-dong, Cheongju-si, Chungbuk-do, 361-720, Korea
Tel : 82-43-261-6114 Fax : 82-43-261-6602
- **Cheonan Factory**
181 Samseong-ri, Mokcheon-myeon, Cheonan-si Chungnam-do, 330-840 Korea
Tel : 82-41-550-8114 Fax : 82-41-566-8408
- **Busan Factory**
1-19 Block Hwajeon-dong, Gangseo-gu, Busan, 618-280, Korea
Tel : 82-51-795-6114 Fax : 82-51-795-6169

Overseas Factories

- **Wuxi Factory, CHINA**
102-A, National High & New Tech Industrial Development Area, Wuxi, Jiangsu, 214028, P.R. China
Tel : 86-510-8534-6666 Fax : 86-510-8534-4078
- **Dalian Factory, CHINA**
No. 15, Liaohexi 3-Road, Economic and Technical Development zone, Dalian 116600, China
Tel : 86-411-273-7777 Fax : 86-411-8730-7560
- **Hanoi Factory, VIETNAM**
Room 1311, 13th Floor, M3-M4 Building 91 Nguyen Chi Thanh street, Hanoi, Vietnam.
Tel : 84-4-6275-8055 Fax : 84-4-6275-8056

R&D Center

- **Advanced Technology R&D Center**
533 Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-749, Korea
Tel : 82-31-450-7114
- **Electro Technology R&D Center**
1 Songjeong-dong, Cheongju-si, Chungcheongbuk-do, 361-720, Korea
Tel : 82-43-261-6114
- **Automation R&D Center**
181 Samseong-ri, Mokcheon-myeon, Cheonan-si, Chungcheongnam-do, 330-840, Korea
Tel : 82-41-550-8272
- **Power Testing & Technology Institute**
1 Songjeong-dong, Cheongju-si, Chungcheongbuk-do, 361-720, Korea
Tel : 82-43-261-6114



Cheongju Factory



Wuxi Factory (China)



Cheonan Factory



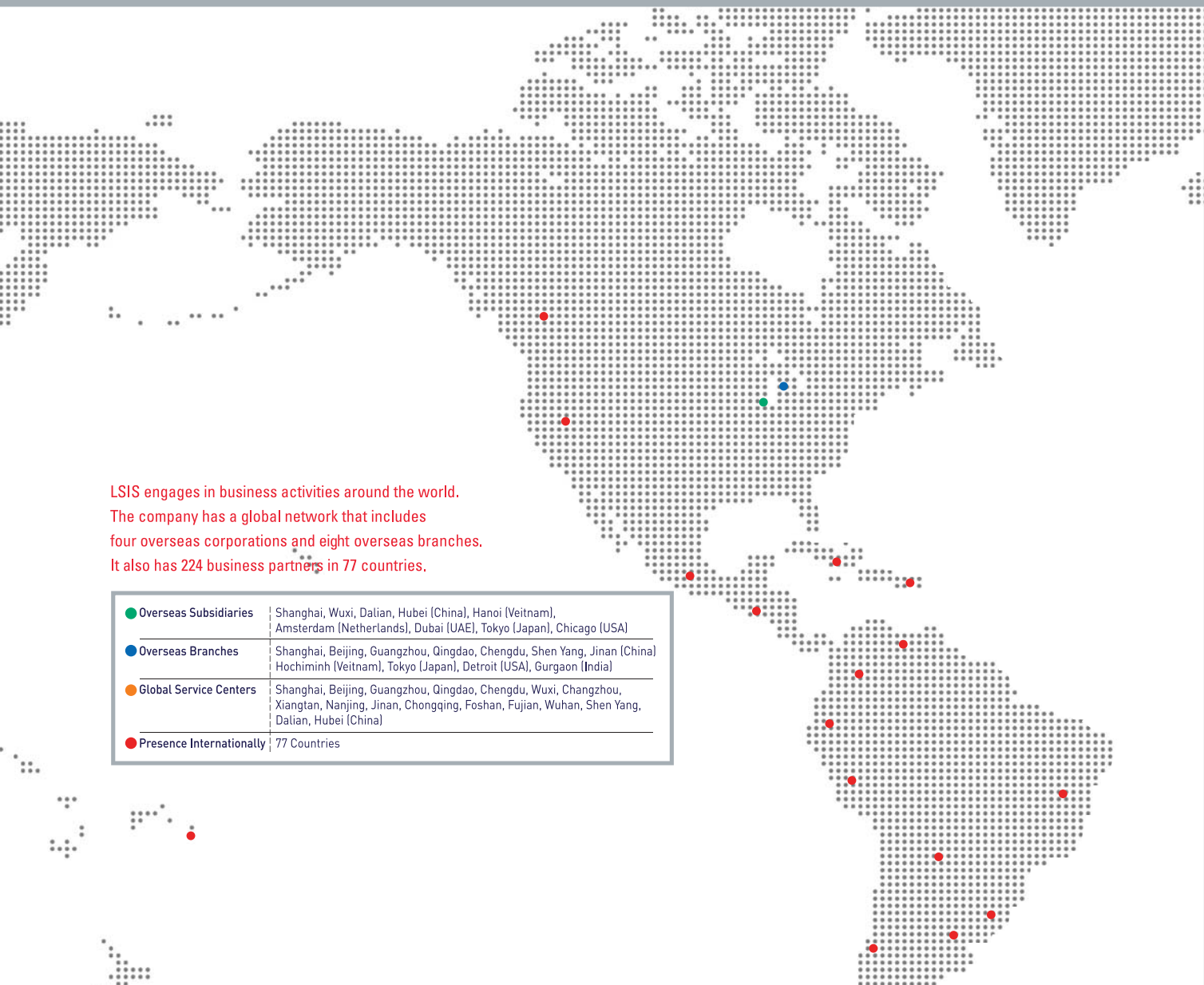
Dalian Factory (China)



Busan Factory



Hanoi Factory (Vietnam)



LSIS engages in business activities around the world.
 The company has a global network that includes
 four overseas corporations and eight overseas branches.
 It also has 224 business partners in 77 countries.

● Overseas Subsidiaries	Shanghai, Wuxi, Dalian, Hubei (China), Hanoi (Vietnam), Amsterdam (Netherlands), Dubai (UAE), Tokyo (Japan), Chicago (USA)
● Overseas Branches	Shanghai, Beijing, Guangzhou, Qingdao, Chengdu, Shen Yang, Jinan (China) Hochiminh (Vietnam), Tokyo (Japan), Detroit (USA), Gurgaon (India)
● Global Service Centers	Shanghai, Beijing, Guangzhou, Qingdao, Chengdu, Wuxi, Changzhou, Xiangtan, Nanjing, Jinan, Chongqing, Foshan, Fujian, Wuhan, Shen Yang, Dalian, Hubei (China)
● Presence Internationally	77 Countries

Overseas Subsidiaries

- LSIS(Shanghai) Co., Ltd. / CHINA
32nd Room 1-4, 32/F, Great Wall Building, No.3000 North Zhongshan Road, Putuo District, Shanghai, P.R. China
Tel : 86-21-5237-9977(609) Fax : 86-21-5237-7189
- LSIS(Dalian) Co., Ltd. / CHINA
No. 15, Liaohexi 3-Road, Economic and Technical Development zone, Dalian, P.R. China
Tel : 86-411-8731-7542 Fax : 86-411-8730-7560 E-Mail : dskim@lsis.com
- LSIS(Wuxi) Co., Ltd. / CHINA
102-A, National High & New Tech Industrial Development Area, Wuxi, Jiangsu, P.R. China
Tel : 86-510-8534-6666 Fax : 86-510-8534-4078 E-Mail : sojin@lsis.com
- LS Hukai Electric(Hubei) Co., Ltd. / CHINA
No. 100, Tanjahe Road, Dianjun District, Yichang City, Hubei Province, P.R. China
Tel : 86-717-667-7536 Fax : 86-717-667-7222 E-Mail : jaewoongh@lsis.com
- LS-VINA Industrial Systems Co., Ltd. / VIETNAM
Room 1311, 13th, M3-M4 Building 91 Nguyen Chi Thanh street, Hanoi, Vietnam
Tel : 84-4-6275-8055 Fax : 86-21-5237-7189
- LSIS[ME] FZE / U.A.E.
LOB 19-205, JAFZA View Tower, Jebel Ali Free Zone, Dubai, United Arab Emirates
Tel : 971-4-886-5360 Fax : 971-4-886-5361 E-Mail : shunlee@lsis.com
- LSIS Europe B.V. / NETHERLANDS
1st. Floor, Tupolevlaan 48, 1119NZ, Schiphol-Rijk, The Netherlands
Tel : 31-20-654-1420 Fax : 31-20-654-1429 E-Mail : junshickp@lsis.com
- LSIS Japan Co., Ltd. / JAPAN
16th, Higashi-Kan, Akasaka Twin Tower, 2-17-22, Akasaka, Minato-ku, Tokyo, Japan
Tel : 81-3-3582-9128 Fax : 81-3-3582-2667 E-Mail : jschuna@lsis.com
- LSIS USA Inc. / U.S.A.
2000 Millbrook Drive, Lincolnshire, Chicago, IL 60069, United States of America
Tel : 847-941-8240 Fax : 847-941-8259

Overseas Branches

- LSIS Shanghai Office / CHINA
Room E-G, 12th, Huamin Empire Plaza, No.726, West Yan'an Road, Shanghai, P.R. China
Tel : 86-21-5237-9977(702) Fax : 86-21-5237-7189
- LSIS Beijing Office / CHINA
Room 2306, Building B Landgent Center, No.24 Middle Road, East 3rd Ring Road, Chaoyang District, Beijing, P.R. China
Tel : 86-10-5761-3127 Fax : 86-10-5761-3128 E-Mail : htroh@lsis.com
- LSIS Guangzhou Office / CHINA
Room 1403, 14th, New Poly Tower, 2 Zhongshan Liu Road, Guangzhou, P.R. China
Tel : 86-20-8326-6784 Fax : 86-20-8326-6287 E-Mail : sojhtroh@lsis.com
- LSIS Qingdao Office / CHINA
Room 2001, Galaxy Building, 29 ShanDong Road, ShiNan District, QingDao, ShanDong, P.R. China
Tel : 86-532-8501-6058 Fax : 86-532-8501-6057 E-Mail : htroh@lsis.com
- LSIS Chengdu Office / CHINA
Room 1710, 17/F Huamin Empire Plaza, NO.1 Fuxin Road, Chengdu, P.R. China
Tel : 86-28-8670-3201 Fax : 86-28-8670-3203 E-Mail : yangcf@lsis.com
- LSIS ShenYang Office / CHINA
Room 803, Hongyuan Building, 52 South Nanjing Road, Heping District, Shenyang, P.R. China
Tel : 86-24-2321-9050 Fax : 86-24-8386-7210 E-Mail : yangcf@lsis.com
- LSIS Jinan Office / CHINA
Room 417, Chuangzhan Center, No. 201, Shanda Road, Lixia District, Jinan, Shandong, P.R. China
Tel : 86-531-8263-8026 Fax : 86-531-8263-8027 E-Mail : yangcf@lsis.com
- LSIS Tokyo Office / JAPAN
16th, Higashi-Kan, Akasaka Twin Tower, 2-17-22, Akasaka, Minato-ku, Tokyo, Japan
Tel : 81-3-3582-9128 Fax : 81-3-3582-2667
- LS-VINA Industrial Systems Hochiminh Office / VIETNAM
4th, Yoco Building, 41 Nguyen Thi Minh Khai Street, Hochiminh City, Vietnam
Tel : 84-8-3822-7941 Fax : 81-84-8-3822-7942 E-Mail : sjbaik@lsis.com
- LSIS Detroit Office / U.S.A.
5700 Crooks Rd, Suite 211, Troy, MI 48098, United States of America
Tel : 1-248-792-2637-8 Fax : 1-248-792-2642t E-Mail : sylee@lsis.com
- LSIS Gurgaon Office / INDIA
109 First Floor, Park Central, Sector-30, Gurgaon- 122 002, Haryana, India
Tel : +0091-124-493-0070 Fax : 91-1244-930-066 E-Mail : hwyim@lsis.com

Green Innovators of Innovation



- 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.

LSIS Co., Ltd.

©2008.01 LSIS Co., Ltd. All Rights Reserved.

HEAD OFFICE

LS Tower, 127, LS-ro, Dongan-gu, Anyang-si, Gyeonggi-Do, 431-848, Korea

■ Southeast Asia	+82-2-2034-4888	cshwang@lsis.com (Charles Hwang)
■ Europe	+82-2-2034-4676	sukyong@lsis.com (Brian Choi)
■ Turkey / Israel / CIS	+82-2-2034-4879	dkimc@lsis.com (Daniel Kim)
■ Oceania	+82-2-2034-4394	kacho@lsis.com (Kendra Cho)
■ North America	+82-2-2034-4471	pikwon@lsis.com (Paul Kwon)
■ Southwest Asia / Africa	+82-2-2034-4467	myleed@lsis.com (Henry Lee)
■ Latin America	+82-2-2034-4286	hkchung@lsis.com (Raul Chung)
■ Middle East	+971-4-886-5360	khchoi1@lsis.com (Lambert Choi)

Overseas Subsidiaries

- **LSIS(Shanghai) Co., Ltd. /CHINA**
32nd Room 1-4, 32/F, Great Wall Building, No.3000 North Zhongshan Road, Putuo District, Shanghai, P.R. China
Tel : 86-21-5237-9977(609) Fax : 86-21-5237-7189
- **LSIS(Dalian) Co., Ltd. /CHINA**
No. 15, Liaohexi 3-Road, Economic and Technical Development zone, Dalian, P.R. China
Tel : 86-411-8731-7542 Fax : 86-411-8730-7560 E-Mail : dskim@lsis.com
- **LSIS(Wuxi) Co., Ltd. /CHINA**
102-A, National High & New Tech Industrial Development Area, Wuxi, Jiangsu, P.R. China
Tel : 86-510-8534-6666 Fax : 86-510-8534-4078 E-Mail : sojin@lsis.com
- **LS Hukai Electric(Hubei) Co., Ltd./CHINA**
No. 100, Tanjiahe Road, Dianjun District, Yichang City, Hubei Province, P.R. China
Tel : 86-717-667-7536 Fax : 86-717-667-7222 E-Mail : jaewoongh@lsis.com
- **LS-VINA Industrial Systems Co., Ltd. /VIETNAM**
Room 1311, 13th, M3-M4 Building 91 Nguyen Chi Thanh street, Hanoi, Vietnam
Tel : 84-4-6275-8055 Fax : 86-21-5237-7189
- **LSIS(ME) FZE/U.A.E.**
LOB 19-205, JAFZA View Tower, Jebel Ali Free Zone, Dubai, United Arab Emirates
Tel : 971-4-886-5360 Fax : 971-4-886-5361 E-Mail : shunlee@lsis.com
- **LSIS Europe B.V./NETHERLANDS**
1st. Floor, Tupolevtaan 48, 1119NZ, Schiphol-Rijk, The Netherlands
Tel : 31-20-654-1420 Fax : 31-20-654-1429 E-Mail : junshickp@lsis.com
- **LSIS Japan Co., Ltd./JAPAN**
16th, Higashi-Kan, Akasaka Twin Tower, 2-17-22, Akasaka, Minato-ku, Tokyo, Japan
Tel : 81-3-3582-9128 Fax : 81-3-3582-2667 E-Mail : jschuna@lsis.com
- **LSIS USA Inc./U.S.A.**
2000 Millbrook Drive, Lincolnshire, Chicago, IL 60069, United States of America
Tel : 847-941-8240 Fax : 847-941-8259

Overseas Branches

- **LSIS Shanghai Office/CHINA**
Room E-G, 12th, Huamin Empire Plaza, No.726, West Yan'an Road, Shanghai, P.R. China
Tel : 86-21-5237-9977(702) Fax : 86-21-5237-7189
- **LSIS Beijing Office/CHINA**
Room 2306, Building B Landgent Center, No.24 Middle Road, East 3rd Ring Road, Chaoyang District, Beijing, P.R. China
Tel : 86-10-5761-3127 Fax : 86-10-5761-3128 E-Mail : htroh@lsis.com
- **LSIS Guangzhou Office/CHINA**
Room 1403, 14th, New Poly Tower, 2 Zhongshan Liu Road, Guangzhou, P.R. China
Tel : 86-20-8326-6784 Fax : 86-20-8326-6287 E-Mail : sojhtroh@lsis.com
- **LSIS Qingdao Office/CHINA**
Room 2001, Galaxy Building, 29 ShanDong Road, ShiNan District, QingDao, ShanDong, P.R. China
Tel : 86-532-8501-6058 Fax : 86-532-8501-6057 E-Mail : htroh@lsis.com
- **LSIS Chengdu Office/CHINA**
Room1710, 17/F Huamin Empire Plaza, NO.1 Fuxin Road, Chengdu, P.R. China
Tel : 86-28-8670-3201 Fax : 86-28-8670-3203 E-Mail : yangcf@lsis.com
- **LSIS Shen Yang Office/CHINA**
Room 803, Hongyuan Building, 52 South Nanjing Road, Heping District, Shenyang, P.R. China
Tel : 86-24-2321-9050 Fax : 86-24-8386-7210 E-Mail : yangcf@lsis.com
- **LSIS Jinan Office/CHINA**
Room 417, Chuangzhan Center, No. 201, Shanda Road, Lixia District, Jinan, Shandong, P. R. China
Tel : 86-531-8263-8026 Fax : 86-531-8263-8027 E-Mail : yangcf@lsis.com
- **LSIS Tokyo Office/JAPAN**
16th, Higashi-Kan, Akasaka Twin Tower, 2-17-22, Akasaka, Minato-ku, Tokyo, Japan
Tel : 81-3-3582-9128 Fax : 81-3-3582-2667
- **LS-VINA Industrial Systems Hochiminh Office/VIETNAM**
4th, Yoco Building, 41 Nguyen Thi Minh Khai Street, Hochiminh City, Vietnam
Tel : 84-8-3822-7941 Fax : 81-84-8-3822-7942 E-Mail : sjbaik@lsis.com
- **LSIS Detroit Office/U.S.A.**
5700 Crooks Rd, Suite 211, Troy, MI 48098, United States of America
Tel : 1-248-792-2637-8 Fax : 1-248-792-2642 E-Mail : sylee@lsis.com
- **LSIS Gurgaon Office/INDIA**
109 First Floor, Park Central, Sector-30, Gurgaon- 122 002, Haryana, India
Tel : +0091-124-493-0070 Fax : 91-1244-930-066 E-Mail : hwym@lsis.com

Specifications in this catalog are subject to change without notice due to continuous product development and improvement.