Ezi-Robo®

Actuator series Driven by Ezi-SERVO

- Hollow Rotary Index Table
- Accurate Gear Driven
- High Precision
- High Rigidity
- High Torque
- Easy to Use

HG



FASTECH

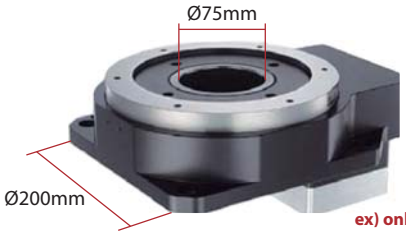
Fast, Accurate, Smooth Motion

Features

1. Hollow rotary table

Large Diameter hollow bore to penetrate the output table equipped HG Series ensure flexibility and convenience in the design of equipment when install complex wiring and piping.

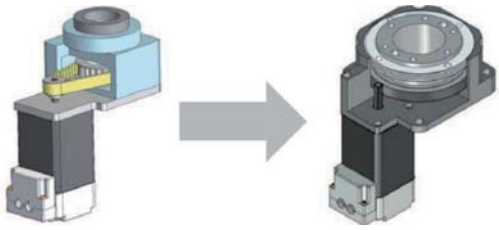
Model Name	Size of plinth(Frame Size)	Hollow Bore Diameter
HG60	60mm	20mm
HG100	100mm	29mm
HG130	130mm	40mm
HG200	200mm	40mm
HG275	200mm	75mm



ex) only HG275 series

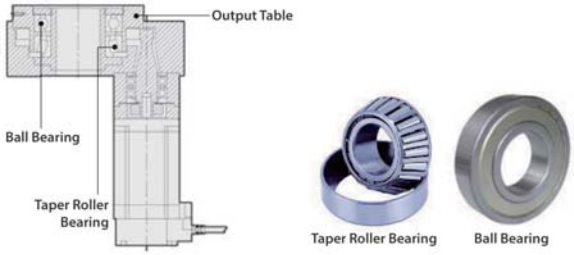
2. Accurate gear driven

Extremely low backlash gear direct drive, so that repetitive positioning accuracy from a single direction is ±15sec, lost motion by positioning from two directions for less than 2min. and the precise positioning can be determined. And Belt and Pulley are not used in this system so it enables cost saving, unnecessary of maintenance and repair service without ad-justment of belt-tensioning.



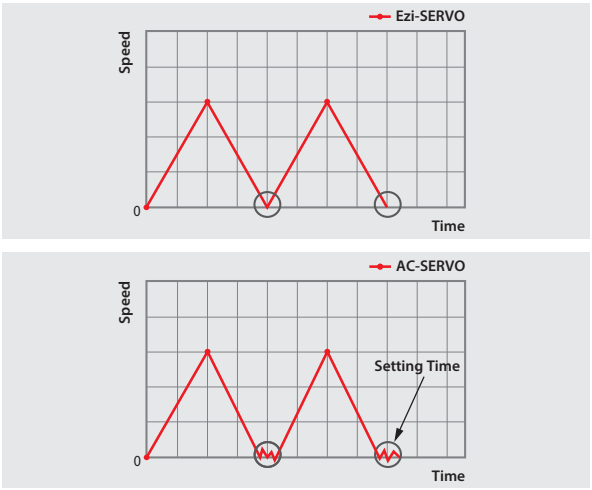
3. High rigidity

High rigidity of taper roller bearing and Ball Bearing integrated HG Series maximizes allowable thrust load and moment load(But, Deep Groove ball bearings applied in HG60 Series)



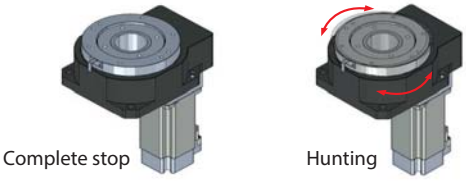
4. Fast response

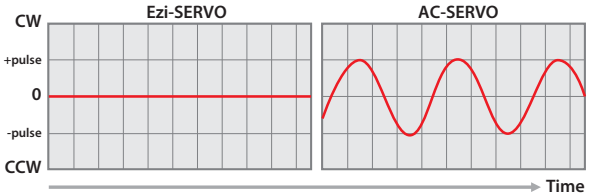
High rigidity Rotary table fixed to the closed loop stepping control system, Ezi-SERVO can shorten positioning time for big inertia applications.

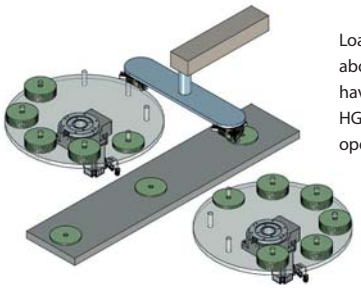


5. Supportiong sudden load fluctuation and rapid acceleration

Adopting a closed loop stepping control system, Ezi-SERVO designed to maintain synchronism and does not have step-out problem, Ezi-Robo HG series can be driven by rapid acceleration or sudden load fluctuation because the situation in a typical servo system that is prone to fluctuation, Hunting does not occur. For sudden load fluctuatoin with a servo system is essential to improve the control performance does not need to gain adjustment is gain Tuning Free Actuator.







Load variations are concerned about the equipment without having to adjust the gain, HG Series enables stable operation.

6. Variety of controller with High Performance and Multi-Asking

Ezi-SERVO, high performance closed loop stepping control system by adopting, pulse train input drives and controller integrated drives are possible to use.



Pulse Input drive



Controller Embedded Drive
(Enable to operate Multi-Axes based on Network)

7. Network Based Motion Control

A maximum of 16 axis can be operated from a PC through RS-485 commu-nications. All of the Motion conditions are set through the network and saved in Flash ROM as a parameter. Motion Library(DLL) is provided for programming under Windows 2000 / XP / 7 / 8 / Vista.



8. Position Table Function

Position Table can be used for motion control by digital input and output signals of host controller. You can operate the motor directly by sending the position table number, start / stop, origin search and other digital input values from a PLC. The PLC can monitor The In-Position, origin search, moving / stop, servo ready and other digital output signals from a drive. A maximum of 256 positioning points can be set from PLC.



9. Simple Return To Home Function

Rotary table drive from home return often necessary to simplify the return to home operation has been equipped with the optional Home-sensor Set. The sensor set comes with all the parts required for the return to home operation, meaning you will spend less time for designing, assembling and procuring parts related to sensor installation.

• **Example of Sensor Installation On HG130**

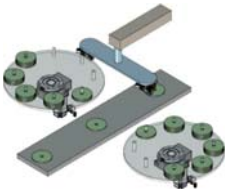


10. Extensive Input / Output Signals And User-Defined Functions

Input 9 points / 9 points signal output according to the needs of users can be defined. Therefore, various functions depending on the needs of the user input / output wiring must be used without changing.

11. Examples of Ezi-Robo HG Applications

Applications support to changing load intertia fluctuation



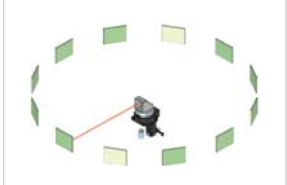
Applications for high precision positining



Applications support moment load



Applications for optical applications using hollow bore



Applications for air absorption using hollow bore

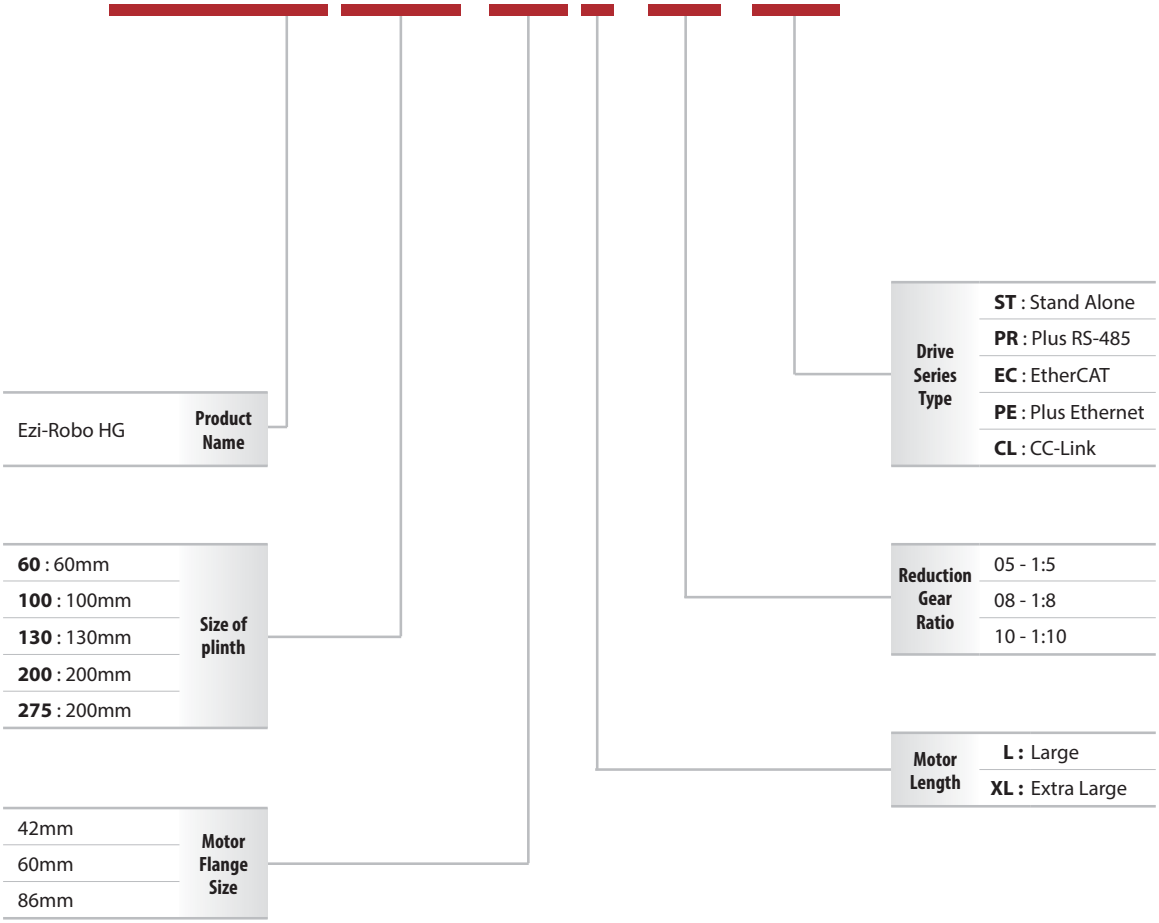


Applications for a precise positioning using hollow bore



Part Numbering Method

RB-HG100-60L-10-ST



Applicable Product Line-up	Products	Specifications
	Ezi-SERVO ST	Pulse Input Type
	Ezi-SERVO Plus-R	Controller Embedded
	Ezi-SERVO II EtherCAT	Embedded EtherCAT
	Ezi-SERVO II Plus-E	Ethernet based controller integrated product
	Ezi-SERVO II CC-Link	Embedded CC-Link

Applicable Drive Type

Ezi-SERVO ST
(Pulse Input / Standard)



Ezi-SERVO Plus-R
(RS-485 / Standard)



Ezi-SERVO II EtherCAT
(EtherCAT / Standard)



Ezi-SERVO II Plus-E
(Ethernet / Standard)



Ezi-SERVO II CC-Link
(CC-Link / Standard)



Motor, Drive Combination

Ezi-Robo HG	MOTOR	DRIVE				
		Ezi-SERVO ST	Ezi-SERVO Plus-R	Ezi-SERVO II EtherCAT	Ezi-SERVO II Plus-E	Ezi-SERVO II CC-Link
Applicable Network		Pulse Input	RS-485	EtherCAT	Ethernet	CC-Link
RB-HG60-42XL-05	EzM-42XL-A	O	O	O	O	O
RB-HG100-60L-08	EzM-60L-A	O	O	O	O	O
RB-HG130-60L-10	EzM-60L-A	O	O	O	O	O
RB-HG200-86L-10	EzM-86L-A	O	O	O		
RB-HG275-86L-10	EzM-86L-A	O	O	O		

※ Ezi-SERVO Ⅱ series motors are applied to EzM2 series motors

How to Read Specification Table

Example of Specification Table

Model Name		Rb-HG60-42XL-05 ST
Type of motor		Ezi-SERVO 42XL Step Motor
① Type of output table supporting bearing		Ball Bearing
② Permissible Torque	(N·m)	4.5
③ Inertia moment	J :(Kg·m^2)	2,330 × 10^{-7}
④ Permissible speed	(rpm)	300
⑤ Gear ratio		1:5
⑥ Maximum Holding Torque	(N·m)	1.6
⑦ Resolution	(ppr)	10,000
⑧ Repetitive Positioning Accuracy	(sec)	±10(0.0028°)
⑨ Lost Motion	(min)	2(0.033°)
⑩ Angular transmission error	(min)	4(0.067°)
⑪ Permissible thrust load	(N)	100
⑫ Permissible moment load	(N·m)	2
⑬ Runout of output table surface	(mm)	0.015
⑭ Runout of output table inner/outer diameter	(mm)	0.015
⑮ Parallelism of output table	(mm)	0.03
⑯ Degree of protection IP40		IP40 (IP20 for motor Connector)
⑰ Mass	(Kg)	1.0

Show Description of Specification Items

① Type of output table supporting bearing — The type of the bearing used for the output table.

② Permissible Torque — The limit of mechanical strength of the reduction gear mechanism enables to make sure the applied torque including acceleration torque and load fluctuation and it will not exceed the permissible torque.

③ Inertia moment — Total sum of rotor inertia moment of the motor and the reduction gear of mechanism, converted to a moment on the output table.

④ Permissible speed — The output table speed can be tolerated by the mechanical strength of the reduction gear mechanism.

⑤ Gear ratio — Deceleration mechanism to configure the number of teeth of two gears.

⑥ Maximum Holding Torque — Hollow Rotary actuator can exert the maximum holding torque once the actuator is at standstill with power supplied.

⑦ Resolution — Needed number of pulse to rotate 1 revolution of output table.

⑧ Repetitive Positioning Accuracy — A Value indicates the degree of error which is generated when positioning performs repeatedly to the same position in the same direction.

⑨ Lost Motion — The difference at the stopped angles achieved when the output table is positioned to the same position during forward and reverse direction of motions. And difference is mainly caused by backlash of gear.

⑩ Angular transmission error — The difference between the theoretical rotation angle of the output table and the actual rotation angle. And this value calculated from the input pulse number.

⑪ Permissible thrust load — The permissible value of thrust load applied to the output table in the axial direction.

⑫ Permissible moment load — When a load is applied to a position away from the center of the output table, the output table receives a tilting force and the permissible moment load refers to the permissible value of moment load calculated by multiplying the offset distance from the center by the applied load.

⑬ Runout of output table surface — The maximum value of runout of the mounted surface of the output table when the output table rotates without load.

⑭ Runout of output table inner/outer diameter — The maximum value of runout of the inner diameter or outer diameter of the table when the output table rotates without load.

⑮ Parallelism of output table — Actuator(plinth base) installed on the output side of the Table and value that indicates whether the degree inclines.

⑯ Degree of protection IP40(IP20 for motor connector) — IEC 60529, EN60034-5(= IEC60034-5) classifies the dust resistance and waterproofing into grades.

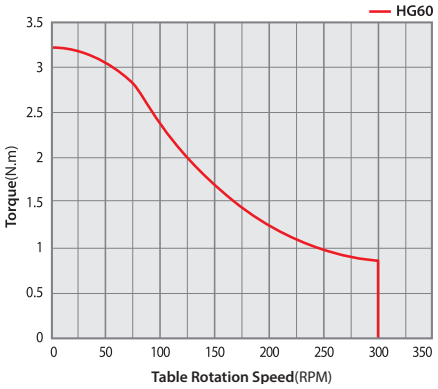
⑰ Mass — A sum of Actuator configured as the output Table, deceleration mechanism, such as driving motor plus the weight of all components.

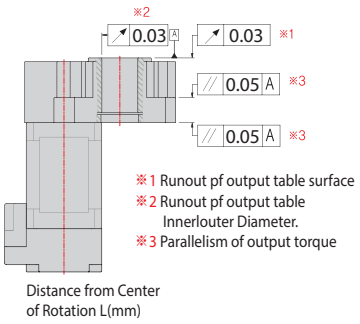
Motor Specification Table

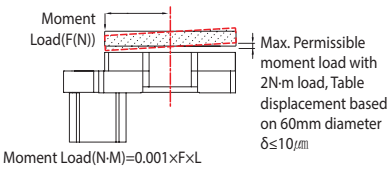
HG60 Series

Model Name		Rb-HG60-42XL-05				
		ST	PR	EC	PE	CL
Type of motor		Ezi-SERVO 42XL Step Motor				
Type of output table supporting bearing		Ball Bearing				
Permissible Torque	(N·m)	4.5				
Inertia moment	J :(Kg·m^2)	2,330 × 10^{-7}				
Permissible speed	(rpm)	300				
Gear ratio		1:5				
Maximum Holding Torque	(N·m)	1.6				
Resolution	(ppr)	10,000				
Repetitive Positioning Accuracy	(sec)	±10(0.0028°)				
Lost Motion	(min)	2(0.033°)				
Angular transmission error	(min)	4(0.067°)				
Permissible thrust load	(N)	100				
Permissible moment load	(N·m)	2				
Runout of output table surface	(mm)	0.03				
Runout of output table inner/outer diameter	(mm)	0.03				
Parallelism of output table	(mm)	0.05				
Degree of protection IP40		IP40 (IP20 for motor Connector)				
Mass	(Kg)	1.0				

Ezi-Robo HG60 Series



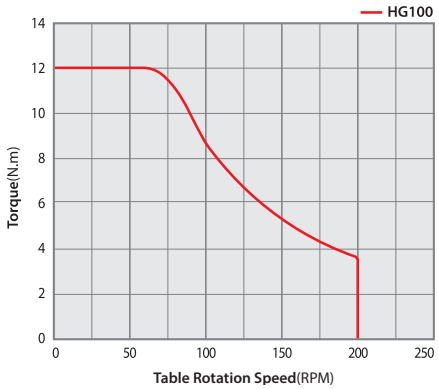


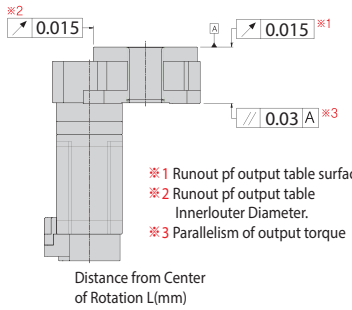


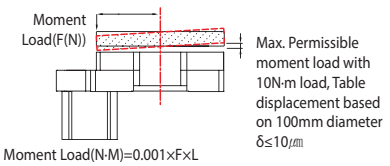
HG100 / HG130 Series

Model Name		Rb-HG100-60L-08					Rb-HG130-60L-10				
		ST	PR	EC	PE	CL	ST	PR	EC	PE	CL
Type of motor		Ezi-SERVO 60L Step Motor					Ezi-SERVO 60L Step Motor				
Type of output table supporting bearing		Taper Roler Bearing + Ball Bearing					Taper Roler Bearing + Ball Bearing				
Permissible Torque	(N·m)	12					14				
Inertia moment	J :(Kg·m^2)	3,898 × 10^{-6}					9,216 × 10^{-6}				
Permissible speed	(rpm)	200					200				
Gear ratio		1:8					1:10				
Maximum Holding Torque	(N·m)	10					12.5				
Resolution	(ppr)	10,000					10,000				
Repetitive Positioning Accuracy	(sec)	±10(0.0028°)					±10(0.0028°)				
Lost Motion	(min)	2(0.033°)					2(0.033°)				
Angular transmission error	(min)	4(0.067°)					3(0.05°)				
Permissible thrust load	(N)	500					2000				
Permissible moment load	(N·m)	10					20				
Runout of output table surface	(mm)	0.015					0.015				
Runout of output table inner/outer diameter	(mm)	0.015					0.015				
Parallelism of output table	(mm)	0.03					0.03				
Degree of protection IP40		IP40 (IP20 for motor Connector)					IP40 (IP20 for motor Connector)				
Mass	(Kg)	4.0					6.0				

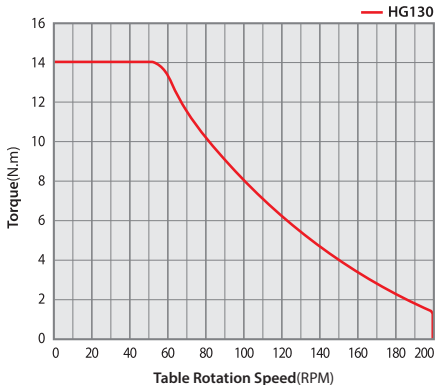
Ezi-Robo HG100 Series

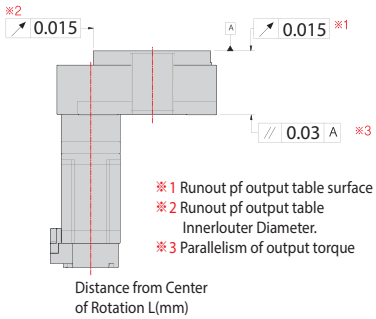


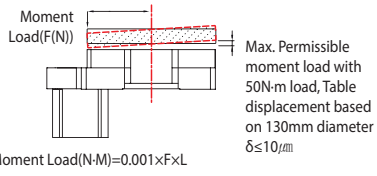




Ezi-Robo HG130 Series



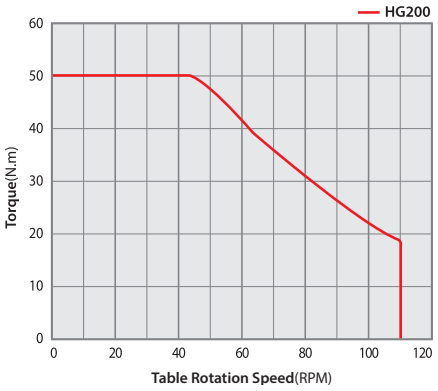


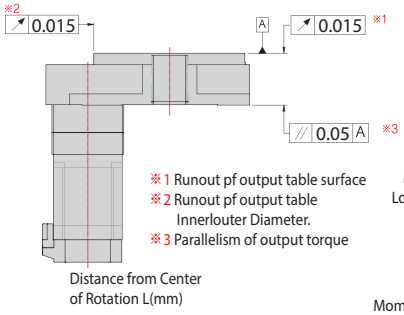


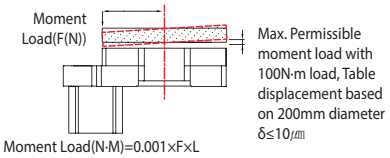
HG200 / HG275 Series

Model Name		Rb-HG200-86L-10			Rb-HG275-86L-10		
		ST	PR	EC	ST	PR	EC
Type of motor		Ezi-SERVO 86L Step Motor			Ezi-SERVO 86L Step Motor		
Type of output table supporting bearing		Taper Roler Bearing + Ball Bearing			Taper Roler Bearing + Ball Bearing		
Permissible Torque	(N·m)	50			55		
Inertia moment	J :(Kg·m^2)	85,792 × 10^{-6}			111,279 × 10^{-6}		
Permissible speed	(rpm)	110			110		
Gear ratio		1:10			1:10		
Maximum Holding Torque	(N·m)	43			43		
Resolution	(ppr)	10,000			10,000		
Repetitive Positioning Accuracy	(sec)	±15(0.0028°)			±15(0.0028°)		
Lost Motion	(min)	2(0.033°)			2(0.033°)		
Angular transmission error	(min)	2(0.033°)			2(0.033°)		
Permissible thrust load	(N)	4,000			4,000		
Permissible moment load	(N·m)	100			100		
Runout of output table surface	(mm)	0.015			0.015		
Runout of output table inner/outer diameter	(mm)	0.015			0.015		
Parallelism of output table	(mm)	0.05			0.05		
Degree of protection IP40		IP40 (IP20 for motor Connector)			IP40 (IP20 for motor Connector)		
Mass	(Kg)	15.5			19.7		

Ezi-Robo HG200 Series

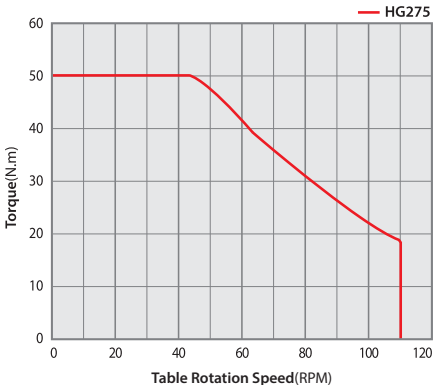


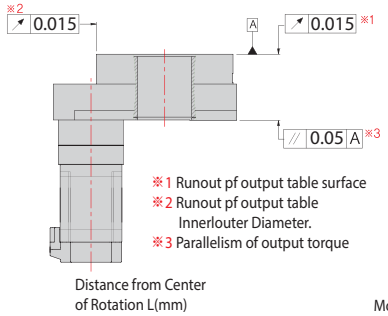


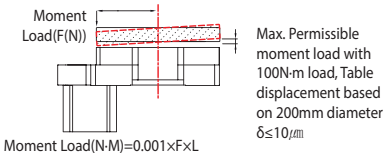


Max. Permissible moment load with 100N·m load, Table displacement based on 200mm diameter δ≤10㎛

Ezi-Robo HG275 Series

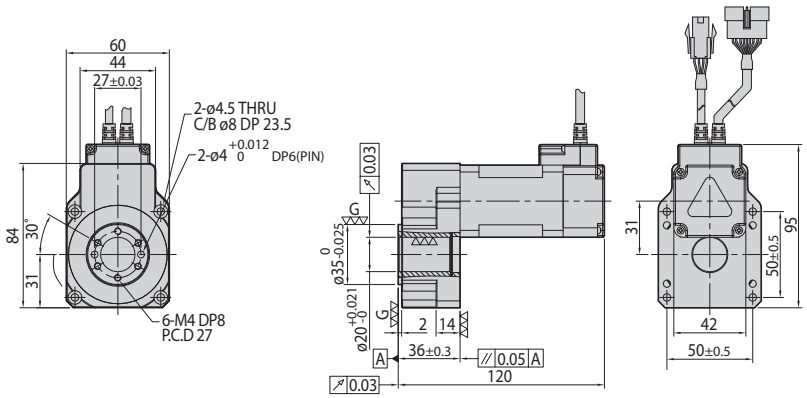






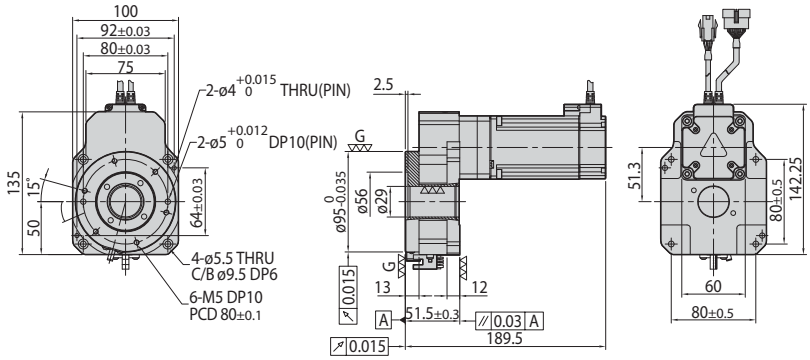
Max. Permissible moment load with 100N·m load, Table displacement based on 200mm diameter δ≤10㎛

Drawings for HG Series



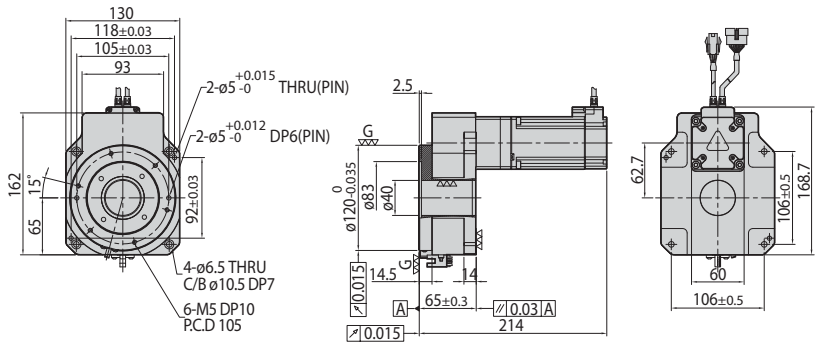
60mm

Model Name	Length(L)
EzM-42XL	60



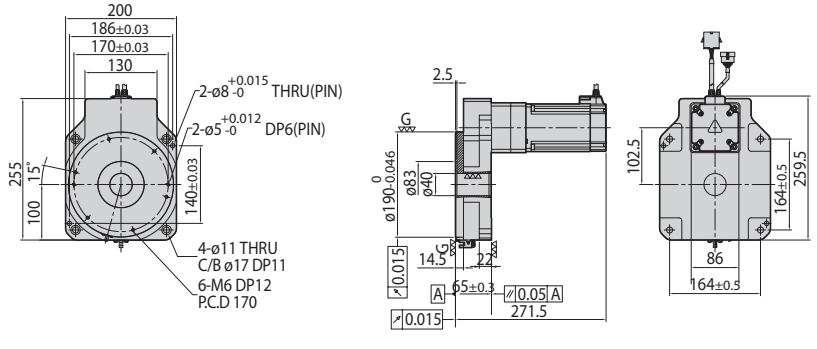
100mm

Model Name	Length(L)
EzM-60L	85



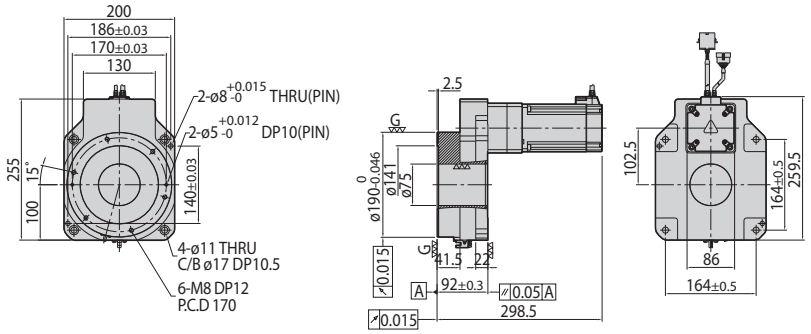
130mm

Model Name	Length(L)
EzM-60L	85



200mm

Model Name	Length(L)
EzM-86L	117



275mm

Model Name	Length(L)
EzM-86L	117

Mechanical Part Option

Home-sensor Set

Rotary table drive less frequently required to perform homing Photo Micro Sensor, Connector Attach Cable, blue filter, install the screws to Set Sensor Set the origin has been established as an option. There needed to detect the origin because the origin of all parts of tne installation when necessary Sensor takes part in designing manufacturing and parts procurement to relieve the trouble, it also can be used to install easily.

1. Type

Model	Sensor output	Applicable product
OSHG-A	NPN	HG60, HG100
OSHG-AY	PNP	
OSHG-B	NPN	HG130, HG200, HG275
OSHG-BY	PNP	

2. Home-sensor Set Composition OSHG-A



3. Specifications

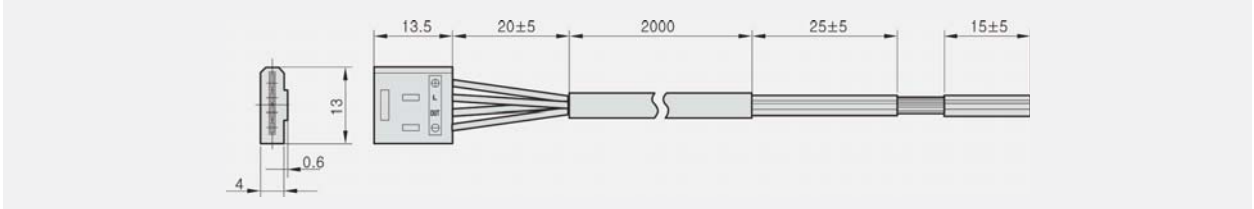
Times	NPN Type	PNP Type
Sensor Model	EE-SX672A(OMRON Product) HG60, HG100, HG130, HG200, HG275 common	EE-SX672R(OMRON Product) HG60, HG100, HG130, HG200, HG275 common
Input Voltage	DC5-24V ±10% Ripple(P-P) 10% less	DC 5-24V ±10%, Ripple(P-P) 10% less
Current Consumption	35mA less	30mA less
Control Output	NPN Open Collector output DC5 ~ 24V 100mA less Residual Voltage 0.8V less(at load current of 100mA)	PNP Open Collector output DC5 ~ 24V 100mA less Residual Voltage 1.3V less(at load current of 100mA)
Display LED	Detection(Red)	Detection(Red)
Sensor Logic	Normally Open / Normally Closed (Switchable, Depending on connection)	Normally Open / Normally Closed (Switchable, Depending on connection)

4. Connector Attached Cable(OMRON robot ode attached connector EE1010-R)

• **Terminal Layout**

①	⊕	Brown
②	L	Pink
③	OUT	Black
④	⊖	Blue





5. Notes for sensor set of installation

Option to install is the origin sensor set pay attention to the following.

- Use tne temperature below 40℃, Motor Part surface temperature 90℃ or less, to be sure to set operating conditions
- Please prepare individual sensor and Bracket to get homing with using from motor shaft. Notes for sensor lines is extended. Sensor shield should be cabled and grounded if extended to more than 2 Meter long.

6. Notes for sensor lines is extended

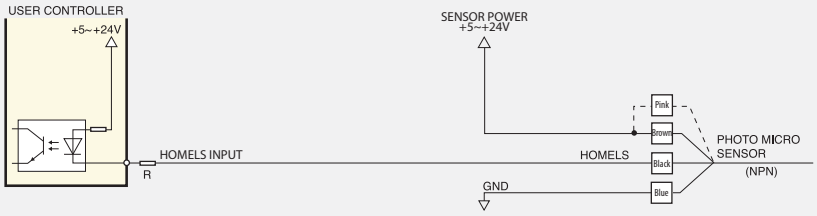
Sensor shield should be cabled and grounded if extended to more than 2 Meter long.

Dimensions of Home-sensor Installation

1. NPN Type

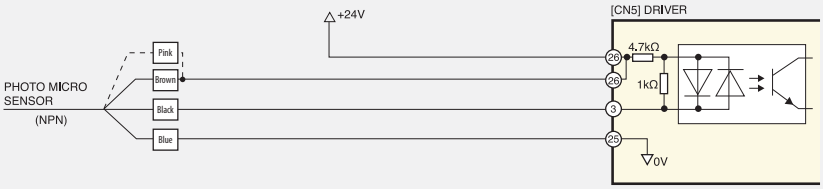
Please use DC 5V, DC 24V power supply or less and consult the current value less than 100mA. If more than100mA, please connect external register R. And sensor power supply and user controller power supply GND should be a common.

• Pulse Train Input unit



Pink lead wire N.C(Normally Closed) needs to be connected with brown lead wire.
N.O(Normally Open) : Pink lead wire is not connected.

• Controller integrated unit

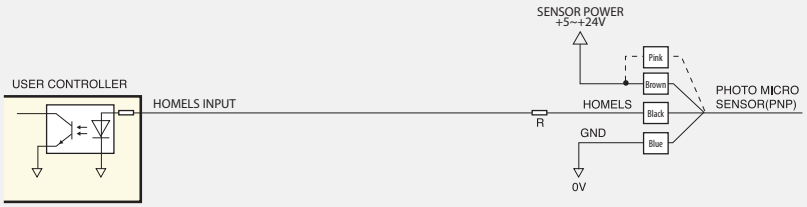


Pink lead wire N.C(Normally Closed) needs to be connected with brown lead wire.
N.O(Normally Open) : Pink lead wire is not connected.

2. PNP Type

Please use DC 5V, DC power supply or less and consult the current value less than 100mA. If more than 50mA, please connect external register R.

• Pulse Train Input unit



Pink lead wire N.C(Normally Closed) needs to be connected with brown lead wire.
N.O(Normally Open) : Pink lead wire is not connected.

• Controller integrated unit

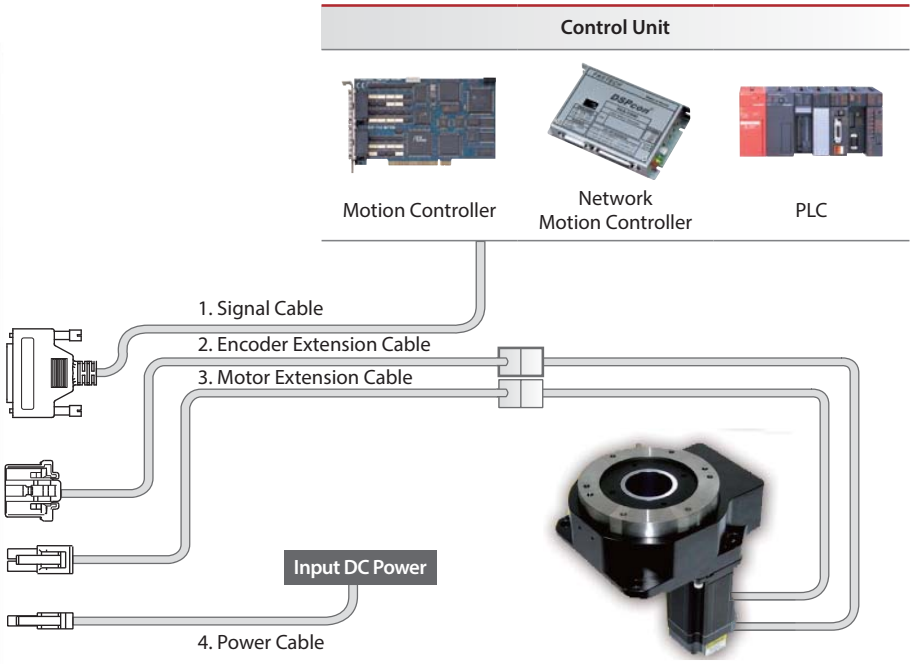


Pink lead wire N.C(Normally Closed) needs to be connected with brown lead wire.
N.O(Normally Open) : Pink lead wire is not connected.

System Configuration

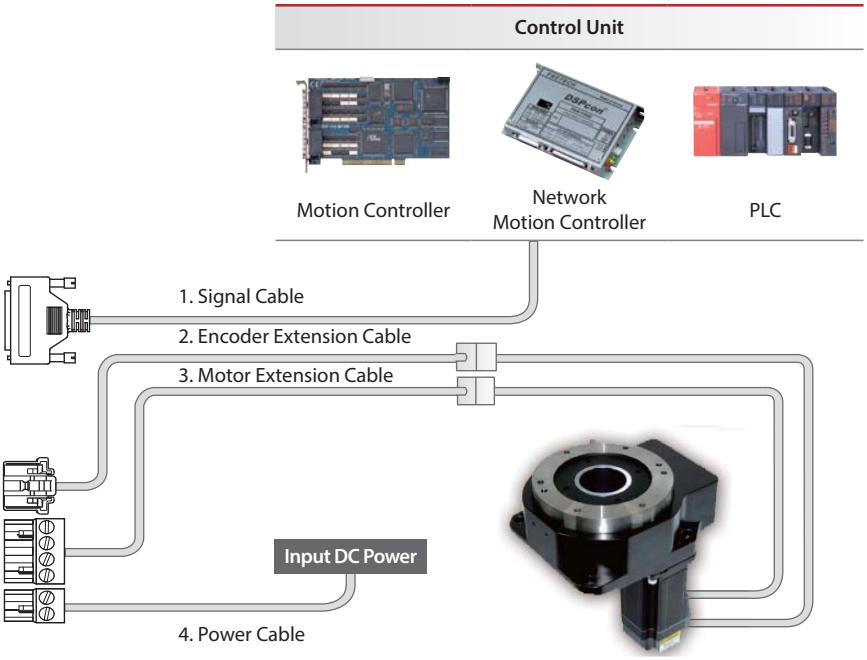
Pulse Train Input Drives



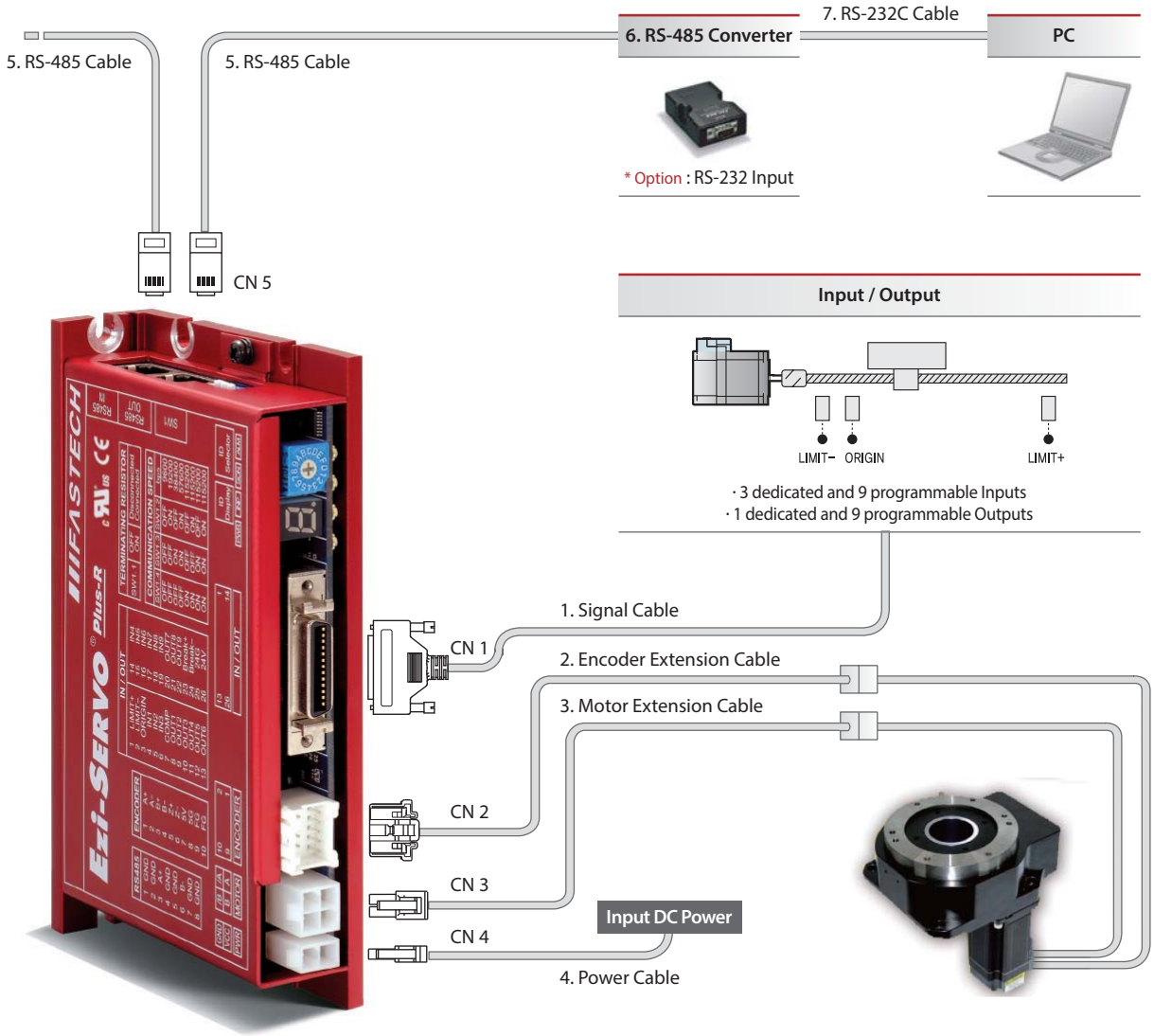


Pulse Train Input Drives(86mm)

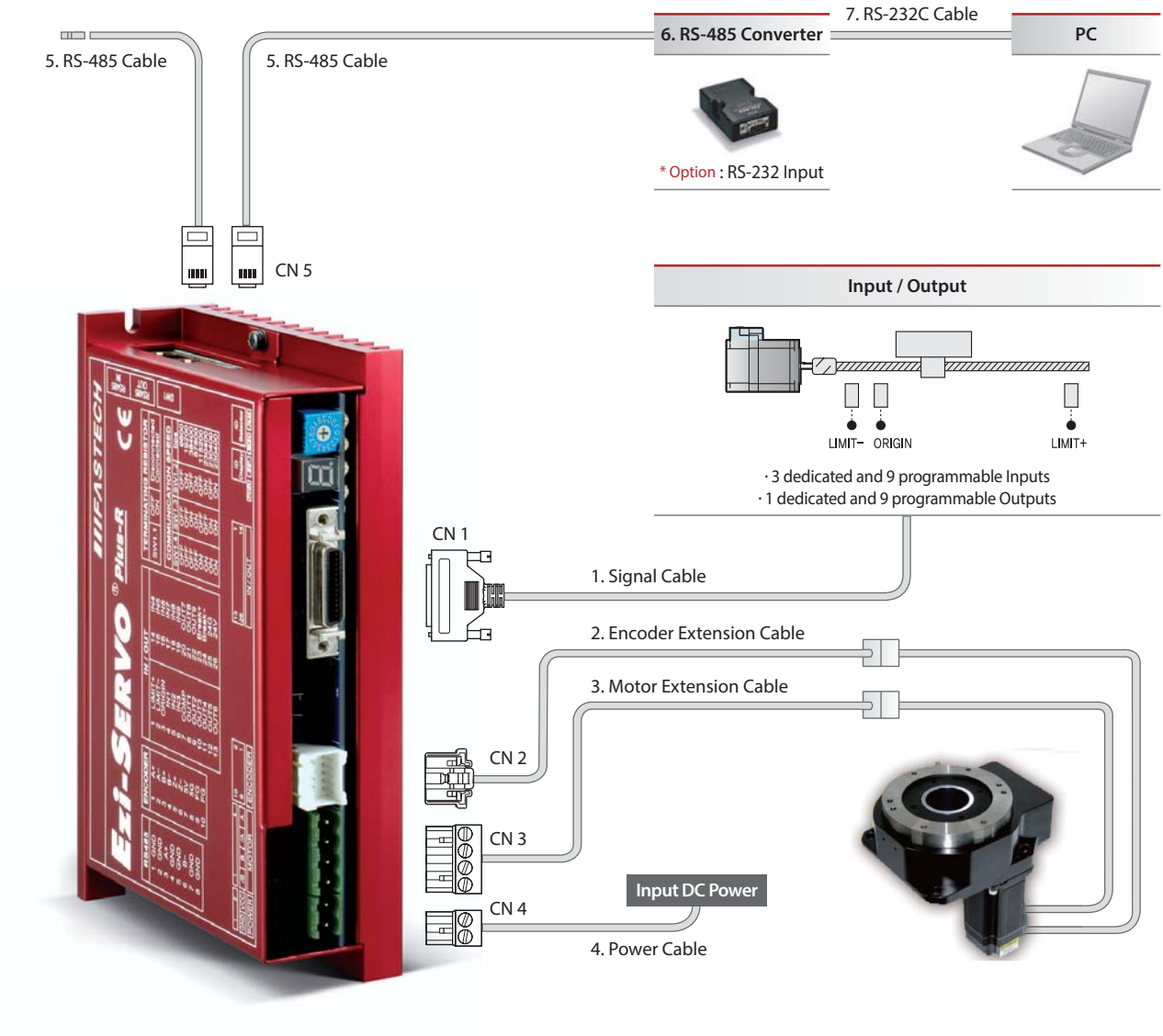




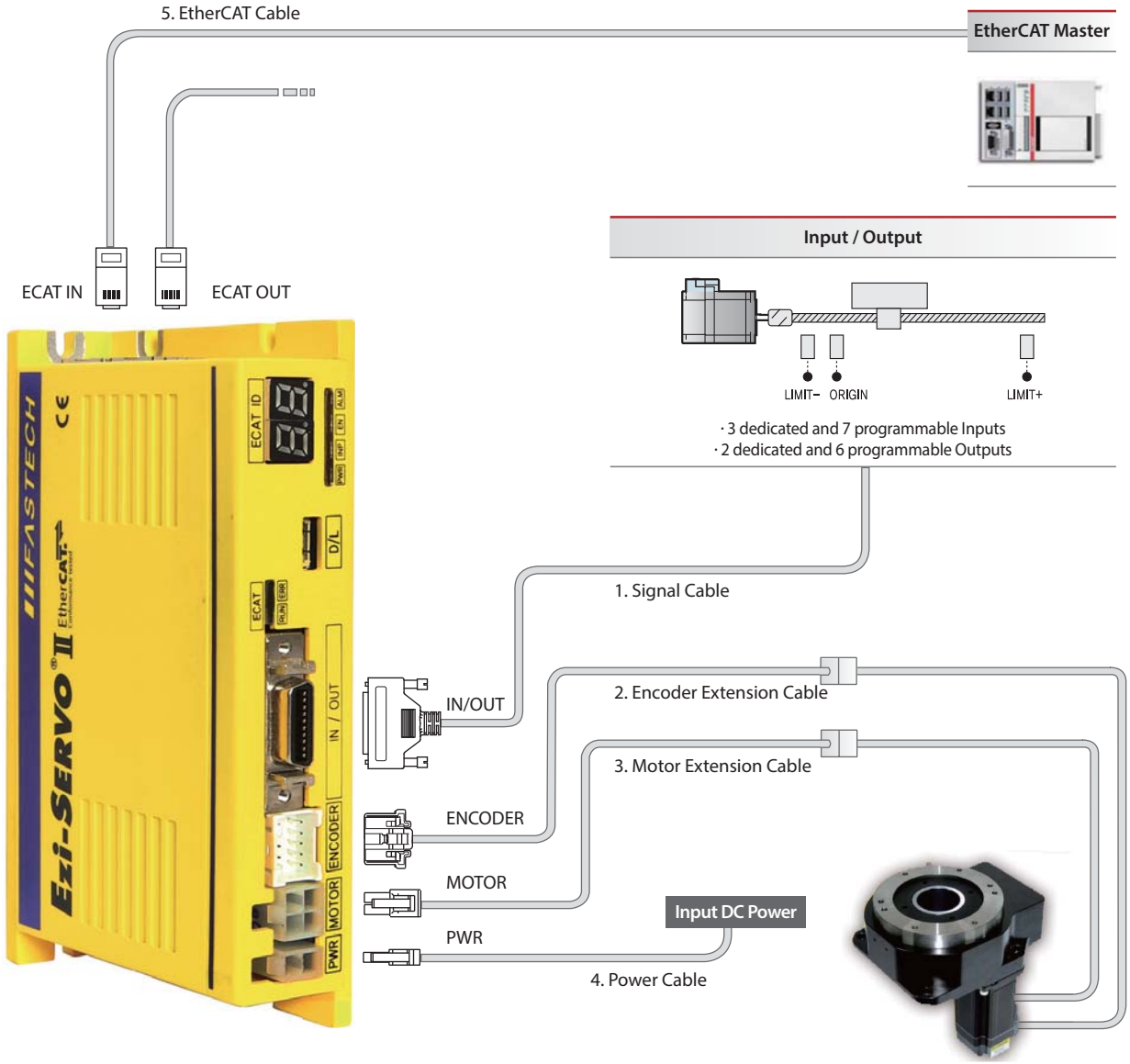
Controller Integrated Drive(RS-485)



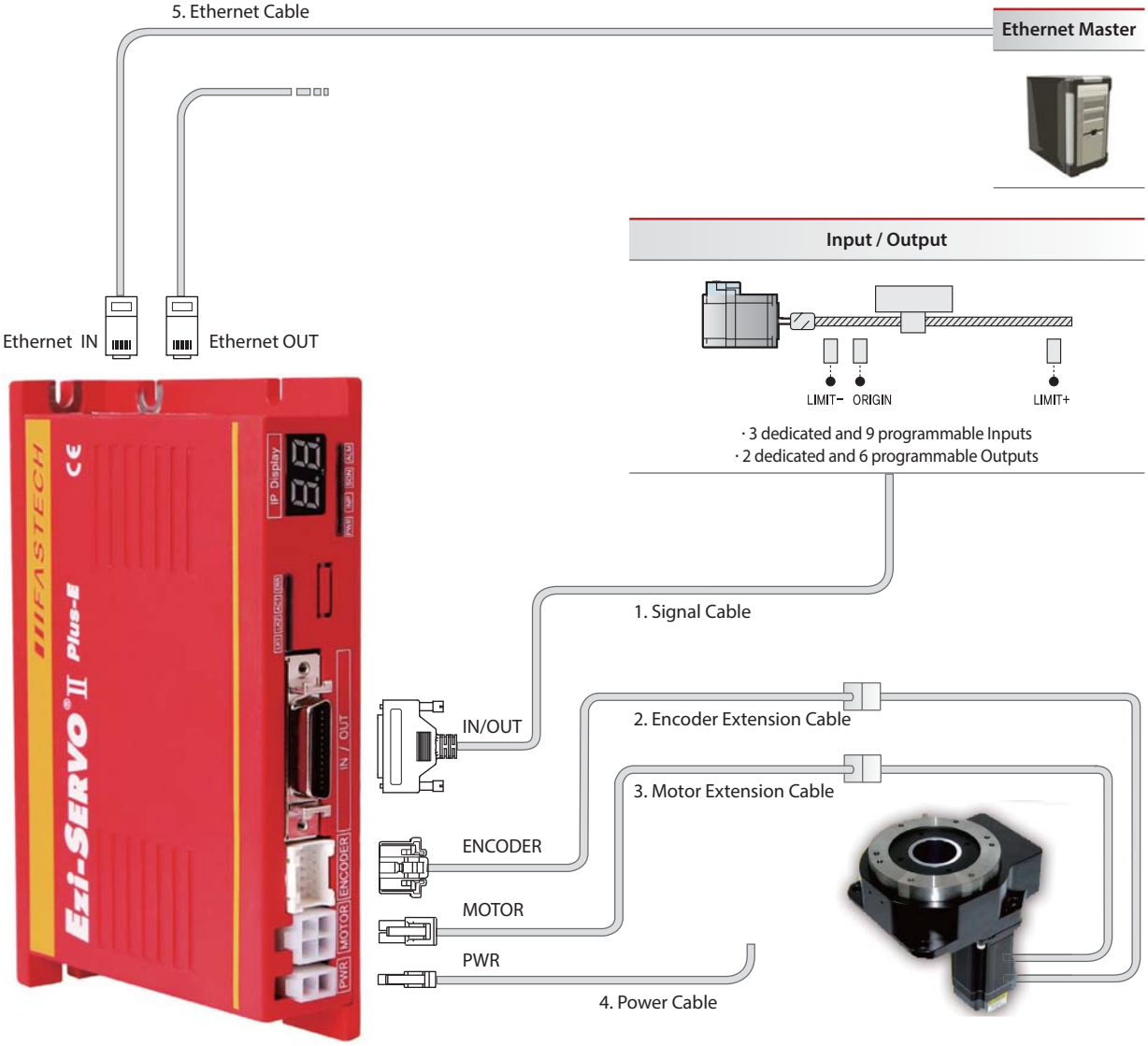
Controller Integrated Drive(86mm RS-485)



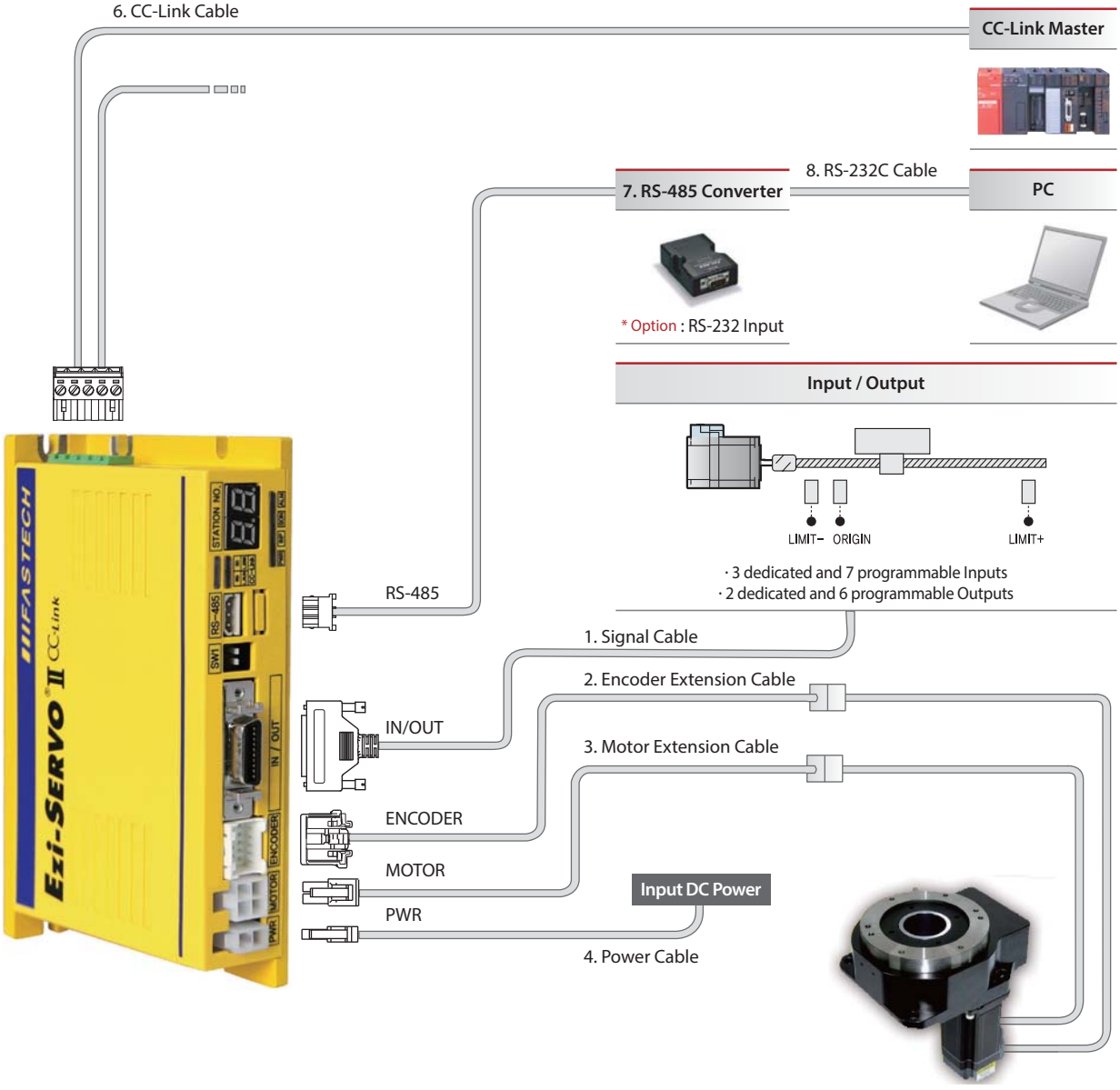
EtherCAT


5. EtherCAT Cable
EtherCAT Master
Input / Output
ECAT IN
ECAT OUT
LIMIT−
ORIGIN
LIMIT+
· 3 dedicated and 7 programmable Inputs
· 2 dedicated and 6 programmable Outputs
1. Signal Cable
IN/OUT
2. Encoder Extension Cable
3. Motor Extension Cable
ENCODER
MOTOR
Input DC Power
PWR
4. Power Cable
Ezi-SERVO II
IFASTECH
ECAT ID
D/L
ECAT
IN / OUT
ENCODER
MOTOR
PWR

Ethernet

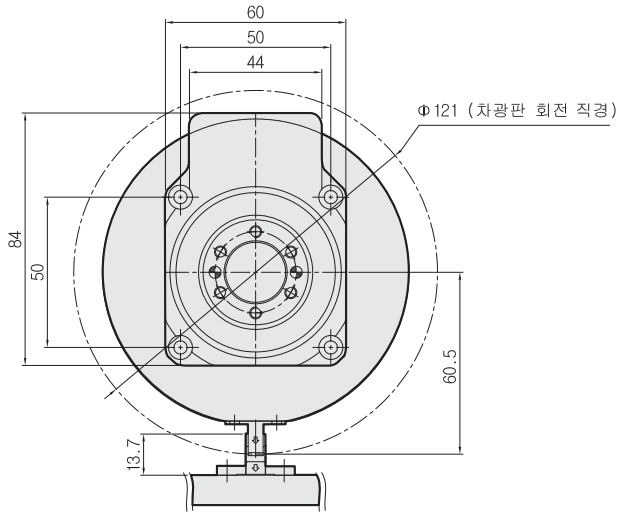

5. Ethernet Cable
Ethernet Master
Input / Output
LIMIT−
ORIGIN
LIMIT+
· 3 dedicated and 9 programmable Inputs
· 2 dedicated and 6 programmable Outputs
Ethernet IN
Ethernet OUT
1. Signal Cable
IN/OUT
2. Encoder Extension Cable
3. Motor Extension Cable
ENCODER
MOTOR
PWR
4. Power Cable
Ezi-SERVO II Plus-E
FASTECH
IP Display
IN / OUT
ENCODER
MOTOR
PWR

CC-Link

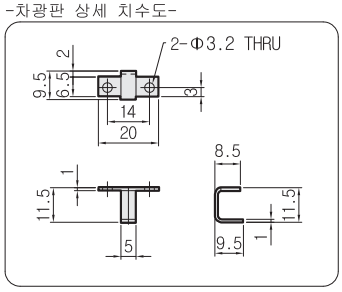

6. CC-Link Cable
CC-Link Master
8. RS-232C Cable
7. RS-485 Converter
PC
* Option : RS-232 Input
Input / Output
LIMIT− ORIGIN LIMIT+
· 3 dedicated and 7 programmable Inputs
· 2 dedicated and 6 programmable Outputs
RS-485
1. Signal Cable
2. Encoder Extension Cable
IN/OUT
3. Motor Extension Cable
ENCODER
MOTOR
Input DC Power
PWR
4. Power Cable
Ezi-SERVO II CC-Link
IAI PASTECH

Dimension of Home-sensor Installation

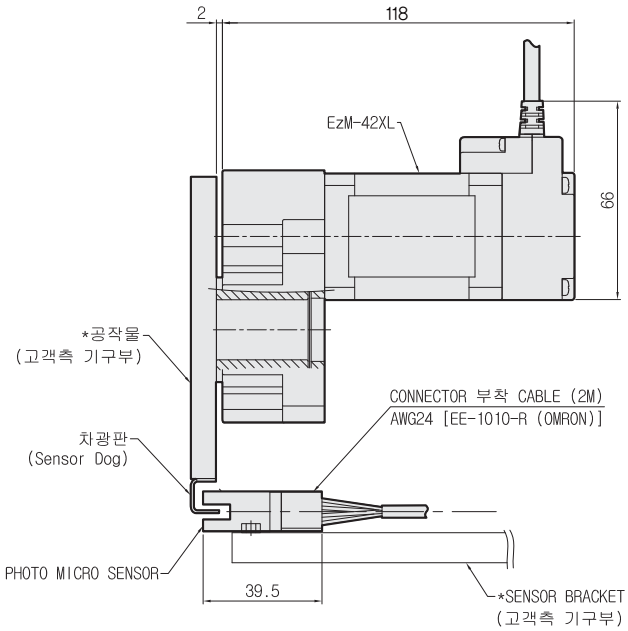
Ezi-Robo HG60



-차광판 상세 치수도-

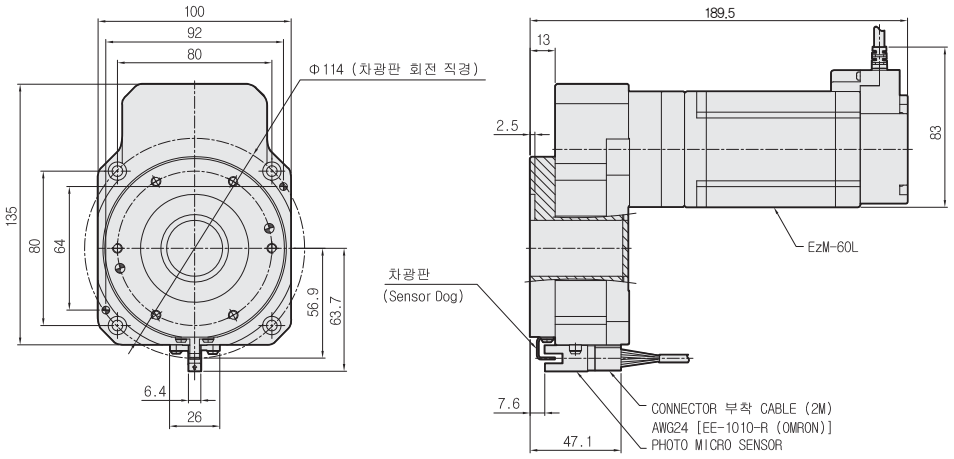


HG60/HG100 공용 차광판 상세도

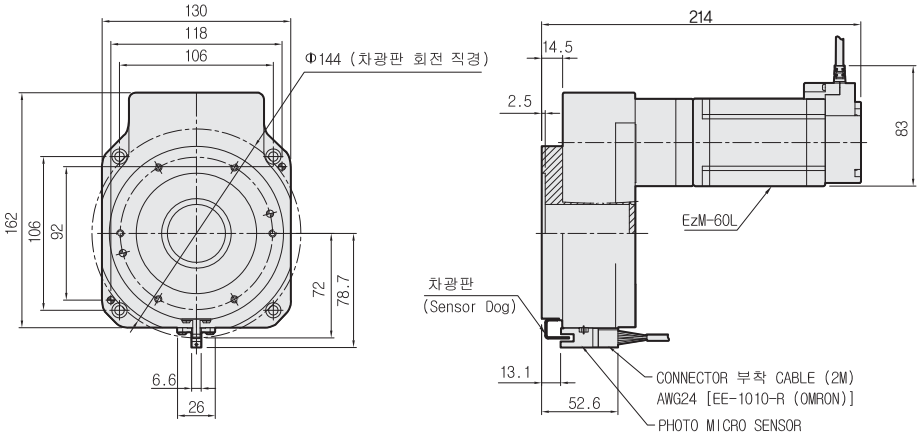


-본 치수도는 원점센서 부착에 따른 예시이며
SENSOR BRACKET 및 공작물은 제공되지 않습니다.

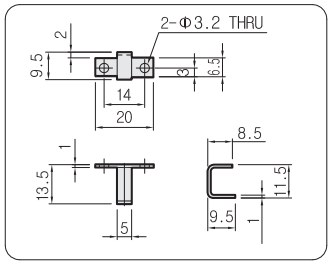
Ezi-Robo HG100



Ezi-Robo HG130

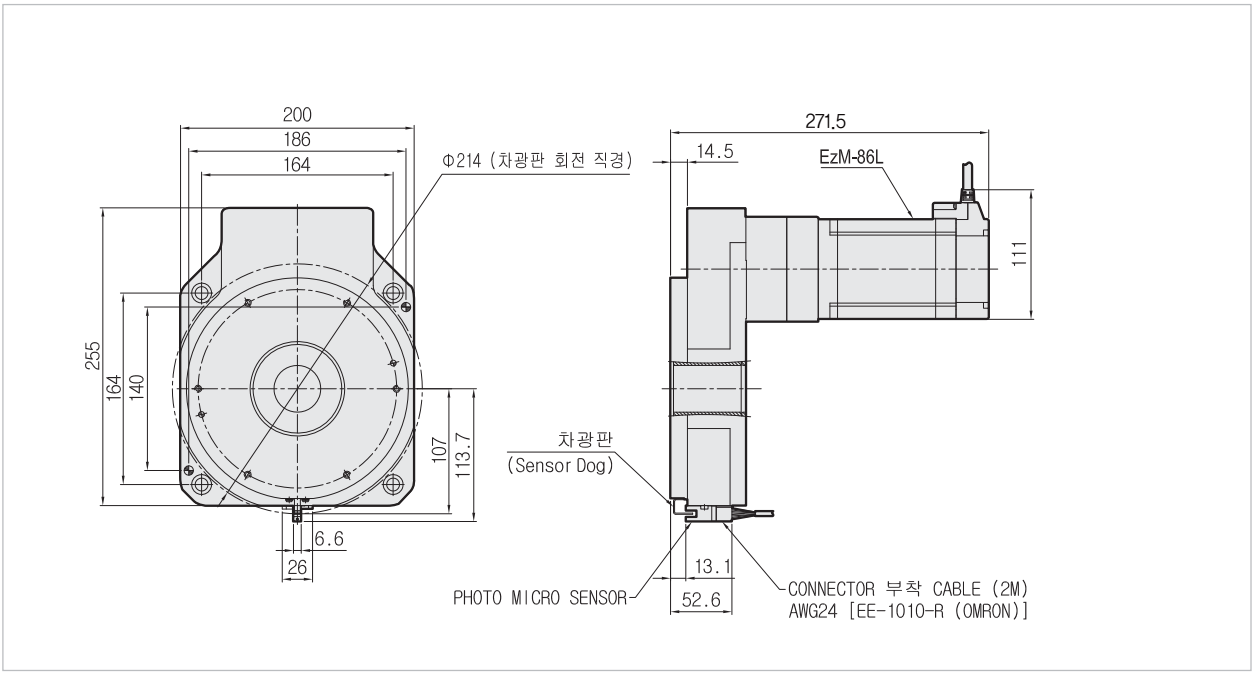


-차광판 상세 치수도 [2:1]-

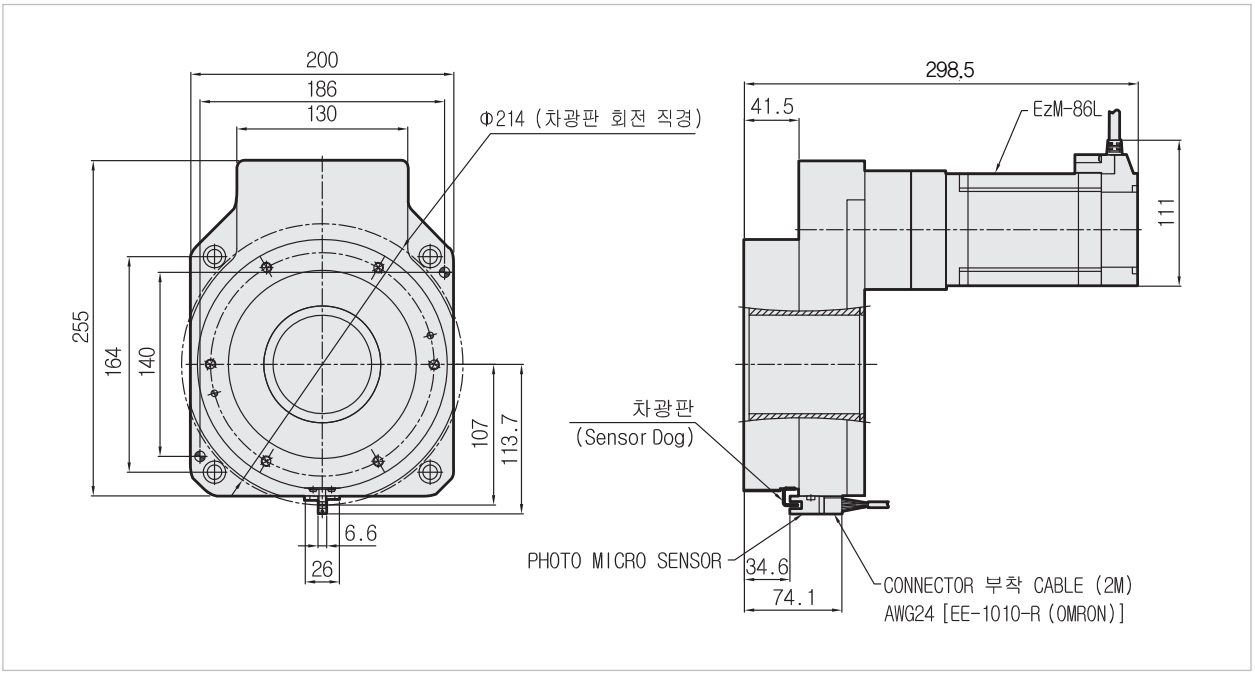


HG130/HG200/HG275 공용 차광판 상세도

Ezi-Robo HG200



Ezi-Robo HG275



FASTECH

Fast, Accurate, Smooth Motion

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