ELS Series EZ-Drive Type

ELS6: Width 62 mm × Height 83 mm 24 VDC

Maximum Transportable Mass: Horizontal 60 kg/Vertical 30 kg
Stroke: 50 to 850 mm (10 mm increments)

Custom-design program "FACE"

Linear Slide Specifications RoHS

Drive System	Ball Screw

Repetitive Positioning Accuracy [mm]	±0.02

Resolution [mm]	0.01

Traveling Parallelism [mm]	0.03

Dynamic Permissible Moment [N·m]	MP: 31.8 MY: 10.3 MR: 40.6
Static Permissible Moment [N·m]	MP: 86.0 MY: 34.0 MR: 110.0

Product Name	Lead [mm]	Transportable Mass [kg]		Thrust [N]	Holding Force [N]	Maximum Speed [mm/s]				
		Horizontal	Vertical			50～650 mm	660～700 mm	710～750 mm	760～800 mm	810～850 mm
ELS6□D□□□-KD-■	12	～30	–	～200	200	600	550	470	420	360
ELS6□D□□□M-KD-■			～15							
ELS6□E□□□-KD-■	6	～60	–	～400	400	300	260	230	200	180
ELS6□E□□□M-KD-■			～30							

●A number or code indicating the table type and stroke length is entered where the box □ is located within the product name.
Either a code from **A** to **D**, or **J** to **M** indicating the sensor is entered where the box ■ is located within the product name.
●Refer to page E-23 for the product name of the motorized linear slides, and page E-42 for the sensor specifications and connections.
✻The holding force of the electromagnetic brake is the same value as the holding force.

Product Number Code

ELS 6 □ □ □□□ □ - KD - □

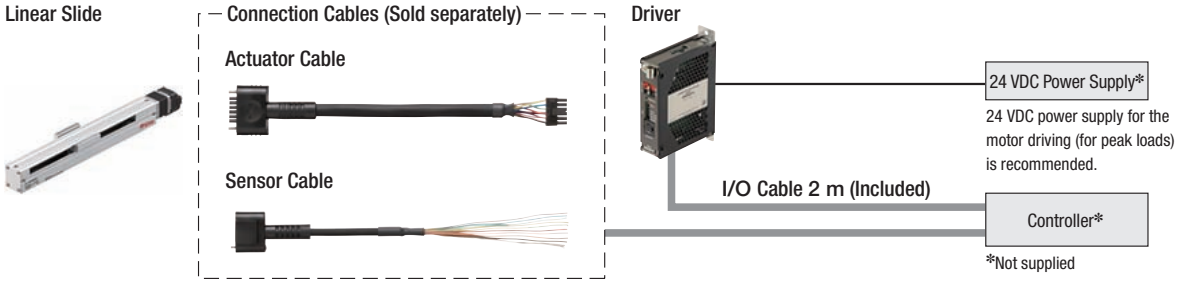
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

●Enter a code or number in the box □ that suits your equipment demands.
●Y-table type, 6 mm lead, 500 mm stroke, without electromagnetic brake, pulse input photocoupler type driver, 3-PNP sensor right mounting would be **ELS6YE050-KD-B**.

①	Series Name	**ELS**: **ELS** Series
②	Linear Slide Size	**6**: Width 62 mm Height 83 mm
③	Table Type	**X**: X-Table Type **Y**: Y-Table Type
④	Ball Screw Lead	**D**: 12 mm **E**: 6 mm
⑤	Stroke	**005**～**085**: 50～850 mm (10 mm increments)
⑥	Electromagnetic Brake	**M**: With Electromagnetic Brake Blank: Without Electromagnetic Brake
⑦	Driver	**KD**: 24 VDC Pulse Input Photocoupler Type
⑧	Sensor Selection✻	**A**: 2-PNP Sensor Right Mounting **J**: 2-NPN Sensor Right Mounting **B**: 3-PNP Sensor Right Mounting **K**: 3-NPN Sensor Right Mounting **C**: 2-PNP Sensor Left Mounting **L**: 2-NPN Sensor Left Mounting **D**: 3-PNP Sensor Left Mounting **M**: 3-NPN Sensor Left Mounting Blank: Without Sensor

✻Left and right sides viewed from the motor side

System Configuration



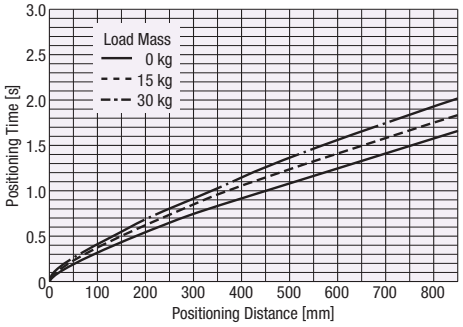
Refer to page E-96 for details on connection cables (sold separately).

Positioning Distance – Positioning Time

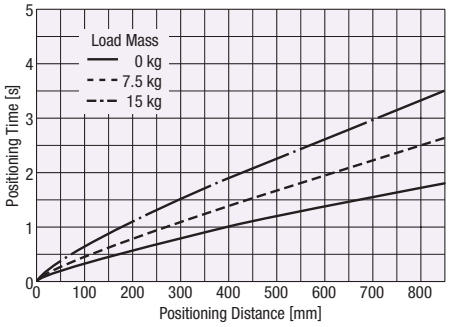
The positioning time (reference) can be checked from the positioning distance.
A reference value for the positioning time can be calculated by multiplying the positioning time calculated from the graph with the positioning time coefficient for the applicable stroke.
Refer to page G-17 for operating speed and acceleration.

●ELS6□D (12 mm lead)

◇Horizontal Direction Installation



◇Vertical Direction Installation

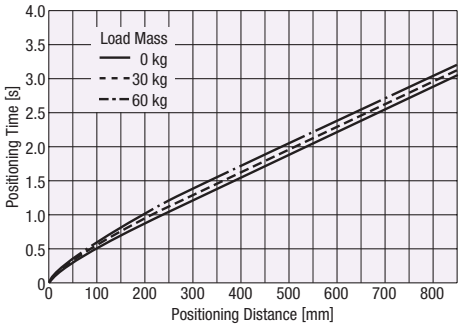


Positioning Time Coefficient

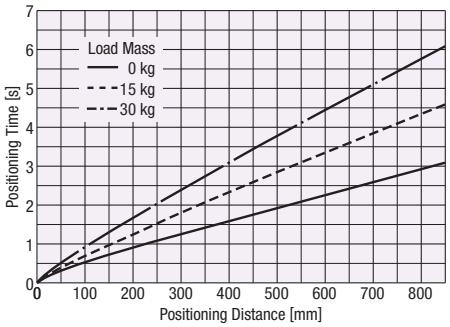
Stroke [mm]	Load Mass					
	Horizontal Direction Installation			Vertical Direction Installation		
	0 kg	15 kg	30 kg	0 kg	7.5 kg	15 kg
50～650	1.0	1.0	1.0	1.0	1.0	1.0
660～700	1.0	1.0	1.0	1.0	1.1	1.2
710～750	1.2	1.1	1.0	1.1	1.1	1.2
760～800	1.3	1.2	1.1	1.2	1.1	1.2
810～850	1.5	1.4	1.3	1.3	1.1	1.2

●ELS6□E (6 mm lead)

◇Horizontal Direction Installation



◇Vertical Direction Installation



Positioning Time Coefficient

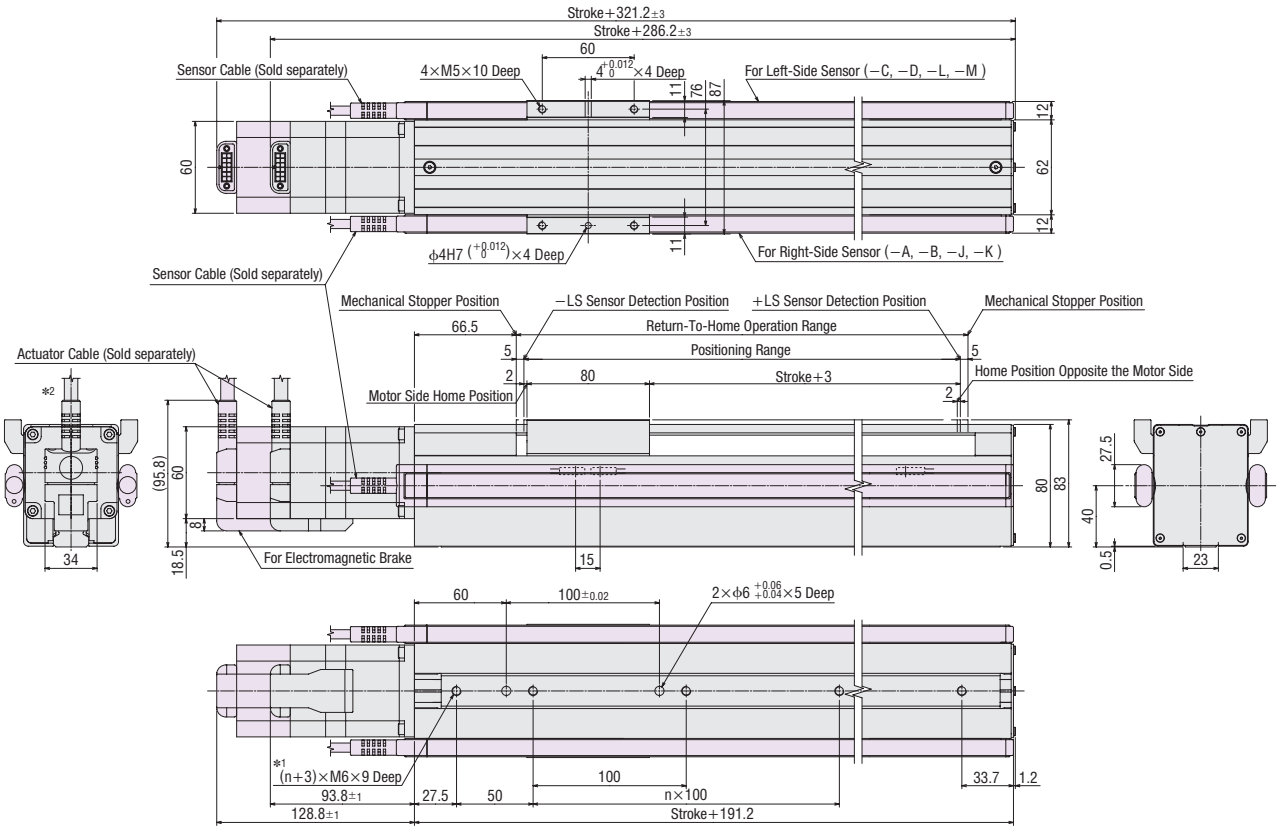
Stroke [mm]	Load Mass					
	Horizontal Direction Installation			Vertical Direction Installation		
	0 kg	30 kg	60 kg	0 kg	15 kg	30 kg
50～650	1.0	1.0	1.0	1.0	1.0	1.0
660～700	1.1	1.1	1.1	1.1	1.0	1.4
710～750	1.2	1.2	1.2	1.2	1.0	1.4
760～800	1.4	1.4	1.3	1.4	1.0	1.4
810～850	1.6	1.5	1.5	1.5	1.1	1.4

Note
●The positioning time in this graph does not include the settling time. Use a settling time of 0.15 sec or less as a reference.

Dimensions of Linear Slides (Unit = mm)

For CAD data, please contact the nearest Oriental Motor sales office.

X-Table Type



✻1 When the strokes are 120, 220, 320, 420, 520, 620, 720 and 820, (n+3) → (n+2).
✻2 The Actuator cable outlet direction can be changed in 90° intervals in four directions.
Be sure that the actuator cable wiring space including the connector is 100 mm or more.

Product Name: **ELS6XD□□□-KD**, **ELS6XE□□□-KD** (Without electromagnetic brake)
ELS6XD□□□M-KD, **ELS6XE□□□M-KD** (With electromagnetic brake)

	Electromagnetic Brake	Numbers Specifiable in the Box □ within the Linear Slide Product Name																
		005	**010**	**015**	**020**	**025**	**030**	**035**	**040**	**045**	**050**	**055**	**060**	**065**	**070**	**075**	**080**	**085**
Stroke [mm]	Not Equipped/ Equipped	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850
Mass [kg]	Not Equipped	3.8	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	6.0	6.2	6.4	6.7	7.0	7.2	7.4	7.6
	Equipped	4.1	4.3	4.6	4.8	5.1	5.3	5.5	5.8	6.0	6.3	6.5	6.7	7.0	7.2	7.5	7.7	7.9

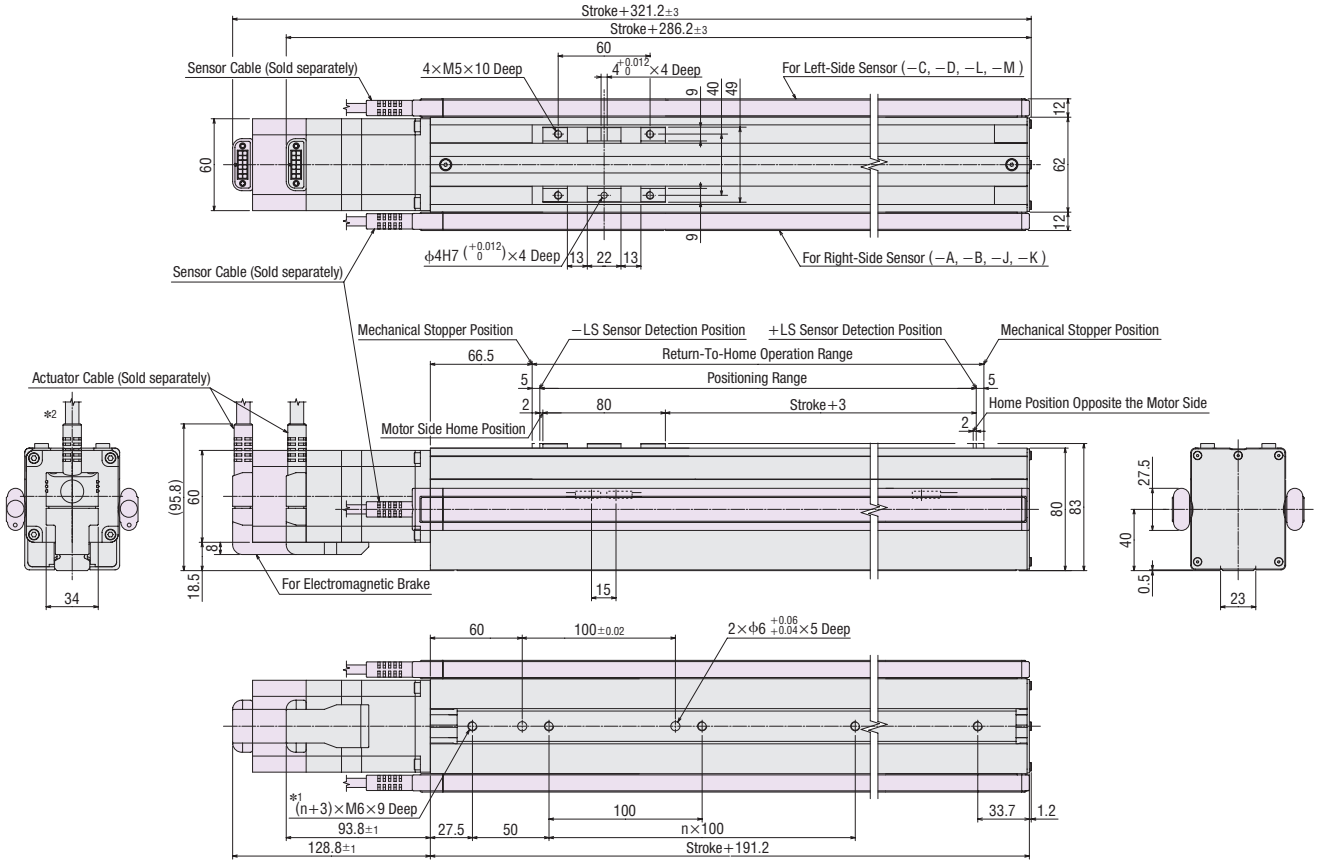
Hole Coefficient (n)

Stroke [mm]	n
50～100	1
110～200	2
210～300	3
310～400	4
410～500	5
510～600	6
610～700	7
710～800	8
810～850	9

Features E-18/General Specifications of Motor E-21/System Configuration E-22

For CAD data, please contact the nearest Oriental Motor sales office.

Y-Table Type



*1 When the strokes are 120, 220, 320, 420, 520, 620, 720 and 820, (n+3) → (n+2).
*2 Actuator cable outlet direction can be changed in 90° intervals in four directions.
Be sure that the actuator cable wiring space including the connector is 100 mm or more.

Product Name: **ELS6YD□□□-KD**, **ELS6YE□□□-KD** (Without electromagnetic brake)
ELS6YD□□□M-KD, **ELS6YE□□□M-KD** (With electromagnetic brake)

	Electromagnetic Brake	Numbers Specifiable in the Box □ within the Linear Slide Product Name																
		005	**010**	**015**	**020**	**025**	**030**	**035**	**040**	**045**	**050**	**055**	**060**	**065**	**070**	**075**	**080**	**085**
Stroke [mm]	Not Equipped/ Equipped	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850
Mass [kg]	Not Equipped	3.8	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	6.0	6.2	6.4	6.7	7.0	7.2	7.4	7.6
	Equipped	4.1	4.3	4.6	4.8	5.1	5.3	5.5	5.8	6.0	6.3	6.5	6.7	7.0	7.2	7.5	7.7	7.9

Hole Coefficient (n)

Stroke [mm]	n
50～100	1
110～200	2
210～300	3
310～400	4
410～500	5
510～600	6
610～700	7
710～800	8
810～850	9

Driver Specifications and Dimensions E-37/Connection and Operation E-38

Driver Operating Mode

Return-To-Home Operation	When the HOME signal is input, the linear slide will perform sensorless return-to-home operation. The operating mode is fixed at a speed of 50 mm/s, an acceleration of 0.45 m/s^2 and starting speed of 6 mm/s with operating direction to the motor side.
Pulse Input Operation	Positioning operation is performed by pulse signal.
Return Operation	When the RETURN signal is input, the linear slide returns to the home position. The home position after return operation is as follows: ①Power ON Position ②Position after Return-To-Home Operation ③Input Position of SET-P Signal of Random Position (Travel amount is constantly calculated by pulse input)

Driver Functions

Electromagnetic Brake Control	A built-in power supply for the electromagnetic brake. After driver power is turned on, as soon as the internal control is enabled, the electromagnetic brake releases. The electromagnetic brake remains released until the power supply for the driver is turned OFF. The electromagnetic brake operation during FREE/OF-CRN signal input can be changed using the settings on the function select switch "4."
Power-Saving Mode/MB FREE	When the function select switch "4" is OFF, if the FREE/OF-CRN signal is input, the motor will become a non-excitation state and the actuator can be moved manually. When the function select switch "4" is ON, if the FREE/OF-CRN signal is input, the electromagnetic brake will be actuated. The motor becomes a non-excitation state.
Pulse Input Mode	2-pulse input mode is selected when function select switch "1" is OFF and 1-pulse input mode is selected when ON.
Current Off/Free Function	This function automatically stops motor excitation when the driver or motor has overheated. When the function select switch "2" is OFF, current off automatically executes and when ON, current off does not execute. In this instance, if an ALM signal is detected, and appropriate steps are not taken, this will damage the driver and cause the motor to burnout. If overheating occurs, a temperature warning signal will also be output.
Motor Standstill Current	Heat generation can be suppressed by switching the motor current at standstill when the driver overheats. When function select switch "3" is OFF, the rated current will be at 50% and at 25% when ON. Normally use at 50%.
Actuator Confirmation	Confirmation of whether actuator and driver combinations are correct is done automatically.
Automatic Setting of Motor Current	When the actuator and driver combinations are changed, the motor rated current is automatically adjusted.
Automatic Setting of Resolution	When the actuator and driver combinations are changed, the resolution is automatically adjusted to 0.01 mm regardless of the actuator product.
Driver Warning Temperature	If the internal temperature of the driver reaches 75˚C, a S_DTEMP signal is output. At the same time, the LED changes from "Green" to "Orange." The operation continues in this condition.
Motor Warning Temperature	If the temperature of the motor reaches 75˚C, a S_MTEMP signal is output. At the same time, the LED changes from "Green" to "Orange." The operation continues in this condition.
Alarm	The ALM signal is output when an overheat (driver internal temperature 85˚C or motor temperature 85˚C), overload or other alarm has generated. At the same time, the LED changes from "Green" to "Red." The alarm can be identified by the blinking red light.

Features E-18/General Specifications of Motor E-21/System Configuration E-22

Driver Specifications

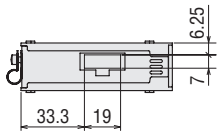
Item	Specifications		
Driver Product Name	EDR36D-K		
Power Supply Input	24 VDC ±10%		
	ELS2	Without Electromagnetic Brake: 1.0 A	–
	ELS4	Without Electromagnetic Brake: 1.6 A	With Electromagnetic Brake: 1.7 A
	ELS6	Without Electromagnetic Brake: 3.7 A	With Electromagnetic Brake: 4.0 A
Maximum Response Frequency	1-Pulse Input Mode, 2-Pulse Input Mode: 250 kHz, Duty 50%		
Operating Modes	Return-To-Home Operation, Pulse Input Operation, Return Operation		
Input Signals/Input Modes	FP, RP 5 VDC Photocoupler Input, Input Resistance 200 Ω HOME, FREE/OF-CRN, RETURN, SET-P 24 VDC Photocoupler Input, Input Resistance 6.8 kΩ		
Output Signals/Output Modes	S_MOVE, S_MTEMP, S_DTEMP, ALM Photocoupler and Open-Collector Output (24 VDC, 10 mA max.)		
Protective Functions	Motor Overheat, Driver Overheat, Overload, Overspeed, Overvoltage, Insufficient Voltage, Over Position Error, Overcurrent, Actuator Communication Error, Encoder Error at Power ON, Driver Memory Error		
Indicators (LED)	Operation Monitor LED (Green: Normal operation, Orange: Warning, Blinking Red: Alarm)		
Cooling Method	Natural Cooling Method		
Mass	115 g		

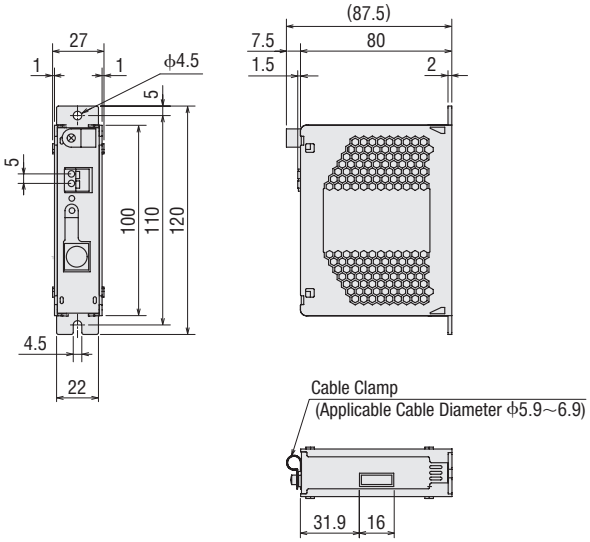
General Specifications of Driver

Item	Specifications
Operating Ambient Temperature	0～+40°C (non-freezing)
Operating Ambient Humidity	85% max. (non-condensing)
Atmosphere	Use in an area without corrosive gases or dust. Do not expose to water or oil.

Driver Dimensions (Unit = mm)

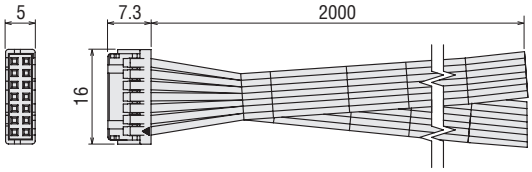
Driver Product Name: EDR36D-K
Mass: 115 g





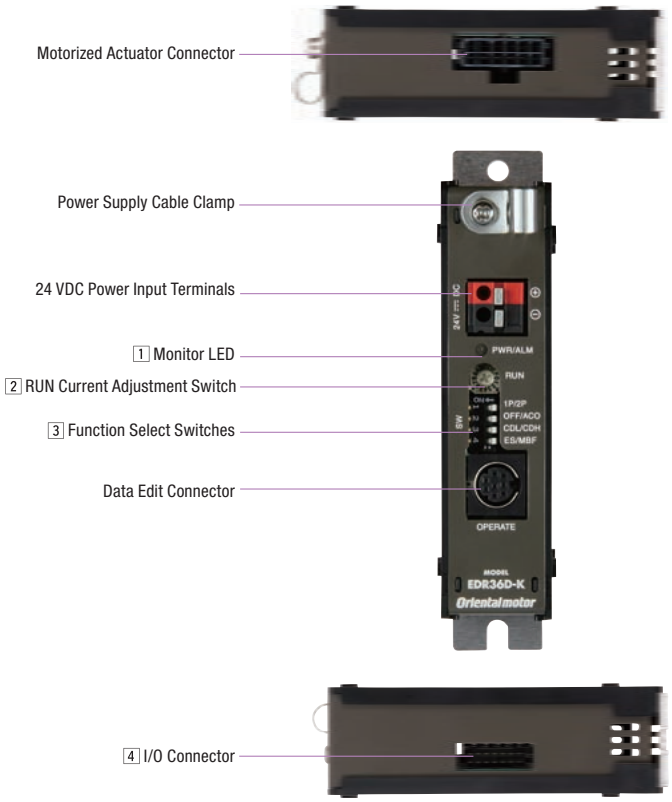
Included

I/O Cable



Connection and Operation

Names and Functions of Driver Parts



1 Operation Monitor LED

Indication	Color	Status
PWR/ALM	Green	Normal Operation Status
	Orange	Warning Status
	Red Blinking	Alarm Status, Identified by Blink Count

2 RUN Current Adjustment Switch

Indication	Switch Name	Function
RUN	RUN Current Adjustment Switch	The motor running current can be adjusted from 6% to 100% of the rated current with the scale 0～F. (Initial value "F" 100%)

3 Function Select Switches

Indication	Switch Name	ON	OFF
1P/2P	Pulse Input Mode Select Switch	1-Pulse Input Mode	2-Pulse Input Mode
OFF/ACO	Current Off Function Switch During Overheat	Current Off Not Performed	Current Off Performed (Operation standstill at overheat)
CDL/CDH	Motor Standstill Current Adjustment Switch	The current at motor standstill is rated at 25%.	The current at motor standstill is rated at 50%.
ES/MBF	Power-Saving Mode Switch	Power-Saving Function (Electromagnetic Brake Control)	Table Free

4 I/O Connector

Pin	Function			Pin	Function		
A1	COM1			B1	COM2		
A2	IN1	Normally Open	HOME	B2	IN3	Normally Open	RETURN
A3	IN2	Normally Open	FREE/OF-CRN	B3	IN4	Normally Open	SET-P
A4	+FP-5V		FWD Direction Pulse (Pulse input+)	B4	OUT1	Normally Open	S_MOVE
A5	−FP		FWD Direction Pulse (Pulse input−)	B5	OUT2	Normally Open	S_MTEMP
A6	+RP-5V		REV Direction Pulse (Operational direction+)	B6	OUT3	Normally Open	S_DTEMP
A7	−RP		REV Direction Pulse (Operational direction−)	B7	OUT4	Normally Closed	ALM

Input Signal Types and Contents

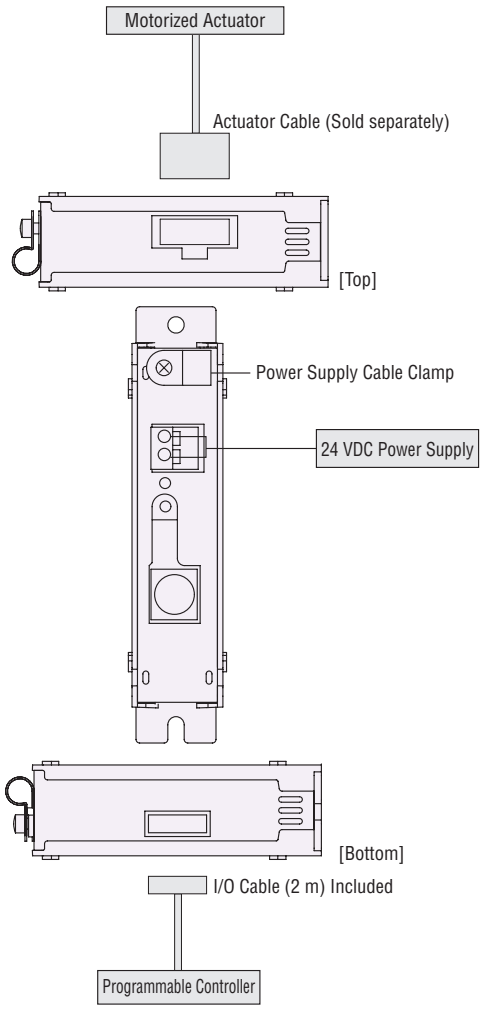
Input Name		Content
HOME	Normally Open	Start Signal for Return-To-Home Operation.
RETURN	Normally Open	Start Signal for Return Operation, Returns to Home Position or SET-P Input Position.
OF-CRN	Normally Open	The motor current turns off and the electromagnetic brake is actuated while this signal ON. (When function select SW4 ON)
FREE	Normally Open	The motor current turns off and the electromagnetic brake is released while this signal ON. (When function select SW4 OFF)
SET-P	Normally Open	The absolute position at the present location is set to 0.

Output Signal Types and Contents

Output Name		Content
S_MOVE	Normally Open	This status signal is output during actuator operation.
ALM	Normally Closed	This signal is output when an alarm generates. This stops all functions.
S_MTEMP	Normally Open	This signal is output when the motor temperature exceeds 75˚C (warning signal).
S_DTEMP	Normally Open	This signal is output when the driver temperature exceeds 75˚C (warning signal).

Features E-18/General Specifications of Motor E-21/System Configuration E-22

Connection Diagrams



Notes on Wiring

Wiring

◇Power Connection

- A power-supply connection cable must be purchased separately.
- Use a solid wire AWG16 (1.25 mm^2) or twisted wire for the power supply connection cable.
  When wiring, use a slotted screwdriver for the power supply input connector (screwdriver tip width 2.6 mm).
- Secure the shielded wire for the power supply connection cable using the power supply cable clamp. Prevent vibrations from disconnecting the lead wire.

◇General

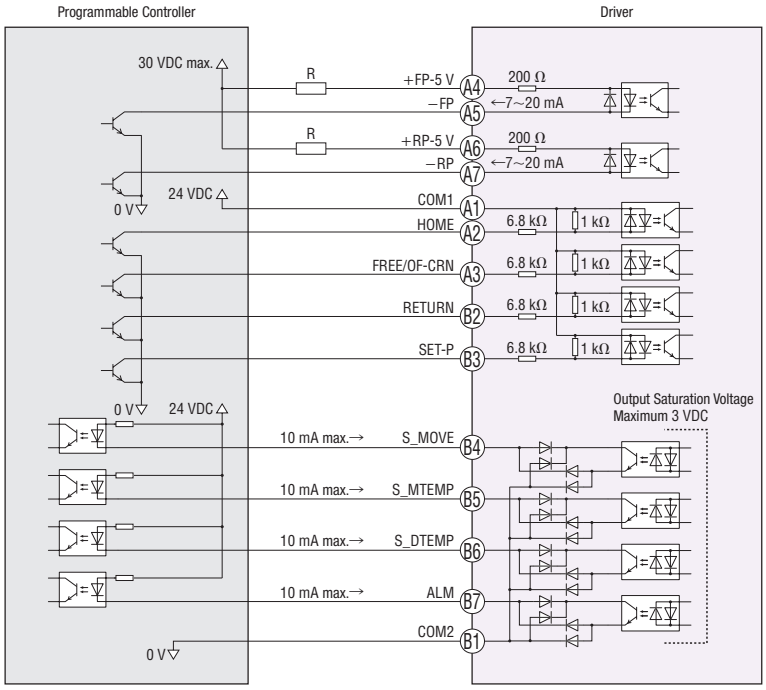
- The I/O cable used for connecting to the programmable controller is attached to the driver.
  I/O Cable
  Conductor: AWG28 (length 2 m)
  Connector:
  Terminal Housing: DF11-14DS-2C (Hirose)
  Terminal : DF11-2428SC (F) (Hirose)
- Use the dedicated actuator cable when connecting to the motorized actuator (max. length 10 m).
- Provide a minimum distance of 30 cm between the I/O signal lines and power lines (AC lines, motor lines and other large-current circuits). Also, do not run the I/O signal lines in the same duct as power lines or bundle them with power lines.

Power Supply

- 24 VDC power supply for the motor driving (for peak loads) is recommended.

●Connection to Programmable Controller

◇Sink Logic (NPN) Specification



Notes on Wiring

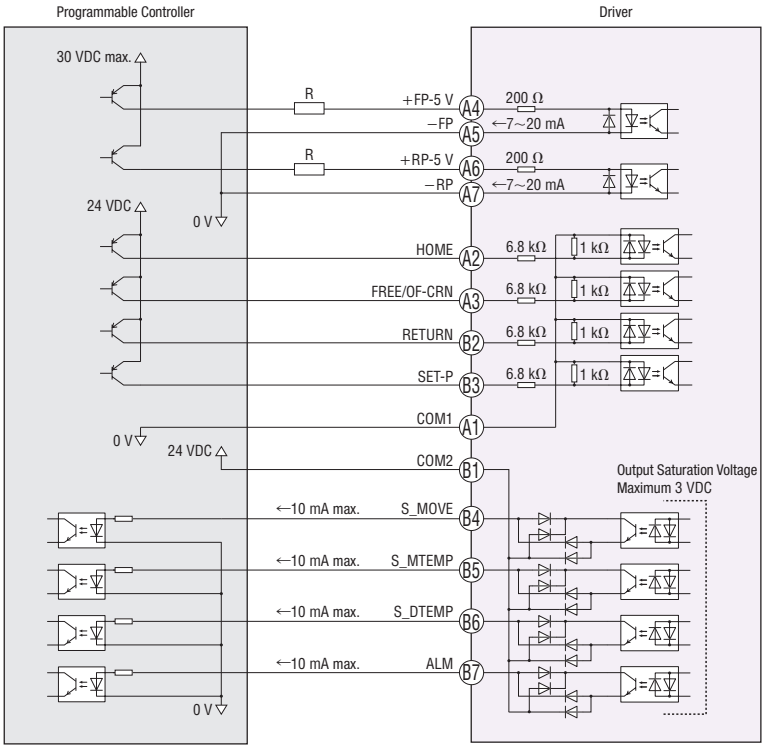
◇Pulse Input Signal

The external resistor is not needed when the voltage is 5 VDC. When the applied voltage exceeds 5 VDC, connect the external resistor (R) to keep the current at 7 to 20 mA.
Example: 24 VDC, R: 1.5 to 2.2 kΩ 0.5 W or more.

◇Output Signal

Check the specifications of the connected device. If the current exceeds 10 mA, connect the external resistor.

◇Source Logic (PNP) Specification



Notes on Wiring

◇Pulse Input Signal

The external resistor is not needed when the voltage is 5 VDC. When the applied voltage exceeds 5 VDC, connect the external resistor (R) to keep the current at 7 to 20 mA.
Example: 24 VDC, R: 1.5 to 2.2 kΩ 0.5 W or more.

◇Output Signal

Check the specifications of the connected device. If the current exceeds 10 mA, connect the external resistor.

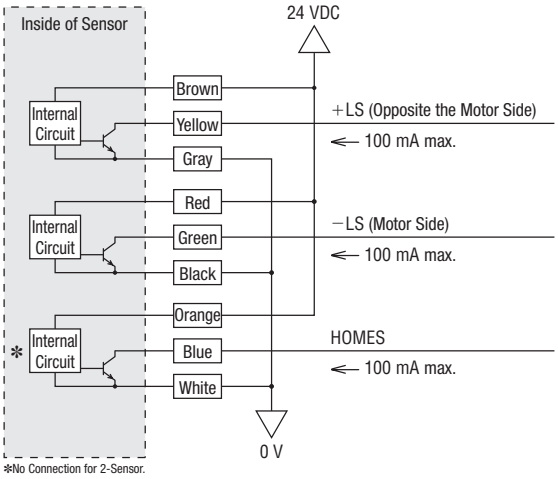
Sensor

NPN Sensor

◇Sensor Specifications

Sensor Type	Magnetic Switch
Power Supply Voltage	5 VDC～28 VDC
Current Consumption	10 mA max. (At 24 VDC)
Control Output	NPN Open-Collector Output, 5～28 VDC, 100 mA max. Internal Voltage Drop 0.5 VDC max. (At load current of 50 mA)
Indicator LED	Detection Display (Red)
Sensor Logic	Normally Open

◇Connecting the Sensor Cable (Lead Wire Type)



PNP Sensor

◇Sensor Specifications

Sensor Type	Magnetic Switch
Power Supply Voltage	5 VDC～28 VDC
Current Consumption	10 mA max. (At 24 VDC)
Control Output	PNP Open-Collector Output, 5～28 VDC, 100 mA max. Internal Voltage Drop 0.5 VDC max. (At load current of 50 mA)
Indicator LED	Detection Display (Green)
Sensor Logic	Normally Open

◇Connecting the Sensor Cable (Lead Wire Type)