KOGANEI

CE

ELEWAVE SERIES
Flat Type Electric Hand

Point input type controller
CC-Link type controller CC-Link

OWNER'S MANUAL Ver.3.3

[Main units]

EW2H8

EW2H18

EW2H28

EW2HL8

EW2HL18

EW2HL28

[Controllers]

EW2C-H-NP

EW2C-H-PN

EW2C-H-CC

EW2C-H-CCD

Contents

Chapter 1 Safety Precautions

1-1 Safety....2
1-2 Precautions....2

Chapter 2 System Configuration

2-1 Entire system configuration....3
2-2 Options and accessories....4
2-3 Setting up for operation....5

Chapter 3 Main Unit

3-1 Handling the main unit
- 3-1-1 Precautions....6

3-2 Mounting
- 3-2-1 Mounting the main unit....6
- 3-2-2 Mounting a workpiece (fingers)....7

Chapter 4 Controller

4-1 Appearance and functions
- 4-1-1 Point input type (NPN specifications, PNP specifications)....8
- 4-1-2 CC-Link type (remote I/O specifications, remote device specifications)....8

4-2 Installation and connection to external devices
- 4-2-1 Controller installation....9
- 4-2-2 Connecting the power supply....9
- 4-2-3 Grounding work....9
- 4-2-4 Precautions on wiring....10
- 4-2-5 Connecting to the actuator....10
- 4-2-6 Connecting the I/O connector....10

4-3 Interfaces (I/O, CC-Link)
- 4-3-1 Connector signal table....10
- 4-3-1-1 I/O connector signal table....10
- 4-3-1-2 CC-Link signal table....10
- 4-3-2 Details of input signals....11
- 4-3-3 Details of output signals....12
- 4-3-4 Input/output circuits....12
- 4-3-4-1 I/O input/output information (point input type controller)....12
- 4-3-4-2 CC-Link input/output information (CC-Link remote I/O type controller)....15
- 4-3-4-3 CC-Link input/output information (CC-Link remote device type controller)....16
- 4-3-4-3-1 List of input/output signals and input/output data....19
- 4-3-4-3-2 1-address occupation mode (remote device: number of occupied addresses, 1 address)....20
- 4-3-4-3-3 2-address occupation mode (remote device: number of occupied addresses, 2 addresses)....21
- 4-3-4-3-4 4-address occupation mode (remote device: number of occupied addresses, 4 addresses)....23
- 4-3-4-3-5 List of input data....25
- 4-3-4-3-6 Details about input data....25
- 4-3-4-3-7 List of input signals....28
- 4-3-4-3-8 Details about input signals....29
- 4-3-4-3-9 List of output data....33
- 4-3-4-3-10 Details about output data....34
- 4-3-4-3-11 List of output signals....39
- 4-3-4-3-12 Details about output signals....39
- 4-3-5 Timing chart....41
- 4-3-5-1 EW2C-H-NP, EW2C-H-PN, EW2C-H-CC timing charts....41
- 4-3-5-2 EW2C-H-CCD timing charts....43

4-4 Actuator number setting....56
4-5 Point data specifications....56
- 4-5-1 Point setting method....57

4-6 How to use the size detecting function
- 4-6-1 When using an actual workpiece for size detecting range setting....58
- 4-6-2 When using direct input for size detecting function setting....58

4-7 Communications
- 4-7-1 Communication parameter specifications....59
- 4-7-2 Communication cable....59
- 4-7-3 Addresses....59
- 4-7-4 Communication commands....59
- 4-7-5 List of communication commands....60
- 4-7-6 Details of communication commands....61

4-8 Parameters
- 4-8-1 Parameter setting method....67
- 4-8-2 Explanation of parameters....68

4-9 Error list....70

Chapter 5 Troubleshooting

5-1 If a problem occurs....72
5-2 Countermeasures for alarms....72
5-3 Alarm specifications....72
- 5-3-1 List of alarm descriptions....73

Chapter 6 Specifications

6-1 Basic specifications of main unit....74
6-2 Basic specifications of the controller....75

Chapter 7 Outline Drawings

7-1 Main unit outline drawings....80
7-2 Controller outline drawings....84
7-3 Additional parts outline drawings....85

Chapter 8 Technical Data

8-1 Limits on gripping force at grip points....88
8-2 Allowed load and allowed moment....88
8-3 Gripping force specifications....89

Chapter 1 Safety Precautions

Thank you for purchasing the Elewave Series Flat Type Electric Hand.
This OWNER'S MANUAL describes the features and how to operate this product.
Please read the manual carefully and use the product in a correct manner.

1-1 Safety

Always observe the safety instructions and precautions listed in this manual. Neglect of necessary safety measures or improper handling could result in product breakdown or damage, or in accidents that lead to injury to the users (people who set up, operate, or adjust and check, etc.).

1-2 Precautions

(1) Precaution for automatic operations
- To prevent injury, install an interlock device to prevent the operator from touching the moving parts of the Electric Hand.

(2) Precaution against pinched fingers, etc.
- Be careful to prevent fingers, etc., from being pinched by the Electric Hand's moving parts during transportation, teaching, or during operation.

(3) Operation not allowed in ambient atmospheres containing flammable gases, etc.
- The Electric Hand is not built to explosion-proof specifications. Do not use in ambient atmospheres containing flammable gases, flammable dust, or flammable liquids, etc. It could result in ignitions or explosions.

(4) Operation not allowed in locations subject to electromagnetic interference, etc.
- Do not use in locations subject to electromagnetic interference, static electric discharge, or radio frequency interference. It could result in erratic operations.

(5) Safety measures for end effectors (such as fingers, etc.)
- Design and manufacture the end effectors to prevent the occurrence of dangerous situations (such as workpieces popping out or falling) due to cut-off or fluctuation of the power supply (electrical power, air pressure, etc.).
- If there is a danger that items held by the end effector could pop out or fall, take appropriate safety measures that take into consideration the size, mass, temperature, and chemical properties of the items.

(6) Precautions for controller checks
- To prevent electric shock when touching the outside terminal and connector of the controller during controller checks, etc., always switch off the controller power and turn off the power supply.
- Never touch the inside of the controller.

(7) Response to a damaged or defective Electric Hand
- If any of the damage or defects listed below have been found, continuing use of the Electric Hand is dangerous. Immediately stop operation and contact us.

Description of damage or defect	Type of danger
Damage to machine harness or motor wiring	Electric shock, Electric Hand's erratic operation
Damage to outer components of Electric Hand	Damaged parts flying off during Electric Hand's operation
Abnormal operation of Electric Hand (position deviation, vibrations, etc.)	Electric Hand's erratic operation

(8) Be careful to not touch hot parts of the motor or controller
- The motor and controller will be very hot in some areas after automatic operations, and touching those areas may cause burns. For checks, etc., first cut the power to the controller, wait for the areas to cool down, confirm the cooled temperature, and then handle those areas.

(9) Protective grounding
- Always ground the controller to protect it against electric shock.

(10) Fasten the cables so that large loads, such as from pulling or twisting, are not applied to the connectors.

(11) The table of the flat type electric hand does not move by external force. Do not subject the table to excessive force or shock.

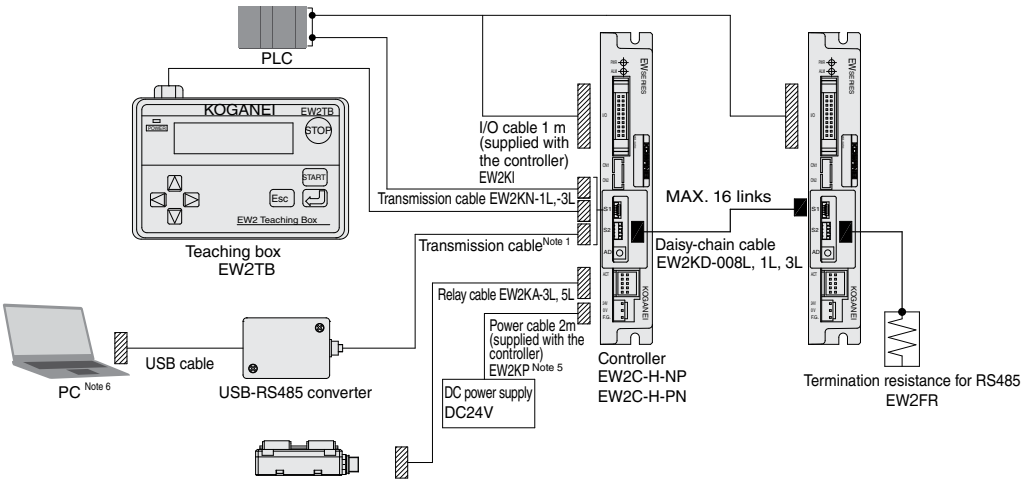
(12) Before using the product, refer to "Safety Precautions" and "Handling Guidelines and Precautions" in the general catalog and on our homepage for product safety precautions.

Chapter 2 System Configuration

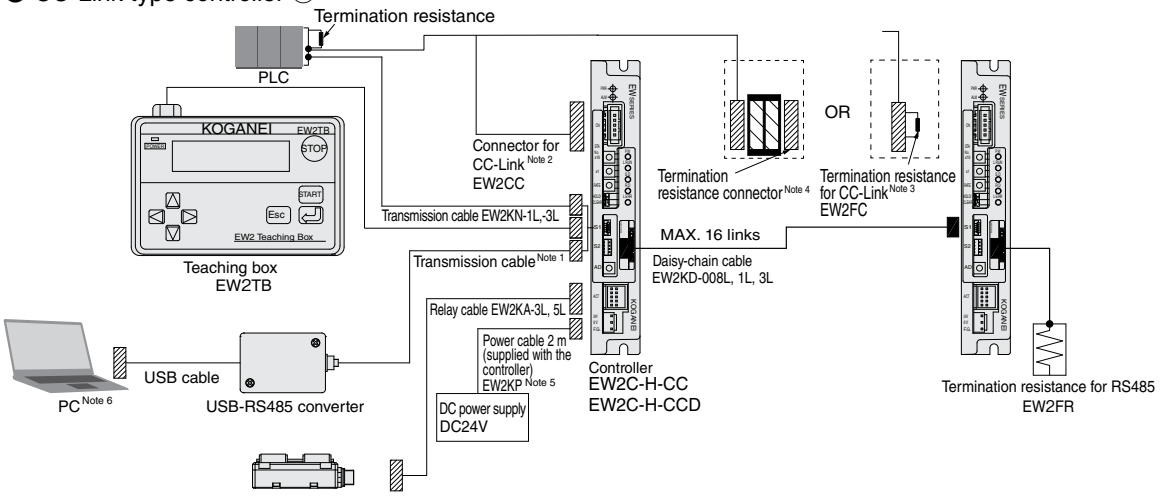
2-1 Entire system configuration

The Electric Hand consists of the following major components.

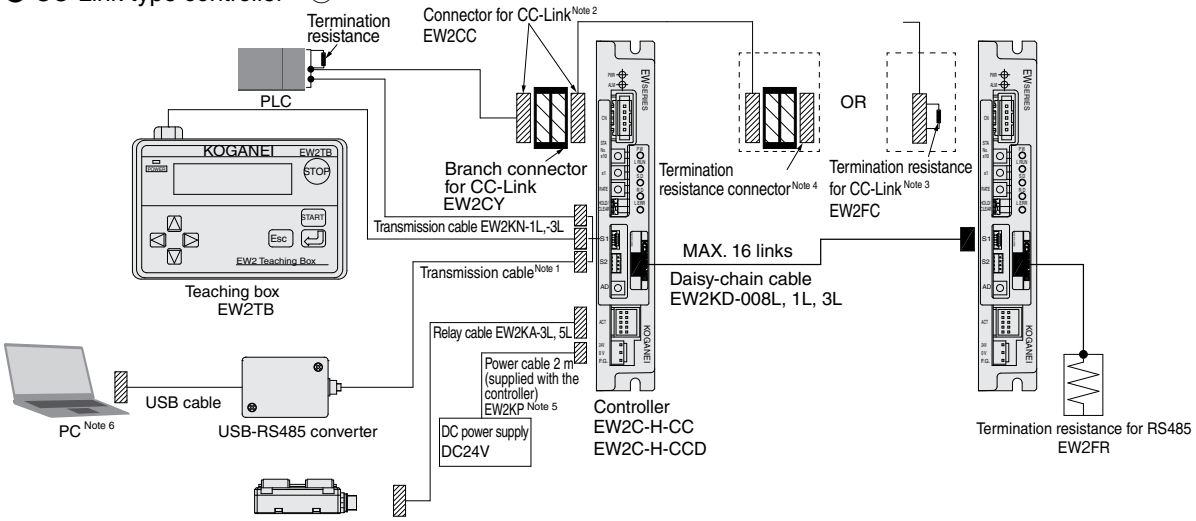
● Point input type controller



● CC-Link type controller ①



● CC-Link type controller ②



Note 1: Communication cables can be selected from the following.
- IBM2A-H1: USB-RS485 converter, with USB cable
- IBM2A-H1-N: USB-RS485 converter, without USB cable
- EW2KN: For communications

Note 2: Only connector for CC-Link are provided. The cables must be prepared by the customer.

Note 3: If you are using an EW2C-H-CC□ as a terminal unit, you must use either termination resistance for CC-Link (EW2FC) or a termination resistance connector.

Note 4: The user must prepare termination resistance connectors. [Recommended] 35T05-6M00-B0M GF from 3M

Note 5: We recommend installing noise filters. (Refer to page 10.)

Note 6: Support software for setting the controller can be downloaded for free from our web site.

2-2 Options and accessories

1. Controllers
   - When option -NP is selected, the controller EW2C-H-NP and the following accessories are included in the package.
     Please confirm at time of purchase.
     Power cable (EW2KP): 1 pc.
     I/O cable (EW2KI): 1 pc.
   - When option -PN is selected, the controller EW2C-H-PN and the following accessories are included in the package.
     Please confirm at time of purchase.
     Power cable (EW2KP): 1 pc.
     I/O cable (EW2KI): 1 pc.
   - When option -CC is selected, the controller EW2C-H-CC and the following accessories are included in the package.
     Please confirm at time of purchase.
     Power cable (EW2KP): 1 pc.
     Connector (EW2CC) for CC-Link: 1 pc.
     Termination resistance (EW2FC) for CC-Link: 1 set
   - When option -CCD is selected, the controller EW2C-H-CCD and the following accessories are included in the package.
     Please confirm at time of purchase.
     Power cable (EW2KP): 1 pc.
     Connector (EW2CC) for CC-Link: 1 pc.
     Termination resistance (EW2FC) for CC-Link: 1 set
2. DIN rail mounting plate
   - When option -DP is selected, the DIN rail mounting plate EW2DP (with 2 mounting screws) is included in the package.
     Please confirm at time of purchase.
3. Positioning pin
   - If option P was selected, then 2 positioning pins are included in the package.

EW2H□8 EW2H□18	EW2P-3
EW2H□28	EW2P-4

   Please confirm at time of purchase.

4. Connecting cable
   - When option -3L or -5L is selected, the connecting cable, EW2KA-3L (3-m cable) or EW2KA-5L (5-m cable) for connecting the Electric Hand main unit and the controller, is included in the package. Please confirm at time of purchase.

2-3 Setting up for operation

	Procedure		Reference section
Installation and connection	Installation		3-2 4-2
	Connections	Connect the power supply, controller, actuator, and personal computer or teaching box.	4-1 4-2
	Turning on the power		4-2
Settings	Setting the actuator number	Set the specified actuator number. Note	4-4
	Changing parameters	Configure parameter data in accordance with your usage conditions.	4-8
	Point data input	Enter point data suitable for the operation.	4-5
	Test operations	Check that operations are normal.	4-3
Operations	Operations	Use the set point commands and START signal to run the desired operation. For continuous operations, use a programmable controller or other external devices to control operations.	4-3

Note: When you purchase the actuator and controller as a set, the controller's actuator number is set to the specified actuator number at the time of shipping.

Model	Actuator No.
EW2H8	72
EW2H18	73
EW2H28	74
EW2HL8	82
EW2HL18	83
EW2HL28	84

Caution: If you purchased an individual controller, be sure to set the actuator number for the connected model of actuator.

Chapter 3 Main Unit

3-1 Handling the main unit

3-1-1 Precautions

(1) Do not apply external force to the lever or finger when it is installed to hold a workpiece.
Applying excessive external force could cause damage to parts.

(2) Restrictions on operations
The motor could cause a rise in temperature under certain operating conditions.
Use the product within the operating temperature range.
Use of the product in conditions exceeding the operation limits could damage or burn the motor.

(3) Operating sound
Some operating conditions such as operating speed or gripping fingers could cause the operating sound to be higher, but this is not a malfunction.

(4) Use the main unit and the controller in locations where there is little dust and dirt. Using them in locations where there are large amounts of dirt and dust create the risk of abnormal operation.

3-2 Mounting

3-2-1 Mounting the main unit

(1) The mounting surface must be flat. Twisting or bending during the mounting could result in defective operation or degraded performance.

(2) Avoid scratching or denting the mounting surface of the main unit, because doing so could cause a detrimental effect on mounting accuracy.

(3) If there is a risk of bolts loosening due to shocks or vibrations, consider taking measures to prevent them from loosening.

(4) To secure the main unit in place, use the through holes for direct mounting, tapped holes, or positioning holes. When mounting the main unit, always use screws that are shorter than the thread depth, and tighten to within the allowable torque range.

● Through holes for direct mounting

	Through hole diameter [mm]	Screw size	Length of through hole [mm]	Maximum tightening torque [N•m]
EW2H□8	ϕ3.4	M3	11.6	0.63
EW2H□18	ϕ4.5	M4	12.5	1.50
EW2H□28	ϕ4.5	M4	18.5	1.50

● Tapped hole

	Screw size	Thread depth [mm]	Distance between screws [mm]	Maximum tightening torque [N•m]	Remarks
EW2H□8	M3	4.5	26	0.63	Can be directly installed on the tool side of the auto hand changer (MJC3)
EW2H□18	M3	5	26	0.63	Can be directly installed on the tool side of the auto hand changer (MJC3)
	M5	5	42	3.00	Can be directly installed on the tool side of the auto hand changer (MJC10)
EW2H□28	M5	5	42	3.00	Can be directly installed on the tool side of the auto hand changer (MJC10)
	M5	5	60	3.00	Can be directly installed on the tool side of the auto hand changer (MJC20)

* The tapped holes and pin holes on the bottom of the electric hand are designed for directly mounting the tool side of our MJC Series Auto Hand Changer.

[Note: Installation of Compliance Light]

Adapter	ELECTRIC HAND	Compliance Light
EW2A-H8	EW2H□8	CPL□34□
EW2A-H18	EW2H□18	CPL□54□
EW2A-H28	EW2H□28	CPL□70□

* Adapters able to mount on our CPL Series Compliance Light are available.

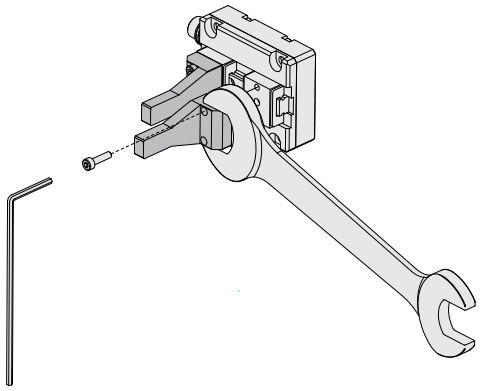
3-2-2 Mounting a workpiece (fingers)

(1) When mounting the workpiece (fingers), always use screws that are shorter than the thread depth. Using screws longer than the thread depth could prevent normal operation.

(2) Tighten the screws for mounting the workpiece (fingers) within the allowable torque range.

	Screw size	Thread depth [mm]	Maximum tightening torque [N•m]
EW2H□8	M2.5	3	0.36
EW2H□18	M3	3	0.63
EW2H□28	M3	3.5	0.63

(3) When mounting a workpiece (fingers), use a wrench to secure the workpiece (fingers) or table, and then position the guide so it is not subject to moment.



Note: The weight of the workpiece (fingers) attached to the guide table must be lower than the maximum payload specifications.

(4) Fasten the cables so that loads, such as from pulling or twisting, are not applied to the connectors. Also, do not fasten the connectors so they are subject to bending moment.

(5) Fasten the cables so that loads, such as from bending, pulling, or twisting, are not applied to the connectors on the controller.

(6) Do not apply external force to the workpiece (fingers) that is mounted to the main unit. Application of excess external force or impact could damage or misalign parts. If this happens, abnormal operations or misalignment of the workpiece (fingers) could occur, so be sure to check the settings and confirm operations. Especially, do not use external force to move the table of the flat type electric hand.Do not subject the table to excessive shock. If you want to move the table manually, use the flathead slot for table operations.

(Note) If you select cable direction "-1", then the flathead slot for table operations on the side of the main unit, for manually operating the table, cannot be used as flathead slot for table operations. (EW2H8, EW2H18, EW2HL8, EW2HL18)

(7) The film of lubricant from the grease could be scraped off by doing short distance roundtrip operations. As a guideline, we recommend replenishing the film of lubricant by doing about 5 roundtrip operations for every 5,000 to 10,000 roundtrips.

(8) Set the weight of the actual gripped workpiece to about 1/10 to 1/20 of the gripping force.

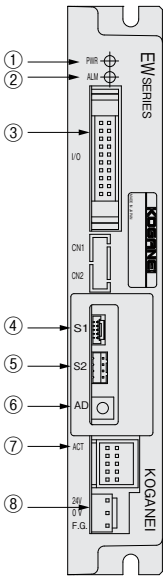
(9) If the electric hand is moved while it is gripping a workpiece, set the workpiece weight to about 1/30 to 1/50 of the gripping force.

(10) The values in the specifications sheet and graphs are only guidelines, because the workpiece weight that can be gripped varies extremely due to material of the fingers, the shape, condition of the gripping surfaces, and the speed the workpiece is moving.

Chapter 4 Controller

4-1 Appearance and functions

4-1-1 Point input type (NPN specifications, PNP specifications)



① POWER LED
Lights when the power supply is turned on.

② ALARM LED
Shows the state of the controller. (See the table below on the right)

③ I/O connector
Use the supplied I/O cable for connecting to sensor switches or an external programmable controller, etc.

④ S1 connector
Connector for connecting teaching box and cable for communications.

⑤ S2 connector
Connector for connecting when daisy-chain connections are used.

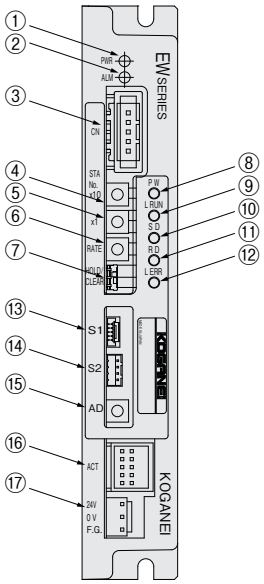
⑥ Address switch
Sets the address. (0 to F, 16 selections)

⑦ ACT connector
This is the connector for connecting to the main unit.

⑧ Power connector
Connects the supplied power cable to supply 24 VDC.

Description	LED state
Alarm occurs	Lights
Error occurs	Quick blinking (ON: 0.25s, OFF: 0.25s)
Origin return not completed	Slow blinking (ON: 0.5s, OFF: 1.5s)
Normal	Not lit

4-1-2 CC-Link type (remote I/O specifications, remote device specifications)



① POWER LED
Lights when the power supply is turned on.

② ALARM LED
Shows the state of the controller. (See the table below on the right)

③ CC-Link connector
Connector to connect external programable controllers, etc.
* The cables must be prepared by the customer.

④ and ⑤ Switches to set CC-Link address codes
Sets the CC-Link address codes. (Sets from 1 to 64)
For remote device specifications, the range changes depending on the number of addresses used. See page 16

⑥ CC-Link baud rate settings switch
Sets the CC-Link baud rate. (Sets from 0 to 4)

Settings	0	1	2	3	4
Transmission rate	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps

⑦ Switch to select inlet port data when link is abnormal
Sets the inlet port data status when link is abnormal.
(Left: HOLD, right: CLEAR)

⑧ to ⑫ CC-Link status display LED
(Refer to table 1)

⑬ S1 connector
Connector for connecting teaching box and cable for communications.

⑭ S2 connector
Connector for connecting when daisy-chain connections are used.

⑮ Address switch
Sets the address.

⑯ ACT connector
This is the connector for connecting to the main unit.

⑰ Power connector
Connects the supplied cable to supply 24 VDC.

Description	LED state
Alarm occurs	Lights
Error occurs	Quick blinking (ON: 0.25s, OFF: 0.25s)
Origin return not completed	Slow blinking (ON: 0.5s, OFF: 1.5s)
Normal	Not lit

[Table 1]

	Display	Description
⑧	PW	Lights when power is ON
⑨	L RUN	Lights when receiving data normally from master address
⑩	SD	Lights when data is transmitting
⑪	RD	Lights according to received data
⑫	L ERR	Lights if there is a transmission error, turns off at time-over. Lights if transmission rate setting is incorrect.

4-2 Installation and connection to external devices

4-2-1 Controller installation

(1) Installation

Use M4 screws in the 5-mm U-grooves on the back of the controller to secure it to a rack that has good thermal conductivity.

(2) Installation (DIN rail installation)

If you have purchased a DIN rail mounting plate, use the 5-mm U slot on the back of the controller and the M4 screws (provided) for installation to the DIN rail mounting plate. After that, mount it to the DIN rail prepared by the user.

(3) Installation environment

- Install the controller in a location with an ambient temperature of 0 to 40°C, humidity of 35 to 85%, and no condensation.
- Install the controller so there is adequate space around it (20 mm or more) with good ventilation.
- Avoid installations in locations subject to corrosive gases, such as sulfuric acid or hydrochloric acid, as well as ambient atmospheres containing flammable gases or liquids, etc.
- Install the controller where there is little dust or dirt.
- Avoid installations in locations subject to metal chips, oil, or water from other equipment.
- Avoid installations in locations subject to electromagnetic or electrostatic noises.
- Install the controller in a location that is free from large vibrations.

4-2-2 Connecting the power supply

(1) Power supply

- Connect the power cable to a power supply with a capacity of 24 VDC ±10% and 1.6 A or more.
- Connector: B3PS-VH (JST Mfg. Co., Ltd.)

Connector pin number table

No.	Signal name	Wire color	Description
1	24 V	Red	Power supply
2	0 V	Blue	
3	FG	Green	Ground

Caution:

- **Supply of an unstable power voltage to the controller will cause alarm shutdowns or abnormal operation.**

  Use adequate care, therefore, in selecting a 24-V power supply. Ensure as stable a power supply as possible.

(2) How to connect the power supply

- Use the supplied power cable to connect to the power supply. Connect the polarity correctly to prevent mis-wiring. Wrong connections could result in fire or other dangerous conditions.
- We recommend using a noise filter on the power cable. (Recommended model: TDK-Lambda's RSEN-2006)
- We recommend twisted cables for the "24-V" and "0-V" power cables.

Caution:

- **The EW2C-H controller does not have a power switch and an emergency stop function. Always install an appropriate power cut-off (isolator) device for the overall system of equipment.**

Danger:

- **Before wiring to the controller, always turn off the power to the overall system of equipment to avoid the danger of electric shock.**

  There is a risk of electric shock.

(3) Insulation resistance/Dielectric strength test

Never conduct an insulation resistance test or dielectric strength test on the controller.

4-2-3 Grounding work

- Always ground the equipment to prevent electric shock to people if there is electric leakage and to prevent erratic operation due to electrical noise.
- We strongly recommend type 3 grounding (grounding resistance of 100 Ω or less) or better.
- Use the F.G. wire of the power cable, for the ground terminal of the controller.
- When using the EW2C-H-CC or EW2C-H-CCD (CC-Link types), we recommend that the F.G. wire connected to the power cable be less than 250 mm. If it is longer than 250 mm, external noise could affect communications.

4-2-4 Precautions on wiring

The following measures are required, such as for connecting peripheral devices, to comply with CE marking regulations.

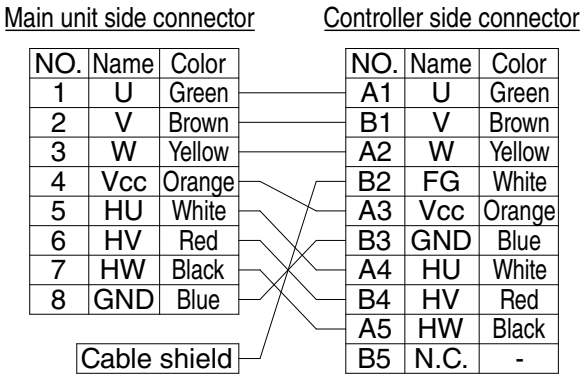
- Attach a clamp filter (2-turn) to the power cable.
- Attach a clamp filter to the controller side of the connecting cable.
  - EW2C-H-NP: 1 (2-turn)
  - EW2C-H-PN: 1 (2-turn)
  - EW2C-H-CC: 3 (each 2-turn)
  - EW2C-H-CCD: 4 (each 2-turn)

[Recommended] TDK's ZCAT3035-1330

- Do not use the connecting cable while it is coiled or bundled with many other cables.
- Make the CC-Link cable less than 30 m, and connect a GND wire while using it.
- If operating the equipment while the teaching box (EW2TB) is connected, attach 1 clamp filter (2-turn) to the cable of the teaching box.

4-2-5 Connecting to the actuator

Connect the actuator connecting cable to the ACT connector on the front of the controller. Turn off the power supply before performing the connection. Be sure that the actuator connecting cable is firmly inserted into the connector.



4-2-6 Connecting the I/O connector

Connect the I/O connector to a programmable controller or other external device.

4-3 Interfaces (I/O, CC-Link)

4-3-1 Connector signal table

4-3-1-1 I/O connector signal table

NO.	Wire color	Signal name	Description	NO.	Wire color	Signal name	Description
01	Brown	POS0	Point setting	02	Red	POS1	Point setting
03	Orange	POS2	Point setting	04	Yellow	POS3	Point setting
05	Green	POS4	Point setting	06	Blue	START	Start signal
07	Purple	STOP	Stop signal	08	Gray	ORG	Return to origin signal
09	White	READY	Preparation completed output	10	Black	BUSY	Command execution in progress output
11	Brown	INPOS	Positioning completed output	12	Red	HOLD	Gripping completed output
13	Orange	24G	- common	14	Yellow	N.C.	N.C.
15	Green	24V GND	Ground	16	Blue	24V IN	24-V input
17	Purple	N.C.	N.C.	18	Gray	24V	+24V
19	White	FG	Frame ground	20	Black	FG	Frame ground

4-3-1-2 CC-Link signal table

No.	Signal name	Description
1	DA	Signal wire
2	DB	Signal wire
3	DG	Digital GND
-		
4	SLD	Shielded

4-3-2 Details of input signals

There are 8 dedicated command inputs as input signals.

○Dedicated command inputs

Dedicated command inputs are inputs to control from an external device, such as a programmable controller.

To accept the START and ORG inputs, the READY, BUSY, and STOP signals must meet the following conditions.

- READY output : ON
- BUSY output : OFF
- STOP input : OFF

* The START and ORG inputs are accepted when the OFF state is switched to the ON state (the moment when the contact closes).
Whether the controller has accepted the command or not can be confirmed by monitoring the BUSY output.

■ Operation start input (START)

From the current position, the tooling moves by the data of the point no. specified from POS0 to POS4.

Caution:

To execute START, it is necessary to confirm the entry states of POS0 to POS4.

■ Returns to origin input (ORG)

Executes return to origin in the direction of the origin return specified in the parameters (PRM5). It is always necessary to execute return to origin after the power is turned on.

■ Operation stop input (STOP)

This is an input to stop the actuator's movement temporarily.

Turning this input ON (closing the contact) while the actuator is operating, or while it is executing return to origin, stops the actuator's movement. While this is in the ON state (the contact is in a closed state), no dedicated command from I/O, no program from a communication, and no return to origin command can be executed.

■ POS0 to POS4

These are inputs for connecting to output circuits of the programmable controller or other devices, and for specifying the point no.

Examples of point specification

POS No. / Point No.	POS4 (2^4)	POS3 (2^3)	POS2 (2^2)	POS1 (2^1)	POS0 (2^0)
P0	OFF	OFF	OFF	OFF	OFF
P1	OFF	OFF	OFF	OFF	ON
P3	OFF	OFF	OFF	ON	ON
P7	OFF	OFF	ON	ON	ON
P15	OFF	ON	ON	ON	ON
P31	ON	ON	ON	ON	ON

4-3-3 Details of output signals

There are 4 output signals: READY, BUSY, INPOS, and HOLD.

ON and OFF refer to the turning on and off of the output transistor.

◯Dedicated outputs

These outputs are for signal interaction with a programmable controller, etc.

■ Preparation completed output (READY)

This output is ON while the system of the controller is operating normally. If an alarm occurs, the output turns OFF, and the motor enters a free state.

■ Command execution in progress output (BUSY)

This signal is ON when a dedicated command input (START) is being executed or when a command from a communication is being executed. If the BUSY signal is ON, then commands are not received from dedicated command inputs (START) or communications.

Caution:

Always turn off dedicated command inputs when BUSY is ON. Leaving input ON prevents BUSY from switching to OFF, even after completing execution of a command.

■ Positioning operation completed output (INPOS)

This signal turns OFF once, when a dedicated command input (START) is accepted, and turns ON when the positioning operation execution process is completed normally, or when the size detecting function is set. If an error occurs during execution, or if STOP has been input, the signal remains unchanged in the OFF state.

■ Gripping operation completed output (HOLD)

When a dedicated command input (START) is accepted, this signal turns OFF once, and comes ON when the positioning operation execution process has been completed normally. If an error occurs during execution, or if STOP is input, the signal remains unchanged in the OFF state.

4-3-4 Input/output circuits

This section provides the specifications for the input/output circuits and examples of wiring. Refer to this example when connecting to the programmable controller or other external equipment.

4-3-4-1 I/O input/output information (point input type controller)

(1) Input/output circuit specifications

◯Input power supply

Input voltage: 24 V±10%

◯Input circuit

Isolation method: Photocoupler isolation
Input response : 30 ms or less
Input current : 5 mA/24 VDC
Input sensitivity : ON current Min. 3 mA
OFF current Max. 1 mA

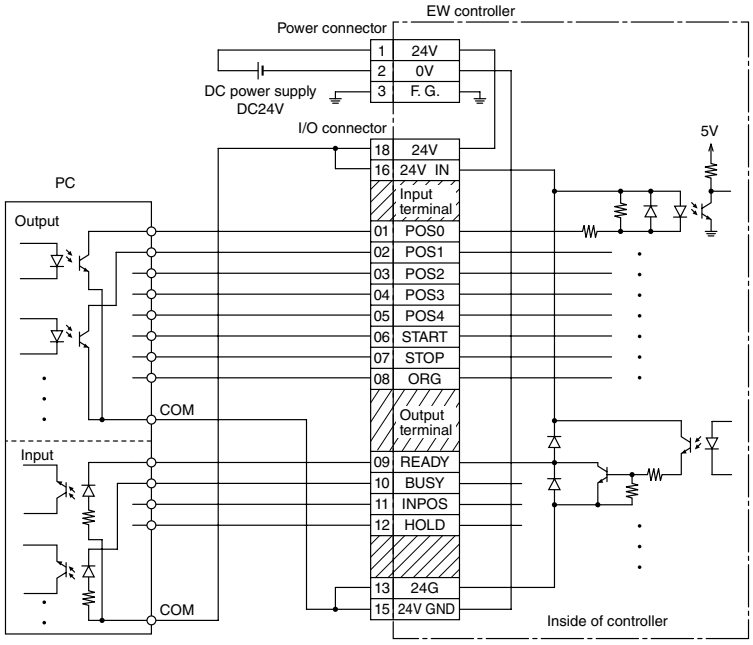
◯Output circuit

Isolation method : Photocoupler isolation between internal circuits and output transistor
Output terminal : Open collector output*
Output response : 1 ms or less
Maximum output current : 30 mA/24 VDC per 1 output
Residual ON voltage : 1.5 V or less

* NPN specifications are NPN output, and PNP specifications are PNP output.

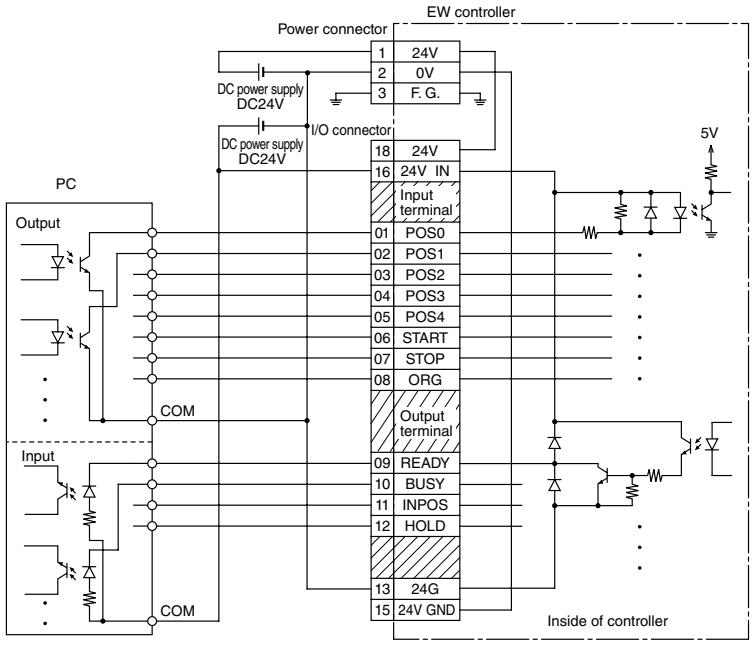
(2) Wiring examples (NPN specifications)

• When using the controller's internal power supply



*Even when using just input or output, short circuit 13-15 and 16-18.

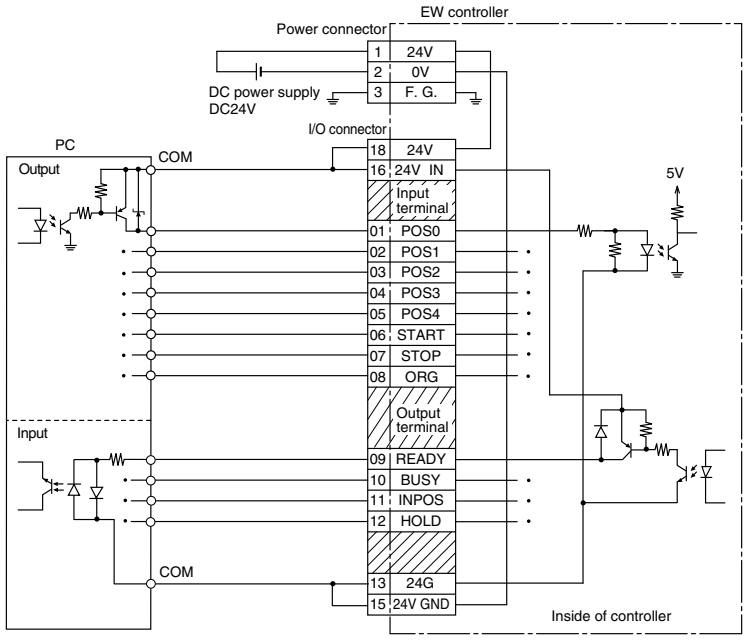
• When a separate power supply is used without using the controller's internal power supply



*Even when using just input or output, connect power to 13 and 16.

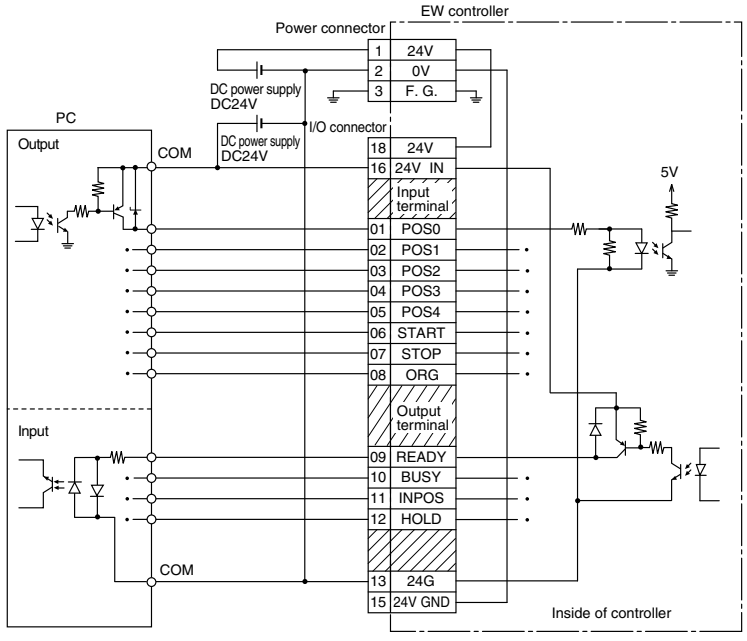
(3) Wiring examples (PNP specifications)

• When using the controller's internal power supply



*Even when using just input or output, short circuit 13-15 and 16-18.

• When a separate power supply is used without using the controller's internal power supply



*Even when using just input or output, connect power to 13 and 16.

4-3-4-2 CC-Link input/output information (CC-Link remote I/O type controller)

(1) Correspondence tables for master address buffer memory

EW2C-H-CC is remote I/O (1-address occupation, input 16 points/output 16 points).

Example) For address code setting “01”

Master address buffer area

Address code	Remote input (RX)	Remote output (RY)
1	RX00 - RX0F	RY00 - RY0F
	RX10 - RX1F	RY10 - RY1F
2	RX20 - RX2F	RY20 - RY2F
	RX30 - RX3F	RY30 - RY3F
3 ⋮	⋮	⋮
64	RX7E0 - RX7EF RX7F0 - RX7FF	RY7E0 - RY7EF RY7F0 - RY7FF

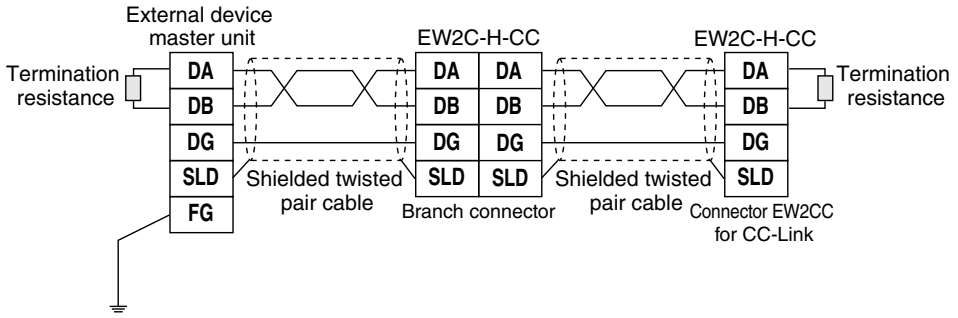
Example) For address code setting “01”

I/O memory map of EW2C-H-CC

Remote input (RX)		Remote output (RY)	
RX00	READY	RY00	Unused
RX01	BUSY	⋮	
RX02	INPOS		
RX03	HOLD		
RX04 ⋮ RX0F	Unused	RY0F	
RX10	Unused	RY10	POS0
⋮ RX1F		RY11	POS1
		RY12	POS2
		RY13	POS3
		RY14	POS4
		RY15	START
		RY16	STOP
		RY17	ORG
		RY18 ⋮ RY1F	Unused

0: Contact OFF
1: Contact ON

(2) Wiring example



* Use a cable that is recommended by the CC-Link Partner Association.
  Connection termination resistance between the DA-DB terminals for unconnected addresses.
* For termination resistance, use “110Ω1/2W” on CC-Link dedicated cable or Ver.1.10 compatible CC-Link dedicated cable, and use “130Ω1/2W” on CC-Link dedicated high-performance cable.
* Securely connect to ground.

(3) CC-Link address code setting switches

Address codes can be set by using the “STA NO. ×10, ×1” rotary switches on the front of the controller.

Example) ×10 switch: 3, ×1 switch: 9 → Sets address code “39”.

Note) Set address codes from 1 to 64.

(4) CC-Link baud rate settings switch

The baud rate can be set by the “RATE” rotary switch on the front of the controller.

Settings	0	1	2	3	4
Transmission rate	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps

Note) Set baud rate from 0 to 4. Also, match it to the communication speed of the master unit you are using.

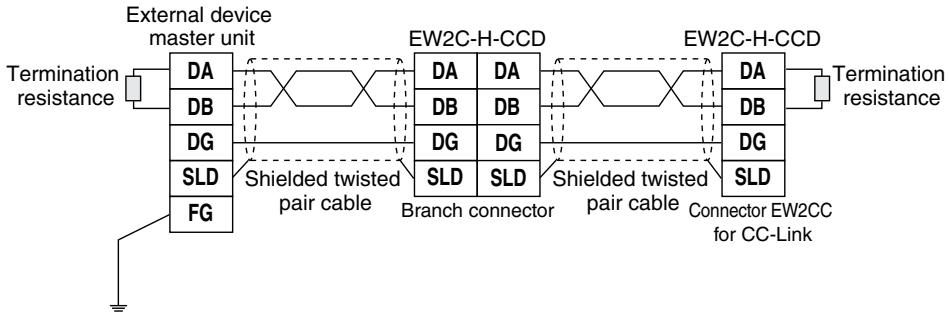
4-3-4-3 CC-Link input/output information (CC-Link remote device type controller)

(1) Operation mode settings

Settings can be done by changing parameter No. 62 (setting the number of CC-Link addresses) from the support software (see page 70) or by writing the number of occupied addresses from CC-Link (see page 52).

Set value	Move mode	Number of occupied addresses
1	1-address occupation mode	1 address
2	2-address occupation mode	2 addresses
4	4-address occupation	4 addresses

(2) Wiring example



(3) CC-Link address code setting switches

Address codes can be set by using the “STA NO. ×10, ×1” rotary switches on the front of the controller.

Example) ×10 switch: 3, ×1 switch: 9 → Sets address code “39”.

Note) Set address codes from 1 to 64.

Setting range: 1 to 64 (when 1 address occupied), 1 to 63 (when 2 addresses occupied), 1 to 61 (when 4 addresses occupied)

(4) CC-Link baud rate settings switch

The baud rate can be set by the “RATE” rotary switch on the front of the controller.

Settings	0	1	2	3	4
Transmission rate	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps

Note) Set baud rate from 0 to 4. Also, match it to the communication speed of the master unit you are using.

(6) Updating master addresses

The address assignments for each operation mode are shown below.

PLC address

Remote input (RX)			Number of occupied addresses		
			1-address occupation	2-address occupation	4-address occupation
RX (n+0)0	to	RX (n+0)F	Domain	Domain	Domain
RX (n+1)0	to	RX (n+1)F	System area		
RX (n+2)0	to	RX (n+2)F			
RX (n+3)0	to	RX (n+3)F		System area	
RX (n+4)0	to	RX (n+4)F			
RX (n+5)0	to	RX (n+5)F			
RX (n+6)0	to	RX (n+6)F			
RX (n+7)0	to	RX (n+7)F			System area

Remote output (RY)			Number of occupied addresses		
			1-address occupation	2-address occupation	4-address occupation
RX (n+0)0	to	RX (n+0)F	Domain	Domain	Domain
RX (n+1)0	to	RX (n+1)F	System area		
RX (n+2)0	to	RX (n+2)F			
RX (n+3)0	to	RX (n+3)F		System area	
RX (n+4)0	to	RX (n+4)F			
RX (n+5)0	to	RX (n+5)F			
RX (n+6)0	to	RX (n+6)F			
RX (n+7)0	to	RX (n+7)F			System area

Note: The domain is the area occupied according to the settings for the number of remote device addresses. Check the various assignment explanation pages regarding descriptions of assignments. The system area is the system area of the remote device address.

Note: n is the registered address of each address code.

PLC address

Remote register input (RWr)	Number of occupied addresses		
	1-address occupation	2-address occupation	4-address occupation
RWr (n+0)	Domain	Domain	Domain
RWr (n+1)			
RWr (n+2)			
RWr (n+3)			
RWr (n+4)			
RWr (n+5)			
RWr (n+6)			
RWr (n+7)			
RWr (n+8)			
RWr (n+9)			
RWr (n+A)			
RWr (n+B)			
RWr (n+C)			
RWr (n+D)			
RWr (n+E)			
RWr (n+F)			

Remote register output (RWw)	Number of occupied addresses		
	1-address occupation	2-address occupation	4-address occupation
RWw (n+0)	Domain	Domain	Domain
RWw (n+1)			
RWw (n+2)			
RWw (n+3)			
RWw (n+4)			
RWw (n+5)			
RWw (n+6)			
RWw (n+7)			
RWw (n+8)			
RWw (n+9)			
RWw (n+A)			
RWw (n+B)			
RWw (n+C)			
RWw (n+D)			
RWw (n+E)			
RWw (n+F)			

Note: The domain is the area occupied according to the settings for the number of remote device addresses. Check the various assignment explanation pages regarding descriptions of assignments.

Note: n is the registered address of each address code.

Example: For 1 address setting, “01” is set for the address code
Master address buffer area

PLC address

Controller Serial No.	Address code	Remote input (RX)			Signal assignment	Remote output (RY)			Signal assignment
1	1	RX 00	to	RX 0F	Domain	RY 00	to	RY 0F	Domain
		RX 10	to	RX 1F	System area	RY 10	to	RY 1F	System area

Controller Serial No.	Address code	Data input		Data output	
		(RWr)	Data assignment	(RWw)	Data assignment
1	1	RWr 0	Domain	RWw 0	Domain
		RWr 1		RWw 1	
		RWr 2		RWw 2	
		RWr 3		RWw 3	

Example: For 2 address settings, “01” is set for the address code
Master address buffer area

PLC address

Controller Serial No.	Address code	Remote input (RX)			Signal assignment	Remote output (RY)			Signal assignment
1	1	RX 00	to	RX 0F	Domain	RY 00	to	RY 0F	Domain
		RX 10	to	RX 1F		RY 10	to	RY 1F	
		RX 20	to	RX 2F		RY 20	to	RY 2F	
		RX 30	to	RX 3F	System area	RY 30	to	RY 3F	System area

Controller Serial No.	Address code	Data input		Data output	
		(RWr)	Data assignment	(RWw)	Data assignment
1	1	RWr 0	Domain	RWw 0	Domain
		RWr 1		RWw 1	
		RWr 2		RWw 2	
		RWr 3		RWw 3	
		RWr 4		RWw 4	
		RWr 5		RWw 5	
		RWr 6		RWw 6	
		RWr 7		RWw 7	

Example: For 4 address settings, “01” is set for the address code
Master address buffer area

PLC address

Controller Serial No.	Address code	Remote input (RX)			Signal assignment	Remote output (RY)			Signal assignment
1	1	RX 00	to	RX 0F	Domain	RY 00	to	RY 0F	Domain
		RX 10	to	RX 1F		RY 10	to	RY 1F	
		RX 20	to	RX 2F		RY 20	to	RY 2F	
		RX 30	to	RX 3F		RY 30	to	RY 3F	
		RX 40	to	RX 4F		RY 40	to	RY 4F	
		RX 50	to	RX 5F		RY 50	to	RY 5F	
		RX 60	to	RX 6F		RY 60	to	RY 6F	
		RX 70	to	RX 7F	System area	RY 70	to	RY 7F	System area

Controller Serial No.	Address code	Data input		Data output	
		(RWr)	Data assignment	(RWw)	Data assignment
1	1	RWr 0	Domain	RWw 0	Domain
		RWr 1		RWw 1	
		RWr 2		RWw 2	
		RWr 3		RWw 3	
		RWr 4		RWw 4	
		RWr 5		RWw 5	
		RWr 6		RWw 6	
		RWr 7		RWw 7	
		RWr 8		RWw 8	
		RWr 9		RWw 9	
		RWr 10		RWw 10	
		RWr 11		RWw 11	
		RWr 12		RWw 12	
		RWr 13		RWw 13	
		RWr 14		RWw 14	
		RWr 15		RWw 15	

Example: For EW2C-H=CCD serial No1 “2 address setting of address setting “01””,
and EW2C-H=CCD serial No2 “1 address setting of address setting “03””
Master address buffer area

PLC address

Controller Serial No.	Address code	Remote input (RX)			Signal assignment	Remote output (RY)			Signal assignment
1	1	RX 00	to	RX 0F	Domain	RY 00	to	RY 0F	Domain
		RX 10	to	RX 1F		RY 10	to	RY 1F	
		RX 20	to	RX 2F		RY 20	to	RY 2F	
		RX 30	to	RX 3F	System area	RY 30	to	RY 3F	System area
2	3	RX 40	to	RX 4F	Domain	RY 40	to	RY 4F	Domain
		RX 50	to	RX 5F	System area	RY 50	to	RY 5F	System area

Controller Serial No.	Address code	Data input		Data output	
		(RWr)	Data assignment	(RWw)	Data assignment
1	1	RWr 0	Domain	RWw 0	Domain
		RWr 1		RWw 1	
		RWr 2		RWw 2	
		RWr 3		RWw 3	
		RWr 4		RWw 4	
		RWr 5		RWw 5	
		RWr 6		RWw 6	
		RWr 7		RWw 7	
2	3	RWr 8	Domain	RWw 8	Domain
		RWr 9		RWw 9	
		RWr 10		RWw 10	
		RWr 11		RWw 11	

*2 addresses are used if 2-address occupation is selected.
Because of this, if address code setting “01” is set for 2-address occupation, then address code “02” cannot be used.

Example: For “4 address settings, “01” is set for the address code” at EW2C-H-CCD serial No1,
“Address code setting ‘05’” at EW2C-H-CC serial No2, and “1 address setting,
“06” is set for the address code” at EW2C-H-CCD serial No3
Master address buffer area

PLC address

Controller Serial No.	Address code	Remote input (RX)			Signal assignment	Remote output (RY)			Signal assignment
1	1	RX 00	to	RX 0F	Domain	RY 00	to	RY 0F	Domain
		RX 10	to	RX 1F		RY 10	to	RY 1F	
		RX 20	to	RX 2F		RY 20	to	RY 2F	
		RX 30	to	RX 3F		RY 30	to	RY 3F	
		RX 40	to	RX 4F		RY 40	to	RY 4F	
		RX 50	to	RX 5F		RY 50	to	RY 5F	
		RX 60	to	RX 6F		RY 60	to	RY 6F	
		RX 70	to	RX 7F	System area	RY 70	to	RY 7F	System area
2	5	RX 80	to	RX 8F	Domain	RY 80	to	RY 8F	Domain (unused)
		RX 90	to	RX 9F	Domain (unused)	RY 90	to	RY 9F	Domain
3	6	RX A0	to	RX AF	Domain	RY A0	to	RY AF	Domain
		RX B0	to	RX BF	System area	RY B0	to	RY BF	System area

Controller Serial No.	Address code	Data input		Data output	
		(RWr)	Data assignment	(RWw)	Data assignment
1	1	RWr 0	Domain	RWw 0	Domain
		RWr 1		RWw 1	
		RWr 2		RWw 2	
		RWr 3		RWw 3	
		RWr 4		RWw 4	
		RWr 5		RWw 5	
		RWr 6		RWw 6	
		RWr 7		RWw 7	
		RWr 8		RWw 8	
		RWr 9		RWw 9	
		RWr 10		RWw 10	
		RWr 11		RWw 11	
		RWr 12		RWw 12	
		RWr 13		RWw 13	
		RWr 14		RWw 14	
		RWr 15		RWw 15	
3	6	RWr 16	Domain	RWw 16	Domain
		RWr 17		RWw 17	
		RWr 18		RWw 18	
		RWr 19		RWw 19	

* 4 addresses are used if 4-address occupation is selected. Because of this, if address code setting “01” is set for 4-address occupation, then address codes “02 to 04” cannot be used.
* Remote I/O address (EW2C-H-CC) is not assigned data, so occupancy is not mentioned in the data input/output table.

4-3-4-3-1 List of input/output signals and input/output data

Description of input signal

Code	Description	1-address occupation	2-address occupation	4-address occupation
POS0	Point 0 bit setting	○	○	○
POS1	Point 1 bit setting	○	○	○
POS2	Point 2 bit setting	○	○	○
POS3	Point 3 bit setting	○	○	○
POS4	Point 4 bit setting	○	○	○
START	Start signal	○	○	○
STOP	Stop signal	○	○	○
ORG	Return to origin signal	○	○	○
X+	(+) movement by specified distance	○	○	○
X-	(-) movement by specified distance	○	○	○
XDEC	(+) movement at constant speed	×	○	○
XINC	(-) movement at constant speed	×	○	○
GMIN	Sets minimum sample gripping position	×	○	○
GMAX	Sets maximum sample gripping position	×	○	○
DR.START	Direct start signal	×	○	○
I.PNT	Point initialization	×	○	○
I.PRM	Parameter initialization	×	○	○
I.ERR	Initializes error history	×	○	○
R.PNT.ALL	Reads points (all)	×	×	○
R.PNT.MD	Reads points (mode)	×	○	×
R.PNT.POS	Reads points (position)	×	○	×
R.PNT.SPD	Reads points (speed)	×	○	×
R.PNT.LV	Reads points (grip level)	×	○	×
R.PRM	Reads parameters	×	○	○
R.VER	Reads versions	×	○	○
W.NP.POS	Write current position (point data)	○	○	○
W.NP.GMIN	Write current position (minimum sample gripping position)	×	○	○
W.NP.GMAX	Write current position (maximum sample gripping position)	×	○	○
W.NP.SFT	Writes current position (origin shift position)	×	○	○
W.PNT.ALL	Writes points (all)	×	○	○
W.PNT.MD	Writes points (mode)	×	○	○
W.PNT.POS	Writes points (position)	×	○	○
W.PNT.SPD	Writes points (speed)	×	○	○
W.PNT.LV	Writes points (grip level)	×	○	○
W.PRM	Writes parameters	×	○	○
W.CCS	Sets the number of CC-Link addresses	○	×	×
C.ERR	Clears current error output	○	○	○
C.DATA	Clears data output	×	○	○
D.PNT	Deletes point	×	○	○

Description of input data

Code	Description	1-address occupation	2-address occupation	4-address occupation
WD.MD	Mode data	×	○	○
WD.POSL	Lower position data (x0.01 mm)	×	○	○
WD.POSU	Upper position data (x0.01 mm)	×	○	○
WD.SPD	Speed data (mm/s)	×	○	○
WD.LV	Grip level data	×	○	○
WD.PRM.NO	Parameter No.	×	○	○
WD.PRM.DL	Parameter/actuator data lower	×	○	○
WD.CCS.NO	Number of CC-Link addresses	○	×	×

*For details, check pages 25 to 40.

Description of output signal

Code	Description	1-address occupation	2-address occupation	4-address occupation
READY	Preparation completed output	○	○	○
BUSY	Command execution in progress output	○	○	○
INPOS	Positioning completed output	○	○	○
HOLD	Gripping completed output	○	○	○
O.ACT	Output while operating	○	○	○
O.WRITE	Output while writing	○	○	○
O.POS0	POS0 check signal output	×	○	○
O.POS1	POS1 check signal output	×	○	○
O.POS2	POS2 check signal output	×	○	○
O.POS3	POS3 check signal output	×	○	○
O.POS4	POS4 check signal output	×	○	○
O.START	START check signal output	×	○	○
O.STOP	STOP check signal output	×	○	○
O.ORG	ORG check signal output	×	○	○

Description of output data

Code	Description	1-address occupation	2-address occupation	4-address occupation
RD.NPL	Current position lower (x0.01 mm)	○	○	○
RD.NPU	Current position upper (x0.01 mm)	○	○	○
RD.CR	Motor current (mA)	○	○	○
RD.ERR	Current error	○	○	○
RD.MD	Mode data	×	△	○
RD.POSL	Lower position data (x0.01 mm)	×	△	○
RD.POSU	Upper position data (x0.01 mm)	×	△	○
RD.SPD	Speed data (mm/s)	×	△	○
RD.LV	Grip level data	×	△	○
RD.PRM.DL	Parameter data lower/revision	×	△	○
RD.PRM.DU	Parameter data upper/version	×	△	○
RD.DL	Various data lower	×	○	△
RD.DU	Various data upper	×	○	△
RD.ERR.H01	History of past errors 1/0	×	○	○
RD.ERR.H23	History of past errors 3/2	×	○	○
RD.ERR.H45	History of past errors 5/4	×	×	○
RD.ERR.H67	History of past errors 7/6	×	×	○
RD.ERR.H89	History of past errors 9/8	×	×	○

* Individual types of data can be acquired when 2 addresses are set.
* There are no individual types of data items because memories for receiving data are set separately when 4 addresses are set.

4-3-4-3-2 1-address occupation mode (remote device: number of occupied addresses, 1 address)

This mode first specifies the point data and then does operations, the same as when using a point type or remote type. It is also possible to set the current position in point data.
Only basic data, such as the current position and error information, can be acquired.

○PLC address configuration
<Controller ⇨ PLC>
PLC side remote input (controller ⇨ PLC)

Device No.	Code	Item	Value (decimal)
RX (n+0)0	READY	Preparation completed output	0: Alarm status, 1: Normal status
RX (n+0)1	BUSY	Command execution in progress output	1: Command being executed state
RX (n+0)2	INPOS	Positioning completed output	1: Positioning complete state
RX (n+0)3	HOLD	Gripping completed output	1: Gripping
RX (n+0)4	O.ACT	Output while operating	0: Stopped, 1: Operating
RX (n+0)5	O.WRITE	Output while writing	1: Writing data
RX (n+0)6	-	Unused	
RX (n+0)7	-	Unused	
RX (n+0)8	-	Unused	
RX (n+0)9	-	Unused	
RX (n+0)A	-	Unused	
RX (n+0)B	-	Unused	
RX (n+0)C	-	Unused	
RX (n+0)D	-	Unused	
RX (n+0)E	-	Unused	
RX (n+0)F	-	Unused	

PLC side remote register (controller ⇨ PLC)

Device No.	Code	Item	Value (decimal)
RWr (n+0)	RD.NPL	Current position lower (x0.01 mm)	-999999 - 999999 RWr (n+0) indicate lower 16 bits, RWr (n+1) indicate upper 16 bits.
RWr (n+1)	RD.NPU	Current position upper (x0.01 mm)	
RWr (n+2)	RD.CR	Motor current (mA)	0 to 9999
RWr (n+3)	RD.ERR	Current error	0 to 99

<PLC ⇨ Controller>
PLC side remote output (PLC ⇨ Controller)

Device No.	Code	Item	Value (decimal)
RY (n+0)0	POS0	Point 0 bit setting	Binary data Point Numbers 0 to 31 Note) See page 11
RY (n+0)1	POS1	Point 1 bit setting	
RY (n+0)2	POS2	Point 2 bit setting	
RY (n+0)3	POS3	Point 3 bit setting	
RY (n+0)4	POS4	Point 4 bit setting	
RY (n+0)5	START	Start signal	1: Starts
RY (n+0)6	STOP	Stop signal	0: Releases, 1: Stops
RY (n+0)7	ORG	Return to origin signal	1: Starts
RY (n+0)8	X+	(+) movement by specified distance	1: Starts
RY (n+0)9	X-	(-) movement by specified distance	1: Starts
RY (n+0)A	W.NP.POS	Write current position (point data)	1: Writes
RY (n+0)B	C.ERR	Clears current error output	1: Clears
RY (n+0)C	W.CCS	Sets the number of CC-Link addresses	1: Writes
RY (n+0)D	-	Unused	
RY (n+0)E	-	Unused	
RY (n+0)F	-	Unused	

PLC side remote register output (PLC ⇨ Controller)

Device No.	Code	Item	Value (decimal)
RWw (n+0)	WD.CCS.NO	Number of CC-Link addresses	1: 1-address occupation, 2: 2-address occupation, 4: 4-address occupation
RWw (n+1)	-	Unused	-
RWw (n+2)	-	Unused	-
RWw (n+3)	-	Unused	-

4-3-4-3-3 2-address occupation mode (remote device: number of occupied addresses, 2 addresses)

This mode makes it possible to operate by directly specifying positions, without using points. Specifying point data in advance and then doing operations is also possible. Besides acquiring current position and current errors, acquiring data, such as each point data and parameter data, is also possible. However, because only 1 of each item of point data can be acquired one time, so if you want to acquire it all at one time, select 4-address occupation.

○PLC address configuration
<Controller ⇨ PLC>
PLC side remote input (controller ⇨ PLC)

Device No.	Code	Item	Value (decimal)
RX (n+0)0	READY	Preparation completed output	0: Alarm status, 1: Normal status
RX (n+0)1	BUSY	Command execution in progress output	1: Command being executed state
RX (n+0)2	INPOS	Positioning completed output	1: Positioning complete state
RX (n+0)3	HOLD	Gripping completed output	1: Gripping
RX (n+0)4	O.ACT	Output while operating	0: Stopped, 1: Operating
RX (n+0)5	O.WRITE	Output while writing	1: Writing data
RX (n+0)6 to RX (n+0)F	-	Unused	
RX (n+1)0	O.POS0	POS0 check signal output	POS0 input status is output as is
RX (n+1)1	O.POS1	POS1 check signal output	POS1 input status is output as is
RX (n+1)2	O.POS2	POS2 check signal output	POS2 input status is output as is
RX (n+1)3	O.POS3	POS3 check signal output	POS3 input status is output as is
RX (n+1)4	O.POS4	POS4 check signal output	POS4 input status is output as is
RX (n+1)5	O.START	START check signal output	START input status is output as is
RX (n+1)6	O.STOP	STOP check signal output	STOP input status is output as is
RX (n+1)7	O.ORG	ORG check signal output	ORG input status is output as is
RX (n+1)8 to RX (n+1)F	-	Unused	

PLC side remote register (controller ⇨ PLC)

Device No.	Code	Item	Value (decimal)
RWr (n+0)	RD.NPL	Current position lower (x0.01 mm)	-999999 - 999999 RWr (n+0) indicate lower 16 bits, RWr (n+1) indicate upper 16 bits.
RWr (n+1)	RD.NPU	Current position upper (x0.01 mm)	
RWr (n+2)	RD.CR	Motor current (mA)	0 to 9999
RWr (n+3)	RD.ERR	Current error	0 to 99
RWr (n+4)	RD.DL	Various data lower	The data that has been read is set. RWr (n+4) indicate lower 16 bits, RWr (n+5) indicate upper 16 bits. ・For version information, RWr (n+5) indicates version information, and RWr (n+4) indicates revision information. ・Speed data is shown in units of (x0.01 mm/s). ・Position data is shown in units of (x0.01 mm).
RWr (n+5)	RD.DU	Various data upper	
RWr (n+6)	RD.ERR.H01	History of past errors 1/0	Past alarm data histories are set. From the new order, then the lower 8 bits of RWr (n+6), and upper 8 bits of RWr (n+6). Register RWr (n+6) Lower 8 bits New RWr (n+6) Upper 8 bits RWr (n+7) Lower 8 bits RWr (n+7) Upper 8 bits Old
RWr (n+7)	RD.ERR.H23	History of past errors 3/2	

<PLC ⇨ Controller>

PLC side remote output (PLC ⇨ Controller)

Device No.	Code	Item	Value (decimal)
RY (n+0)0	POS0	Point 0 bit setting	Binary data Point Numbers 0 to 31 Note) See page 11
RY (n+0)1	POS1	Point 1 bit setting	
RY (n+0)2	POS2	Point 2 bit setting	
RY (n+0)3	POS3	Point 3 bit setting	
RY (n+0)4	POS4	Point 4 bit setting	
RY (n+0)5	START	Start signal	1: Starts
RY (n+0)6	STOP	Stop signal	0: Releases, 1: Stops
RY (n+0)7	ORG	Return to origin signal	1: Starts
RY (n+0)8	X+	(+) movement by specified distance	1: Starts
RY (n+0)9	X-	(-) movement by specified distance	1: Starts
RY (n+0)A	XDEC	(+) movement at constant speed	1: Starts
RY (n+0)B	XINC	(-) movement at constant speed	1: Starts
RY (n+0)C	GMIN	Sets minimum sample gripping position	1: Starts
RY (n+0)D	GMAX	Sets maximum sample gripping position	1: Starts
RY (n+0)E	DR.START	Direct start signal	1: Starts
RY (n+0)F	-	Unused	
RY (n+1)0	I.PNT	Point initialization	1: Starts initialization
RY (n+1)1	I.PRM	Parameter initialization	1: Starts initialization
RY (n+1)2	I.ERR	Initializes error history	1: Starts initialization
RY (n+1)3	R.PNT.MD	Reads points (mode)	1: Reads
RY (n+1)4	R.PNT.POS	Reads points (position)	1: Reads
RY (n+1)5	R.PNT.SPD	Reads points (speed)	1: Reads
RY (n+1)6	R.PNT.LV	Reads points (grip level)	1: Reads
RY (n+1)7	R.PRM	Reads parameters	1: Reads
RY (n+1)8	R.VER	Reads versions	1: Reads
RY (n+1)9 to RY (n+1)F	-	Unused	
RY (n+2)0	W.NP.POS	Write current position (point data)	1: Writes
RY (n+2)1	W.NP.GMIN	Write current position (minimum sample gripping position)	1: Writes
RY (n+2)2	W.NP.GMAX	Write current position (maximum sample gripping position)	1: Writes
RY (n+2)3	W.NP.SFT	Writes current position (origin shift position)	1: Writes
RY (n+2)4	W.PNT.ALL	Writes points (all)	1: Writes
RY (n+2)5	W.PNT.MD	Writes points (mode)	1: Writes
RY (n+2)6	W.PNT.POS	Writes points (position)	1: Writes
RY (n+2)7	W.PNT.SPD	Writes points (speed)	1: Writes
RY (n+2)8	W.PNT.LV	Writes points (grip level)	1: Writes
RY (n+2)9	W.PRM	Writes parameters	1: Writes
RY (n+2)A	C.ERR	Clears current error output	1: Clears
RY (n+2)B	C.DATA	Clears data output	1: Clears
RY (n+2)C	D.PNT	Deletes point	1: Deletes
RY (n+2)D to RY (n+2)F	-	Unused	

PLC side remote register output (PLC ⇨ Controller)

Device No.	Code	Item	Value (decimal)
RWw (n+0)	WD.MD	Mode data	65(A), 67(C), 73(I), 79(O), 85(U), 0(none/delete)
RWw (n+1)	WD.POSL	Lower position data (x0.01 mm)	-999999 - 999999 RWw (n+1) indicate lower 16 bits, RWw (n+2) indicate upper 16 bits. Note) The input range varies depending on the model.
RWw (n+2)	WD.POSU	Upper position data (x0.01 mm)	
RWw (n+3)	WD.SPD	Speed data (mm/s)	0 to 30000 Note) The input range varies depending on the model.
RWw (n+4)	WD.LV	Grip level data	0 to 5
RWw (n+5)	WD.PRM.NO	Parameter No.	0 to 300
RWw (n+6)	WD.PRM.DL	Parameter/actuator data lower	-999999 - 999999 RWw (n+6) indicate lower 16 bits, RWw (n+7) indicate upper 16 bits. Note) The input range varies depending on the model.
RWw (n+7)	WD.PRM.DU	Parameter/actuator data upper	

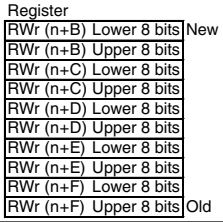
4-3-4-3-4 4-address occupation mode (remote device: number of occupied addresses, 4 addresses)

This mode makes it possible to operate by directly specifying positions, without using points. Specifying point data in advance and then doing operations is also possible. The point data settings and each data item can be initialized. Besides acquiring current position and current errors, acquiring data, such as each point data and parameter data, is also possible. The content that can be received is the same as 2-address occupation mode, but there is more data, such as error history, than 2-address occupation mode, so received data is easier to manage in this mode.

○PLC address configuration
<Controller ⇨ PLC>
PLC side remote input (controller ⇨ PLC)

Device No.	Code	Item	Value (decimal)
RX (n+0)0	READY	Preparation completed output	0: Alarm status, 1: Normal status
RX (n+0)1	BUSY	Command execution in progress output	1: Command being executed state
RX (n+0)2	INPOS	Positioning completed output	1: Positioning complete state
RX (n+0)3	HOLD	Gripping completed output	1: Gripping
RX (n+0)4	O.ACT	Output while operating	0: Stopped, 1: Operating
RX (n+0)5	O.WRITE	Output while writing	1: Writing data
RX (n+0)6 to RX (n+0)F	-	Unused	
RX (n+1)0	O.POS0	POS0 check signal output	POS0 input status is output as is
RX (n+1)1	O.POS1	POS1 check signal output	POS1 input status is output as is
RX (n+1)2	O.POS2	POS2 check signal output	POS2 input status is output as is
RX (n+1)3	O.POS3	POS3 check signal output	POS3 input status is output as is
RX (n+1)4	O.POS4	POS4 check signal output	POS4 input status is output as is
RX (n+1)5	O.START	START check signal output	START input status is output as is
RX (n+1)6	O.STOP	STOP check signal output	STOP input status is output as is
RX (n+1)7	O.ORG	ORG check signal output	ORG input status is output as is
RX (n+1)8 to RX (n+6)F	-	Unused	

PLC side remote register (controller ⇨ PLC)

Device No.	Code	Item	Value (decimal)
RWr (n+0)	RD.NPL	Current position lower (x0.01 mm)	-999999 - 999999 RWr (n+0) indicate lower 16 bits, RWr (n+1) indicate upper 16 bits.
RWr (n+1)	RD.NPU	Current position upper (x0.01 mm)	
RWr (n+2)	RD.CR	Motor current (mA)	0 to 9999
RWr (n+3)	RD.ERR	Current error	0 to 99
RWr (n+4)	RD.MD	Mode data	65(A), 67(C), 73(I), 79(O), 85(U), 0(none/delete)
RWr (n+5)	RD.POSL	Lower position data (x0.01 mm)	-999999 - 999999 RWr (n+5) indicate lower 16 bits, RWr (n+6) indicate upper 16 bits.
RWr (n+6)	RD.POSU	Upper position data (x0.01 mm)	
RWr (n+7)	RD.SPD	Speed data (mm/s)	0 to 30000
RWr (n+8)	RD.LV	Grip level data	0 to 5
RWr (n+9)	RD.PRM.DL	Parameter data lower/revision	The data that has been read is set. RWr (n+9) indicate lower 16 bits, RWr (n+A) indicate upper 16 bits.
RWr (n+A)	RD.PRM.DU	Parameter data upper/version	For version information, RWr (n+A) indicates version information, and RWr (n+9) indicates revision information.
RWr (n+B)	RD.ERR.H01	History of past errors 1/0	Past alarm data histories are set. From the new order, then the lower 8 bits of RWr (n+B), and upper 8 bits of RWr (n+B). 
RWr (n+C)	RD.ERR.H23	History of past errors 3/2	
RWr (n+D)	RD.ERR.H45	History of past errors 5/4	
RWr (n+E)	RD.ERR.H67	History of past errors 7/6	
RWr (n+F)	RD.ERR.H89	History of past errors 9/8	

<PLC ⇨ Controller>

PLC side remote output (PLC ⇨ Controller)

Device No.	Code	Item	Value (decimal)
RY (n+0)0	POS0	Point 0 bit setting	Binary data Point Numbers 0 to 31 Note) See page 11
RY (n+0)1	POS1	Point 1 bit setting	
RY (n+0)2	POS2	Point 2 bit setting	
RY (n+0)3	POS3	Point 3 bit setting	
RY (n+0)4	POS4	Point 4 bit setting	
RY (n+0)5	START	Start signal	1: Starts
RY (n+0)6	STOP	Stop signal	0: Releases, 1: Stops
RY (n+0)7	ORG	Return to origin signal	1: Starts
RY (n+0)8	X+	(+) movement by specified distance	1: Starts
RY (n+0)9	X-	(-) movement by specified distance	1: Starts
RY (n+0)A	XDEC	(+) movement at constant speed	1: Starts
RY (n+0)B	XINC	(-) movement at constant speed	1: Starts
RY (n+0)C	GMIN	Sets minimum sample gripping position	1: Starts
RY (n+0)D	GMAX	Sets maximum sample gripping position	1: Starts
RY (n+0)E	DR.START	Direct start signal	1: Starts
RY (n+0)F	-	Unused	
RY (n+1)0	I.PNT	Point initialization	1: Starts initialization
RY (n+1)1	I.PRM	Parameter initialization	1: Starts initialization
RY (n+1)2	I.ERR	Initializes error history	1: Starts initialization
RY (n+1)3	R.PNT.ALL	Reads points (all)	1: Reads
RY (n+1)4	R.PRM	Reads parameters	1: Reads
RY (n+1)5	R.VER	Reads versions	1: Reads
RY (n+1)6 to RY (n+1)F	-	Unused	
RY (n+2)0	W.NP.POS	Write current position (point data)	1: Writes
RY (n+2)1	W.NP.GMIN	Write current position (minimum sample gripping position)	1: Writes
RY (n+2)2	W.NP.GMAX	Write current position (maximum sample gripping position)	1: Writes
RY (n+2)3	W.NP.SFT	Writes current position (origin shift position)	1: Writes
RY (n+2)4	W.PNT.ALL	Writes points (all)	1: Writes
RY (n+2)5	W.PNT.MD	Writes points (mode)	1: Writes
RY (n+2)6	W.PNT.POS	Writes points (position)	1: Writes
RY (n+2)7	W.PNT.SPD	Writes points (speed)	1: Writes
RY (n+2)8	W.PNT.LV	Writes points (grip level)	1: Writes
RY (n+2)9	W.PRM	Writes parameters	1: Writes
RY (n+2)A	C.ERR	Clears current error output	1: Clears
RY (n+2)B	C.DATA	Clears data output	1: Clears
RY (n+2)C	D.PNT	Deletes point	1: Deletes
RY (n+2)D to RY (n+6)F	-	Unused	

PLC side remote register output (PLC ⇨ Controller)

Device No.	Code	Item	Value (decimal)
RWw (n+0)	WD.MD	Mode data	65(A), 67(C), 73(I), 79(O), 85(U), 0(none/delete)
RWw (n+1)	WD.POSL	Lower position data (x0.01 mm)	-999999 - 999999 RWw (n+1) indicate lower 16 bits, RWw (n+2) indicate upper 16 bits. Note) The input range varies depending on the model.
RWw (n+2)	WD.POSU	Upper position data (x0.01 mm)	
RWw (n+3)	WD.SPD	Speed data (mm/s)	0 to 30000 Note) The input range varies depending on the model.
RWw (n+4)	WD.LV	Grip level data	0 to 5
RWw (n+5)	WD.PRM.NO	Parameter No.	0 to 300
RWw (n+6)	WD.PRM.DL	Parameter/actuator data lower	-999999 - 999999 RWw (n+6) indicate lower 16 bits, RWw (n+7) indicate upper 16 bits. Note) The input range varies depending on the model.
RWw (n+7)	WD.PRM.DU	Parameter/actuator data upper	
RWw (n+8) to RWw (n+F)	-	Unused	

4-3-4-3-5 List of input data

○: Function available,
×: Function not available

Code	Description	1-address occupation	2-address occupation	4-address occupation
WD.MD	Mode data	×	○	○
WD.POSL	Lower position data (x0.01 mm)	×	○	○
WD.POSU	Upper position data (x0.01 mm)	×	○	○
WD.SPD	Speed data (mm/s)	×	○	○
WD.LV	Grip level data	×	○	○
WD.PRM.NO	Parameter No.	×	○	○
WD.PRM.DL	Parameter/actuator data lower	×	○	○
WD.PRM.DU	Parameter/actuator data upper	×	○	○
WD.CCS.NO	Number of CC-Link addresses	○	×	×

4-3-4-3-6 Details about input data

(1) WD.MD
Function Set while specifying a mode.
Data format

Data name	WD.MD
Data position	16bits

Example: For mode A

Data name	WD.MD
Data position	65 (hexadecimal: 41)
	Character: A

ASCII control character

Mode name	A	I	C	O	U
Decimal data	65	73	67	79	85
Hexadecimal data	41	49	43	4F	55

Input by ASCII control character.

(2) WD.POSU, WD.POSL
Function Set while specifying a position. Units: (×0.01 mm)
Data format

Data name	WD.POSU	WD.POSL
Data position	Upper 16 bits	Lower 16 bits
	Total 32 bits	

Example: For position -5.00

Data name	WD.POSU	WD.POSL
Data position	65535 (hexadecimal: FFFF)	65035 (hexadecimal: FE0C)
	-500 (hexadecimal: FFFFFE0C)	

Example: For position 1000.15 mm

Data name	WD.POSU	WD.POSL
Data position	1 (hexadecimal: 1)	34479 (hexadecimal: 86AF)
	100015 (hexadecimal: 186AF)	

(3) WD.SPD
Function Set while specifying a speed. Units: (mm/s)
Data format

Data name	WD.SPD
Data position	16bit

Example: For 50 mm/s

Data name	WD.SPD
Data position	50 (hexadecimal: 32)

(4) WD.LV
Function Set while specifying a gripping level.
Data format

Data name	WD.LV
Data position	16bit

Example: For level 5

Data name	WD.LV
Data position	5 (hexadecimal: 5)

(5) WD.PRM.NO
Function Set while specifying a parameter number.
Data format

Data name	WD.PRM.NO
Data position	16bit

Example: For PRM10

Data name	WD.PRM.NO
Data position	10 (hexadecimal: A)

(6) WD.PRM.DU, WD.PRM.DL
Function Set while specifying parameter data. Also set while specifying an actuator number.
Data format

Data name	WD.PRM.DU	WD.PRM.DL
Data position	Upper 16 bits	Lower 16 bits
	Total 32 bits	

Example: For data -1600

Data name	WD.PRM.DU	WD.PRM.DL
Data position	65535 (hexadecimal: FFFF)	63935 (hexadecimal: F9C0)
	-1600 (hexadecimal: FFFFF9C0)	

Example: For data 160000

Data name	WD.PRM.DU	WD.PRM.DL
Data position	2 (hexadecimal: 2)	28928 (hexadecimal: 7100)
	160000 (hexadecimal: 27100)	

Example: For EW2H8 actuator number 72

Data name	WD.PRM.DU	WD.PRM.DL
Data position	0	72 (hexadecimal: 48)
	72 (hexadecimal: 48)	

(7) WD.CCS.NO
Function Set while specifying the number of occupied addresses when in 1-address occupation mode.
Data format

Data name	WD.CCS.NO
Data position	16bit

4-3-4-3-7 List of input signals

○: Function available, ×: Function not available

Code	Description	1-address occupation	2-address occupation	4-address occupation
POS0	Point 0 bit setting	○	○	○
POS1	Point 1 bit setting	○	○	○
POS2	Point 2 bit setting	○	○	○
POS3	Point 3 bit setting	○	○	○
POS4	Point 4 bit setting	○	○	○
START	Start signal	○	○	○
STOP	Stop signal	○	○	○
ORG	Return to origin signal	○	○	○
X+	(+) movement by specified distance	○	○	○
X-	(-) movement by specified distance	○	○	○
XDEC	(+) movement at constant speed	×	○	○
XINC	(-) movement at constant speed	×	○	○
GMIN	Sets minimum sample gripping position	×	○	○
GMAX	Sets maximum sample gripping position	×	○	○
DR.START	Direct start signal	×	○	○
I.PNT	Point initialization	×	○	○
I.PRM	Parameter initialization	×	○	○
I.ERR	Initializes error history	×	○	○
R.PNT.ALL	Reads points (all)	×	×	○
R.PNT.MD	Reads points (mode)	×	○	×
R.PNT.POS	Reads points (position)	×	○	×
R.PNT.SPD	Reads points (speed)	×	○	×
R.PNT.LV	Reads points (grip level)	×	○	×
R.PRM	Reads parameters	×	○	○
R.VER	Reads versions	×	○	○
W.NP.POS	Write current position (point data)	○	○	○
W.NP.GMIN	Write current position (minimum sample gripping position)	×	○	○
W.NP.GMAX	Write current position (maximum sample gripping position)	×	○	○
W.NP.SFT	Writes current position (origin shift position)	×	○	○
W.PNT.ALL	Writes points (all)	×	○	○
W.PNT.MD	Writes points (mode)	×	○	○
W.PNT.POS	Writes points (position)	×	○	○
W.PNT.SPD	Writes points (speed)	×	○	○
W.PNT.LV	Writes points (grip level)	×	○	○
W.PRM	Writes parameters	×	○	○
W.CCS	Sets the number of CC-Link addresses	○	×	×
C.ERR	Clears current error output	○	○	○
C.DATA	Clears data output	×	○	○
D.PNT	Deletes point	×	○	○

4-3-4-3-8 Details about input signals

(1) POS0 to POS4

Function Sets point numbers. See page 11 regarding point numbers from bits.
Signal ON: Bit ON, OFF: Bit OFF

(2) START

Function Operates by point data of point numbers set by POS0 to POS4.
Signal ON: Starts startup
Remarks If it does not operate, check the error number and point data.

(3) STOP

Function Stops operations.
Signal ON: Operation stop
Remarks While STOP is input, does not operate even if operate command is input.

(4) ORG

Function Return to origin.
Signal ON: Return to origin start

(5) X+ / X–

Function Moves by only the specified distance at the speed shown below.
Movement distance = PRM25/100 [mm]
Moving speed = PRM24 [mm/s]
Movement direction X+: + side "Open direction" X-: − side "Close direction"
Signal ON: Start operation by specified amount

(6) XINC / XDEC

Function Moves to grip at the speed shown in the following equation.
Stops if stop command is input, an object to grip is detected, or the software limit is reached.
Moving speed = PRM24 [mm/s]
Grip level = PRM26
Movement direction XINC: + side "Open direction" XDEC: − side "Close direction"
Signal ON: Start gripping operation

(7) GMIN / GMAX

Function Sets the gripping position for the minimum sample (maximum sample) when using the size detecting function.

Gripping direction	WD.MD data	O: + side "Open direction", C: − side "Close direction"
Moving speed	WD.SPD data	See page 89 regarding relationship between grip level and maximum speed.
Grip level	WD.LV data	See page 89 regarding relationship between grip level and maximum speed.
Setting sample	GMIN: Minimum sample,	GMAX: Maximum sample

Signal ON: Start size detection operation
Remarks Gripping position storage for GMIN, PRM32 (minimum sample gripping position) and for GMAX, PRM31 (maximum sample gripping position).

(8) DR.START

Function Specify operation directly to operate. See 4-5 Point data specifications for input range.

Mode	WD.MD data
Movement position	WD.POSU data, WD.POSL data
Moving speed	WD.SPD data
Grip level	WD.LV data

Signal ON: Start direct operation
Remarks See page 89 regarding relationship between grip level and maximum speed for gripping operations.

(9) I.PNT

Function Deletes all point data.
Signal ON: Executes data point deletion

(10) I.PRM

Function Resets parameter data to their initial values.
Actuator number WD.PRM.DU data, WD.PRM.DL data
Signal ON: Executes initialization
Remarks The first 2 digits in the serial No. on the actuator unit are the actuator No.
Check the actuator No. on the actuator unit, and then initialize the parameters.

Actuator model	EW2H8	EW2H18	EW2H28	EW2HL8	EW2HL18	EW2HL28
Actuator No.	72	73	74	82	83	84

(11) I.ERR

Function Deletes all error history data.
Signal ON: Executes initialization

(12) R.PNT.ALL

Function Reads batches of point data of point numbers set by POS0 to POS4.
Mode RD.MD data
Movement position RD.POSU data, RD.POSL data
Moving speed RD.SPD data
Grip level RD.LV data
Signal ON: Executes read

(13) R.PNT.MD

Function Reads mode of point data of point numbers set by POS0 to POS4.
Mode RD.DU data, RD.DL data
Signal ON: Executes read

(14) R.PNT.POS

Function Reads movement position of point data of point numbers set by POS0 to POS4.
Movement position RD.DU data, RD.DL data
Signal ON: Executes read

(15) R.PNT.SPD

Function Reads moving speed of point data of point numbers set by POS0 to POS4.
Moving speed RD.DU data, RD.DL data
Signal ON: Executes read

(16) R.PNT.LV

Function Reads grip level of point data of point numbers set by POS0 to POS4.
Grip level RD.DU data, RD.DL data
Signal ON: Executes read

(17) R.PRM

Function Reads parameters.
Specified parameter No. WD.PRM.NO data
Read data (for 2-address occupation) RD.DU data, RD.DL data
Read data (for 4-address occupation) RD.PRM.DU data, RD.PRM.DL data
Signal ON: Executes read

(18) R.VER

Function Reads the controller software version number.
Read data (for 2-address occupation) RD.DU data, RD.DL data
Read data (for 4-address occupation) RD.PRM.DU data, RD.PRM.DL data
Signal ON: Executes read
Remarks Version data is stored in DU and revision data is in DL.

(19) W.NP.POS

Function Writes current position point data of point numbers set by POS0 to POS4.
Signal ON: Executes write
Remarks Point data can be written in O or C mode, but it is not applied to operations while in O or C mode.
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(20) W.NP.GMIN / W.NP.GMAX

Function Sets the gripping position and current position for the minimum sample (maximum sample) when using the size detecting function.
Setting sample W.NP.GMIN: Minimum sample, W.NP.GMAX: Maximum sample
Signal ON: Executes write
Remarks Current position storage for W.NP.GMIN, PRM32 (minimum sample gripping position) and for W.NP.GMAX, PRM31 (maximum sample gripping position).
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(21) W.NP.SFT

Function Sets the current position as the origin shift distance (virtual origin).
Signal ON: Executes write
Remarks For W.NP.SFT, current position is stored in PRM35 (origin shift distance).
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(22) W.PNT.ALL

Function Writes batches of point data of point numbers set by POS0 to POS4.
Mode WD.MD data
Movement position WD.POSU data, WD.POSL data
Moving speed WD.SPD data
Grip level WD.LV data
Signal ON: Executes write
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(23) W.PNT.MD

Function Writes mode of point data of point numbers set by POS0 to POS4.
Mode WD.MD data
Signal ON: Executes write
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(24) W.PNT.POS

Function Writes movement position of point data of point numbers set by POS0 to POS4.
Movement position WD.POSU data, WD.POSL data
Signal ON: Executes write
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(25) W.PNT.SPD

Function Writes moving speed of point data of point numbers set by POS0 to POS4.
Moving speed WD.SPD data
Signal ON: Executes write
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(26) W.PNT.LV

Function Writes grip level of point data of point numbers set by POS0 to POS4.
Grip level WD.LV data
Signal ON: Executes write
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

(27) W.PRM

Function Writes parameters.
Specified parameter No. WD.PRM.NO data
Written data WD.PRM.DU data, WD.PRM.DL data
Signal ON: Executes write
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.
Note) PRM0 is an actuator number, so it cannot be changed by writing parameters.
Change it by initializing the parameters.

(28) W.CCS

Function Sets number of occupied addresses.
Specified address codes WD.CCS.NO data
Signal ON: Executes write

(29) C.ERR

Function Clears the current error output data.
Current error output RD.ERR data
Signal ON: Executes data clear
Remarks Clears only values that are output, this function does not clear alarms, such as overtime.

(30) C.DATA

Function Clears the output data, except for current errors.
(Clear data for 2-address occupation)
RD.DU data, RD.DL data
(Clear data for 4-address occupation)
RD.MD data, RD.POSU data, RD.POSL data, RD.SPD data, RD.LV data, RD.PRM.DU data, RD.PRM.DL data
Signal ON: Executes data clear

(31) D.PNT

Function Deletes point data of point numbers set by POS0 to POS4.
Signal ON: Executes deletion
Remarks If O.WRITE signal is not output, check the error number and point data.
Writing may be done normally, even though there is no output, due to conditions such as the number of units connected and the communication speed.

4-3-4-3-9 List of output data

○: Function available, △: function covered through other data, ×: function not available

Code	Description	1-address occupation	2-address occupation	4-address occupation
RD.NPL	Current position lower (x0.01 mm)	○	○	○
RD.NPU	Current position upper (x0.01 mm)	○	○	○
RD.CR	Motor current (mA)	○	○	○
RD.ERR	Current error	○	○	○
RD.MD	Mode data	×	△	○
RD.POSL	Lower position data (x0.01 mm)	×	△	○
RD.POSU	Upper position data (x0.01 mm)	×	△	○
RD.SPD	Speed data (mm/s)	×	△	○
RD.LV	Grip level data	×	△	○
RD.PRM.DL	Parameter data lower/revision	×	△	○
RD.PRM.DU	Parameter data upper/version	×	△	○
RD.DL	Various data lower	×	○	△
RD.DU	Various data upper	×	○	△
RD.ERR.H01	History of past errors 1/0	×	○	○
RD.ERR.H23	History of past errors 3/2	×	○	○
RD.ERR.H45	History of past errors 5/4	×	×	○
RD.ERR.H67	History of past errors 7/6	×	×	○
RD.ERR.H89	History of past errors 9/8	×	×	○

* Individual types of data can be acquired when 2 addresses are set.
* There are no individual types of data items because memories for receiving data are set separately when 4 addresses are set.

4-3-4-3-10 Details about output data

(1) RD.NPU, RD.NPL

Function Stored when current position was acquired. Units: (×0.01 mm)

Data format

Data name	RD.NPU	RD.NPL
Data position	Upper 16 bits	Lower 16 bits
	Total 32 bits	

Example: For position -5.00

Data name	RD.NPU	RD.NPL
Data position	65535 (hexadecimal: FFFF)	65035 (hexadecimal: FE0C)
	-500 (hexadecimal: FFFFFE0C)	

Example: For position 1000.15 mm

Data name	RD.NPU	RD.NPL
Data position	1 (hexadecimal: 1)	34479 (hexadecimal: 86AF)
	100015 (hexadecimal: 186AF)	

(2) RD.CR

Function Stored when value of average current flowing through motor was acquired. Units: (mA)

Data format

Data name	RD.CR
Data position	16bit

Example: For 1000 mA

Data name	RD.CR
Data position	1000 (hexadecimal: 3E8)

(3) RD.ERR

Function Stored when current error was acquired.

Can be cleared after occurring by return to origin or C.ERR signal input.

Data format

Data name	RD.ERR
Data position	16bit

Example: For 01. Overtime occurs

Data name	RD.ERR
Data position	1 (hexadecimal: 1)

Example: If there is no error

Data name	RD.ERR
Data position	0

(4) RD.MD

Function Stored when mode data of point data was acquired.

Data format

Data name	RD.MD
Data position	16bit

Example: For mode A

Data name	RD.MD
Data position	65 (hexadecimal: 41)
	Character: A

ASCII control character

Mode name	A	I	C	O	U
Decimal data	65	73	67	79	85
Hexadecimal data	41	49	43	4F	55

(5) RD.POSU, RD.POSL

Function Stored when position data of point data was acquired. Units: (×0.01 mm)

Data format

Data name	RD.NPU	RD.NPL
Data position	Upper 16 bits	Lower 16 bits
	Total 32 bits	

Example: For position -5.00

Data name	RD.NPU	RD.NPL
Data position	65535 (hexadecimal: FFFF)	65035 (hexadecimal: FE0C)
	-500 (hexadecimal: FFFFFE0C)	

Example: For position 1000.15 mm

Data name	RD.NPU	RD.NPL
Data position	1 (hexadecimal: 1)	34479 (hexadecimal: 86AF)
	100015 (hexadecimal: 186AF)	

(6) RD.SPD

Function Stored when speed data of point data was acquired. Units: (mm/s)

Data format

Example: For mode A

Data name	RD.MD
Data position	65 (hexadecimal: 41)
	Character: A

Data name	RD.SPD
Data position	16bit

(7) RD.LV

Function Stored when grip level of point data was acquired.

Data format

Data name	RD.LV
Data position	16bit

Example: For level 5

Data name	RD.LV
Data position	5 (hexadecimal: 5)

(8) RD.PRM.DU, RD.PRM.DL

Function Stored when parameter data and actuator number were acquired.
In addition, when version information is acquired, the version data is stored in the upper 16 bits and revision data is in the lower 16 bits.

Data format

Data name	RD.PRM.DU	RD.PRM.DL
Data position	Upper 16 bits	Lower 16 bits
	Total 32 bits	

Example: For data -1600

Data name	RD.PRM.DU	RD.PRM.DL
Data position	65535 (hexadecimal: FFFF)	63935 (hexadecimal: F9C0)
	-1600 (hexadecimal: FFFFF9C0)	

Example: For data 160000

Data name	RD.PRM.DU	RD.PRM.DL
Data position	2 (hexadecimal: 2)	28928 (hexadecimal: 7100)
	160000 (hexadecimal: 27100)	

Example: For EW2H8 actuator number 72

Data name	RD.PRM.DU	RD.PRM.DL
Data position	0	72 (hexadecimal: 48)
	72 (hexadecimal: 48)	

Example: For version 1.00

Data name	RD.PRM.DU	RD.PRM.DL
Data position	100 (hexadecimal: 64)	0
	6553600 (hexadecimal: 640000)	

Example: For version 1.80a

Data name	RD.PRM.DU	RD.PRM.DL
Data position	180 (hexadecimal: B4)	1 (hexadecimal: 1)
	11796481 (hexadecimal: B40001)	

(9) RD.DU, RD.DL

Function Stored when various data of point data, parameter data, and actuator number were acquired. In addition, when version information is acquired, the version data is stored in the upper 16 bits and revision data is in the lower 16 bits.

Data format

Data name	RD.DU	RD.DL
Data position	Upper 16 bits	Lower 16 bits
	Total 32 bits	

Example: For data -1600

Data name	RD.DU	RD.DL
Data position	65535 (hexadecimal: FFFF)	63935 (hexadecimal: F9C0)
	-1600 (hexadecimal: FFFFF9C0)	

Example: For data 160000

Data name	RD.DU	RD.DL
Data position	2 (hexadecimal: 2)	28928 (hexadecimal: 7100)
	160000 (hexadecimal: 27100)	

Example: For mode A

Data name	RD.DU	RD.DL
Data position	0	65 (hexadecimal: 41)
	Character: A	

Example: For EW2H8 actuator number 72

Data name	RD.DU	RD.DL
Data position	0	72 (hexadecimal: 48)
	72 (hexadecimal: 48)	

Example: For version 1.00

Data name	RD.DU	RD.DL
Data position	100 (hexadecimal: 64)	0
	6553600 (hexadecimal: 640000)	

Example: For version 1.80a

Data name	RD.DU	RD.DL
Data position	180 (hexadecimal: B4)	1 (hexadecimal: 1)
	11796481 (hexadecimal: B40001)	

(10) RD.ERR.H01 to RD.ERR.H89

Function Stores past error histories. In addition, when version information is acquired, the version data is stored in the upper 16 bits and revision data is in the lower 16 bits.

Data format

Data name	RD.ERR.H01	
Data position	Upper 8 bits	Lower 8 bits
	History 1	History 0 (latest)
	Total 16 bits	

Data name	RD.ERR.H23	
Data position	Upper 8 bits	Lower 8 bits
	History 3	History 2
	Total 16 bits	

• • •

RD.ERR.H45 and past history.

Example: If occurs in order from newest: 01, 21, 23, 06, 31, 32, 31, 32, 23, 01

Data name	RD.ERR.H01	
Data position	Upper 8 bits	Lower 8 bits
	21 (hexadecimal: 15)	1 (hexadecimal: 1)
	5377 (hexadecimal: 1501)	

Data name	RD.ERR.H23	
Data position	Upper 8 bits	Lower 8 bits
	6 (hexadecimal: 6)	23 (hexadecimal: 17)
	1559 (hexadecimal: 617)	

Data name	RD.ERR.H45	
Data position	Upper 8 bits	Lower 8 bits
	32 (hexadecimal: 20)	31 (hexadecimal: 1F)
	8223 (hexadecimal: 201F)	

Data name	RD.ERR.H67	
Data position	Upper 8 bits	Lower 8 bits
	32 (hexadecimal: 20)	31 (hexadecimal: 1F)
	8223 (hexadecimal: 201F)	

Data name	RD.ERR.H89	
Data position	Upper 8 bits	Lower 8 bits
	1 (hexadecimal: 1)	23 (hexadecimal: 17)
	279 (hexadecimal: 117)	

Remarks For 2-address occupation, data after RD.ERR.H45 cannot be acquired.

4-3-4-3-11 List of output signals

○: Function available, ×: Function not available

Code	Description	1-address occupation	2-address occupation	4-address occupation
READY	Preparation completed output	○	○	○
BUSY	Command execution in progress output	○	○	○
INPOS	Positioning completed output	○	○	○
HOLD	Gripping completed output	○	○	○
O.ACT	Output while operating	○	○	○
O.WRITE	Output while writing	○	○	○
O.POS0	POS0 check signal output	×	○	○
O.POS1	POS1 check signal output	×	○	○
O.POS2	POS2 check signal output	×	○	○
O.POS3	POS3 check signal output	×	○	○
O.POS4	POS4 check signal output	×	○	○
O.START	START check signal output	×	○	○
O.STOP	STOP check signal output	×	○	○
O.ORG	ORG check signal output	×	○	○

4-3-4-3-12 Details about output signals

(1) READY

Function Outputs when preparations are complete. This output is ON while the system of the controller is operating normally.
If an alarm occurs, the output turns OFF, and the motor enters a free state.
Signal ON: Normal status, OFF: Alarm generated

(2) BUSY

Function Outputs when command execution is in progress. This signal is set to ON when a dedicated command input is being executed or when a command from a personal computer is being executed. When the BUSY signal is ON, no operations are received except for return to origin.
Signal ON: Currently executing command OFF: Command can be received in current state
[Note] Always turn off dedicated command inputs when BUSY is ON. Leaving input ON prevents BUSY from switching to OFF, even after completing execution of a command.

(3) INPOS

Function Outputs positioning operation complete.
This signal turns OFF once, when a dedicated command input is accepted, and turns ON when the positioning operation execution process is completed normally, or when the size detecting function is set. If an error occurs during execution, or if STOP has been input, the signal remains unchanged in the OFF state.
Signal ON: After return to origin is complete, and positioning operation has completed normally, and when the size detection function is set and within size range
OFF: Other than above

(4) HOLD

Function Outputs when gripping operation is complete. When a dedicated command input is accepted, this signal turns OFF once, and comes ON when the positioning operation execution process has been completed normally.
If an error occurs during execution, or if STOP is input, the signal remains unchanged in the OFF state.
Signal ON: Gripping operation completed normally (gripping target detected)
OFF: Gripping target not detected

(5) O.ACT

Function Outputs during actuator operation. This is different from a BUSY signal, dedicated command input signals are not related.
This signal is OFF while the HOLD signal is ON.
Signal ON: Actuator is operating OFF: Actuator is stopped

(6) O.WRITE

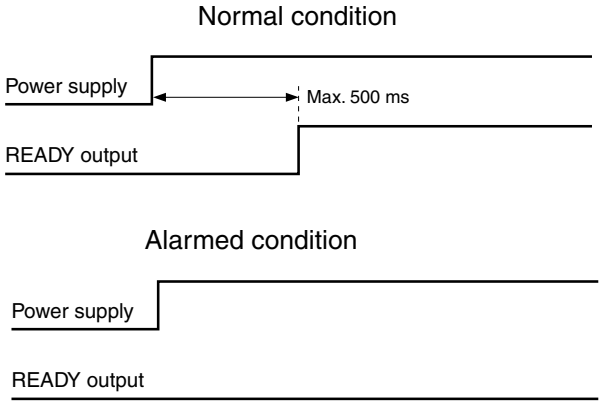
Function Outputs while memory media is writing. Writes point data and parameter data and outputs during initialization. While this signal is being output, commands and write commands from CC-Link are not received.
Furthermore, this signal is not output when writing history because an error was generated.
Writing may end instantly due to a write command.
This output may be undetectable, due to conditions such as the number of units connected or communication speed, so when writing check the error numbers and point data to confirm that writing was normal.
Signal ON: Currently writing to memory media OFF: Waiting for data to write

(7) O.POS0 to O.POS4, O.START, O.STOP, and O.ORG

Function Outputs for confirming dedicated input. When POS0 to POS4, START, STOP, or ORG signals are input, they are returned as output. Use this to confirm that input has been done normally.
Signal ON: Dedicated input signal input exists OFF: Dedicated input signal input does not exist

4-3-5 Timing chart

(1) When the power is turned on



Before inputting a dedicated command, check that the READY output is turned ON after the power has been supplied.
If READY output is OFF, even after the specified time has elapsed after the power is turned on, it means that an alarm has occurred.

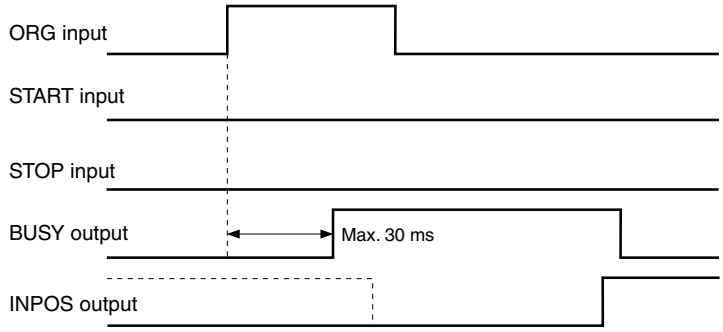
4-3-5-1 EW2C-H-NP, EW2C-H-PN, EW2C-H-CC timing charts

(1) Execution of custom command

■ When a dedicated command is received, the BUSY output turns ON. Whether the BUSY output turns off determines whether the command has ended normally.

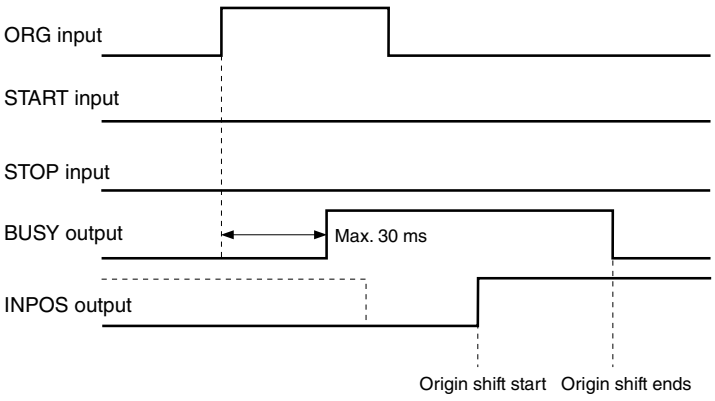
■ Always use pulse inputs for dedicated commands. Leaving input ON prevents BUSY output from turning OFF even after execution of a command has been completed.

1. When returning to origin

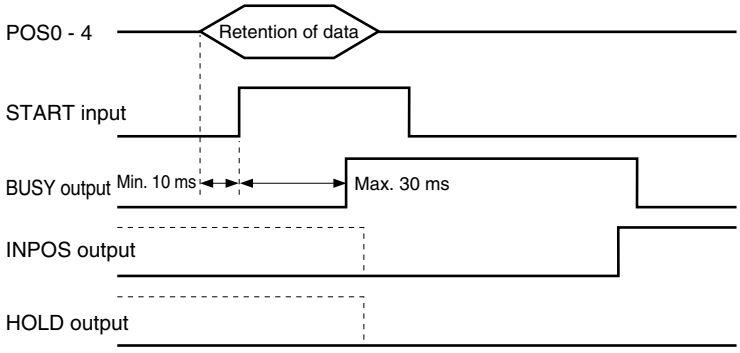


① After ORG input is turned ON, the BUSY output is turned ON.
② After confirming that BUSY output has turned ON, the ORG input is turned OFF (contact is opened).
③ Waits until BUSY output is turned OFF.
④ When BUSY output is turned OFF, INPOS output is ON, and this means that the operation has ended normally.

1-1. When returning to origin (with origin shift)

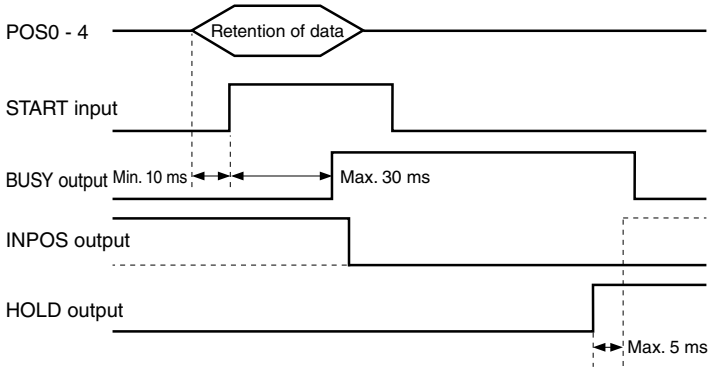


2. Positioning mode, for A, I



① For POS0 to POS4, input the point numbers. Maintain this input state until BUSY output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Introduce a delay of at least 10 ms, and then input START input.
③ At the rise of a dedicated command input, BUSY output turns ON.
④ Check that BUSY output is ON, and then set the dedicated command input to OFF (open the contact).
After this, the point data can be freely changed.
⑤ Wait until BUSY output turns OFF.
⑥ When BUSY output turns OFF, INPOS output is ON, and this means that the operation has ended normally.

3. Gripping mode, for U, C, O



① For POS0 to POS4, input the point numbers. Maintain this input state until BUSY output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Introduce a delay of at least 10 ms, and then input START input.
③ At the rise of a dedicated command input, BUSY output turns ON.
④ Check that BUSY output is ON, and then set the dedicated command input to OFF (open the contact).
After this, the point data can be freely changed.
⑤ Wait until BUSY output turns OFF.
⑥ When BUSY output turns OFF, HOLD output is ON, and this means that the operation has ended normally.

* Stops at the limit position if there is no gripping target. At that point, the INPOS output and HOLD output turn OFF.
* When the size detecting function is effective, and the workpiece is gripped within the setting range, INPOS output turns ON within 5 ms after HOLD output turns ON.

4-3-5-2 EW2C-H-CCD timing charts

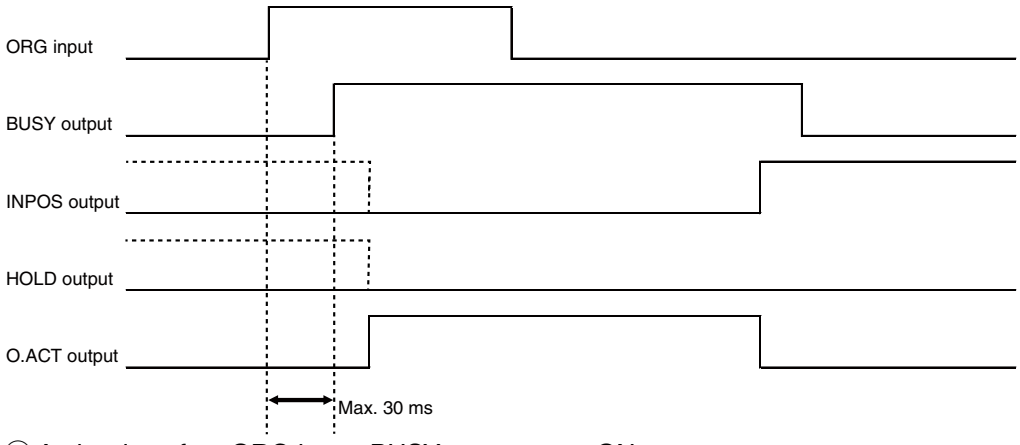
* The communication delay time varies according to the number of units and the communication speed. The actual waiting times, etc., will be longer than those described due to the communication delay time. So, allow for communication delays when doing controls.

(1) Execution of operation command

■ When an operation command is received, the BUSY output turns ON. Whether the BUSY output turns off determines whether the command has ended normally.

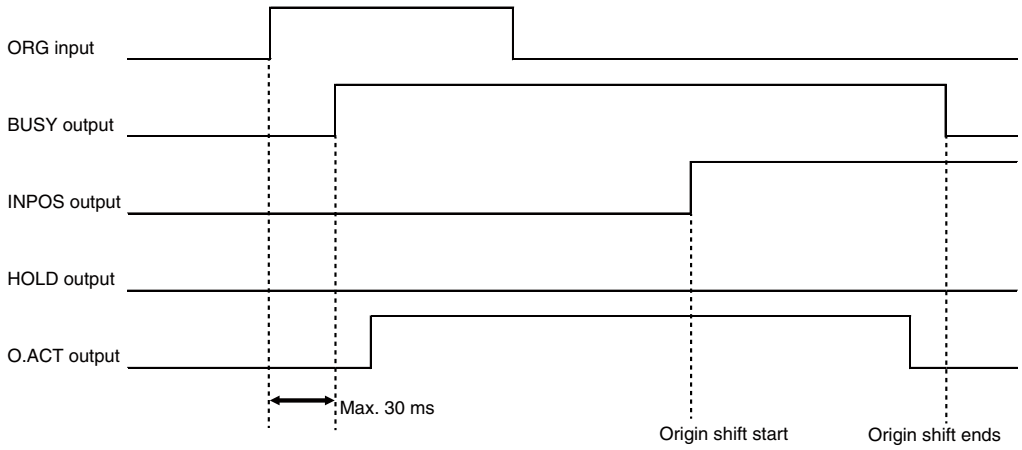
■ Always use pulse inputs for operation commands. Leaving input ON prevents BUSY output from turning OFF even after execution of a command has been completed.

1. When returning to origin



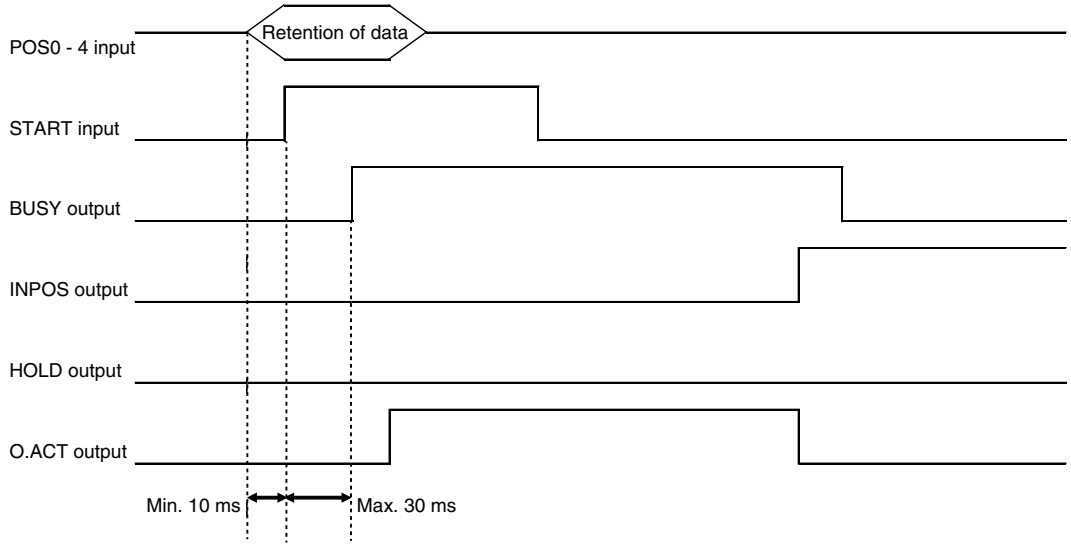
① At the rise of an ORG input, BUSY output turns ON.
② Check that BUSY output is ON, and then set the ORG input to OFF (open the contact).
③ Waits until BUSY output turns OFF.
④ When BUSY output turns OFF, INPOS output is ON, and this means that the operation has ended normally.

2. When returning to origin, with origin shift



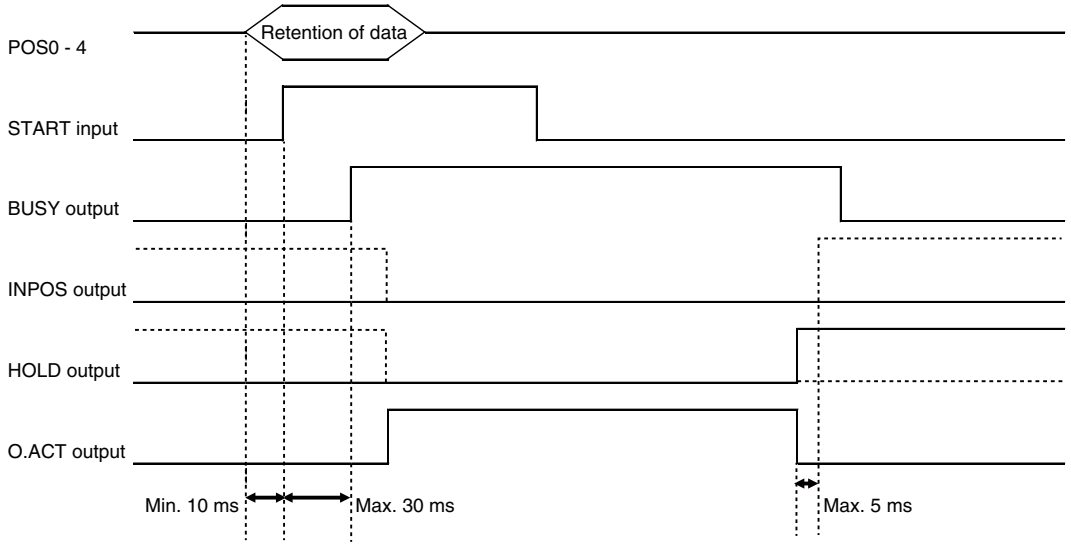
① At the rise of an ORG input, BUSY output turns ON.
② Check that BUSY output is ON, and then set the ORG input to OFF (open the contact).
③ Waits until BUSY output turns OFF.
④ When BUSY output turns OFF, INPOS output is ON, and this means that the operation has ended normally.

3. For point operation, positioning mode, and AI mode



① For POS0 to POS4, input the point numbers. Maintain this input state until BUSY output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Introduce a delay of at least 10 ms, and then input START input.
③ At the rise of an operation command input, BUSY output turns ON.
④ Check that BUSY output is ON, and then set the operation command input to OFF (open the contact). After this, the point data can be freely changed.
⑤ Waits until BUSY output turns OFF.
⑥ When BUSY output turns OFF, INPOS output is ON, and this means that the operation has ended normally.

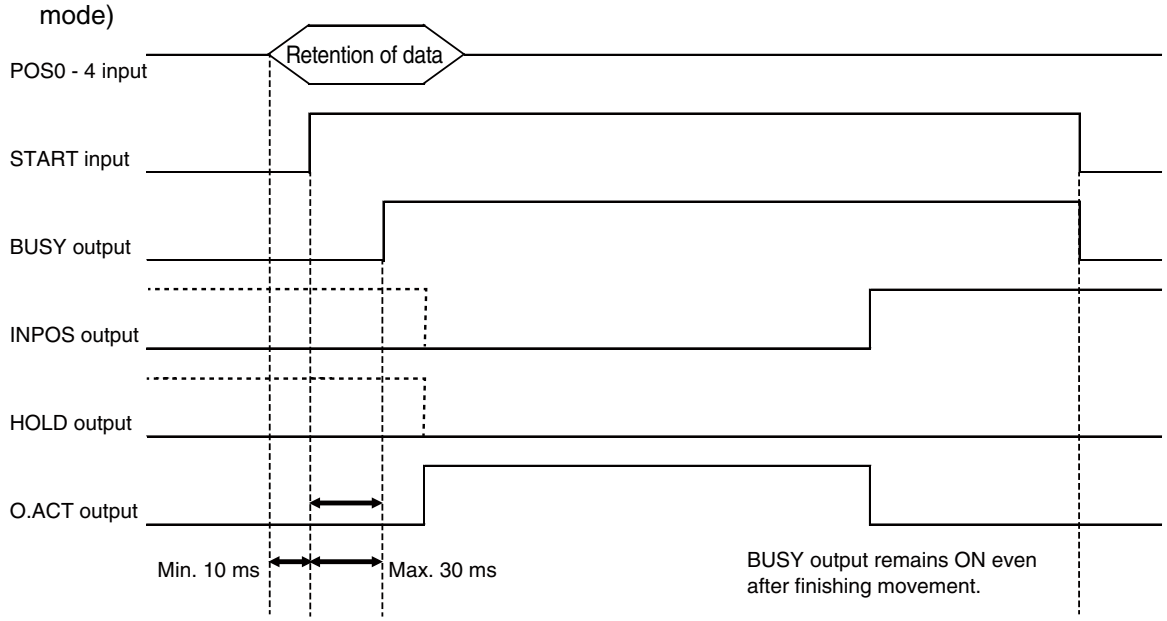
4. For point operation, gripping mode, and U, C, O mode



① For POS0 to POS4, input the point numbers. Maintain this input state until BUSY output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Introduce a delay of at least 10 ms, and then input START input.
③ At the rise of an operation command input, BUSY output turns ON.
④ Check that BUSY output is ON, and then set the operation command input to OFF (open the contact). After this, the point data can be freely changed.
⑤ Waits until BUSY output turns OFF.
⑥ When BUSY output turns OFF, HOLD output is ON, and this means that the operation has ended normally.

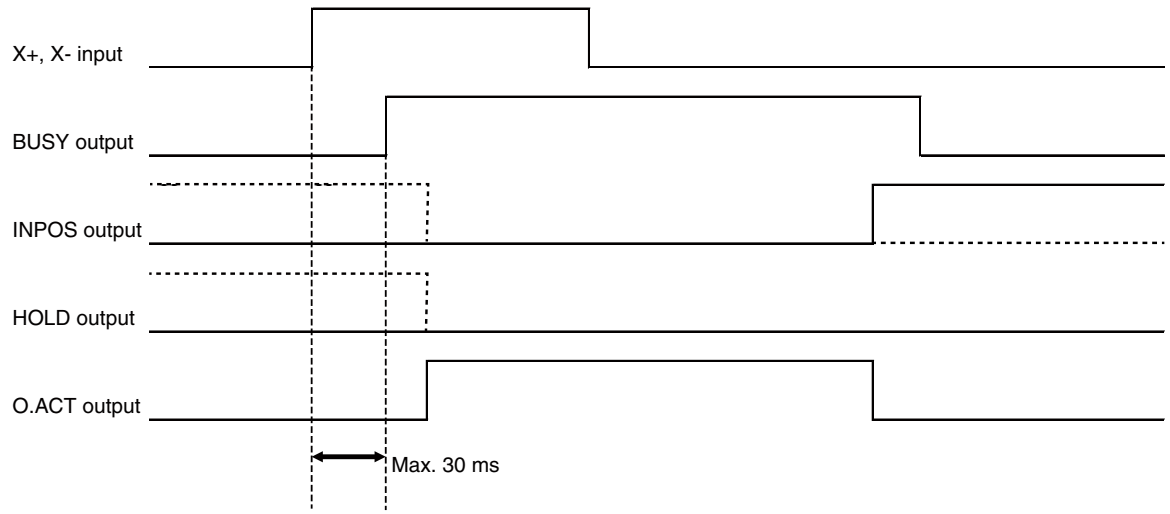
* Stops at the limit position if there is no gripping target. At that point, the INPOS output and HOLD output turn OFF.
* When the size detecting function is enabled, and the workpiece is gripped within the setting range, INPOS output turns ON within 5 ms after HOLD output turns ON. (Gripping mode only)

5. To continue operation input after completing operation (Example: Point operation in positioning mode)



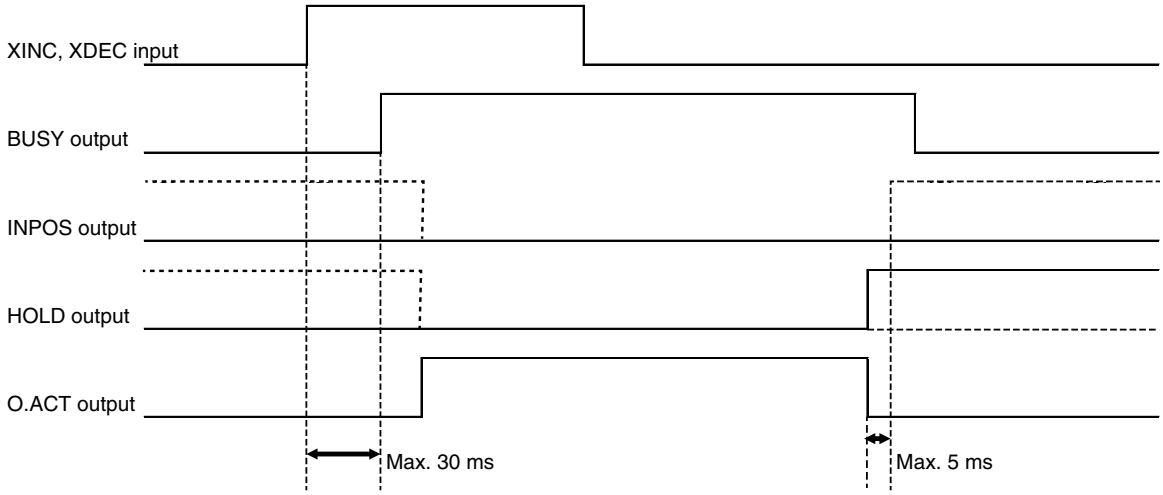
As an example described in point operation (START input), to keep BUSY signal ON, the same as for other operation input signals. However, even if ORG input is ON, it turns OFF together when the BUSY output signal returns to origin is complete, without interlocking with BUSY output signal only ORG input.

6. Inching operation



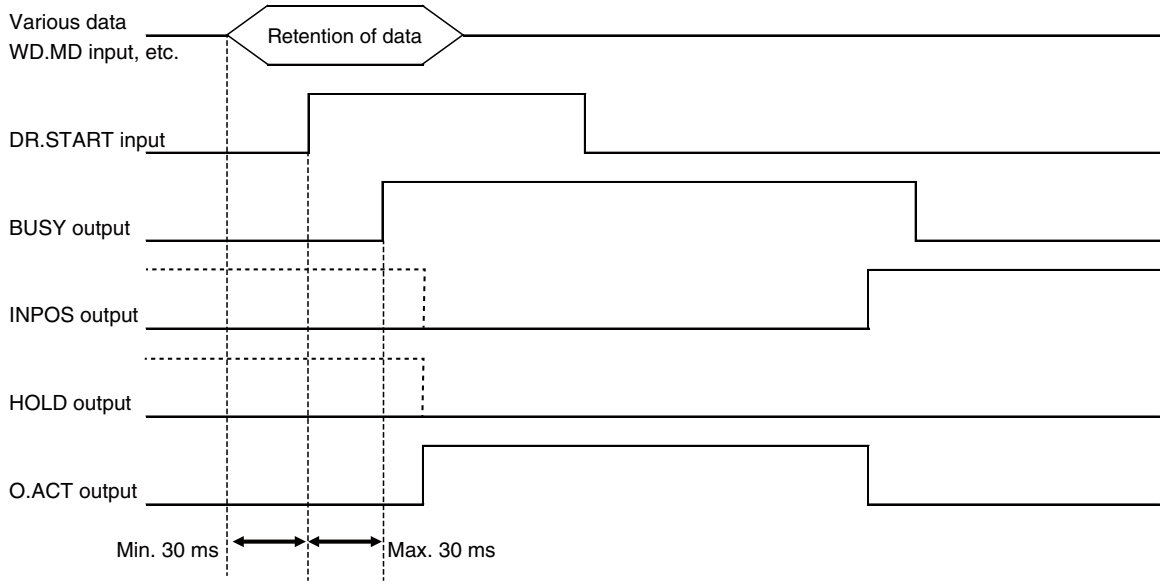
① At the rise of an operation command input, BUSY output turns ON.
② Check that BUSY output is ON, and then set the operation command input to OFF (contact is opened).
③ Waits until BUSY output turns OFF.
④ When BUSY output turns OFF, INPOS output is ON, and this means that the operation has ended normally.

7. Movement at constant speed operation



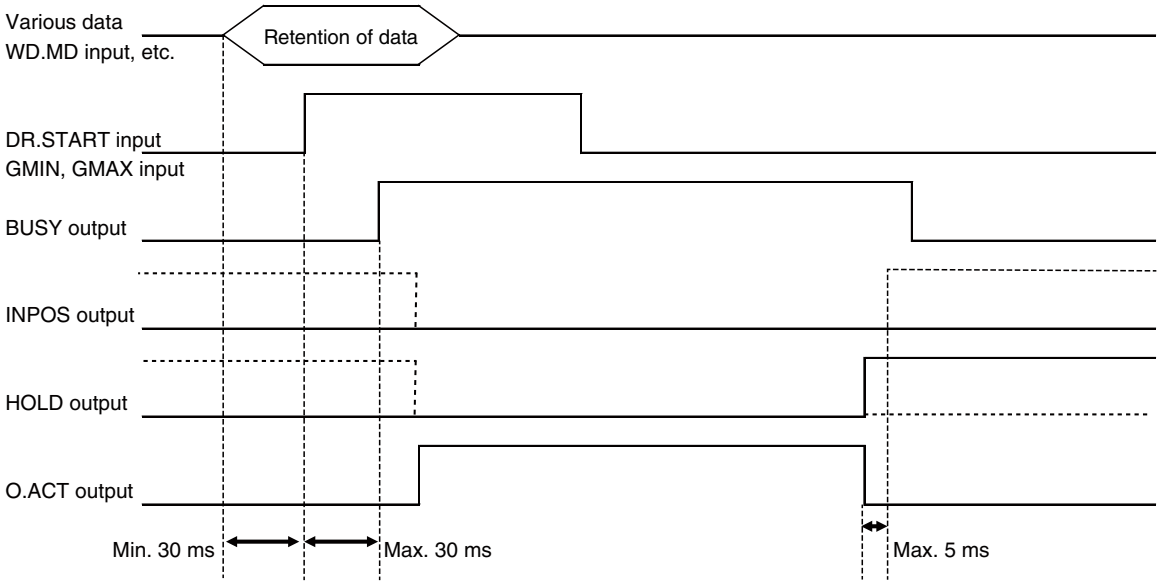
① At the rise of an operation command input, BUSY output turns ON.
② Check that BUSY output is ON, and then set the operation command input to OFF (contact is opened).
③ Waits until BUSY output turns OFF.
④ When BUSY output turns OFF, HOLD output is ON, and this means that the operation has ended normally.
* Stops at the limit position if there is no gripping target. At that point, the INPOS output and HOLD output turn OFF.

8. For direct operation, positioning mode, and A.I. mode



① Input direct data to WR.MD etc. Maintain this input state until BUSY output turns ON. (Changing the input state too early could cause mis-recognition of data.)
* Setting data requires different data depending on the specified operation. Before an operation, specify the data, and then start the operation.
② Introduce a delay of at least 30 ms, and then input DR.START input.
③ At the rise of an operation command input, BUSY output turns ON.
④ Check that BUSY output is ON, and then set the operation command input to OFF (open the contact). After this, the direct data can be freely changed.
⑤ Waits until BUSY output turns OFF.
⑥ When BUSY output turns OFF, INPOS output is ON, and this means that the operation has ended normally.

9. For direct operation, gripping mode, and U, C, O mode, sample gripping position setting operation



① Input direct data to WR.MD etc. Maintain this input state until BUSY output turns ON. (Changing the input state too early could cause mis-recognition of data.)

* Setting data requires different data depending on the specified operation. Before an operation, specify the data, and then start the operation.

② Introduce a delay of at least 30 ms, and then input DR.START input.

③ At the rise of an operation command input, BUSY output turns ON.

④ Check that BUSY output is ON, and then set the operation command input to OFF (open the contact). After this, the direct data can be freely changed.

⑤ Waits until BUSY output turns OFF.

⑥ When BUSY output turns OFF, HOLD output is ON, and this means that the operation has ended normally.

* Stops at the limit position if there is no gripping target. At that point, the INPOS output and HOLD output turn OFF.

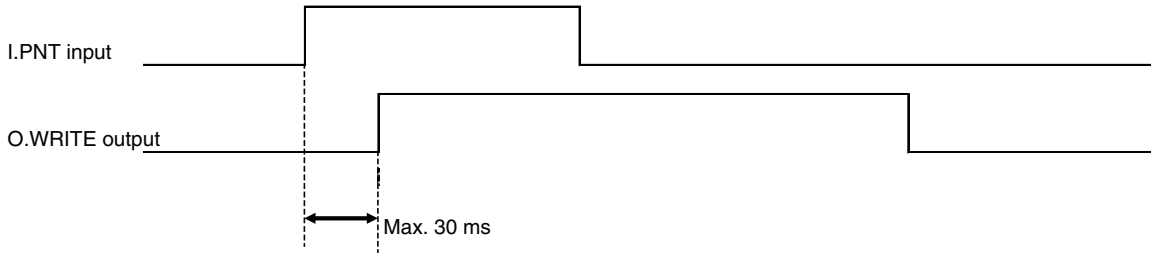
* When the size detecting function is enabled, and the workpiece is gripped within the setting range, INPOS output turns ON within 5 ms after HOLD output turns ON. (Gripping mode only)

Each set of data requires different data depending on the specified operation. Before an operation, specify the data, and then start the operation.

Operation	Code	Mode	Position	Speed	Grip level	Remarks
		WD.MD	WD.POSL WD.POSU	WD.SPD	WR.LV	
Direct operation	DR.START	○	△	○	△	Depends on mode
Operation to set minimum sample gripping position	GMIN	○	×	○	○	
Operation to set maximum sample gripping position	GMAX	○	×	○	○	

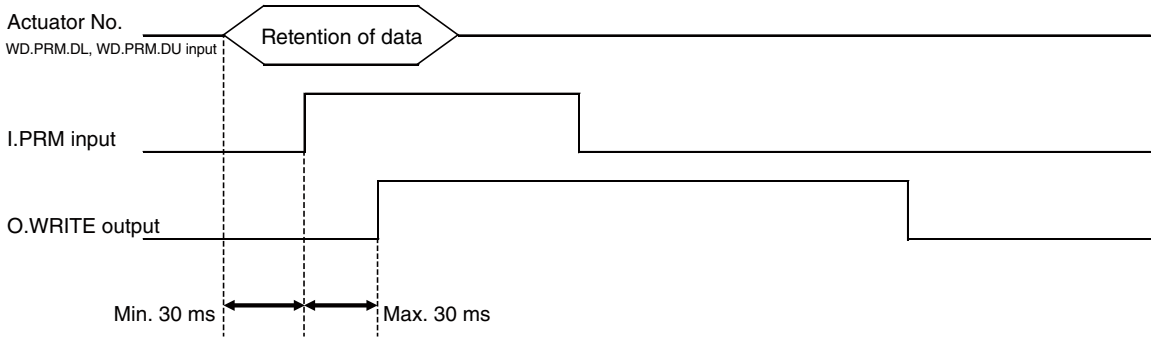
(2) Execution of data related commands

10. Initialization of point data



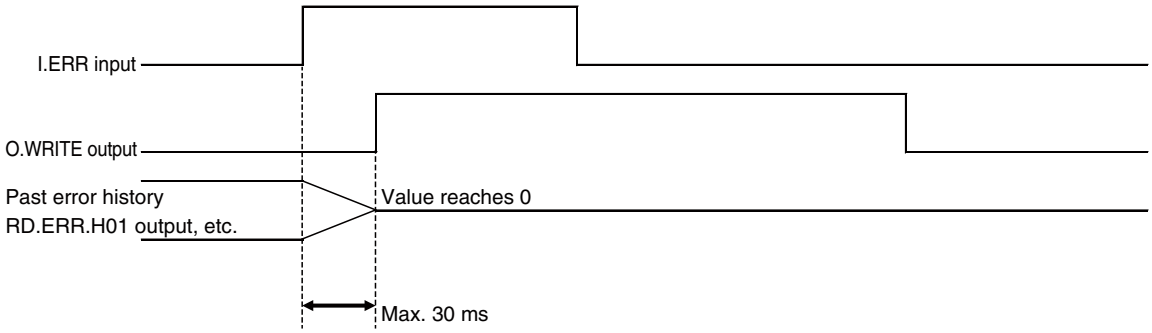
① At the rise of a dedicated command input, O.WRITE output turns ON.
② Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
③ Waits until O.WRITE output turns OFF.
④ When O.WRITE output turns OFF, this means that the operation has ended normally.
* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.

11. Initialization of parameter data



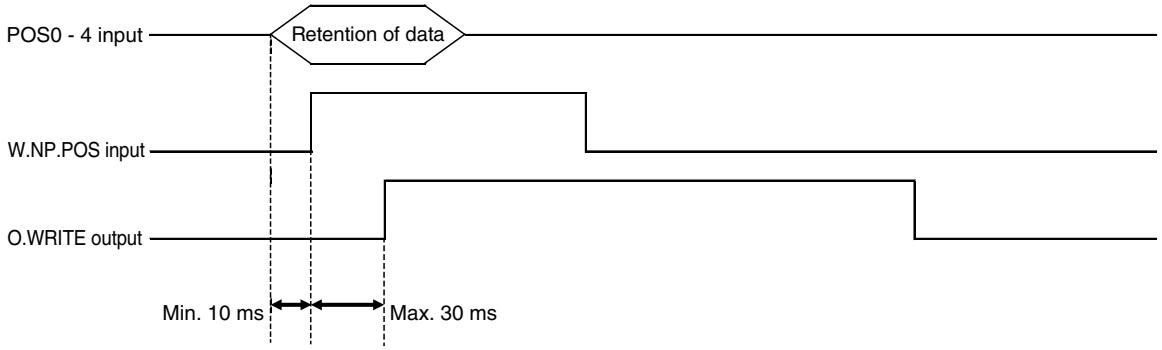
① Input actuator numbers in WD.PRM.DL and WD.PRM.DU. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Introduce a delay of at least 30 ms, and then input dedicated commands.
③ At the rise of a dedicated command input, O.WRITE output turns ON.
④ Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
⑤ Waits until O.WRITE output turns OFF.
⑥ When O.WRITE output turns OFF, this means that the operation has ended normally.
* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 53 is output to current alarms.
* Initialized actuator numbers are set in WD.PRM.DL and WD.PRM.DU.

12. Initialization of error history



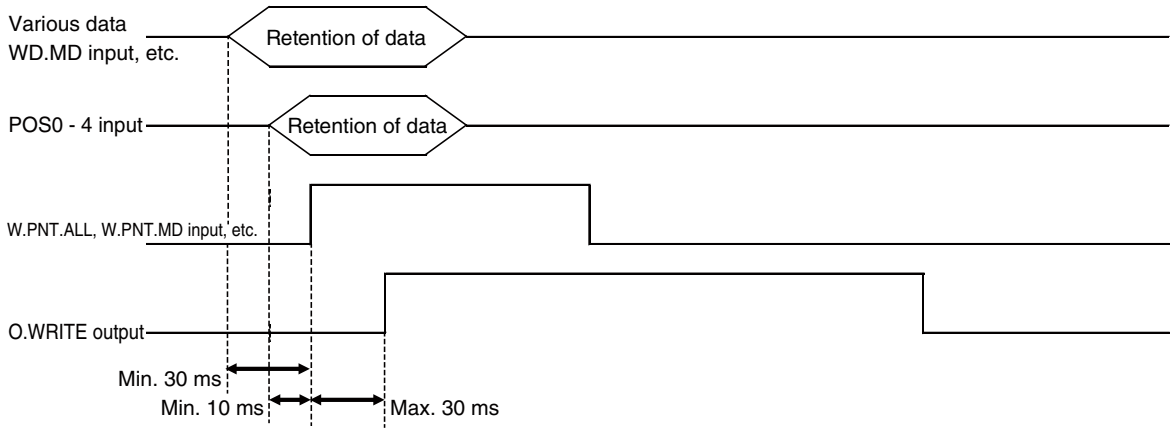
① At the rise of a dedicated command input, O.WRITE output turns ON.
② Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
③ Waits until O.WRITE output turns OFF.
④ When O.WRITE output turns OFF, this means that the operation has ended normally.
* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.

13. Writing point data of current position



① For POS0 to POS4, select the point numbers. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Introduce a delay of at least 10 ms, and then input dedicated commands.
③ At the rise of a dedicated command input, O.WRITE output turns ON.
④ Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
After this, the point data can be freely changed.
⑤ Waits until O.WRITE output turns OFF.
⑥ When O.WRITE output turns OFF, this means that the operation has ended normally.
* O.WRITE output may finish writing in an instant, depending on the amount of data.
Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected.
Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 23 is output to current alarms.
* The point numbers that are written are set by POS0 to POS4.

14. Writing point data of direct settings



① Select point numbers at POS0 to POS4, and input various data in WR.MD. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)

② Delay 30 ms or more from input of WR.MD and 10 ms or more from selection of point numbers, and then input dedicated commands.

③ At the rise of a dedicated command input, O.WRITE output turns ON.

④ Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact). After this, the point data can be freely changed.

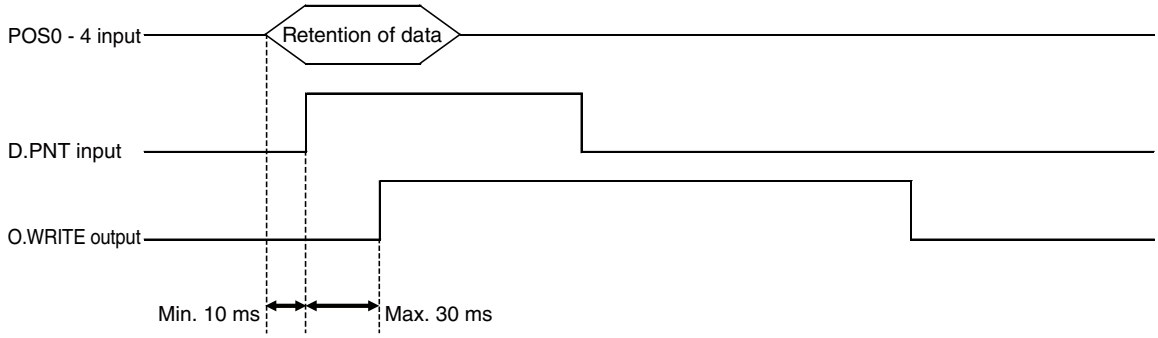
⑤ Waits until O.WRITE output turns OFF.

⑥ When O.WRITE output turns OFF, this means that the operation has ended normally.

* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 23 is output to current alarms.
* The point numbers that are written are set by POS0 to POS4.
* Each set of data requires different data depending on the writing range. Before executing writing, specify the data, and then start.
* To clear the values, you can write 0 to clear them. You can also do a batch delete by inputting D.PNT.

Range to write point data	Code	Mode	Position	Speed	Grip level	Remarks
		WR.MD	WD.POSL WD.POSU	WR.SPD	WR.LV	
All	W.PNT.ALL	○	△	○	△	Depends on mode
Mode	W.PNT.MD	○	×	×	×	
Position	W.PNT.POS	×	○	×	×	
Speed	W.PNT.SPD	×	×	○	×	
Grip level	W.PNT.LV	×	×	×	○	

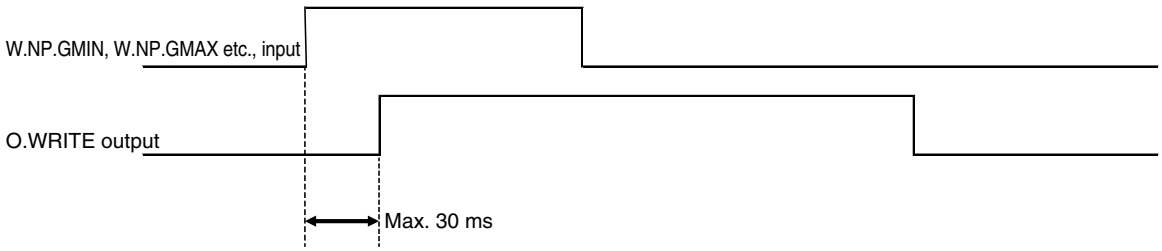
15. Deleting point data



① For POS0 to POS4, select the point numbers. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Delay 10 ms or more from selection of point numbers, and then input dedicated commands.
③ At the rise of a dedicated command input, O.WRITE output turns ON.
④ Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact). After this, the point data can be freely changed.
⑤ Waits until O.WRITE output turns OFF.
⑥ When O.WRITE output turns OFF, this means that the operation has ended normally.

* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 23 is output to current alarms.
* The point numbers that are deleted are set by POS0 to POS4.
* You can also clear values individually by inputting W.PNT.**.

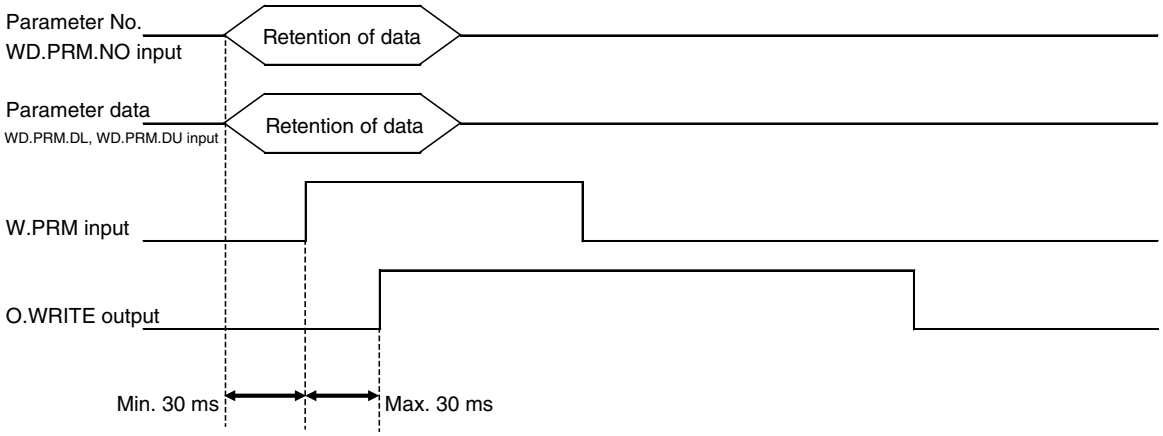
16. Writing parameter data of current position



① At the rise of a dedicated command input, O.WRITE output turns ON.
② Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
③ Waits until O.WRITE output turns OFF.
④ When O.WRITE output turns OFF, this means that the operation has ended normally.

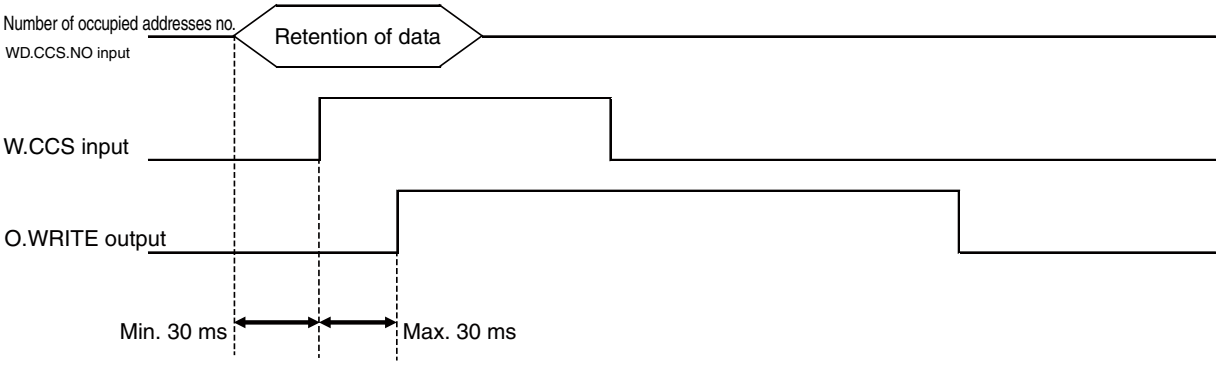
* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 23 is output to current alarms.

17. Writing parameter data of parameter data



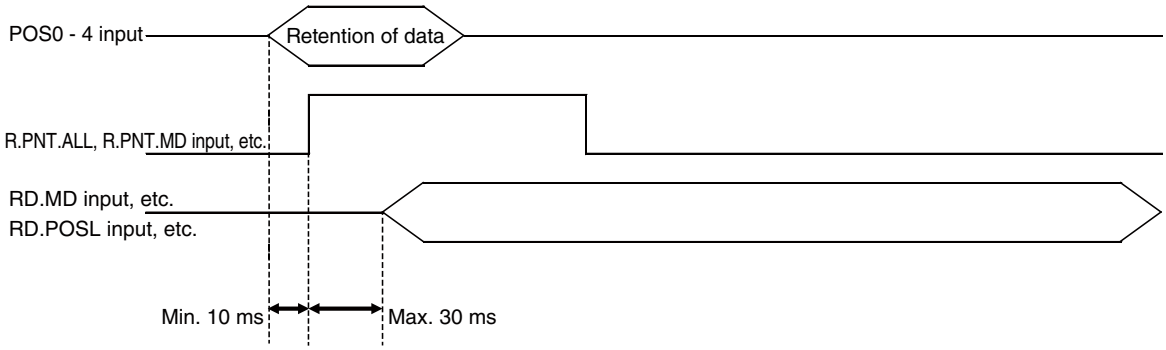
① Input parameter number by WD.PRM.NO, and input various data in WD.PRM.DL and WD.PRM.DU. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Delay 30 ms or more from input of WD.PRM.DL and WD.PRM.DU, and then input dedicated commands.
③ At the rise of a dedicated command input, O.WRITE output turns ON.
④ Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
⑤ Waits until O.WRITE output turns OFF.
⑥ When O.WRITE output turns OFF, this means that the operation has ended normally.
* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 23 is output to current alarms.

18. Writes number of occupied addresses Number of occupied addresses no.



① Input address codes by WD.CCS.NO. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Delay 30 ms or more from input of WD.CCS.NO, and then input dedicated command input.
③ At the rise of a dedicated command input, O.WRITE output turns ON.
④ Check that O.WRITE output is ON, and then set the dedicated command input to OFF (open the contact).
⑤ Waits until O.WRITE output turns OFF.
⑥ When O.WRITE output turns OFF, this means that the operation has ended normally.
* O.WRITE output may finish writing in an instant, depending on the amount of data. Because of this, O.WRITE output may be undetected, depending on the communication speed and number of units connected. Create a ladder circuit that determines that writing is complete if 100 ms after execution of writing and initialization the O.WRITE signal has not been output and there are 0 current alarms.
* When outside the data range, error 23 is output to current alarms.

19. Reading point data for point data

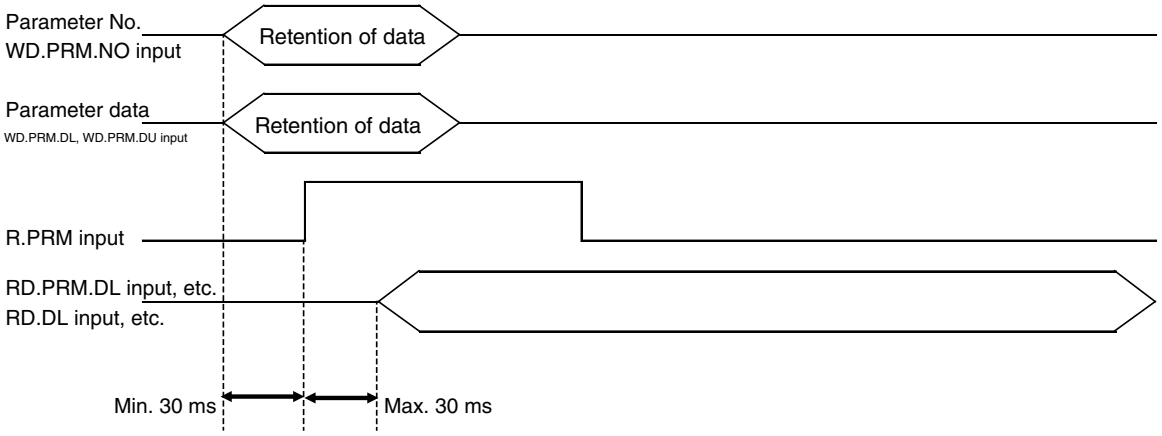


① Select point numbers by POS0 to POS4. Maintain this input state until O.WRITE output turns ON. (Changing the input state too early could cause mis-recognition of data.)
② Delay 10 ms or more from selection of point numbers, and then input dedicated commands.
③ After rise of dedicated command input, the specified data is stored at the specified address within 30 ms.
④ After confirming received data has been stored, or 30 ms after the rise of the dedicated command, set the dedicated command input to OFF (open the contact).

* The point numbers that are read are set by POS0 to POS4.
* The stored data may vary depending on the read range. Also, note that the storage location may change depending on the number of occupied addresses.
* Clear the data by D.DATA input before reading the data.
* When the point data is cleared, 0 is received.

Range to read point data	Code	Address selection	Storage destination				Remarks
			Mode	Position	Speed	Grip level	
		When 2-addresses occupied	RD.DL RD.DU	RD.DL RD.DU	RD.DL RD.DU	RD.DL RD.DU	
		When 4-addresses occupied	RD.MD	RD.POSL RD.POSU	RD.SPD	RD.LV	
All	R.PNT.ALL		○	○	○	○	Only when 4-addresses occupied
Mode	R.PNT.MD		○	×	×	×	
Position	R.PNT.POS		×	○	×	×	
Speed	R.PNT.SPD		×	×	○	×	
Grip level	R.PNT.LV		×	×	×	○	

20. Reading parameter data for parameter data

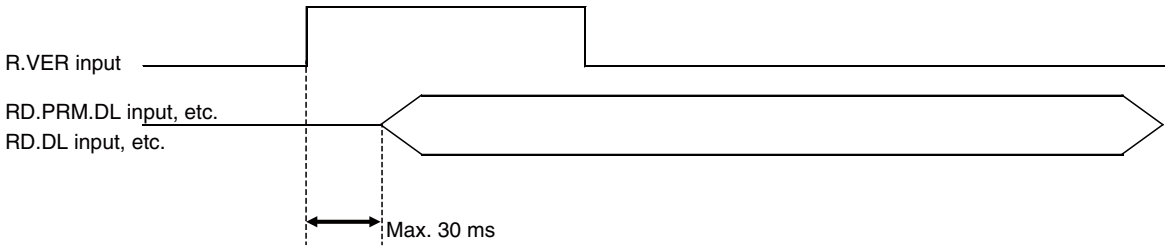


① Input parameter number by WD.PRM.NO, and input various data in WD.PRM.DL and WD.PRM.DU. Hold this data until after confirming received data has been stored or 30 ms after the rise of dedicated command input.
② Delay 30 ms or more from input of WD.PRM.DL and WD.PRM.DU, and then input dedicated command input.
③ After rise of dedicated command input, the specified data is stored at the specified address within 30 ms.
④ After confirming received data has been stored, or 30 ms after the rise of the dedicated command, set the dedicated command input to OFF (open the contact).

* When outside the data range, error 23 is output to current alarms.
* Note that the storage location may change depending on the number of occupied addresses.
* Clear the data by D.DATA input before reading the data.

Code	Address selection	Storage destination
R.PRM	When 2-addresses occupied	RD.DL RD.DU
	When 4-addresses occupied	RD.PRM.DL RD.PRM.DU

21. Reading versions of version data

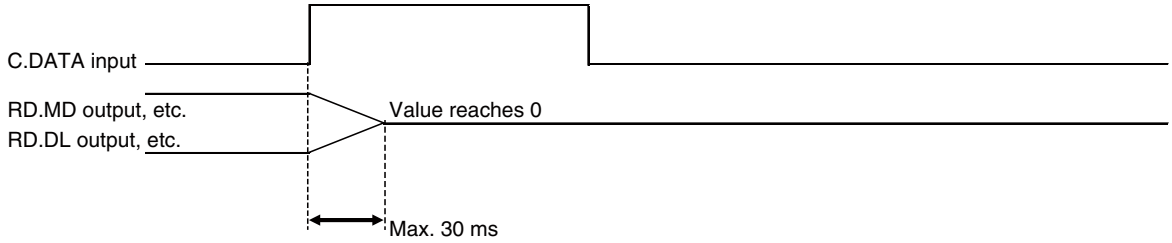


① After rise of dedicated command input, the specified data is stored at the specified address within 30 ms.
② After confirming received data has been stored, or 30 ms after the rise of the dedicated command, set the dedicated command input to OFF (open the contact).

* Note that the storage location may change depending on the number of occupied addresses.
* Clear the data by D.DATA input before reading the data.

Code	Address selection	Storage destination
R.PRM	When 2-addresses occupied	RD.DL RD.DU
	When 4-addresses occupied	RD.PRM.DL RD.PRM.DU

22. Clearing data output



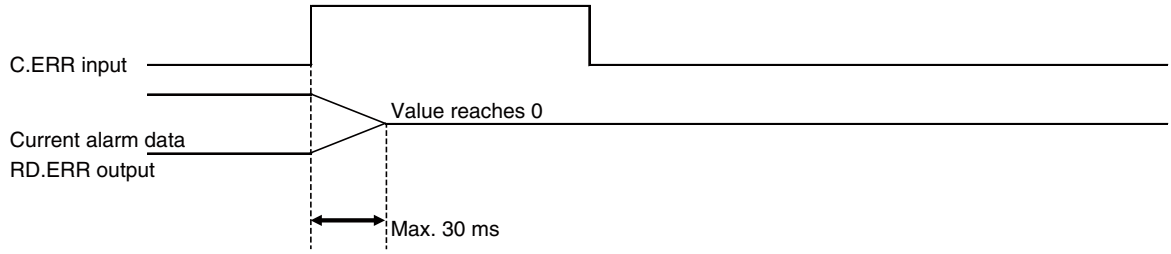
① After rise of dedicated command input, the specified data is stored at the specified address within 30 ms.

② After confirming the data is 0, or 30 ms after the rise of the dedicated command, set the dedicated command input to OFF (open the contact).

* Note that the cleared data may change depending on the number of occupied addresses.

Code	Address selection	Clear data
C.DATA	When 2-addresses occupied	RD.DL RD.DU
	When 4-addresses occupied	RD.MD RD.POSL RD.POSU RD.SPD RD.LV RD.PRM.DL RD.PRM.DU

23. Clearing current alarm output



① After rise of dedicated command input, the RD.ERR output becomes 0 within 30 ms.

② After confirming the RD.ERR output is 0, or 30 ms after the rise of the dedicated command, set the dedicated command input to OFF (open the contact).

4-4 Actuator number setting

Set the actuator number in the following table in accordance with the actuator type.

Model	Actuator No.
EW2H8	72
EW2H18	73
EW2H28	74
EW2HL8	82
EW2HL18	83
EW2HL28	84

Actuator number setting method (Use either of the following methods for the setting.)

1. Using communication commands. (See page 66.)
2. Using the initialization command in the support software to initialize parameters.
   (For details, see the support software Owner's Manual.)
3. Using I.PRM. (EW2C-H-CCD only) (See page 48.)

Note: When you purchase the actuator and controller as a set, the controller's actuator number is set to the specified actuator number when shipped.

4-5 Point data specifications

P0 = Mode, Position (mm), Speed (mm/s), Gripping level

● Gripping force (5 levels from 1 to 5)
(Input not needed when specifying positioning mode of A or I.)

● Operating speed

	EW2H□8	EW2H□18	EW2H□28
A,I,U	5 to 50	5 to 50	5 to 50
O,C	5 to 20	5 to 30	5 to 20

Note) For gripping mode, the grip level changes depending on the speed range. (Refer to page 89.)

● Movement distance (+: open side, -: closed side. Input not needed when specifying gripping operation of O or C.)

● A : Positioning operation (absolute position)
I : Positioning operation (relative position)
O : Gripping operation (opening)
C : Gripping operation (closing)
U : Gripping operation with acceleration/deceleration movement

4-5-1 Point setting method

Editing of points is done by computer, teaching box, or W.PNT.** (EW2C-H-CCD only).

For the communication parameters and cable specifications, see section “4-7 Communications” on page 59.

Editing of points by communications is done by using general communications software or custom support software.

For how to use the support software, see the separately available support software User’s Manual.

For how to use the teaching box, see the separately available teaching box User’s Manual.

See page 49 regarding settings by W.PNT.**.

[Example] When editing and confirming point data by communication commands

- Use the communication command @WPNT to edit

WPNT

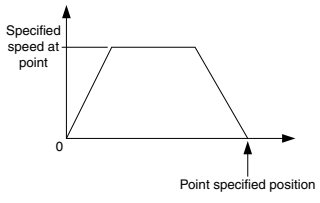
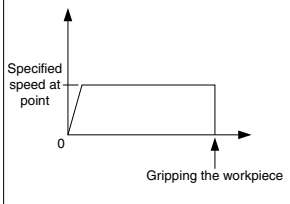
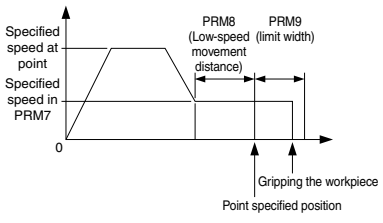
Function	Writes point data.
Format	@address, WPNT, point number, mode, position, speed, forcec/r
Transmission example	@0, WPNT, 0, A, -3.5,50 c/r
Response	OK c/r
Explanation	For the data format, see page 56.

- After editing, use the communication command @?PNT to check the point data

? PNT

Function	Reads the specified point data.
Format	@ address, ?PNT, point number c/r
Transmission example	@0, ?PNT, 0 c/r
Response	OK,A, -3.5, 50 c/r ·····Absolute position of 3.5 mm, speed of 50 mm/s
Explanation	For the contents of the response data, see page 56.

● Electric hand operation mode

Mode	Positioning Moves to the specified point with acceleration/deceleration, and then stops.		Gripping[Note] Operates at constant speed, and grips at the set force.		Gripping with acceleration/deceleration movement Operates gripping operations during acceleration/deceleration movement.
Setting value	A	I	C	O	U
Description	Moves to the specified point position in the coordinate system where the origin is 0	Moves from the current position to the specified point position	Operates to closing side	Operates to opening side	Operates to the specified point, and performs gripping operation at the speed set in PRM7 from the distance forward of the point set in PRM8
Operation Pattern					
Remarks	—		—		Suitable for soft gripping with high cycle operation.

Note: In gripping mode, do not use the C to O or the O to C operations because they will cause improper operation.

Note: If operation is done in mode I from a location at a manually changed position, operation is done using the position reference of before the position was manually changed.

Note: Gripping of a workpiece must always be done in gripping mode (C,O) or by gripping mode (U) with acceleration/deceleration movement. If gripping is done in positioning mode (A,I), then an alarm is output and normal gripping cannot be done.

4-6 How to use the size detecting function

4-6-1 When using an actual workpiece for size detecting range setting

Procedure	Communication command	Remarks
① Execute return to origin.	@ address, ORG	
② Place the minimum sample in place, and set the dimensions.	@ address, GMIN C(O), speed, gripping force	Use HOLD ON to save the gripping position in PRM32
③ Execute return to origin.	@ address, ORG	
④ Place the maximum sample in place, and set the dimensions.	@ address, GMAX C(O), speed, gripping force	Use HOLD ON to save the gripping position in PRM31
⑤ Activate the size detecting function.	@ address, WPRM,33,1	PRM33 = 0 deactivates the size detecting function.

- With the above settings, the size detecting function activates from the next gripping operation (in O, C, and U modes).
  (A and I modes are not supported.)
- When doing the settings, use communication commands to specify the gripping direction. (C: Closing direction, O: Opening direction)
- When the workpiece is gripped and HOLD turns ON, then while within the range of the minimum sample dimensions < gripping dimensions < maximum sample dimensions, then INPOS turns ON, otherwise INPOS stays OFF.
- For EW2C-H-CCD, even GMIN input or GMAX input can be set. See page 47.

Note 1) When the minimum sample dimension = maximum sample dimension, or when the minimum sample dimension > maximum sample dimension, the size detecting function becomes disabled.

Note 2) Set the value of PRM31 or 32 to be the same sign (+ or -). (When either of the two is 0, or when they are of opposite sign, the size detecting function becomes invalid.)

Note 3) The resolution is 0.05 mm.

Note 4) The gripping position may vary due to variations in the amount the guide falls and mechanical rattles. We recommend periodic resetting.

4-6-2 When using direct input for size detecting function setting

Procedure	Example of communication command	Remarks
① Input the gripping position when gripping the minimum sample.	@ address, WPRM,32,-500	The gripping position of the minimum sample is assumed to be -5 mm.
② Input the gripping position when gripping the maximum sample.	@ address, WPRM,31,-450	The gripping position of the maximum sample is assumed to be -4.5 mm.
③ Activate the size detecting function.	@address, WPRM,33,1	PRM33 = 0 deactivates the size detecting function.

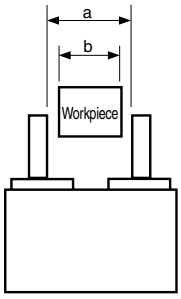
- For EW2C-H-CCD, even WD.PRM.** input can be set. In addition, it is also possible to set the current position as is. See page 51, 52.

Note 1) The values written in PRM31 and 32 are not workpiece dimensions. Instead, they are the gripped positions when gripping the workpiece. Input values based on calculations of the workpiece dimensions and the distance between fingers after executing return to origin, or input values based on the confirmed movement distance when gripping the workpiece (@?POS).

Note 2) The minimum setting distance is 0.05 mm.

Note 3) The gripping position may vary due to variations in the amount the guide falls and mechanical rattles. We recommend periodic resetting.

[Method for calculation of the movement distance]



a: Distance between fingers after executing return to origin

b: Workpiece dimension

Gripping position = -(a-b)/ 2

* In closing, the gripping position gives a negative value.

Caution: Regarding how to use the support software and teaching box, see the Owner's Manual for each.

4-7 Communications

Connect communications (initialization/point & parameters/operations) with external devices (USB-RS485 converter/teaching box) to the “S1” connector.
When using daisy-chain connections, connect to “S2”.

Note 1) Use the USB-RS485 converter/teaching box for doing the various settings of the controller.

4-7-1 Communication parameter specifications

Communication specifications

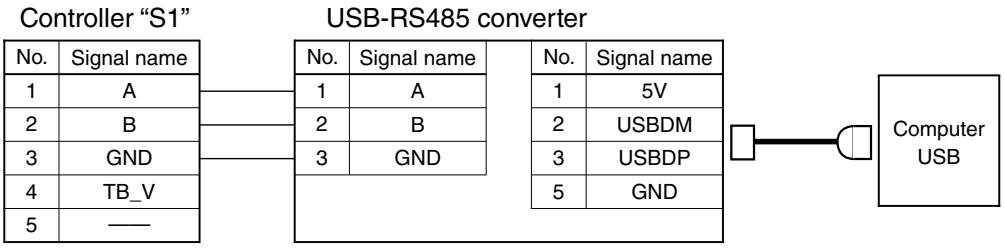
Item	Specifications
Baud rate	115.2kbps
Stop bit	1
Start bit	1
Parity bit	Odd
Data bit length	8
Communication method	Half-duplex & asynchronous

4-7-2 Communication cable

Connector S1: SM05B-GHS-TB(JST)

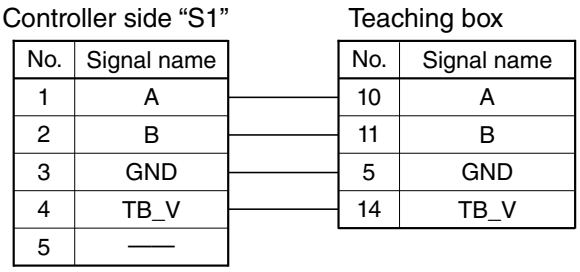
S2: DF3-4P-2DS(HRS)

● When connected to a computer using a USB-RS485 converter



Terminal layout and wiring (USB-RS485 converter - computer)

● When connected to a teaching box



Terminal layout and wiring (teaching box)

4-7-3 Addresses

The address of the RS485 can be set by using the address switches (AD switches) on the front of the controller. The address of the RS485 can also be set without using the AD switches. See page 67 “4-8 Parameters”.

Note) Do not connect devices with the same address in a daisy-chain connection.

4-7-4 Communication commands

To facilitate easy communication with external equipment, communication commands are as standard.

@<Address>, <Command>[,<Operand 1>][,<Operand 2>][,<Operand 3>][,<Operand 4>][,<Operand *>]c/r

4-7-5 List of communication commands

Classification	Command	Operand 1	Operand 2	Operand 3	Operand 4	Operand 5	Command description
Actuator operation	ORG						Returns to origin
	MOVD	Coordinate value (mm)	Speed (mm/s)				Executes coordinate specified movement
	MOVH	Coordinate value (mm)	Speed (mm/s)	Force			Executes coordinate specified gripping operation
	MOVP	Point No.					Moves to the specified point
	GMIN	Gripping direction	Speed (mm/s)	Force			Minimum for size detecting function Sets sample gripping position
	GMAX	Gripping direction	Speed (mm/s)	Force			Maximum for size detecting function Sets sample gripping position
	X+						(+) movement by specified distance
	X–						(-) movement by specified distance
	XINC						(+) movement at constant speed
	XDEC						(-) movement at constant speed
	STOP						Interruption of operation
Data handling	?POS						Reads current position
	?PRM	Parameter No.					Reads specified parameter
	?PNT	Point No.					Reads specified point data
	?ORG						Confirms return to origin
	?VER						Reads version number
	?DIO						Reads I/O states
	?MOVE						Reads whether operating or not
	?ERR						Reads error history records
	?EALL						Reads all error history
	WPNT	Point No.	Mode	Position (speed)	Speed (force)	Force	Writes point data
	WPRM	Parameter No.	Data				Writes parameters
	DPNT	Point No.					Deletes point data
Utilities	IPNT						Initializes all point data
	IPRM	Actuator No.					Initializes all parameters
	IERR						Initializes error history

Classification	Response	Description
Response from controller	OK	Normal completion of operation
	NG	Error generated After comma, error number
	STOP	Stop command After comma, stop number

* Refer to page 70, page 71, and page 73 for explanation of error numbers and stop numbers.

4-7-6 Details of communication commands

(1) **ORG**

Function	Return to origin.
Format	@ address, ORG c/r
Transmission example	@0,ORG c/r
Response	OK c/r

(2) **MOVD**

Function	Performs positioning to the specified position (absolute position of origin reference) at the specified speed (speed on one side of the moving part).
Format	@address, MOVD, position, speed c/r
Transmission example 1	@0,MOVD ,-3.5, 50 c/r
Response	OK c/r
Explanation	Moves at speed of 50 mm/s to the 3.5 mm position from the origin.
Transmission example 2	@0,MOVD ,-10, 20 c/r
Response	NG ,23 c/r
Explanation	Data beyond the limit of the software cannot be entered.

(3) **MOVH**

Function	Performs gripping operation to the specified position (absolute position of origin reference) at the specified speed (speed on one side of the moving part) and gripping force. (Mode U operation, see page 56)
Format	@address, MOVH, position, speed, force c/r
Transmission example	@0,MOVH, -3.5, 50, 5 c/r
Response	OK c/r
Explanation	Moves to position 3.5 mm from origin at speed of 50 mm/s in positioning mode, and from there performs gripping operation at gripping force of 5.

(4) **MOVP**

Function	Performs operation by using the specified PNT No. data.
Format	@ address, MOVP, point number c/r
Transmission example 1	@0,MOVP, 2 c/r
Response	OK c/r
Explanation	Performs operation specified by PNT No 2.
Transmission example 2	@0,MOVP, 12 c/r
Response	NG ,52 c/r
Explanation	No point data in PNT No 12, causing an error.

(5) **GMIN (GMAX)**

Function	Sets the gripping position for the minimum sample (maximum sample) when using the size detecting function.
Format	@address, GMIN gripping direction, speed, gripping force c/r
Transmission example	@0,GMIN, C, 10, 5 c/r
Response	OK c/r
Explanation	This means normal gripping, and setting complete.

Note) See page 89 regarding relationship between grip level and maximum speed.

(6) **X+(X-)**

Function	Moves by only the specified distance to (+) side “opening direction” ((-) side “closing direction”) at the speed shown below. Movement distance = PRM25/100 [mm] Moving speed = PRM24 [mm/s]
Format	@ address, X+c/r
Transmission example	@0,X+c/r
Response	OK c/r

(7) **XINC (XDEC)**

Function	Moves continuously at the speed shown in the following equation to (+) side “opening direction” ((-) side “closing direction”). Stops when stop command is input or the software limit is reached. Moving speed = PRM24 [mm/s]
Format	@address,XINC c/r
Transmission example	@0,XINC c/r
Response	OK c/r

(8) **STOP**

Function	Stops operations.
Format	@address, STOP c/r
Transmission example	@0, STOP c/r
Response	STOP, 61 c/r

(9) **?POS**

Function	Reads the current position.	
Format	@address,?POS c/r	
Transmission example	@0, ?POS c/r	
Response 1	OK, -5.67 c/r ·····	Current position is 5.67 mm from the origin (The minus sign indicates toward the closing side.)
Response 2	NG, 01, -1.47 ·····	During an alarm, the NG description and current position are returned. (While an overtime alarm is occurring, the current position is 1.47 mm from the origin position)

(10) **?PRM**

Function	Reads the specified parameter.
Format	@ address, ?PRM, parameter number c/r
Transmission example	@0, ?PRM, 25 c/r
Response	OK, 100 c/r

(11) ?**PNT**

Function	Reads the specified point data.
Format	@ address, ?PNT, point number c/r
Transmission example	@0, ?PNT, 10 c/r
Response	OK,A, -5.00, 35 c/r ····· Absolute position of 5 mm, speed of 35 mm/s
Explanation	For the contents of the response data, see page 56.

(12) ?**ORG**

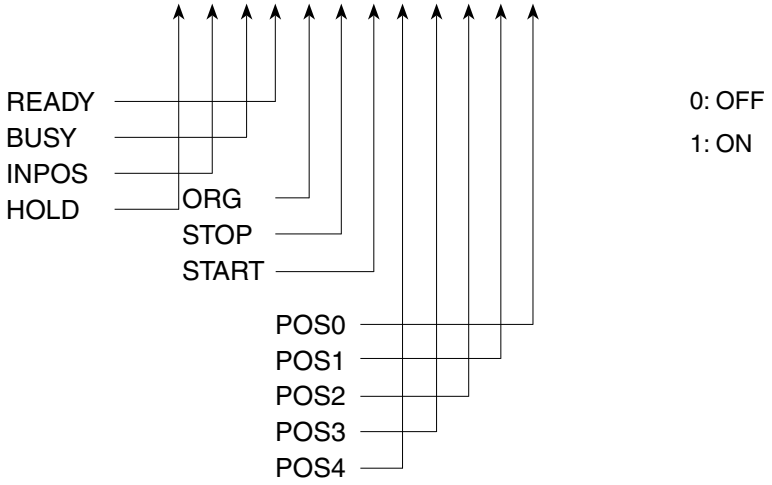
Function	Confirms whether return to origin has been completed or not.
Format	@ address, ?ORG c/r
Transmission example	@0,?ORG c/r
Response 1	OK, 0 c/r ····· Return to origin not completed
Response 2	OK, 1 c/r ····· Return to origin completed

(13) ?**VER**

Function	Checks the controller software version number
Format	@ address, ?VER c/r
Transmission example	@0, ?VER c/r
Response	OK, 1.01 c/r

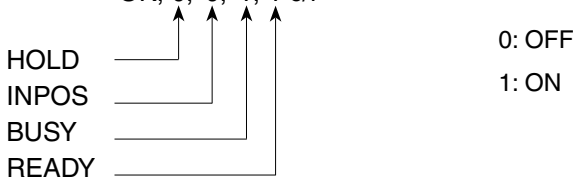
(14) ?**DIO**

Function	Reads custom input/output status.
Format	@ address, ?DIO c/r
Transmission example	@0, ?DIO c/r
Response	OK, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0 c/r



(15) ?**MOVE**

Function	Reads actuator operation status.
Format	@address, ?MOVE c/r
Transmission example	@0, ?MOVE c/r
Response	OK, 0, 0, 1, 1 c/r



Explanation	Used to confirm operations have ended, such as after @address or ORG operations.

(16) ?**ERR**

Function	Reads latest alarms and error history records.
Format	@address, ?ERR c/r
Transmission example	@0, ?ERR c/r
Response	OK, 23 c/r

Note) Alarm number 04: Power supply voltage drop was not saved.

(17) **?EALL**

Function	Reads alarm and error history records. (Up to 16 records. The latest record is added to the back.)
Format	@address,?EALL c/r
Transmission example	@0, ?EALL c/r
Response	OK, 32, 01, 03 c/r (In this case, 03 becomes the latest error)

Note) Alarm number 04: Power supply voltage drop was not saved.

(18) **WPNT**

Function	Writes point data.
Format	@address, WPNT, point number, mode, position, speed, forcec/r
Transmission example	@0, WPNT, 0, A, -3.5,50 c/r
Response	OK c/r
Explanation	For the data format, see page 56.

(19) **WPRM**

Function	Writes parameters.
Format	@ address, ?WPRM, parameter number, value c/r
Transmission example	@0, WPRM, 2, -400 c/r
Response	OK c/r (Sends only data that requires changes.)

Note) PRM0 is an actuator number, so it cannot be changed by writing parameters. Change it by initializing the parameters.

(20) **DPNT**

Function	Deletes point data.
Format	@ address, ?DPNT, point number c/r
Transmission example	@0, DPNT, 0 c/r
Response	OK c/r

(21) **IPNT**

Function	Deletes all point data.
Format	@address,?IPNT c/r
Transmission example	@0, IPNT c/r
Response	OK c/r

(22) **IPRM**

Function	Resets parameters to their initial values.
Format	@ address, IPRM, actuator number c/r
Transmission example	@0, IPRM, 72 c/r
Response	OK c/r

* The first 2 digits in the serial No. on the actuator unit are the actuator No.
Check the actuator No. on the actuator unit, and then initialize the parameters.

Model	Actuator No.
EW2H8	72
EW2H18	73
EW2H28	74
EW2HL8	82
EW2HL18	83
EW2HL28	84

(23) **IERR**

Function	Deletes all error history and alarms.
Format	@address, IERR c/r
Transmission example	@0, IERR c/r
Response	OK c/r

4-8 Parameters

The controller does not have any potentiometer, dip switches, or any other hardware adjustment mechanism.

Instead, it uses parameters that can easily be set through a personal computer, teaching box, or W.PRM.** (EW2C-H-CCD only). This section describes how to change and set the parameters, and gives details of each parameter.

Safety

Because software is used to detect motor overtime and other abnormalities, the controller parameters must be set correctly for the connected actuator code.

If you purchased the controller as a set of options in an order form for an actuator, the parameters have already been initialized to match the model of actuator of the set, but in any case other than that, before you start using it, first set the actuator code to match the model of the actuator. If any problem is found, please contact us.

Caution:

Changing parameters other than those described in this manual could result in fatal damage or defects in the actuator and controller.

4-8-1 Parameter setting method

Changing parameters is done by computer, teaching box, or W.PRM.** (EW2C-H-CCD only). For the communication parameters and cable specifications, refer to section “4-7 Communications” on page 59.

Changing of parameters by communications is done by using general-purpose communications software or dedicated support software.

For instructions of the software, see the separately available support software Owner’s Manual.

For how to use the teaching box, see the separately available teaching box User’s Manual.

See page 52 regarding settings by W.PRM.**.

4-8-2 Explanation of parameters

PRM0 : Actuator No.

Displays the actuator No. This parameter is only for reading. Change it by initializing the parameters.

PRM1 : (+) software limit

Sets the (+) side actuator movement range. (Only enabled in the A, I, C, or O operation mode.)

For safety, always set a suitable value.

Input range 0 to 9995 (×0.01 mm)

Initial value 10

PRM2 : (-) software limit

Sets the (-) side actuator movement range. (Only enabled in the A, I, C, or O operation mode.)

For safety, always set a suitable value.

Input range -9995 to 0 (×0.01 mm)

Initial value

Actuator No.	72	73	74	82	83	84
Initial value	- 500	- 700	- 900	- 1600	- 2100	- 2600

PRM5 : Origin return direction

Sets the origin return direction. Selecting 0 sets the origin return on the opening side, and selecting 1 sets the origin return on the closing side.

Input range 0, 1

Meaning 0: Opening side 1: Closing side

Initial value 0

PRM7 : Gripping speed

Sets the gripping speed in the U mode. The speed is set for one side of the moving part.

Input range

Actuator No.	72	73	74	82	83	84
Input range	5 to 20	5 to 30	5 to 20	5 to 20	5 to 30	5 to 20

* See page 89 regarding relationship between grip level and maximum speed.

Initial value 10

PRM8 : Low-speed movement distance

Sets the distance at low-speed movement from the position forward of the point specified in the U mode. (See page 57)

Input range 5 to 9995 (×0.01 mm)

Initial value 100

PRM9 : Limit width

Sets the range where gripping operation is performed from the position specified in the U mode. (See page 57)

When the movement distance exceeds the limit width during gripping operation, it is stopped because the limit was exceeded.

Input range 5 to 9995 (×0.01 mm)

Initial value 100

PRM10 : Origin return speed

Sets the speed when returning to origin. The speed is set for one side of the moving part.

Input range 5 to 20 (mm/s)

Initial value

Actuator No.	72	73	74	82	83	84
Initial value	10	10	10	20	20	20

PRM21 : Stroke

Input the effective stroke of the actuator.

Input range 5 to 9995 (×0.01 mm)

Initial value

Actuator No.	72	73	74	82	83	84
Initial value	500	700	900	1600	2100	2600

PRM24 : Moving speed when teaching

Parameter for specifying the speed during movement by the communication command X+, X-, XINC, or XDEC.

This is also used during teaching playback for point. The speed is set for one side of the moving part.

Input range 5 to 20 (mm/s)

Initial value 10

PRM25 : Movement distance when teaching

Sets the movement distance with the communication commands X+ and X-.

Input range 5 to 9995 (×0.01 mm)

Initial value 10

PRM26 : Gripping force during teaching movement

Sets the gripping force during movement by the communication command XINC or XDEC.

Input range 1 to 5

Initial value 5

PRM31 : Maximum sample gripping position

Sets the gripping position when gripping a maximum sample when using the size detecting function. (Initial value: 0)

(X0.01 mm)

Actuator No.	72	73	74	82	83	84
Input range	-500 to 500	-700 to 700	-900 to 900	-1600 to 1600	-2100 to 2100	-2600 to 2600

PRM32 : Minimum sample gripping position

Sets the gripping position when gripping a minimum sample when using the size detecting function. (Initial value: 0)

(X0.01 mm)

Actuator No.	72	73	74	82	83	84
Input range	-500 to 500	-700 to 700	-900 to 900	-1600 to 1600	-2100 to 2100	-2600 to 2600

PRM33 : Size detecting function

Switches between enabling/disabling the size detecting function.

Input range 0, 1

Meaning 0: Function disabled 1: Function enabled

Initial value 0

PRM35 : Origin shift distance

Sets the virtual origin. Always execute return to origin after setting it. When executing return to origin, the product temporarily returns to its mechanical origin and then moves the distance set for the origin shift position to complete return to origin. And, that position becomes 0. For example, if an accidental position deviation occurred, it is ordinarily necessary to re-teach all point data. However, by setting the amount of deviation with this parameter, a quick recovery is possible without taking the time to re-teach.

Input range -9995 to 9995 (×0.01 mm)

Initial value 0

PRM36 : Origin shift speed

Sets the speed for origin shift. The speed is set for one side of the moving part.

Input range 5 to 50 (mm/s)

Initial value 10

PRM60 : RS485 address setting value

If parameters are selected (PRM61=1) by PRM61, , then this sets the RS485 address. This value is not changed by parameter initialization.

Input range 0 to F (16 selections)

Initial value 0

PRM61 : RS485 address setting method

Switches the RS485 address setting method. This value is not changed by parameter initialization.

Input range 0, 1

Meaning 0: Switch, 1: Parameter

Initial value 0

*Minimum setting unit for distance related parameters is 0.05 mm.

PRM62 : CC-Link address setting value (EW2C-H-CCD only)

Switches the address of CC-Link. This value is not changed by parameter initialization. But, the address of the CC-Link is changed after the power is turned off and then on again.

Input range 1, 2, 4

Initial value 1

4-9 Error list

(1) Command related

Error No.	Item	Description
21	Error description	Typing mistake
	Cause	Command is not correct
	Countermeasure	Use the correct command
23	Error description	Data error
	Cause	Error in the numerical data
	Countermeasure	Correct the data
24	Error description	Overrun error
	Cause	Error in the transferred data
	Countermeasure	Send the correct command
25	Error description	Framing error
	Cause	Error, noise, in the transferred data
	Countermeasure	Send the correct command, turn off the power supply and then unplug and replug the communication connector
26	Error description	Parity error
	Cause	Error, noise, in the transferred data
	Countermeasure	Send the correct command, turn off the power supply and then unplug and replug the communication connector.

(2) Operation related

Error No.	Item	Description
31	Error description	Running
	Cause	Another command is already being executed, so this command cannot be accepted
	Countermeasure	Wait until the current command finishes before inputting the new command
32	Error description	Origin incomplete
	Cause	Command cannot be executed because the origin return has not been completed
	Countermeasure	Execute origin return
35	Error description	Can't execute
	Cause	The parameter contradicts the operation command
	Countermeasure	Change the parameter or point data
37	Error description	Limit exceeded
	Cause	The position to be moved to exceeds the software limit
	Countermeasure	Edit the point data
39	Error description	Point setting error
	Cause	Combination of operation mode, speed, and grip level are outside range of specifications
	Countermeasure	Edit the point data

(3) System related

Error No.	Item	Description
52	Error description	No point data
	Cause	No data has been registered at the specified point number
	Countermeasure	Register the point data
53	Error description	No actuator type
	Cause	Actuator number setting is incorrect
	Countermeasure	Check the actuator number, and try the initialization again
56	Error description	Data protected
	Cause	Attempted to write to a parameter that is write-protected
	Countermeasure	Writing is allowed only to parameters that are write-enabled
57	Error description	No parameter
	Cause	Attempted to read a parameter number that is not registered
	Countermeasure	Read a registered parameter number
58	Error description	Saving data
	Cause	Attempted to perform another write operation while writing to non-volatile memory
	Countermeasure	Wait until writing to non-volatile memory is complete before writing

(4) Stop messages

Error No.	Item	Description
61	Error description	Stop command
	Meaning	Stopped due to the stop command
63	Error description	Stop input
	Meaning	Stopped due to a STOP input entered from I/O

Chapter 5 Troubleshooting

5-1 If a problem occurs

When informing us of trouble, please provide information that is as detailed as possible about the following items.

Item	Description (Example)
What?	Controller model Actuator model Power supply
When?	Time of purchase (Serial No.) Period of use, conditions of operation When the power is turned on? 1 hour after the power is turned on
Under what conditions?	During operation The position of the Electric Hand when the problem occurred
What happened?	Does not operate Alarm is output
How frequently?	Always occurs Once an hour Cannot be reproduced

5-2 Countermeasures for alarms

When READY output is OFF, an alarm is determined to have been issued. In addition, when an alarm is issued, the ALM LED on the front of the controller lights.

When an alarm is issued, turn the power off temporarily, eliminate the cause of the alarm, and then turn on the power again.

5-3 Alarm specifications

The transmission format for an alarm message is as follows.

NG, <Alarm No.> c/r

Checking the alarm content

To check the content of the alarm, use a communication cable to connect to a personal computer, and enter the @ADDRESS, ?EALL or @ADDRESS, ?ERR command. (See page 64 and page 65.)

5-3-1 List of alarm descriptions

Alarm No.	Alarm description	Meaning	Probable cause	Countermeasure
01	Overtime	• Excessive load • Cable disconnected	1) Problem with usage 2) Connecting cable is broken or connection is defective 3) Mechanical lock 4) Gripping beyond the gripping range in U mode 5) Too much friction in the actuator unit	1) Reduce the load 2) Inspect the cable continuity 3) Check whether there is any external interference 4) Recheck the point data, low speed movement distance, and limit width 5) Check whether or not the friction resistance of the moving part of the actuator is too high, and adjust correctly
04Note	Power supply voltage drop	Power supply (24 VDC) input voltage is too low	Setting mistake for power supply voltage value Power supply is unstable	Raise the power supply voltage Use a stable power supply
05	Power supply voltage high	Input voltage is too high	Power supply	Reduce power supply voltage
06	Cable disconnected	• Excessive load during return to origin • Cable disconnected	1) Connecting cable is broken or connection is defective 2) Mechanical lock	1) Inspect the cable continuity 2) Check whether there is any external interference
08	Point data error	Point data has been corrupted	Power supply was turned off while writing data	Turn on the power supply again, and initialize the point data
09	Parameter data error	Parameter data has been corrupted	Power supply was turned off while writing data	Turn on the power supply again, and initialize the parameter data

Note: Alarm number 4 power supply voltage drop may output an alarm number when the power (24 VDC) is turned off normally also. Furthermore, it is not recorded in the alarm and error history.

Chapter 6 Specifications

6-1 Basic specifications of main unit

● Standard stroke type

Item \ Model			EW2H8	EW2H18	EW2H28
Motor			Brushless motor		
Maximum speed (one side, in positioning mode)		mm/s	50		
Maximum speed (one side, in gripping mode)[Note 1]		mm/s	20	30	20
Minimum speed (one side)		mm/s	5		
Maximum gripping force[Note 1]		N	8 to 16	18 to 33	28 to 50
Operating temperature range		℃	0 to 40		
Open/close stroke		mm	10 (One side 5)	14 (One side 7)	18 (One side 9)
Repeatability of positioning accuracy		mm	±0.05		
Allowed moment (dynamic)	Mp	N•m	0.051	0.1	0.3
	My	N•m	0.03	0.1	0.4
	Mr	N•m	0.06	0.2	0.8
Maximum payload(one side)[Note 2]		kg	0.2 (0.1)	0.3 (0.15)	0.4 (0.2)
Mass		kg	0.09	0.16	0.36
Applicable controller			**EW2C-H-NP**, **EW2C-H-PN**, **EW2C-H-CC**, **EW2C-H-CCD**		

● Long stroke type

Item \ Model			EW2HL8	EW2HL18	EW2HL28
Motor			Brushless motor		
Maximum speed (one side, in positioning mode)		mm/s	50		
Maximum speed (one side, in gripping mode)[Note 1]		mm/s	20	30	20
Minimum speed (one side)		mm/s	5		
Maximum gripping force[Note 1]		N	8 to 16	18 to 33	28 to 50
Operating temperature range		℃	0 to 40		
Open/close stroke		mm	32 (One side 16)	42 (One side 21)	52 (One side 26)
Repeatability of positioning accuracy		mm	±0.05		
Allowed moment (dynamic)	Mp	N•m	0.05	0.1	0.3
	My	N•m	0.03	0.1	0.4
	Mr	N•m	0.06	0.2	0.8
Maximum payload(one side)[Note 2]		kg	0.2 (0.1)	0.3 (0.15)	0.4 (0.2)
Mass		kg	0.14	0.25	0.48
Applicable controller			**EW2C-H-NP**, **EW2C-H-PN**, **EW2C-H-CC**, **EW2C-H-CCD**		

Note 1: For details of the gripping force and gripping speed, refer to the graphs on page 89.

Note 2: Total weight of the fingers, on both sides, that are installed to the table.

6-2 Basic specifications of the controller

● Point input type controller (NPN specifications)

Item	Model	EW2C-H-NP
Control specifications	Motor drive method	Square-wave drive
	Control method	Closed loop control[Note 1]
	Operating method	PTP, force control
	Origin detection method	Detection at the stroke end
	Location detection method	Hall IC output
	Minimum setting distance	0.05mm
	Point setting	32 points
	Point input method	Numeric input, teaching input, direct teaching
	Point setting input	5 points
	Control input	3 points (ORG, START, STOP)
	Control output	4 points (READY, BUSY, HOLD, INPOS)
	Abnormality detection output	Overtime, disconnection, incorrect data, system abnormality
	Motor drive cable	Motor drive output and Hall IC input dedicated cable (with F.G. shielding)
	Hall IC cable	
RS485 Communication method	External communications	RS485 1ch (Communication with computer or teaching box) Daisy-chains are possible (maximum 16 units can be connected)
	Communication method	Half duplex
	Synchronization method	Asynchronous
	Communication speed	115.2kbps
	Parity bit	Odd
	Communication distance	Total cable length less than 100 m
	Communications cable	Dedicated cable (twisted shielded cables)
General specifications	Mass	0.2 kg
	Power supply	DC24V±10% 1.6AMAX (RS485 communications common power supply)
	Power supply indicator	PWR
	Operating temperature range	0 to 40°C
	Operating humidity range	35 to 85% RH (no condensation)
	Storage temperature range	-10 to 65°C
	Back-up	EEPROM used to maintain setting conditions
	Noise resistance	IEC61000-4-4 level 3
	Accessories	I/O cable, power cable

Note 1: Hall IC used for step-out detection.

● Point input type controller (PNP specifications)

Item	Model	EW2C-H-PN
Control specifications	Motor drive method	Square-wave drive
	Control method	Closed loop control[Note 1]
	Operating method	PTP, force control
	Origin detection method	Detection at the stroke end
	Location detection method	Hall IC output
	Minimum setting distance	0.05mm
	Point setting	32 points
	Point input method	Numeric input, teaching input, direct teaching
	Point setting input	5 points
	Control input	3 points (ORG, START, STOP)
	Control output	4 points (READY, BUSY, HOLD, INPOS)
	Abnormality detection output	Overtime, disconnection, incorrect data, system abnormality
	Motor drive cable	Motor drive output and Hall IC input dedicated cable (with F.G. shielding)
	Hall IC cable	
RS485 Communication method	External communications	RS485 1ch (Communication with computer or teaching box) Daisy-chains are possible (maximum 16 units can be connected)
	Communication method	Half duplex
	Synchronization method	Asynchronous
	Communication speed	115.2kbps
	Parity bit	Odd
	Communication distance	Total cable length less than 100 m
	Communications cable	Dedicated cable (twisted shielded cables)
General specifications	Mass	0.2 kg
	Power supply	DC24V±10% 1.6A MAX (RS485 communications common power supply)
	Power supply indicator	PWR
	Operating temperature range	0 to 40°C
	Operating humidity range	35 to 85% RH (no condensation)
	Storage temperature range	-10 to 65°C
	Back-up	EEPROM used to maintain setting conditions
	Noise resistance	IEC61000-4-4 level 3
	Accessories	I/O cable, power cable

Note 1: Hall IC used for step-out detection.

● CC-Link remote I/O type controller

Item \ Model		EW2C-H-CC					
Control specifications	Motor drive method	Square-wave drive					
	Control method	Closed loop control[Note 1]					
	Operating method	PTP, force control					
	Origin detection method	Detection at the stroke end					
	Location detection method	Hall IC output					
	Minimum setting distance	0.05mm					
	Point setting	32 points					
	Point input method	Numeric input, teaching input, direct teaching					
	Point setting input	5 points					
	Control input	3 points (ORG, START, STOP)					
	Control output	4 points (READY, BUSY, HOLD, INPOS)					
	Abnormality detection output	Overtime, disconnection, incorrect data, system abnormality					
	Motor drive cable	Motor drive output and Hall IC input dedicated cable (with F.G. shielding)					
	Hall IC cable						
RS485 Communication method	External communications	RS485 1ch (Communication with computer or teaching box) Daisy-chains are possible (maximum 16 units can be connected)					
	Communication method	Half duplex					
	Synchronization method	Asynchronous					
	Communication speed	115.2kbps					
	Parity bit	Odd					
	Communication distance	Total cable length less than 100 m					
	Communications cable	Dedicated cable (twisted shielded cables)					
General specifications	Mass	0.2 kg					
	Power supply	DC24V±10% 1.6A MAX (CC-Link communications and RS485 communications common power supply)					
	Power supply indicator	PWR					
	Operating temperature range	0 to 40°C					
	Operating humidity range	35 to 85% RH (no condensation)					
	Storage temperature range	-10 to 65°C					
	Back-up	EEPROM used to maintain setting conditions					
	Noise resistance	IEC61000-4-4 level 3					
	Accessories	CC-Link connector, power cable, and termination resistor for CC-Link					
CC-Link Communication specifications CC-Link	Version	Ver.1.10					
	Communication method	Broadcast polling method					
	Synchronization method	Frame synchronization method					
	Transmission line method	Bus format (EIA RS485 compliant)					
	Communication speed	156k/625k/2.5M/5M/10Mbps changed by switch (rotary switch)					
	Number of occupied addresses	Remote I/O address, 1 address					
	Address setting	1 to 64, changed by switch (rotary switch)					
	CLEAR/HOLD	Changed by switch (DIP switch) CLEAR; when C-Link communication error occurs, clears all except for specified controller connections HOLD; when C-Link communication error occurs, holds state from immediately before error state occurred					
	Display	PW, L RUN, SD, RD, L ERR (LED: Red)					
	Transmission distance	Communication speed bps	156k	625k	2.5M	5M	10M
		Total cable length m	1200	900	400	160	100
	Communications cable	Ver.1.10 compatible CC-Link dedicated cable					
	Termination resistance	110Ω (when using Ver.1.10 compatible CC-Link dedicated cable)					

Note 1: Hall IC used for step-out detection.

● CC-Link remote device type controller

Item	Model	EW2C-H-CCD					
Control specifications	Motor drive method	Square-wave drive					
	Control method	Closed loop control[Note 1]					
	Operating method	PTP, force control					
	Origin detection method	Detection at the stroke end					
	Location detection method	Hall IC output					
	Minimum setting distance	0.05mm					
	Point setting	32 points					
	Point input method	Numeric input, teaching input, direct teaching					
	Point setting input	5 points					
	Abnormality detection output	Overtime, disconnection, incorrect data, system abnormality					
	Motor drive cable	Motor drive output and Hall IC input dedicated cable (with F.G. shielding)					
	Hall IC cable						
RS485 Communication method	External communications	RS485 1ch (Communication with computer or teaching box) Daisy-chains are possible (maximum 16 units can be connected)					
	Communication method	Half duplex					
	Synchronization method	Asynchronous					
	Communication speed	115.2kbps					
	Parity bit	Odd					
	Communication distance	Total cable length less than 100 m					
	Communications cable	Dedicated cable (twisted shielded cables)					
General specifications	Mass	0.2 kg					
	Power supply	DC24V±10% 1.6A MAX (CC-Link communications and RS485 communications common power supply)					
	Power supply indicator	PWR					
	Operating temperature range	0 to 40°C					
	Operating humidity range	35 to 85% RH (no condensation)					
	Storage temperature range	-10 to 65°C					
	Back-up	FRAM used to maintain setting conditions					
	Noise resistance	IEC61000-4-4 level 3					
	Accessories	CC-Link connector, power cable, and CC-Link termination resistor					
CC-Link Communication specifications CC-Link	Version	Ver.1.10					
	Communication method	Broadcast polling method					
	Synchronization method	Frame synchronization method					
	Transmission line method	Bus format (EIA RS485 compliant)					
	Communication speed	156k/625k/2.5M/5M/10Mbps changed by switch (rotary switch)					
	Number of occupied addresses	Remote device address, 1 address/2 addresses/4 addresses					
	Maximum number of connected units	When 1 address occupied: 42 units, when 2 addresses occupied: 32, when 4 addresses occupied: 16 units					
	Address setting	Changed by switch (rotary switch) When 1-address occupied: 1 to 64, when 2 addresses occupied: 1 to 63, when 4 addresses occupied: 1 to 61					
	CLEAR/HOLD	Changed by switch (DIP switch) CLEAR; when C-Link communication error occurs, clears all except for specified controller connections HOLD; when C-Link communication error occurs, holds state from immediately before error state occurred					
	Display	PW, L RUN, SD, RD, L ERR (LED: Blue)					
	Transmission distance	Communication speed bps	156k	625k	2.5M	5M	10M
		Total cable length m	1200	900	400	160	100
	Communications cable	Ver.1.10 compatible CC-Link dedicated cable					
	Termination resistance	110Ω (when using Ver.1.10 compatible CC-Link dedicated cable)					

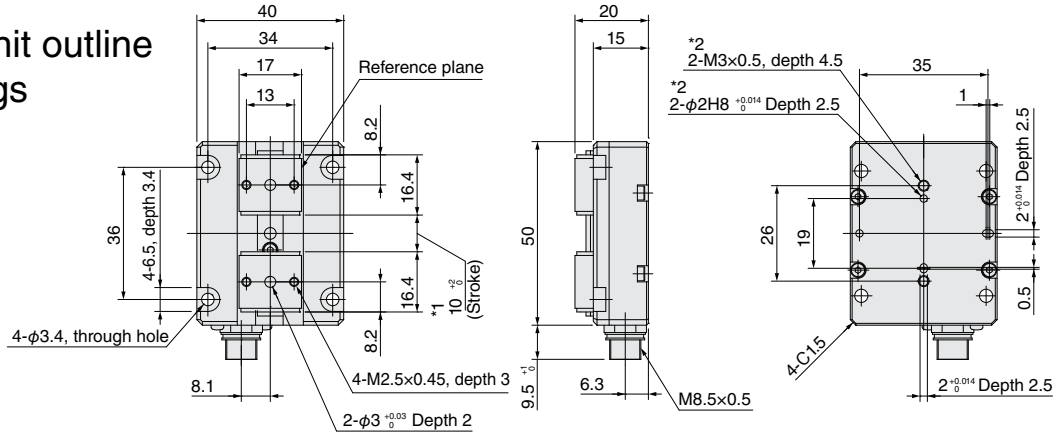
Note 1: Hall IC used for step-out detection.

MEMO

Chapter 7 Outline Drawings

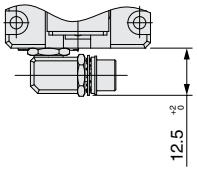
7-1 Main unit outline drawings

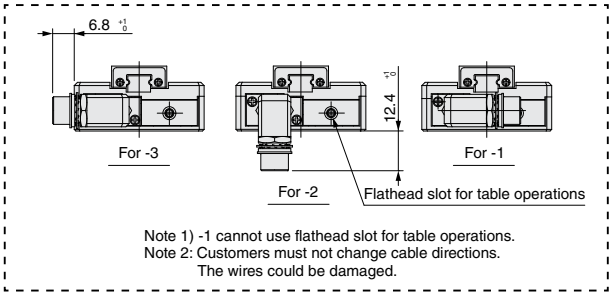
EW2H8



*1 Dimension of origin position of open side. Use origin shift if adjustment of the origin position is needed.
*2 Our auto hand changer MJC3T can be installed directly.

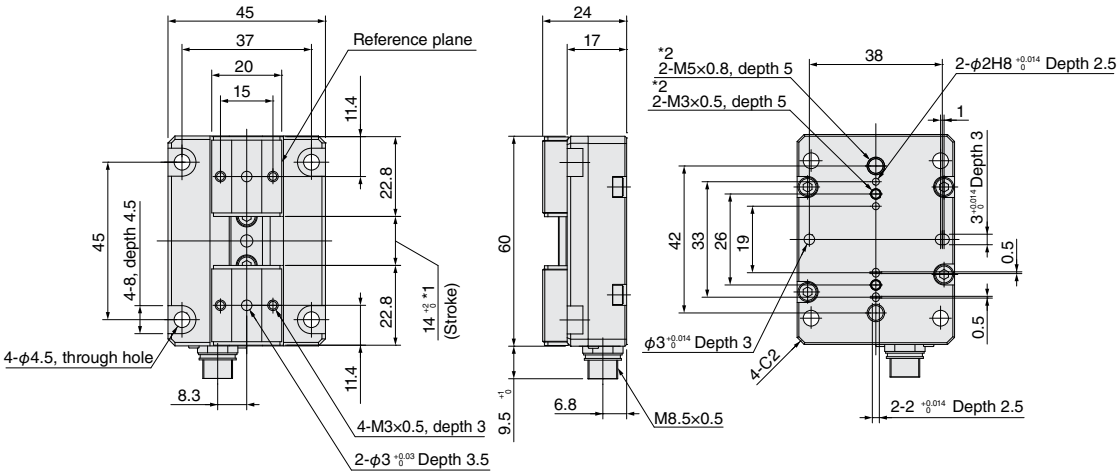
Cable direction: For 1, 2, or 3





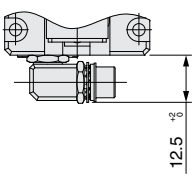
Note 1) -1 cannot use flathead slot for table operations.
Note 2: Customers must not change cable directions.
The wires could be damaged.

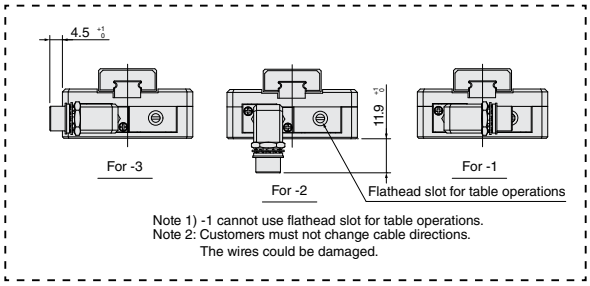
EW2H18



*1 Dimension of origin position of open side. Use origin shift if adjustment of the origin position is needed.
*2 Our auto hand changer MJC3T or MJC10T can be installed directly.

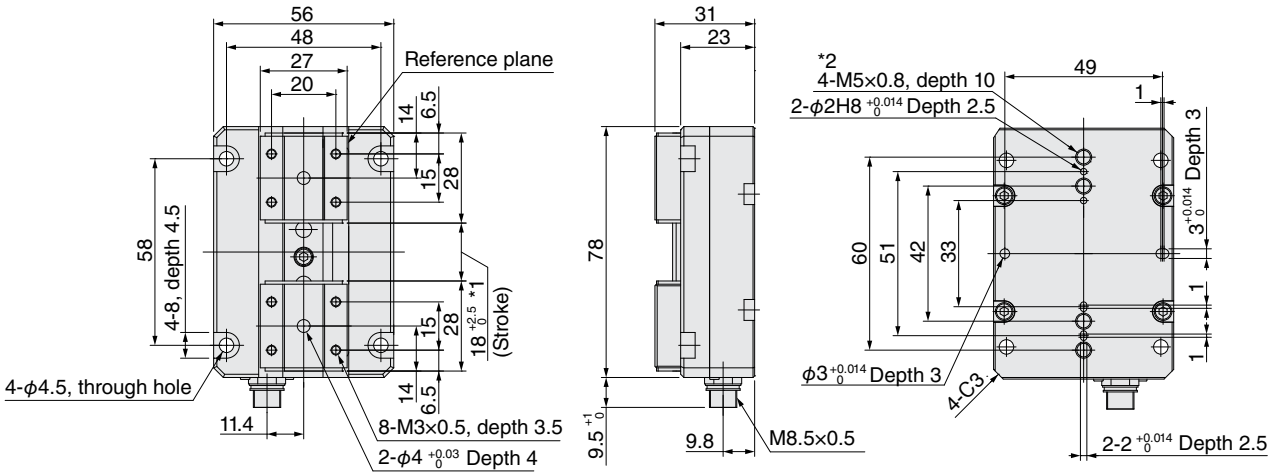
Cable direction: For 1, 2, or 3





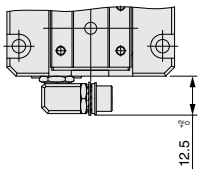
Note 1) -1 cannot use flathead slot for table operations.
Note 2: Customers must not change cable directions.
The wires could be damaged.

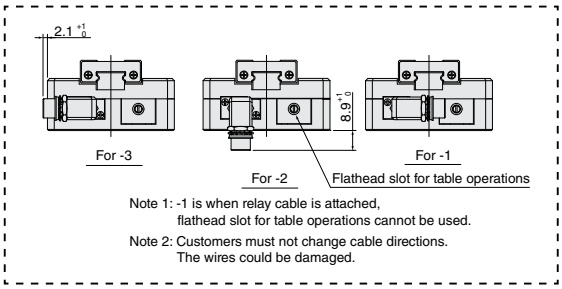
EW2H28



*1 Dimension of origin position of open side. Use origin shift if adjustment of the origin position is needed.
*2 Our auto hand changer MJC10C or MJC20T can be installed directly.

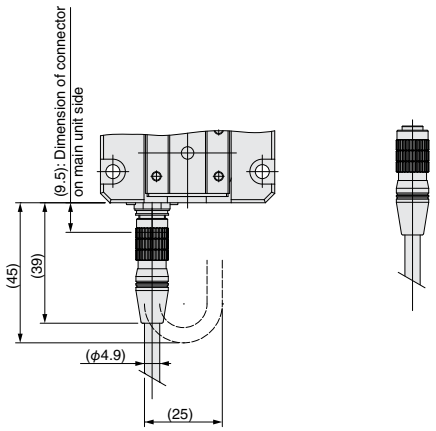
Cable direction: For 1, 2, or 3





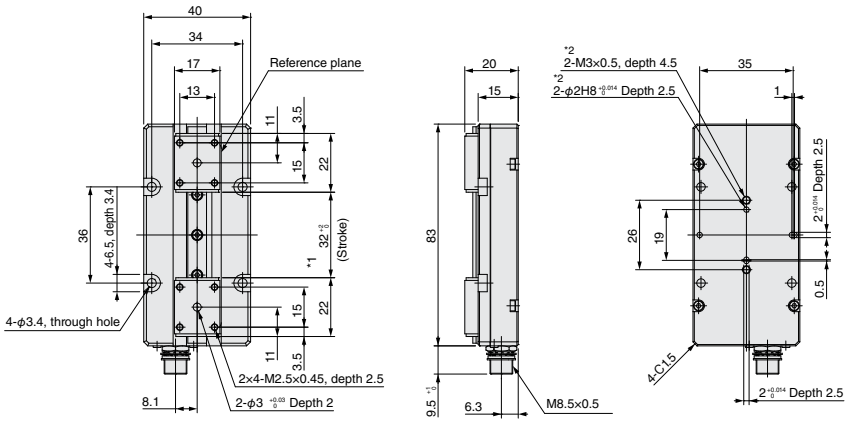
Note 1: -1 is when relay cable is attached, flathead slot for table operations cannot be used.
Note 2: Customers must not change cable directions. The wires could be damaged.

● Dimensions when relay cable is installed, dimensions when cable is bent (reference value)



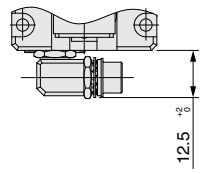
Note) The connector dimension becomes about +30 mm longer when the relay cable is attached, the same as when direction of cable is incorrect.

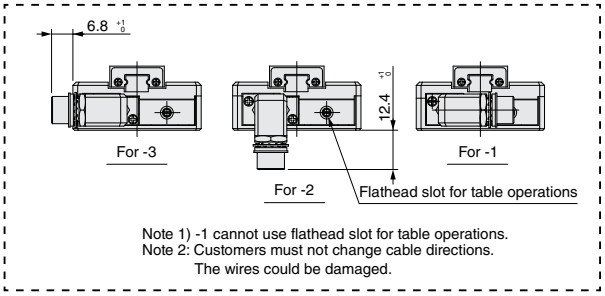
EW2HL8



*1 Dimension of origin position of open side. Use origin shift if adjustment of the origin position is needed.
*2 Our auto hand changer MJC3T can be installed directly.

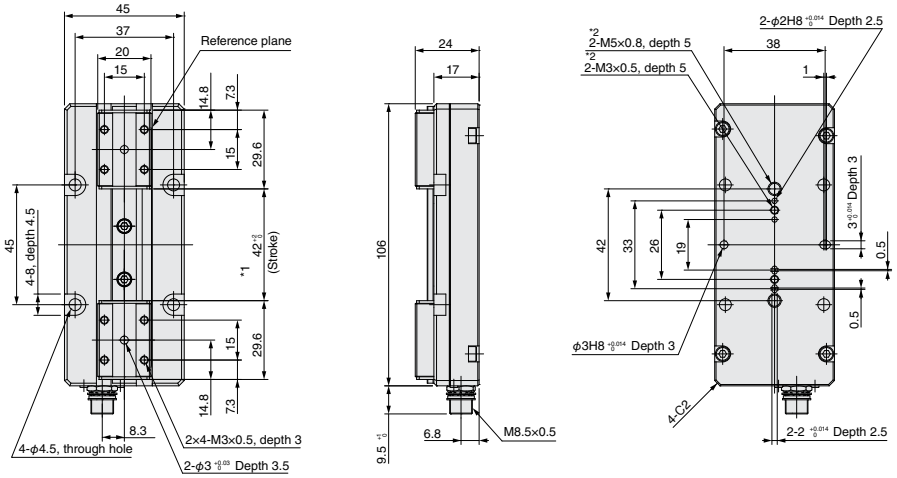
Cable direction: For 1, 2, or 3





Note 1) -1 cannot use flathead slot for table operations.
Note 2: Customers must not change cable directions.
The wires could be damaged.

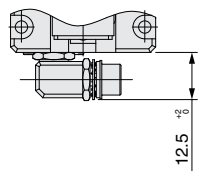
EW2HL18

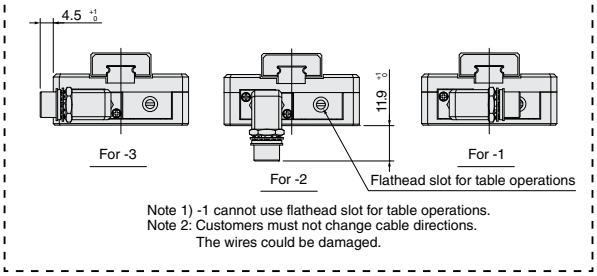


*Dimension of origin position of open side.

*1 Dimension of origin position of open side. Use origin shift if adjustment of the origin position is needed.
*2 Our auto hand changer MJC3T or MJC10T can be installed directly.

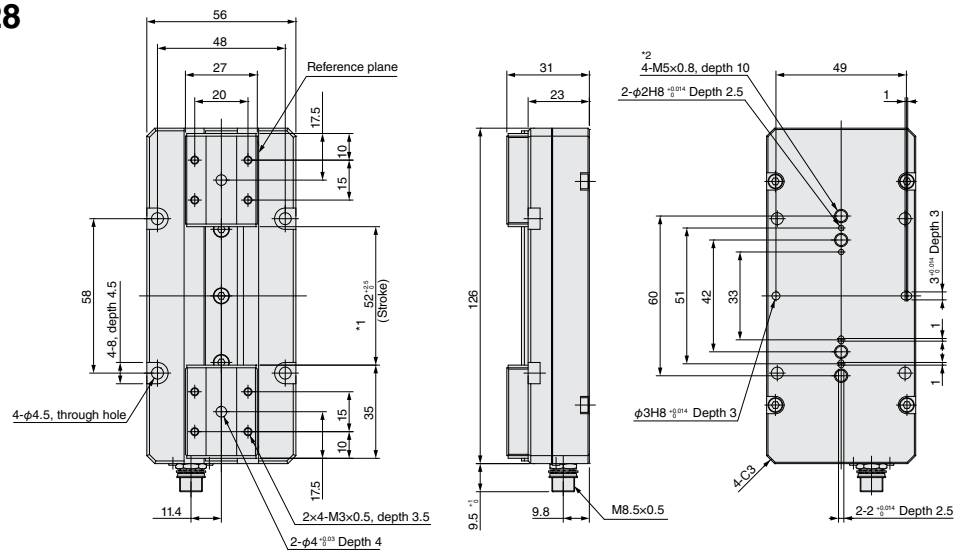
Cable direction: For 1, 2, or 3





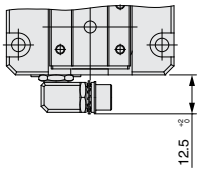
Note 1) -1 cannot use flathead slot for table operations.
Note 2: Customers must not change cable directions.
The wires could be damaged.

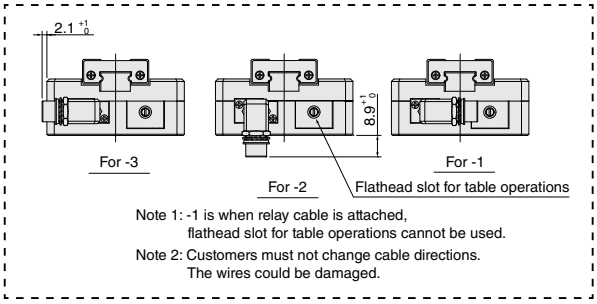
EW2HL28



*1 Dimension of origin position of open side. Use origin shift if adjustment of the origin position is needed.
*2 Our auto hand changer MJC10T or MJC20T can be installed directly.

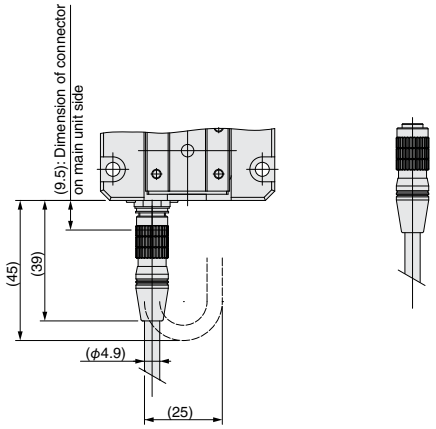
Cable direction: For 1, 2, or 3





Note 1: -1 is when relay cable is attached, flathead slot for table operations cannot be used.
Note 2: Customers must not change cable directions. The wires could be damaged.

● Dimensions when relay cable is installed, dimensions when cable is bent (reference value)



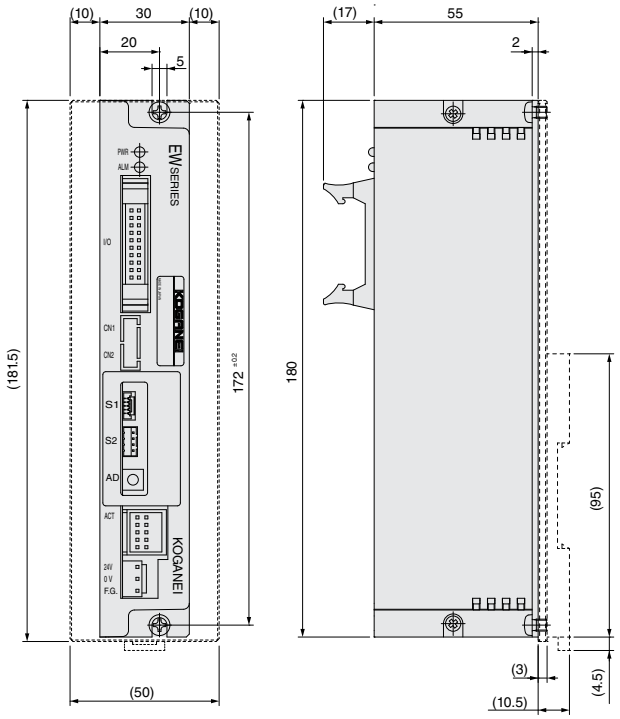
Note) The connector dimension becomes about +30 mm longer when the relay cable is attached, the same as when direction of cable is incorrect.

7-2 Controller outline drawings

(Point input type)

EW2C-H-□ - □ — **DIN rail mounting plate**
No entry: None
DP: Yes

Controller type
NP : Point input type (NPN specifications)
PN : Point input type (PNP specifications)

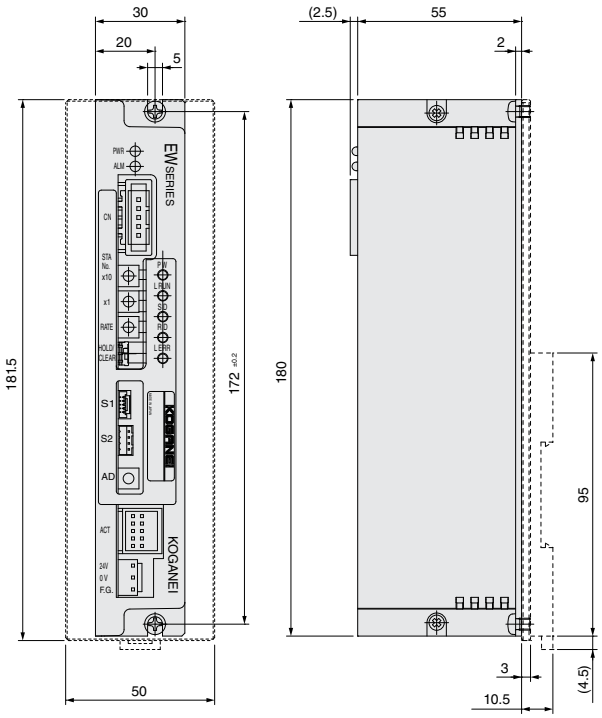


* Dotted line indicates dimensions of DIN rail mounting plate

(CC-Link type)

EW2C-H-□ - □ — **DIN rail mounting plate**
No entry: No mounting plate
DP: With mounting plate

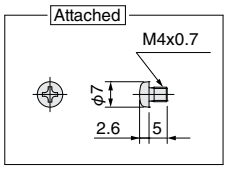
Controller type
CC : CC-Link remote I/O type
CCD : CC-Link remote device type controller

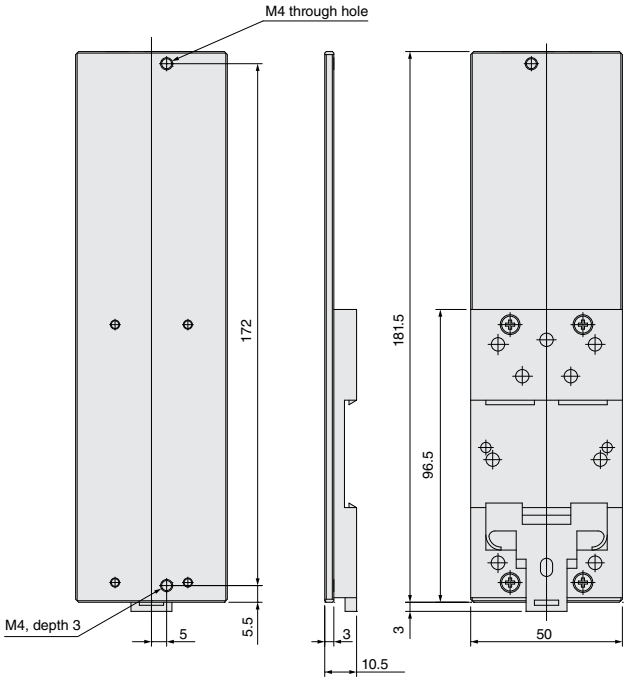


* Dotted line indicates dimensions of DIN rail mounting plate

(DIN rail mounting plate)

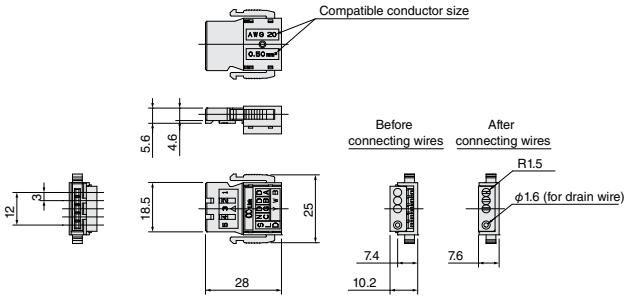
EW2DP





(Connector for CC-Link)

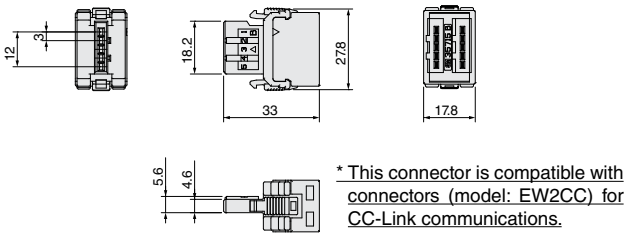
EW2CC



* This connector is compatible with cables for CC-Link communications.

(Branch connector for CC-Link)

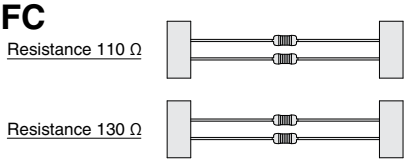
EW2CY



* This connector is compatible with connectors (model: EW2CC) for CC-Link communications.

(Termination resistance for CC-Link)

EW2FC

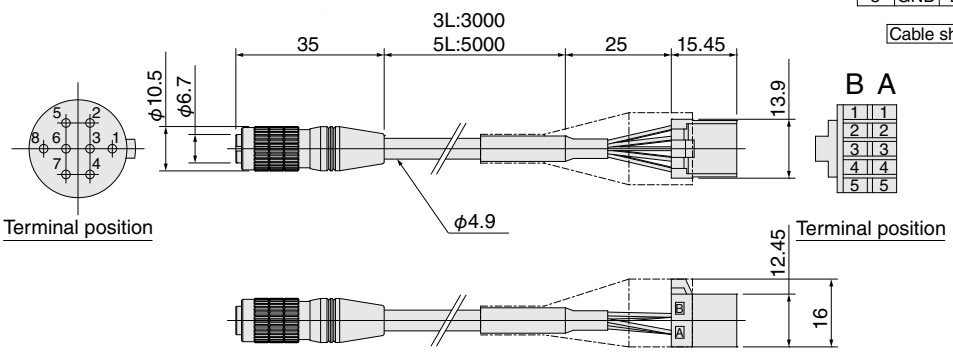


7-3 Additional parts outline drawings

• Connecting cable

EW2KA-□

3L: 3 m
5L: 5 m



Main unit side connector

NO.	Name	Color
1	U	Green
2	V	Brown
3	W	Yellow
4	Vcc	Orange
5	HU	White
6	HV	Red
7	HW	Black
8	GND	Blue

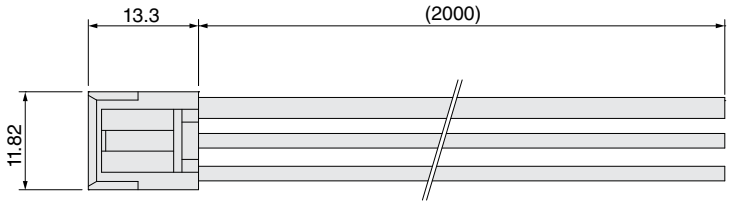
Cable shield

Controller side connector

NO.	Name	Color
A1	U	Green
B1	V	Brown
A2	W	Yellow
B2	FG	White
A3	Vcc	Orange
B3	GND	Blue
A4	HU	White
B4	HV	Red
A5	HW	Black
B5	N.C.	-

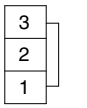
• For power

EW2KP



Power connector terminal layout

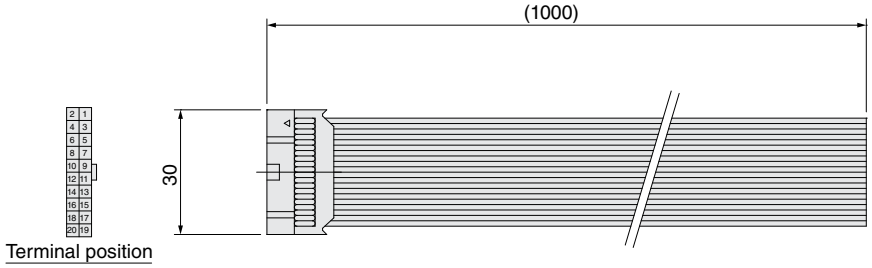
NO.	Name	Color
1	24V	Red
2	GND	Blue
3	F.G.	Green



Terminal layout

• For I/O

EW2KI



I/O Connector terminal layout

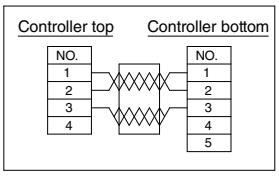
NO.	Name	Color
1	POS0	Brown
2	POS1	Red
3	POS2	Orange
4	POS3	Yellow
5	POS4	Green
6	START	Blue
7	STOP	Purple
8	ORG	Gray
9	RDY	White
10	BUSY	Black
11	INPOS	Brown
12	HOLD	Red
13	24G IN	Orange
14	N.C.	Yellow
15	24G	Green
16	24V IN	Blue
17	N.C.	Purple
18	24V	Gray
19	F.G.	White
20	F.G.	Black

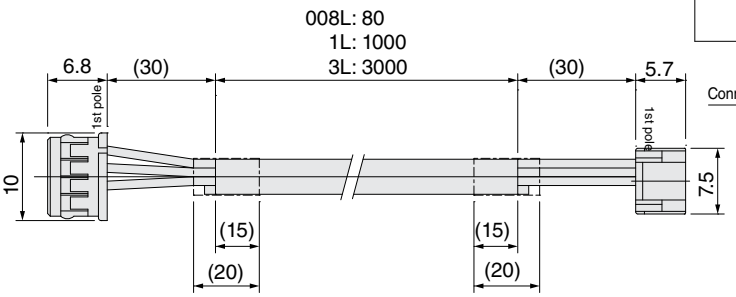
• For daisy chains

EW2KD-□

008L: 80 mm
1L: 1 m
3L: 3 m

Cable layout chart





Connector terminal layout (controller top)

NO.	Name	Color
1	A	Brown
2	B	Blue
3	GND	Black
4		

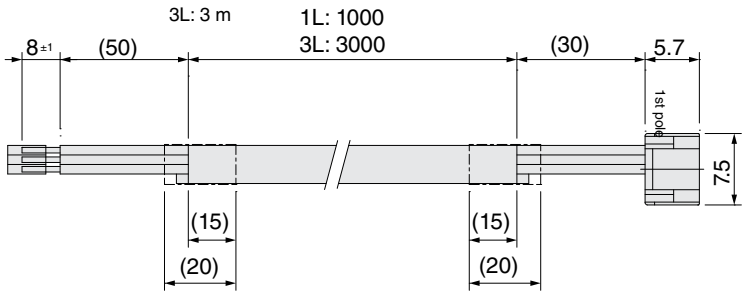
Connector terminal layout (controller bottom)

NO.	Name	Color
1	A	Brown
2	B	Blue
3	GND	Black
4		
5		

• For communications

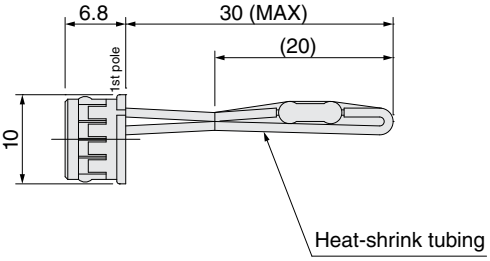
EW2KN -□

1L: 1 m
3L: 3 m



● Termination resistance

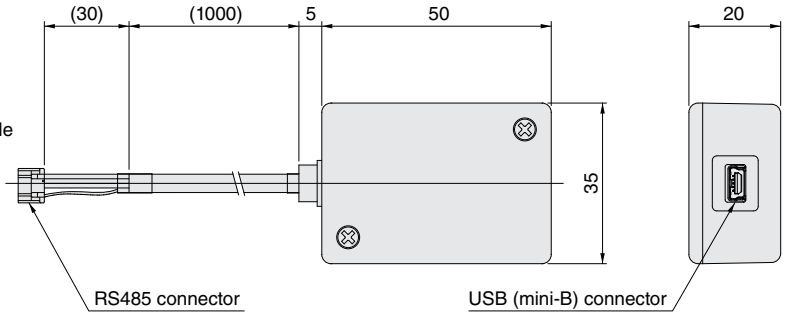
EW2FR

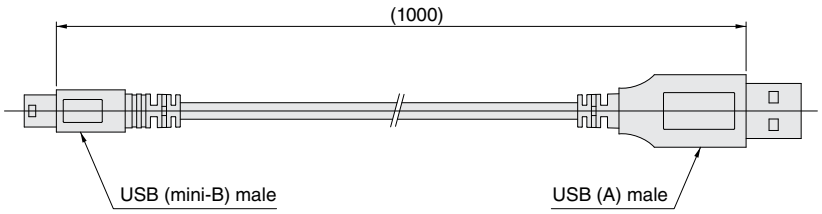


• USB-RS485 converter for communications

● **IBM2A - H1 -□**

No entry: With USB cable
N: Without USB cable





• For connecting (separated wires), for main unit* (robot cable)

EW2KBA-□

* For wiring of auto hand changer (MJC)

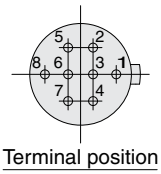
015L: 150 mm
025L: 250 mm

Main unit side connector

NO.	Name	Color
1	U	Green
2	V	Brown
3	W	Yellow
4	Vcc	Orange
5	HU	White
6	HV	Red
7	HW	Black
8	GND	Blue

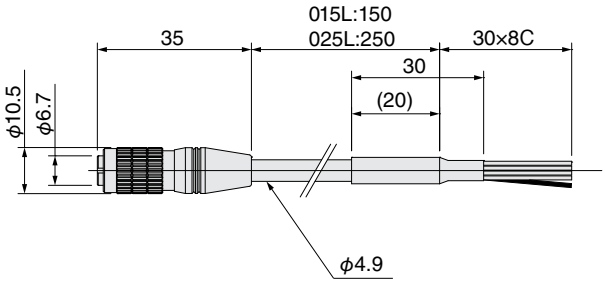
Cable shield

Cable layout chart



Terminal position

Main unit side ←



• For connecting (separated wires), for controller* (robot cable)

EW2KBB-□

* For wiring of auto hand changer (MJC)

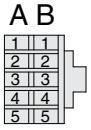
3L: 3 m
5L: 5 m

Controller side connector

No.	Name	Color
A1	U	Green
B1	V	Brown
A2	W	Yellow
B2	FG	Shield
A3	Vcc	Orange
B3	GND	Blue
A4	HU	White
B4	HV	Red
A5	HW	Black
B5	N.C.	-

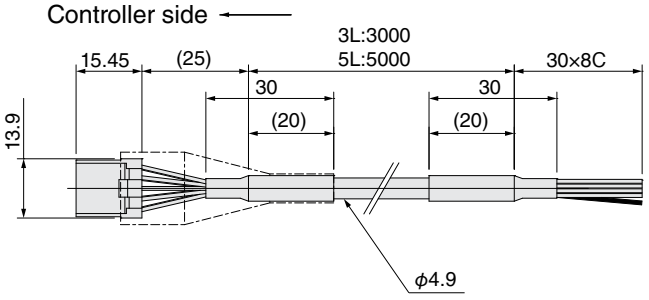
Cable shield

Cable layout chart



Terminal position

Controller side ←



• Positioning pin

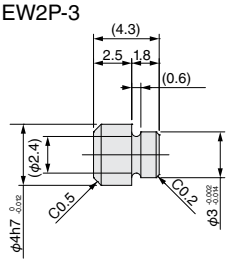
EW2P - □

Size

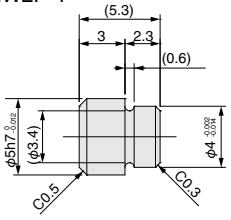
3: ϕ3 (for EW2□8, EW2□18)

4: ϕ4 (for EW2□28)

EW2P-3



EW2P-4



• Adapter for installing Compliance Light

EW2A-H□

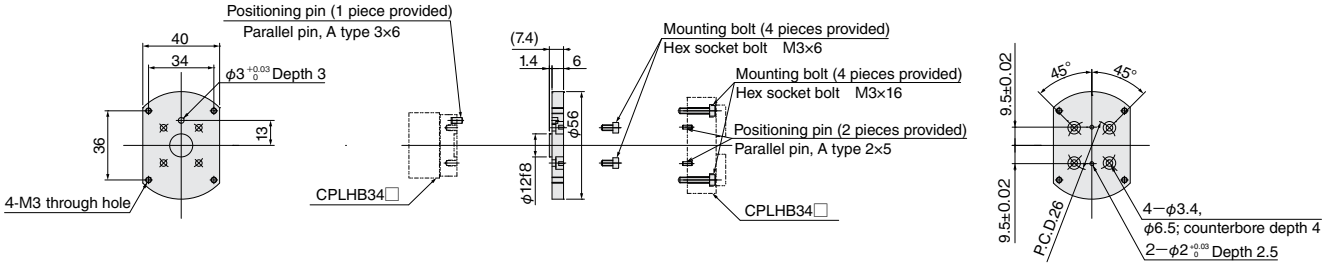
Size (gripping force)

8 : 8N (for CPL□34□)

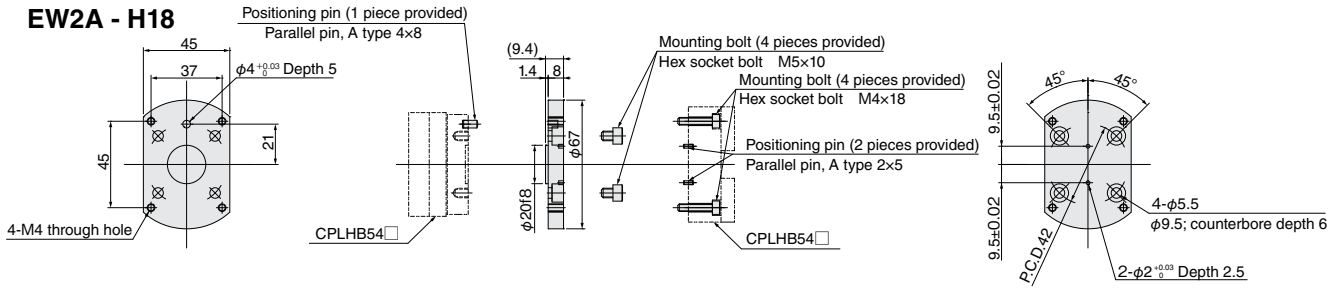
18 : 18N (for CPL□54□)

28 : 28N (for CPL□70□)

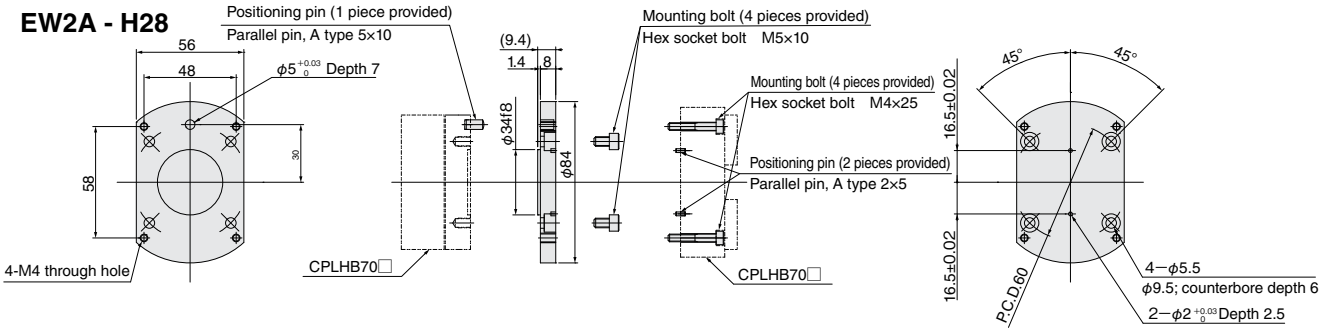
EW2A - H8



EW2A - H18



EW2A - H28



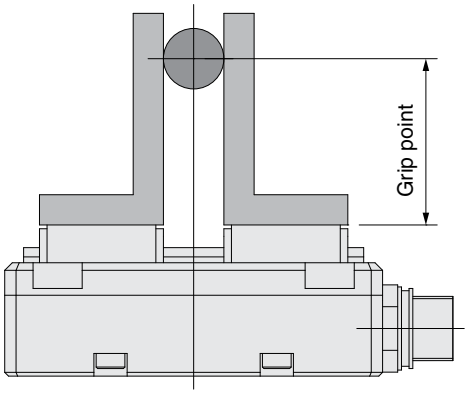
Tightening torque

● Mounting a workpiece

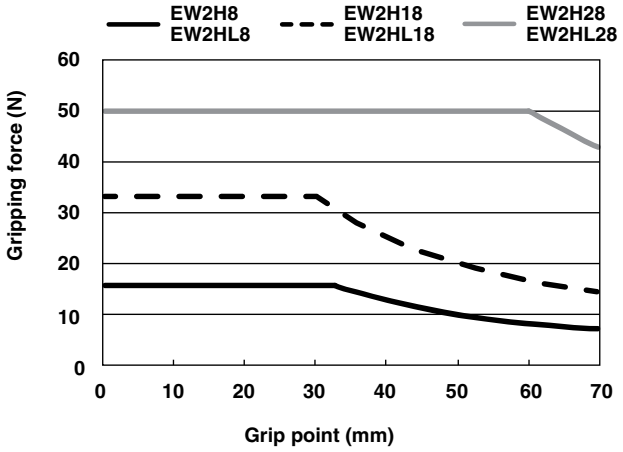
Bolts used	Maximum tightening torque (**N·m**)
M3×0.5	0.63
M4×0.5	1.5
M5×0.8	3

Chapter 8 Technical Data

8-1 Limits on gripping force at grip points

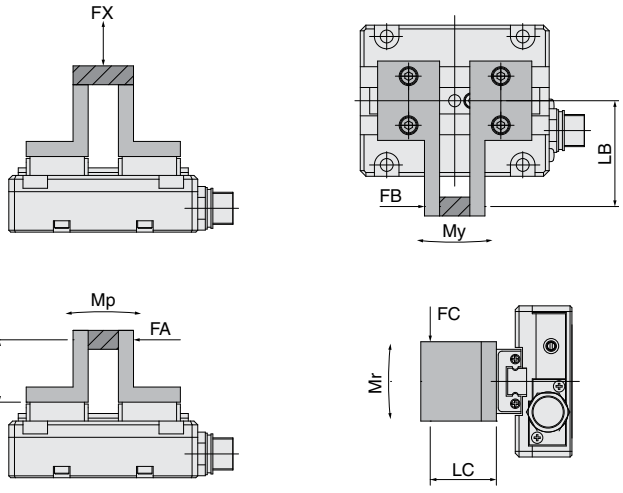


● Grip point and gripping force graph



*Shows grip points in relation to maximum gripping forces for various sizes. Set a grip point that is below the allowed moment (Mp).

8-2 Allowed load and allowed moment



● Mp = FA×LA (N•m)
● My = FB×LB (N•m)
● Mr = FC×LC (N•m)

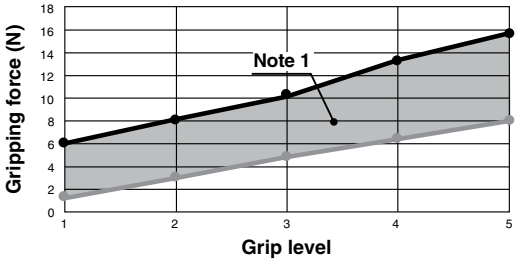
[Flat Type Electric Hand]

Load and moment / Model	FX	Mp	My	Mr
	N	N•m	N•m	N•m
EW2□8	40	0.5	0.3	0.6
EW2□18	120	1.0	1.0	2.0
EW2□28	190	3.0	4.0	8.0

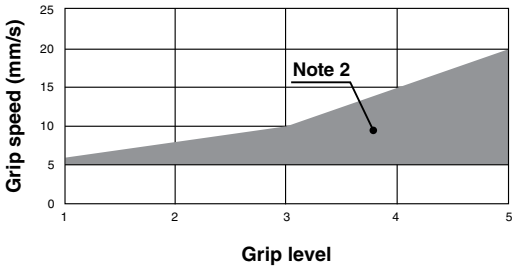
8-3 Gripping force specifications

EW2H8
EW2HL8

Grip level ⇔ Grip force



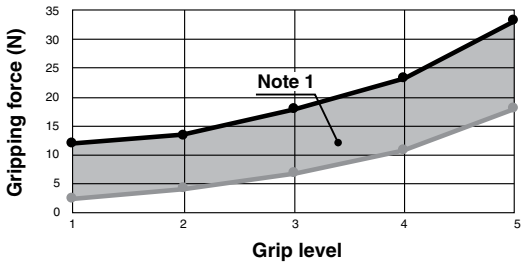
Grip level ⇔ Settable speed range



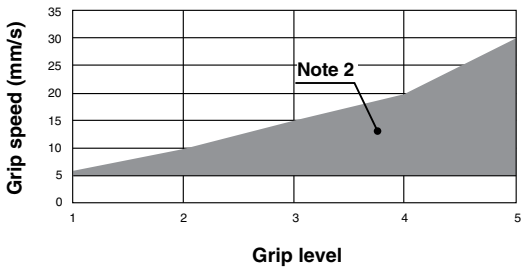
*The above gripping graphs are guidelines.

EW2H18
EW2HL18

Grip level ⇔ Grip force



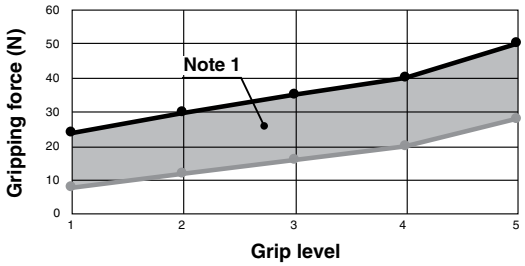
Grip level ⇔ Settable speed range



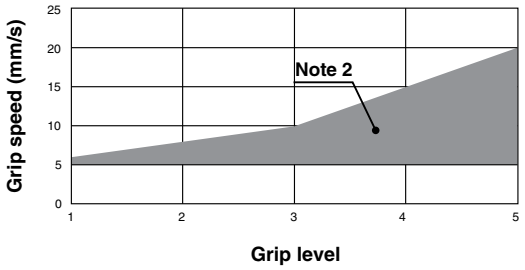
*The above gripping graphs are guidelines.

EW2H28
EW2HL28

Grip level ⇔ Grip force



Grip level ⇔ Settable speed range



*The above gripping graphs are guidelines.

Note 1) Forces are generated within the ranges shown in the graphs at each set grip level.
Note 2) Gripping speeds can be set within the ranges shown in the graphs according to the set grip levels.

MEMO

Revision History

Ver.1.0
Created new for sale of Flat Type Electric Hand EW2H

Ver. 2.0
Added long stroke specifications for Flat Type Electric Hand EW2HL
Added point input type (PNP specifications) to controller EW2C-H-PN
Added additional parts of positioning pin EW2P positioning pin and branch connector EW2CY for CC-Link

Ver.3.0
Added CC-Link remote device type EW2C-H-CCD to controllers and EW2FC to additional parts.

Ver.3.1
Pages 19, 20, 25, 27, 28, 32, 52 Added CC-Link input signal CC-Link address settings (W.CCS) and input data CC-Link address codes (WD.CCS.NO)
Ver.3.2
Page 57 Corrected note in "● Electric hand operation mode"

Ver.3.3
Added CE compliance mark.
Page 16 Added occupied address writing from CC-Link to operation mode settings
Page 78 Deleted number of occupied addresses (parameter switching) in CC-Link communication specifications

If you have questions about the contents of this manual, or about other technical issues, please consult the OVERSEAS DEPARTMENT at the address and telephone number shown below.

<Contact>
Koganei Corporation, Overseas Department
Address: 3-11-28, Midori-cho, Koganei City, Tokyo
Tel: 042-383-7172
Fax: 042-383-7206

ELEWAVE SERIES
Flat Type Electric Hand
With point input type controller

With CC-Link type controller

OWNER'S MANUAL

Aug. 2022 Ver.3.3 X435177

©Koganei Corporation

The contents of this manual, or any portion thereof, may not be duplicated or copied without permission by Koganei.

KOGANEI CORPORATION
Overseas Department
TEL: 042-383-7172

Aug. 31, 2022 Ver. 3.3 KG ©KOGANEI CORP. PRINTED IN JAPAN