

KOGANEI



ELEWAVE SERIES NS Sliders

Point input type controller

OWNER'S MANUAL Ver.3.4

〔Main Units〕

EWM5HSA

EWM5HLA

EWM5SSA

EWM5SLA

〔Controller〕

EWHC-NH

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Chapter 1 Safety Precautions

Thank you for purchasing the Elewave Series NS Slider.

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 user (person to set up, operator, or person to adjust or 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 NS Sliders.

(2) Precaution against pinched fingers, etc.

- Be careful to prevent fingers, etc., from being pinched by the NS sliders moving parts during transportation, teaching, or during operation.

(3) Operation not allowed in ambient atmospheres containing flammable gases, etc.

- The NS sliders are not an explosion-proof specification. 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 pushers, 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 pushed 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 NS Slider

- If any of the damage or defects listed below have been found, continuing use of the NS slider 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, NS sliders' erratic operation
Damage to outer components of NS sliders	Damaged parts flying off during NS sliders' operation
Abnormal operation of NS sliders (position deviation, vibrations, etc.)	NS sliders' 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.

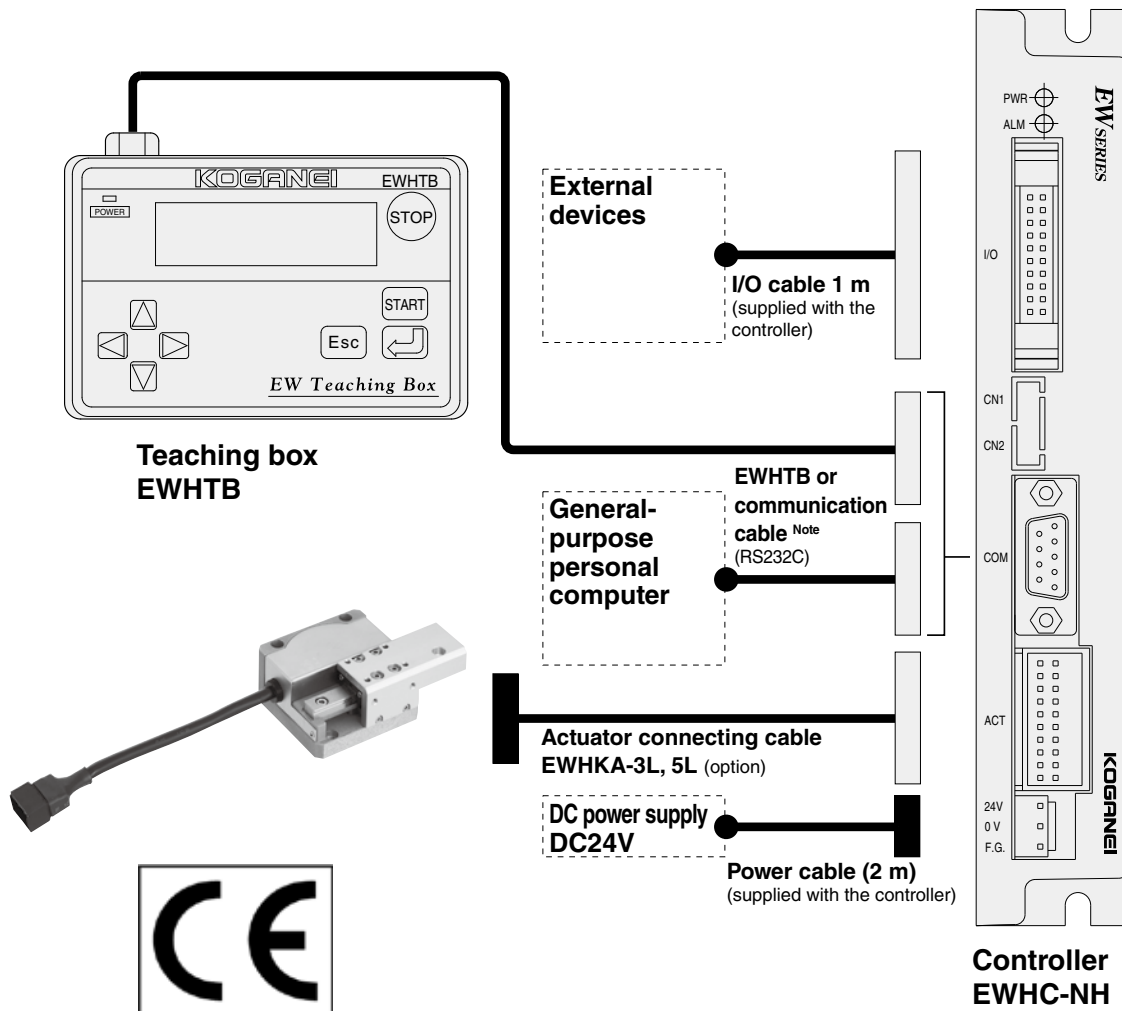
(9) Protective grounding

- Always ground the controller to protect it against electric shock.

Chapter 2 System Configuration

2-1 Entire system configuration

The NS sliders consist of the following major components.



Note: RS232C cable (reference)

Specifications: D-sub 9 pin ←→ D-sub 9 pin and cross cable

Model : C06N-09FS-09FS-CROSS

Manufacturer : Misumi Corp.

The communication cable must be prepared by the customer.

2-2 Options and accessories

- When Option -C (with controller EWHC-NH) is selected, the controller EWHC-NH and the following accessories are included in the package. Please confirm at time of purchase.

Power cable (1 pc.)

I/O cable (1 pc.)

- When Option -3L or -5L (the cable connecting the NS Slider main unit and the controller) is selected, the cable (-3L: cable length 3 m, -5L: cable length 5 m) 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 it operates normally. 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.

Type	Actuator No.
EWM5S□A-20	30
EWM5S□A-40	31
EWM5H□A-20	32
EWM5H□A-40	33

Note: 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 repeated bending or tensile force to the lead wires. Moreover, never carry the main unit by the lead wires. The wires could break.
- (2) Do not apply external force to the workpiece while the workpiece is mounted.
Applying excessive external force could cause damage to parts.
- (3) Restrictions on operations
The stepping 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.
- (4) Operating sound
Operating speed or workpiece conditions could cause the operating sound to be higher, but this is not a malfunction.

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) Use the counterbored holes on the bottom face to secure the main unit.

3-2-2 Mounting a workpiece

- (1) When mounting the workpiece, 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 within the allowable torque range.

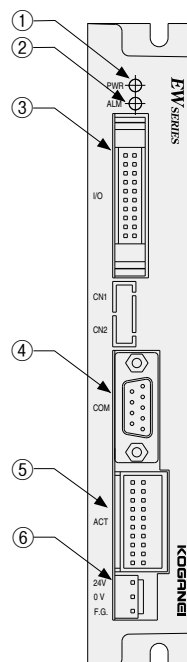
Mounting position	Screw size	Thread depth (mm)	Maximum tightening torque (N•m)
Slider tap hole	M3	4	0.63

*For the exterior dimension diagrams, see pages 34 and 35.

Chapter 4 Controller

4-1 Appearance and functions

- 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 COM connector
This is the connector for connecting to the RS-232C terminal on a personal computer, or the teaching box, etc.
- ⑤ ACT connector
This is the connector for connecting to the main unit.
- ⑥ Power connector
Connects the supplied power cable to supply 24 VDC.



4-2 Installation and connection to external devices

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

4-2-1 Controller installation

(1) Installation

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

(2) 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 the power supply with a capacity of 24 VDC \pm 10% and 0.6 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.

Caution:

- **The EWHC-NH 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.

4-2-4 Connecting the communication unit

- The EWHC-NH can be connected to equipment, such as a personal computer, that has an RS-232C interface.
- To connect to a personal computer, connect the RS-232C connector (9 pins) of the dedicated cable to the controller's connector.

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.

NO.	Signal name	Description	NO.	Signal name	Description
A1	A+	Motor output A+	B1	B+	Motor output B+
A2	A-	Motor output A-	B2	B-	Motor output B-
A3	FG	Frame ground	B3	N.C.	N.C.
A4	COM1 (24V)	COM 24V	B4	COM2 (24V)	COM 24V
A5	N.C.	N.C.	B5	N.C.	N.C.
A6	FG	Frame ground	B6	GND 5V	Ground (5V)
A7	DV+	Encoder power supply+	B7	DV-(GND 5V)	Encoder power supply-
A8	EA+	Encoder signal A+	B8	EA-	Encoder signal A-
A9	EB+	Encoder signal B+	B9	EB-	Encoder signal B-
A10	EC+	Encoder signal C+	B10	EC-	Encoder signal C-

4-2-6 Connecting the I/O connector

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

4-3 I/O interface

4-3-1 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	RDY	Preparation completed output	10	Black	BUSY	Command execution in progress output
11	Brown	INPOS	Positioning completed output	12	Red	HOLD	Pushing completed output
13	Orange	24G	- common	14	Yellow	24G	- common
15	Green	24V GND	Ground	16	Blue	24V IN	24-V input
17	Purple	POS5	Point setting	18	Gray	24V	+24V
19	White	FG	Frame ground	20	Black	FG	Frame ground

4-3-2 Details of input signals

There are 9 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 and BUSY 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.

■ START

From the current position, the tooling moves by the data of the point no. specified from POS0 to POS5.

Caution:

To execute START, it is necessary to confirm the entry states of POS0 to POS5.

■ ORG

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

Caution:

If the actuator unit was changed while being used, first initialize the origin position data (INIT ORG), and then execute return to origin. (See P. 26)

■ 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 personal computer, and no return to origin command can be executed.

■ POS0 to POS5

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

Point No. \ POS No.	POS5 (2 ⁵)	POS4 (2 ⁴)	POS3 (2 ³)	POS2 (2 ²)	POS1 (2 ¹)	POS0 (2 ⁰)
P0	OFF	OFF	OFF	OFF	OFF	OFF
P1	OFF	OFF	OFF	OFF	OFF	ON
P3	OFF	OFF	OFF	OFF	ON	ON
P7	OFF	OFF	OFF	ON	ON	ON
P15	OFF	OFF	ON	ON	ON	ON
P31	OFF	ON	ON	ON	ON	ON
P63	ON	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)

When the controller system is operating normally, this output is set to ON. If an alarm is issued, this output is set to OFF and the motor enters a free state.

■ Command execution in progress output (BUSY)

This signal is set to ON when a dedicated command is being executed or when a command from a personal computer is being executed. This signal is ON whenever a dedicated command input is accepted. As a result, when the BUSY signal is ON, the controller cannot accept other dedicated command inputs or commands from a personal computer.

Caution:

Always turn off dedicated commands 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 whenever 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.

■ Pushing operation completed output (HOLD)

When a dedicated command input is accepted, this signal temporarily turns OFF, and turns ON when the push operation execution process is completed normally. If an error occurs during execution, or if STOP has been 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 example connections. Refer to this example when connecting to the programmable controller or other external equipment.

(1) Input/output circuit specifications

○ Input power supply

Input voltage : 24 V \pm 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

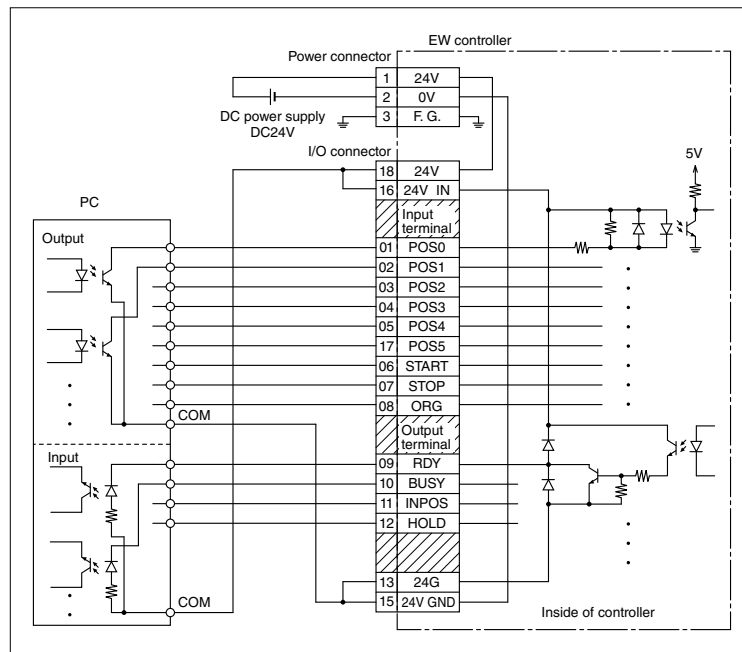
Output terminals : NPN open collector output for all output common terminals (0V side)

Output response : 1 ms or less

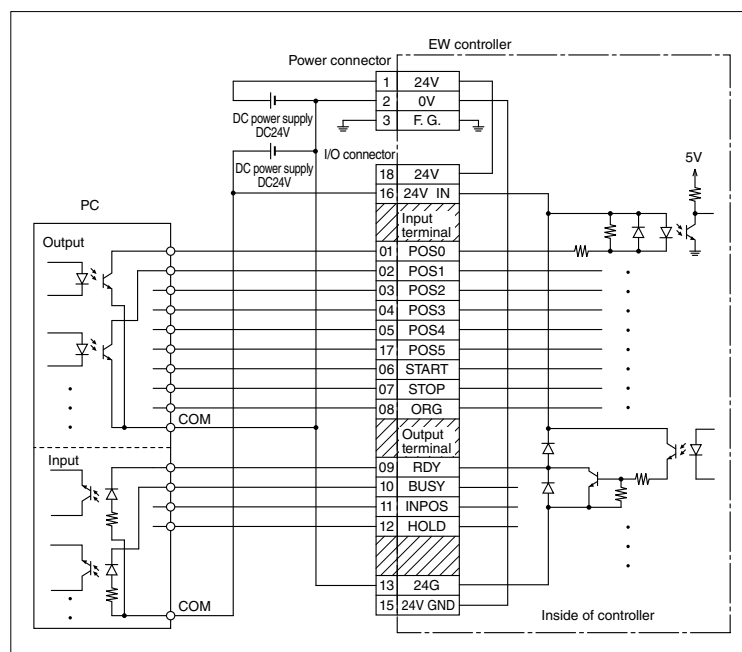
Maximum output current : 30 mA/24 VDC per 1 output

Residual ON voltage : 1.5 V or less

(2) Wiring system when using the controller's internal power supply



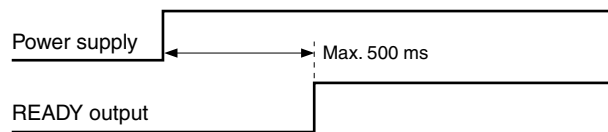
(3) Wiring method when a separate power supply is used without using the controller's internal power supply



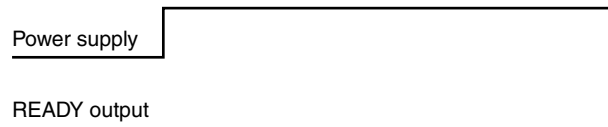
4-3-5 Timing chart

(1) When the power is turned on

Normal condition



Alarmed condition



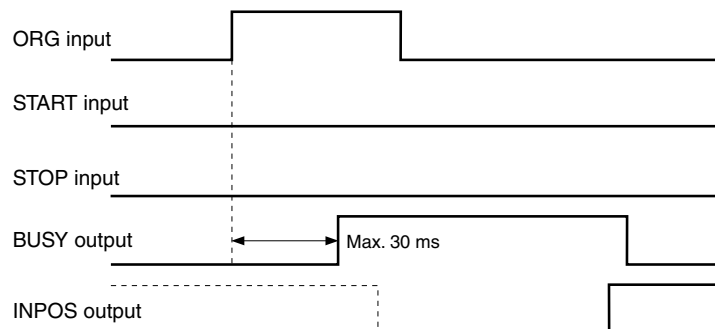
Before inputting a dedicated command, check that the READY output is turned ON after the power has been supplied.

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.

(2) Execution of custom command

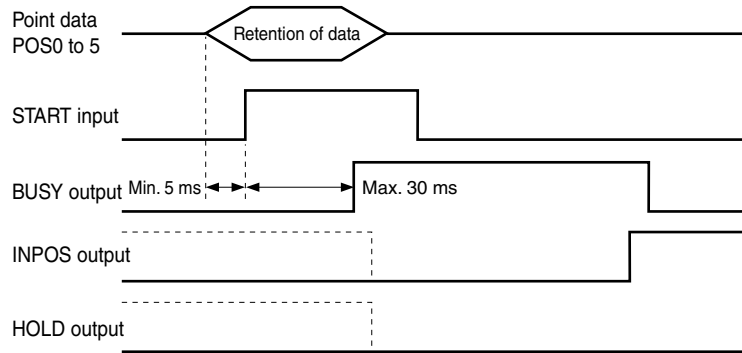
- When a dedicated command is received, the BUSY output turns ON. Whether the BUSY output turns off determines whether the command has ended normally.
- Always use pulse inputs for dedicated commands. Leaving input ON prevents BUSY output from turning OFF even after execution of a command has been completed.

1. When returning to origin



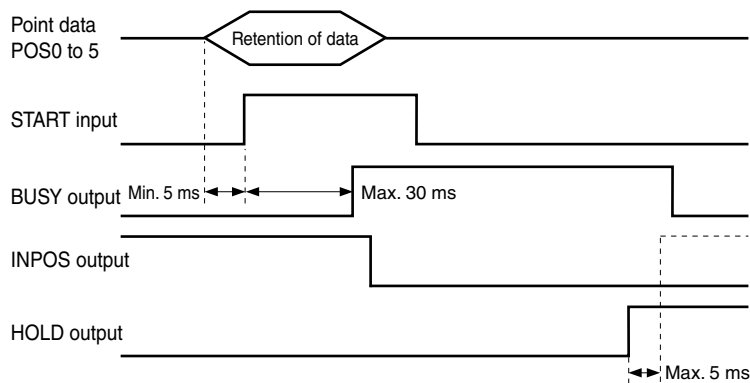
- ① After ORG input is turned ON, the BUSY output is turned ON.
- ② After confirming that BUSY output has turned ON, the ORG input is turned OFF (contact is opened).
- ③ Waits until BUSY output is turned OFF.
- ④ When BUSY output is turned OFF, INPOS output is ON, and this means that the operation has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

2. Positioning mode, for A, I



- ① Input point data in POS0 to POS5. 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 5ms, 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.

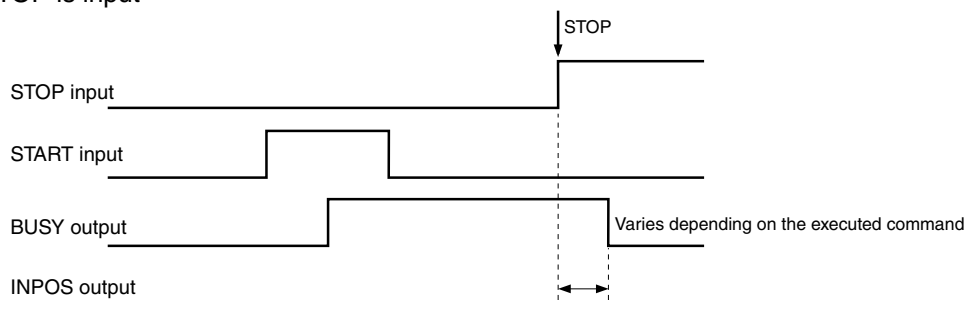
3. Pushing mode, for U, C, O



- ① Input point data in POS0 to POS5. 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 5ms, 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.

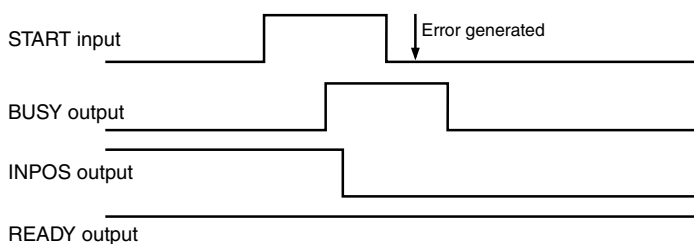
* When the size detecting function is effective, and the workpiece is pushed within the setting range, INPOS output turns ON within 5 ms after HOLD output turns ON.

4. When STOP is input



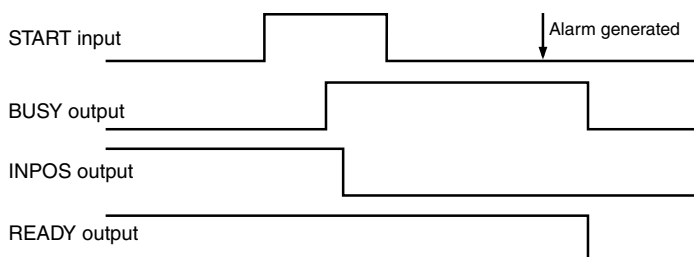
When inputting STOP input during execution of a command, BUSY output turns OFF. The READY output remains unchanged.

5. When an error has occurred



■ With the READY output is in the ON state, the BUSY, INPOS, and HOLD outputs are in the OFF state.

6. When an alarm is issued



■ The READY, BUSY, INPOS, and HOLD outputs all turn OFF.

4-4 Actuator number setting

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

Type	Actuator No.
EWM5S□A-20	30
EWM5S□A-40	31
EWM5H□A-20	32
EWM5H□A-40	33

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

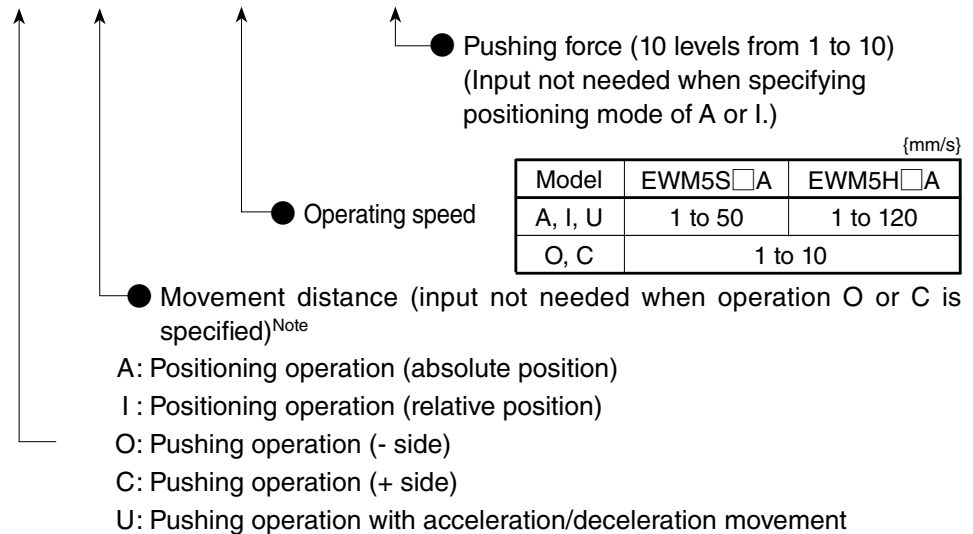
1. Using the communication command @INIT PRM. (See P. 26.)
2. Using the initialization command in the support software to initialize parameters.

(For details, see the support software Owner's Manual.)

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



Note) The side opposite to the origin return direction is the + direction.

4-5-1 Point setting method

Point editing is performed via the RS232C port, on either a personal computer or the teaching box. For the communication parameters and cable specifications, see section “4-7 Communication with a personal computer” on P. 18.

Editing of parameters 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.

Use the communication command @WRITE PNT to edit.

@WRITE PNT

Personal computer side

@WRITE PNT c/r l/f

P0 = A, 10.00, 50 c/r l/f

P1 = I, 3.00, 50 c/r l/f

P2 = C, 10, 10 c/r l/f

^Z

Controller side

READY c/r l/f

OK c/r l/f

After editing, use the communication command @READ PNT to check the point data.

Transmission example @READ PNT c/r l/f

Response P0 = A, 10.00, 50 c/r l/f

P1 = I, 3.00, 50 c/r l/f

P2 = C, 10, 10 c/r l/f

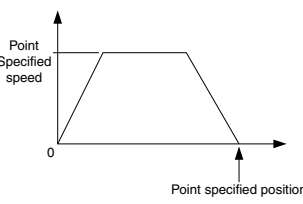
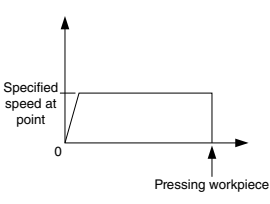
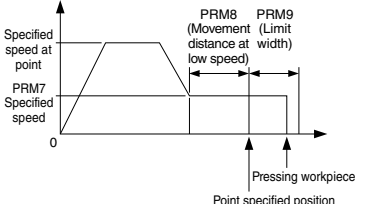
P5 = O, 5, 5 c/r l/f

P6 = U, 2.00, 40, 8 c/r l/f

OK c/r l/f

Reads all data that has been entered.

● NS slider operation mode

Mode	Positioning		Pushing ^{Note}		Pushing with acceleration/deceleration movement
	Moves to the specified point with acceleration/deceleration, and then stops.		Operates at constant speed, and pushes at the set force.		Performs pushing operation 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 point specified position	Operates to + side	Operates to - side	Moves to the specified point, and performs pushing operation at the speed set in PRM7 from the distance forward the point set in PRM8
Operation pattern					
Remarks	—		—		Suitable for soft pushing with high cycle operation.

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

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

- With the above settings, the size detecting function activates from the next pushing operation (in O, C, and U modes).
(A and I modes are not supported.)
- When doing the settings, use communication commands to specify the pushing direction. (C: + direction, O: - direction)
- When the workpiece is pushed and HOLD turns ON, when within the range of the minimum sample dimensions (bmin) < workpiece dimensions (b) < maximum sample dimensions (bmax), INPOS turns ON, while at all other times INPOS remains in the OFF state.

Caution 1: When the minimum sample dimension = maximum sample dimension, or when the minimum sample dimension > maximum sample dimension, the size detecting function becomes invalid.

Caution 2: Set the value of PRM31 and PRM32 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.)

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

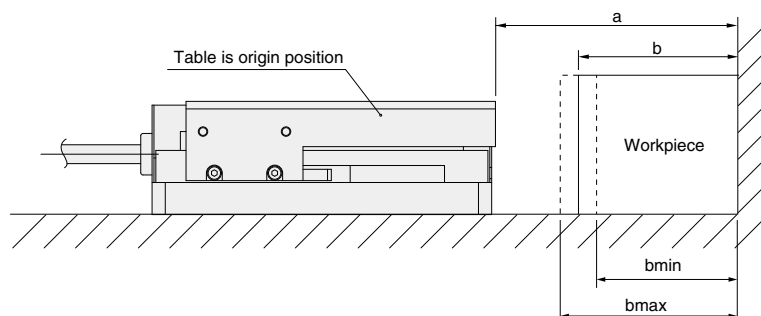
Procedure	Example of communication command	Remarks
① Input the pushing position when pushing the minimum sample.	@WRITE PRM PRM32=500 ^Z	The pushing position of the minimum sample is assumed to be 5 mm.
② Input the pushing position when pushing the maximum sample.	@WRITE PRM PRM31=450 ^Z	The pushing position of the maximum sample is assumed to be 4.5 mm.
③ Activate the size detecting function.	@WRITE PRM PRM33=1 ^Z	PRM33 = 0 deactivates the size detecting function.

Caution 1: The values written in PRM31 and 32 are not workpiece dimensions. Instead, they are the pushed positions when pushing the workpiece. Input values based on calculations of the workpiece dimensions and the table position after executing return to origin, or input values based on the confirmed movement distance when pushing the workpiece (at @?POS).

Caution 2: When the minimum sample dimension = maximum sample dimension, or when the minimum sample dimension > maximum sample dimension, the size detecting function becomes invalid.

Caution 3: Set the value of PRM31 and PRM32 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.)

[Method for calculation of the movement distance]



a: Table position after return to origin
b: Workpiece dimension
bmin: Minimum sample dimension
bmax: Maximum sample dimension
Pushing position = a - b

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

4-7 Communication with personal computer

4-7-1 Communication parameter specifications

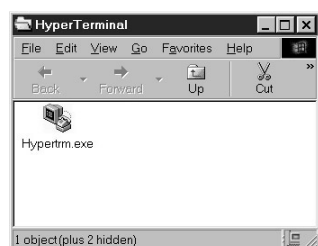
Set the communication parameter settings for a personal computer and other external equipment in the following manner. For the setting methods, see the User's Manual for each machine.

■ Transmission rate	9600 bps
■ Data bit length	8 bits
■ Stop bit length	1 bit
■ Parity check	On
■ Parity setting, Odd parity	(ODD)
■ Control method (X parameter)	XON/XOFF software control method (Effective)
■ Communication method	Full duplex
■ Synchronous method	Asynchronous method
■ Return key transmission	CR code
■ CR code reception	For CR/LF reception Return + line feed CR reception Return

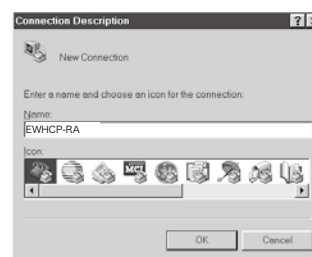
Setting method for Hyperterminal, as standard with Windows 95 to Windows XP*

*Windows is the registered trademark of the U.S. Microsoft Corp.

1. Double-click on Hyperterm.exe.



2. Enter name, select icon and click "OK."



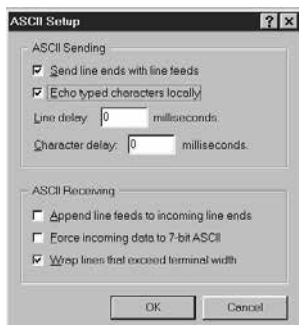
3. For the connection method, select "Direct to Com1" and click "OK."



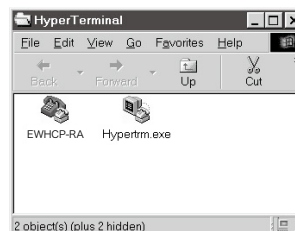
4. Set the port and click "OK."



5. Click the "File," "Properties," and select "ASCII Setup," and then add a check mark as shown in the figure at right, and click "OK."



6. When starting up for the second time or later, double-click on the icon of the newly created file.



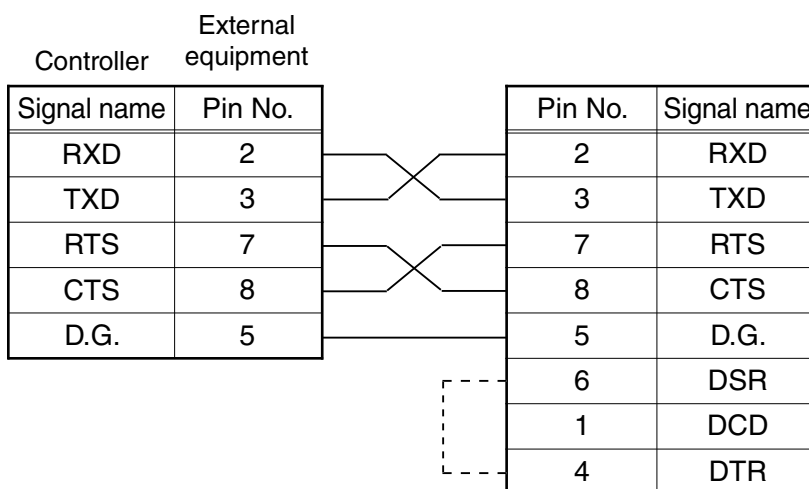
Note: If you want to input commands on Windows 7 or later, do the operations in the "Free Command Transmission Window" of the support software.

4-7-2 Communication cable

Applicable connector model

Applicable connector part No. : XM2D-0901 (OMRON-made) or equivalent products

Applicable connector cover part No.: XM2S-0911 (OMRON-made) or equivalent products



4-7-3 Communication commands

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

Communication commands are divided into the following 4 categories.

1. Robot language
2. Data handling
3. Utilities
4. Special codes

With the exception of the special codes, the format for communication commands is as follows.

@<Operation code>[<Operand 1>][,<Operand 2>][,<Operand 3>][,<Operand 4>]c/r l/f

- Basically, communication commands are executed by sending 1 line that begins with the start code '@' (=40H) and ends with the code c/r (=0DH) l/f (=0AH) to the controller. The special codes, however, do not require the start code and c/r l/f.
- Communication commands are composed of operation codes and operands. Depending on the command, either no operand is used or up to a maximum of 4 operands are used.
The brackets [] refer to items that can be omitted.
- The character codes used are the JIS8 level codes (ASCII codes with katakana characters added). Input characters can be either capital letters or lower case letters.
- At least 1 space must be inserted between the operation code and the operand.
- Items with the < > mark (angle brackets) in the operand should be specified by the user. Check the details of each communication command, and enter appropriate data. (See sub-section "4-7-4 List of communication commands" on P. 20.)
- When entering 2 or more operands, insert a comma (,) between them.

4-7-4 List of communication commands

Classification	Command	Operand 1	Operand 2	Operand 3	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 pushing operation
	MOVP	Point No.			Moves to the specified point
	GMIN	Pushing direction	Speed (mm/s)	Force	Sets position to push minimum sample for size detecting function
	GMAX	Pushing direction	Speed (mm/s)	Force	Sets position to push maximum sample for size detecting function
	X+				(+) movement by specified distance
	X-				(-) movement by specified distance
	XINC				(+) movement at constant speed
	XDEC				(-) movement at constant speed
	SRVO	Switch			Energizes motor
Data handling	?POS				Reads current position
	?PNO				Reads current point No.
	?PRM	Parameter No.			Reads specified parameter
	?P	Point No.			Reads specified point data
	?ORG				Confirms return to origin
	?SRVO				Confirms motor energized state
	?VER				Reads version number
	READ	PNT			Reads all point data
		PRM			Reads all parameters
		DIO			Reads I/O states
		ERR			Reads error history records
	WRITE	PNT			Writes all point data
		PRM			Writes all parameters
	PDEL	Point No.	Number of points		Deletes point data
Utilities	INIT	PNT			Initializes all point data
		PRM	Actuator No.		Initializes all parameters
		ORG			Initializes origin position data
		ERR			Initializes error history

Classification	Code	Command description
Special code	^C(=03H)	Interrupts ORG, XINC, XDEC
	^Z (=1AH)	Ends data transmission

Classification	Response	Description
Response from controller	OK	Normal completion of operation
	NG	Error generated
		Contents of error at next line (within 20 characters)
	STOP	Stop command
		Reason for stop at next line (within 20 characters)
	READY	Completion of writing preparation

4-7-5 Details of communication commands

(1) **@ORG**

Function	Return to origin.
Format	@ORG c/r l/f
Transmission example	@ORG c/r l/f
Response	OK c/r l/f

(2) **@MOVD**

Function	Performs positioning to the specified position (absolute position of origin reference) at the specified speed.
Format	@MOVD position, speed c/r l/f
Transmission example 1	@MOVD 3.5, 50c/r l/f
Response	OK c/r l/f
Explanation	Moves at speed of 50 mm/s to the 3.5 mm position from the origin.

Transmission example 2 @MOVD 50,100 c/r l/f

Response NG c/r l/f
23: Data error c/r l/f

Explanation Data beyond the limit of the software cannot be entered.

(3) **@MOVH**

Function	Performs pushing operation at the specified speed and pushing force in direction to the specified position (absolute position of origin reference). (Mode U operation, see P. 16.)
Format	@MOVH position, speed, force c/r l/f
Transmission example 1	@MOVH 3.5, 35, 6 c/r l/f
Response	OK c/r l/f
Explanation	This command performs the pushing operation to the 3.5 mm position from the origin at 35 mm/s speed with a pushing force of 6.
Transmission example 2	@MOVH 3.5, 30, 6 c/r l/f
Response	NG c/r l/f 64: Stop limit c/r l/f
Explanation	This means that the pushing was unable to be performed.

(4) **@MOV P**

Function	Operates by using the specified POS No. data.
Format	@MOV P point No. c/r l/f
Transmission example 1	@MOV P 2 c/r l/f
Response	OK c/r l/f
Explanation	Performs operation specified at POS2.
Transmission example 2	@MOV P 12 c/r l/f
Response	NG c/r l/f 52: No point data c/r l/f
Explanation	No data at the point specified by POS12, causing an error.

(5) **@GMIN (@GMAX)**

Function	Sets the pushing position for the minimum sample (maximum sample) when using the size detecting function.
Format	@GMIN pushing direction, speed, pushing force c/r l/f
Transmission example	@GMIN C, 35, 10 c/r l/f
Response 1	OK c/r l/f
Explanation 1	This means normal pushing, and setting complete.
Response 2	NG c/r l/f 64: Stop limit c/r l/f
Explanation 2	This means that the pushing was unable to be performed. The setting failed.

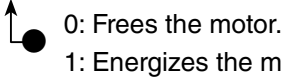
(6) @X+(@X-)

Function	Moves by only the specified distance to + side (- side) at the speed shown below. Movement distance = PRM25/100 [mm] Moving speed = PRM24 [mm/s]
Format	@X+ c/r l/f
Transmission example	@X+ c/r l/f
Response	OK c/r l/f

(7) @XINC (@XDEC)

Function	Moves continuously at the speed shown in the following equation to + side (- side). Stops when ^C is input or the tooling reaches the software limit. Moving speed = PRM24 [mm/s]
Format	@XINC c/r l/f
Transmission example	@XINC c/r l/f
Response 1	STOP c/r l/f 63: Stop command c/r l/f
Response 2	STOP c/r l/f 64: Stop limit c/r l/f

(8) @SRVO

Function	Commands either for turning on the motor and performing feedback control, or for turning off the motor.
Format	@SRVO switch c/r l/f <div style="display: inline-block; vertical-align: middle; margin-left: 10px;">  </div>
Transmission example	@SRVO 1 c/r l/f
Response	OK c/r l/f

(9) @?VER

Function	Checks the controller software version number
Format	@?VER c/r l/f
Transmission example	@?VER c/r l/f
Response	1.01 c/r l/f OK c/r l/f

(10) @?POS

Function	Reads the current position.
Format	@?POS c/r l/f
Transmission example	@?POS c/r l/f
Response	5.67 c/r l/f Current position is 5.67 mm from the origin OK c/r l/f

(11) @?PNO

Function	Reads the current point no.
Format	@?PNO c/r l/f
Transmission example	@?PNO c/r l/f
Response	2 c/r l/f Point no. is 2 OK c/r l/f

(12) @?PRM

Function	Reads the specified parameter.
Format	@?PRM parameter no. c/r l/f
Transmission example	@?PRM 25 c/r l/f
Response	100 c/r l/f OK c/r l/f

(13) @?P

Function	Reads the specified point data.
Format	@?P point no. c/r l/f
Transmission example	@?P 10 c/r l/f
Response	A, 5.00, 35 c/r l/f ····· Absolute position of 5 mm, speed of 35 mm/s OK c/r l/f
Explanation	For the contents of the response data, see P.15.

(14) @?ORG

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

(15) @?SRVO

Function	Can confirm the motor energized state.
Format	@?SRVO c/r l/f
Transmission example	@?SRVO c/r l/f
Response 1	0 c/r l/f ····· De-energized state OK c/r l/f
Response 2	1 c/r l/f ····· Energized and feedback controlled OK c/r l/f

(16) @READ PNT

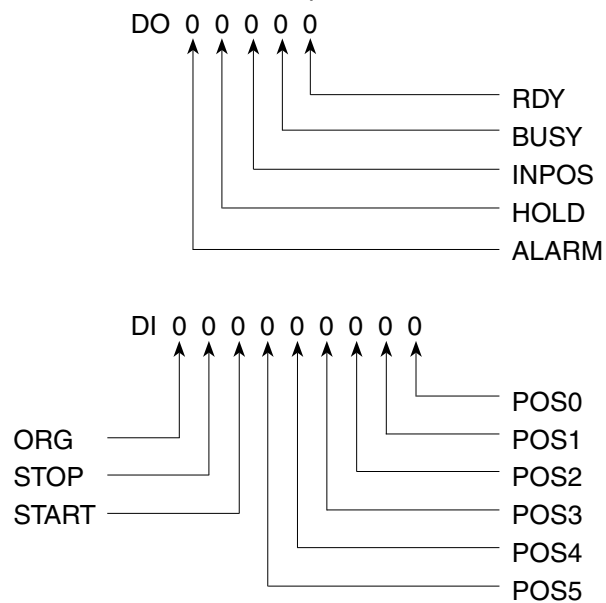
Function	Reads all point data.
Format	@READ PNT c/r l/f
Transmission example	@READ PNT c/r l/f
Response	P0 = A, 6.00, 15, 0 c/r l/f P1 = U, 3.00, 35, 8 c/r l/f P2 = A, 6.00, 5, 0 c/r l/f P5 = C, 20, 5 c/r l/f OK c/r l/f Reads all data that has been entered.
Explanation	For the contents of the response data, see P.15.

(17) @READ PRM

Function	Reads all parameter data.
Format	@READ PRM c/r l/f
Transmission example	@READ PRM c/r l/f
Response	PRM0=30 c/r l/f PRM1 = 2000 c/r l/f PRM2 = -20 c/r l/f • • PRM63 = 10 c/r l/f OK c/r l/f

(18) @READ DIO

Function	Reads custom input/output status.
Format	@READ DIO [Address] c/r l/f
Transmission example	@READ DIO c/r l/f
Response	DO 0000 c/r l/f DI 000000000 c/r l/f OK c/r l/f
Explanation	Contents of response data are shown below.



(19) @READ ERR

Function	Reads error history records. (Up to the latest 16 records. The latest record is added to the bottom line.)	
Format	@READ ERR c/r l/f	
Transmission example	@READ ERR c/f l/f	
Response	32: Origin return not completed c/r l/f 01: Overload c/r l/f 03: Overheat c/r l/f OK c/r l/f	

(20) @WRITE PNT

Function	Writes point data	
Format	@WRITE PNT c/r l/f	
Transmission example	Personal computer side	Controller side
	@WRITE PNT c/r l/f	
	P0 = A, 6.00, 35 c/r l/f	READY c/r l/f
	P1 = U, 3.00, 15, 8 c/r l/f	
	^Z	
		OK c/r l/f
Explanation	For the data format, see P.15.	

(21) @WRITE PRM

Function	Writes parameters.	
Format	@WRITE PRM c/r l/f	
Transmission example	Personal computer side	Controller side
	@WRITE PRM c/r l/f	
	PRM1 = 1500 c/r l/f	READY c/r l/f
	PRM2 = 0 c/r l/f	
	^Z	
		OK c/r l/f
	Sends only data that requires changes.	

(22) @PDEL

Function	Deletes point data from the specified "Point No." by the number shown as "number of points."	
Format	@PDEL, point no., number of points c/r l/f	
Transmission example	@PDEL 10, 5 c/r l/f	
Response	OK c/r l/f	

(23) @INIT PNT

Function	Deletes all point data.
Format	@INIT PNT c/r l/f
Transmission example	@INIT PNT c/r l/f
Response	OK c/r l/f

(24) @INIT PRM

Function Resets parameters to their initial values.
 Format @INIT PRM actuator No. c/r l/f
 Transmission example @INIT PRM 30 c/r l/f
 Response OK c/r l/f

* 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.
 When executing INIT PRM, the origin position data is also initialized.

Type	Actuator No.
EWM5S□A-20	30
EWM5S□A-40	31
EWM5H□A-20	32
EWM5H□A-40	33

(25) @INIT ORG

Function Initializes the origin position data. Execute this command when the
 actuator unit was replaced during use.
 Format @INIT ORG c/r l/f
 Transmission example @INIT ORG c/r l/f
 Response OK c/r l/f

(26) @INIT ERR

Function Deletes all error history.
 Format @INIT ERR c/r l/f
 Transmission example @INIT ERR c/r l/f
 Response OK c/r l/f

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.

This section describes how to change and set the parameters, and gives details of each parameter.

Safety

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

When the controller was shipped with the actuator as a set, the controller parameters had already been initialized to match the then shipped actuator, but in any case other than that, first set the actuator No. in accordance with the actuator being used, before operating the controller (See P. 14) 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

Parameter editing is performed via the RS232C port on the personal computer. For communication parameters and cable specifications, see section “4-7 Communication with a personal computer” on P. 18.

The editing parameter is carried out by using general-purpose communication software or dedicated support software.

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

Parameter edit commands

@WRITE PRM

Function	Writes parameters.		
Format	@WRITE PRM c/r l/f		
Transmission example	Personal computer side	Controller side	
	@WRITE PRM c/r l/f	READY c/r l/f	
	PRM1 = 1500 c/r l/f		
	PRM2 = 0 c/r l/f		
	^Z		
		OK c/r l/f	
	Sends only data that requires changes.		

After editing, read and check the parameter data.

@READ PRM

Function	Reads all parameter data.		
Format	@READ PRM c/r l/f		
Transmission example	@READ PRM c/r l/f		
Response	PRM0 = 30 c/r l/f		
	PRM1 = 1500 c/r l/f		
	PRM2 = 0 c/r l/f		
	•		
	•		
	PRM63 = 10 c/r l/f		
	OK c/r l/f		

4-8-2 Explanation of parameters

PRM0 : Actuator No.

Displays the actuator No. This parameter is only for reading.

PRM1 : (+) software limit

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

For safety, always set a suitable value.

Input range 0 to 9999 (×0.01 mm)

Initial value

Actuator No.	30	31	32	33
Initial value	2000	4000	2000	4000

PRM2 : (-) software limit

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

For safety, always set a suitable value.

Input range -9999 to 0 (×0.01 mm)

Initial value -20

PRM4 : Acceleration

Sets the acceleration. When lower acceleration is required, change this parameter.

Input range 1 to 100 (%)

Initial value 100

PRM5 : Origin return direction

Sets the origin return direction.

Input range 0, 1

Meaning 0: Cable side, 1: Opposite cable side

Initial value 0

PRM7 : Pushing speed

Sets the pushing speed in the U mode.

Input range 1 to 10 (mm/s)

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 P. 15.)

Input range 1 to 9999 (×0.01 mm)

Initial value 200

PRM9 : Limit width

Sets the range where pushing is performed from the position specified in the U mode.

(See P. 15.)

When the movement distance exceeds the limit width during pushing operation, an alarm is issued.

Input range 1 to 9999 (×0.01 mm)

Initial value 200

PRM10: Origin return speed

Sets the speed when returning to origin.

Input range 1 to 15 (mm/s)

Initial value 5

PRM22: Selecting English or Japanese

Sets the language used for response messages in communications.

Input range 0, 1

Meaning 0: English 1: Japanese

Initial value 1

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.

Input range 1 to 15 (mm/s)
Initial value 5

PRM25: Movement unit when teaching

Sets the movement amount by the communication command @X+, or @X-.

Input range 1 to 9999 (×0.01 mm)
Initial value 10

PRM26: Pushing force during teaching movement

Sets the pushing force during movement by the communication command @X+, @X-, @XINC, or @XDEC.

Input range 1 to 10
Initial value 5

PRM30: Maximum speed

Sets the maximum speed when the communication commands (@MOVD, or @MOVH), or the custom command START signal is input.

Input range 1 to 100 (%)
Initial value 100

$$\text{Maximum speed during execution} = \frac{\text{Command setting speed} \times \text{PRM30}}{100} \text{ (mm/s)}$$

PRM31: Maximum sample pushing position

Sets the pushing position when pushing a maximum sample when using the size detecting function.

Input range -4000 to 4000 (×0.01 mm)
Initial value 0

PRM32: Minimum sample pushing position

Sets the pushing position when pushing a minimum sample when using the size detecting function.

Input range -4000 to 4000 (×0.01 mm)
Initial value 0

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

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 to the position 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 as this parameter, a quick recovery is possible without taking the time to re-teach.

Input range -32768 to 32767 (×0.01 mm)
Initial value 0

PRM36: Origin shift speed

Sets the speed for origin shift.

Input range 1 to 15 (mm/s)
Initial value 5

4-9 Message list

4-9-1 Error messages

(1) Command related

Error No.	Item	Description
21	Message	Typing mistake
	Cause	Command is not correct
	Countermeasure	Input a correct command
23	Message	Data error
	Cause	Error in the numerical data
	Countermeasure	Correct the data
24	Message	Overrun error
	Cause	Error in the transferred data
	Countermeasure	Send the correct command
25	Message	Framing error
	Cause	Error in the transferred data
	Countermeasure	Send the correct command

(2) Operation related

Error No.	Item	Description
31	Message	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	Message	Origin incomplete
	Cause	Command cannot be executed because the origin return has not been completed
	Countermeasure	Execute origin return
34	Message	Motor free
	Cause	Command cannot be executed because the motor is in a free state
	Countermeasure	Return the motor to normal.
35	Message	Can't execute
	Cause	The parameter contradicts the operation command
	Countermeasure	Change the parameter or point data
37	Message	Limit exceeded
	Cause	The position to be moved to exceeds the software limit
	Countermeasure	Edit the point data.

(3) System related

Error No.	Item	Description
52	Message	No point data
	Cause	No data has been registered at the specified point number
	Countermeasure	Register the point data
53	Message	No actuator type
	Cause	Actuator type number setting is incorrect
	Countermeasure	Redo the initialization using actuator numbers that support the various models
56	Message	Data protected
	Cause	Protected parameters have been rewritten
	Countermeasure	Data that is protected cannot be rewritten
57	Message	No parameter
	Cause	Attempted to rewrite parameter numbers that are not registered as parameters
	Countermeasure	Rewrite with numbers that are registered as parameters
58	Message	Saving data
	Cause	Data that was being saved to memory was overwritten
	Countermeasure	Proceed after saving the data in memory

(4) Stop messages

Error No.	Item	Description
61	Message	Stop command
	Meaning	Stopped due to the stop command
63	Message	Stop input
	Meaning	Stopped due to a STOP input entered from I/O
64	Message	Stop limit
	Meaning	Stopped at the limit position

Chapter 5 Troubleshooting

5-1 If a problem occurs

When informing Koganei 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 NS slider 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.

```
<Alarm No.>: <Alarm message> c/r l/f
```

Checking the alarm content

To check the content of the alarm, use a communication cable to connect to a personal computer, and enter the @READ ERR command. (See P. 25.)

5-3-1 Alarm message list

Alarm No.	Alarm message	Meaning	Probable cause	Countermeasure
01	Overload	<ul style="list-style-type: none"> Excessive load Cable disconnected 	1) Problem with usage 2) Motor/encoder cable is broken or connection is defective 3) Mechanical lock 4) Pushing beyond the pushing range in U mode 5) Too much friction in the actuator unit	1) Reduce the acceleration 2) Inspect the cable continuity 3) Check whether or not the moving part of the actuator is in mechanical lock 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
03	Overheat	Rise in circuit temperature	1) Overcurrent 2) Shorted cable	Inspect the cables
04 ^{Note}	Power supply voltage drop	Input voltage is too low	Power supply	Increase power supply voltage
05	Power supply voltage high	Input voltage is too high	Power supply	Reduce power supply voltage
06	Cable disconnected	<ul style="list-style-type: none"> Excessive load during return to origin Cable disconnected 	1) Motor/encoder cable is broken or connection is defective 2) Mechanical lock	1) Inspect the cable continuity 2) Check whether or not the moving part of the actuator is in mechanical lock
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 drop may output an alarm message when the power (24 VDC) is turned off normally also. Furthermore, it is not recorded in the error history.

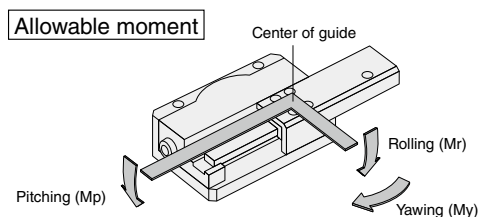
Chapter 6 Specifications

6-1 Basic specifications of main unit

Item \ Model		EWM5HSA·EWM5HLA	EWM5SSA·EWM5SLA
Motor		2-phase stepping motor	
Maximum thrust ^{Note 1}	N	18 to 27	42 to 65
Maximum payload ^{Note 2}	kg	1 (horizontal), 0.4 (vertical)	2 (horizontal), 0.8 (vertical)
Maximum speed	mm/s	120	50
Minimum operating time	s	0.25 (st.20), 0.42 (st.40)	0.50 (st.20), 0.90 (st.40)
Minimum speed	mm/s	1	
Repeatability of positioning accuracy	mm	±0.03	
Operating temperature range	°C	0 to 40	
Allowable moment	My (yawing) N·m	1	
	Mp (pitching) N·m	1	
	Mr (rolling) N·m	1.5	
Mass	kg	0.27 (st.20, short table type) , 0.30 (st.20, long table type) 0.35 (st.40, short table type) , 0.40 (st.40, long table type)	
Applicable controller		EWHC-NH	

Note 1: For details of the thrust, see the graphs on P. 38.

2: There is no function for holding while the power is off.

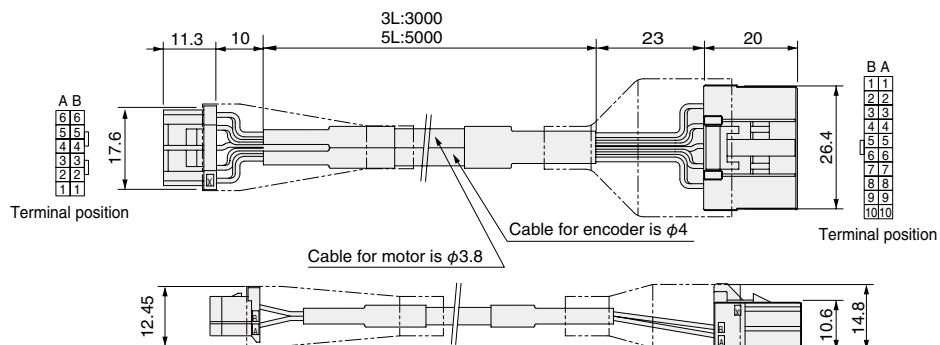


6-2 Basic specifications of the controller

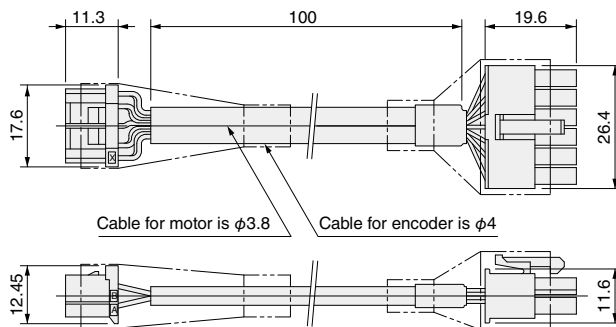
Item \ Model		EWHC-NH
Axis control	Motor drive method	Microstep drive
	Control method	Closed loop control
	Operating method	PTP, force control
	Origin detection method	Detection at the stroke end
	Location detection method	Encoder A, B phase output
	Minimum setting distance	0.01mm
External input/output	Acceleration setting	1 to 100%
	Point setting	64 points
	Point input method	Numeric input, teaching input, direct teaching
	Point setting input	6 inputs photocoupler reception, 5 mA TYP/1 input
	Control input	3 inputs (ORG, START, STOP) photocoupler reception, 5 mA TYP/1 input
	Control output	4 outputs (READY, BUSY, HOLD, INPOS), 30 mA MAX./1 output
	Abnormality detection output	Overload, disconnection, incorrect data, system abnormality
	External communications	RS232C 1ch (Communication with personal computer or teaching box)
General specifications	Motor drive output	Dedicated cable (with F.G.)
	Encoder input	Dedicated cable (with shielding)
	Mass	0.2kg
	Power supply	24 VDC±10%, 0.6 A MAX. (Motor and I/O share same power supply)
	Operating temperature	0 to 40°C
	Operating humidity	35 to 85% RH (no condensation)
	Storage temperature	-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

Cables (additional parts)

- Connecting cable

EWHKA- ☐

- Conversion cable^{Note}

EWTK

Note: Conversion cable is to be connected to the EWM5H ☐ A, EWM5S ☐ A, and EWHK- ☐ (old cable).

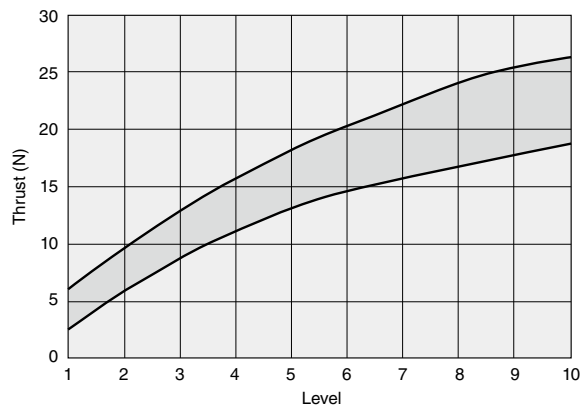
Chapter 8 Technical Data

8-1 Thrust range

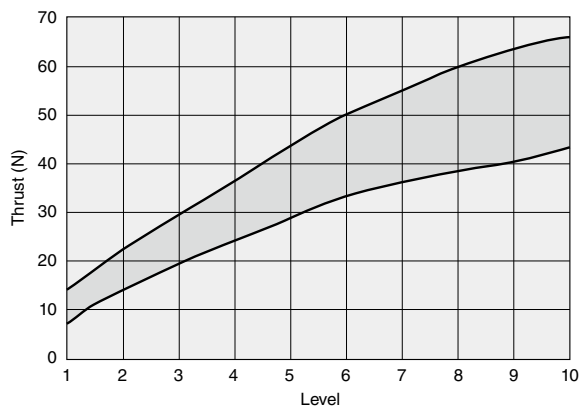
Forces are generated within the range shown in the graphs below at each set level.

Note that precision of the thrust repeatability at the same position is within 5%.

EWM5H□A



EWM5S□A



Revision History

Ver 2.0

Page 28 PRM31 Input range -1000 to 1000 changed to -4000 to 4000.
PRM32 Input range -1000 to 1000 changed to -4000 to 4000.

Ver.3.0

All pages Changed main unit models and relay cable models in line with changes to main unit connector specifications. Changed dimensions in diagrams of main unit.

Ver.3.1

All pages Changed internal wiring of controller, changed communication commands, changed error messages, changed alarm messages, changed connecting cables, changed thrust range.

Ver3.2

Page 17 Added Note in “4-6-2 When using direct input for size detecting function setting”
Added minimum sample dimensions and maximum sample dimensions to drawings in [Method for calculation of the movement distance].
Page 36 Added drawing of power cable EW2KP and DIN rail mounting plate EW2DP.

Ver.3.3

Page 16 Edited Note in “● NS slider operation mode”

Ver.3.4

Added CE compliance mark.

Page 33 General specifications of 「Controller Basic Specifications」 Noise resistance revised.

ELEWAVE SERIES NS Sliders

With point input type controller

OWNER'S MANUAL

Aug. 2022 Ver.3.4 X435044

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