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Date: January 16, 2008

Announcement

Subject: Renewal of Elewave Series

This is to inform you that we will renew Elewave series as follows.

Discontinuation model: Electric Actuators Elewave Series

Main body: EWHRT□ (Rotary Actuators), EWHA□ (Electric Hands)
EWM5□□ (NS Sliders)

Controller: EWHC-R (Controller for Rotary Actuators)

Cable: EWHK-□L (Catalog No. BK-C0024)

Discontinuation schedule: From March 1, 2008

Substitute model: Electric Actuators Elewave Series (Renewal products)

Main body: EWHRT□A (Rotary Actuators), EWHA□A (Electric Hands)
EWM5□□A (NS Sliders)

Controller: EWHC-RA (Controller for Rotary Actuators)

Cable: EWHKA-□L

Note1: The model code of EWHC-NH (Controller for NS Sliders and Electric Hands) is not changed but its case color will be changed (Blue → Silver gray)

Note2: As for other changing points of products, please refer to attached documents.

Please feel free to ask us for any questions.

Changing points of Elewave Series renewal

1. Model code will be changed

· Add "A" after model code of main body

· Example for change of model code

Products	Existing Model code	New Model code
Rotary Actuators main body	EWHRT3	EWHRT3 A
Electric Hands main body	EWHA12	EWHA12 A
NS Sliders main body	EWM5□S-20	EWM5□S A -20
Cable	EWHK-3L	EWHK A -3L

2. Detail of renewal

Items	Existing Model	New Model	Remarks
Outer appearance (Rotary)	Resin case 	Metal case 	Material of cover is changed from resin to metal.
Tube and connector (Common for All Elewave models)	Connector for existing model 	Connector for new model 	Down-sizing of the connector 
	Tube color: White 	Tube color: Black 	Change tube for wire protection In case of connecting new body to existing cable, conversion connector (EWTK) is necessary.
Controller	Blue color 	Silver gray color 	In accordance with changing color of actuator, color of the cover of controller is changed.

Elewave new & old conversion chart

How to check compatibility

Ex.) Controller model code "EWHC-NH(V2.00~) + EWHKA-□L" with main body model code "EWM5□□A"

When you see following compatibility chart, it is applicable because responding portion is marked "O"

Actuator model code	Actuator No.	Controller model (version) + Cable model			
		EWHC-H(~V1.01) + EWHK-□L	EWHC-H(V1.02~) + EWHK-□L	EWHC-NH(V2.00~) + EWHK-□L	EWHC-NH(V2.00~) + EWHK-□L
EWM5□□□	30, 31, 32, 33	O ^{Note1}	O ^{Note1}	O	X
EWM5□□A		O ^{Note1,2}	O ^{Note1,2}	O ^{Note2}	O

Note1: It is necessary to return the controller to manufacturer, to rewrite ROM data.

Note2: It is necessary to use with exchange cable "EWTk".

Responding column

•Explanation for each mark

When responding column is marked "O", it is applicable with the combination

When responding column is marked with "Note", it is applicable after adding parts, rewrite ROM data etc.

When responding column is marked "X" it is NOT applicable. Please contact us.

•Cautions

This new & old conversion chart is as of Jan 7, 2008

Existing model as of Jan 7, 2008 is shown with red color.

1. Electric Rotary Actuators

(1) Point data input type controller

Actuator model code	Actuator No.	Controller model (version) + cable model				Actuator cable length	RoHS responding
		EWC-R + EWHK-□L	EWHC-R + EWHK-□L	EWHC-RA + EWHKA-□L	EWHC-RS + EWHKA-□L		
EWR3	60	O	O	X	X	250mm	X
EWHRT3, 5, 10, 20	61, 62, 63, 64	X	O	X	X	100mm	O ^{Note3}
EWHRT3A, 5A, 10A, 20A	61, 62, 63, 64	X	O ^{Note2}	O	X	100mm	O
EWHRT40A, 60A	65, 66	X	O ^{Note1,2}	O	X	100mm	O
EWHRT1A	50	X	X	X	O	100mm	O

(2) Pulse input type controller

Actuator model code	Actuator No.	Controller model (version) + cable model			Actuator cable length	RoHS Responding
		EWHCP-R + EWHK-□L	EWHCP-RA + EWHKA-□L	EWHCP-RS + EWHKA-□L		
EWR3	60	X	X	X	250mm	X
EWHRT3, 5, 10, 20	61, 62, 63, 64	O	X	X	100mm	O ^{Note3}
EWHRT3A, 5A, 10A, 20A	61, 62, 63, 64	O ^{Note2}	O	X	100mm	O
EWHRT40A, 60A	65, 66	O ^{Note1,2}	O	X	100mm	O
EWHRT1A	50	X	X	O	100mm	O

Note1: It is necessary to return the controller to manufacturer, to rewrite ROM data.

Note2: It is necessary to use with exchange cable "EWTk".

Note3: Some were shipped without RoHS responding

2. Electric Hands

(1) Point data input type controller

Actuator model code	Actuator No.	Controller model (version) + cable model					Actuator cable length	RoHS responding
		EWC-H + EWHK-□L	EWHC-H(~V1.01) + EWHK-□L	EWHC-H(V1.02~) + EWHK-□L	EWHC-NH(V2.00~) + EWHK-□L	EWHC-NH(V2.00~) + EWHKA-□L		
EWH12	83	O	O	O	O	X	250mm	X
EWA12	83	O	O	O	O	X	250mm (100mm ^{Note3})	X
	84	O ^{Note1}	O	O	O	X	100mm	O
EWA24	85	X	O ^{Note1,2}	O ^{Note2}	O	X	100mm	O
EWA36	86	X	O ^{Note1,2}	O ^{Note2}	O	X	100mm	O
EWA12A	84	X	O ^{Note1,2}	O ^{Note2}	O ^{Note2}	O	100mm	O
EWA24A	85	X	O ^{Note1,2}	O ^{Note2}	O ^{Note2}	O	100mm	O
EWA36A	86	X	O ^{Note1,2}	O ^{Note2}	O ^{Note2}	O	100mm	O

(2) Pulse input type controller

Actuator model code	Actuator No.	Controller model (version) + cable model		Actuator cable length	RoHS responding
		EWHCP-NH(V1.00~) + EWHK-□L	EWHCP-NH(V1.00~) + EWHKA-□L		
EWH12	83	X	X	250mm	X
EWA12	83	X	X	250mm (100mm ^{Note3})	X
	84	O	X	100mm	O
EWA24	85	O	X	100mm	O
EWA36	86	O	X	100mm	O
EWA12A	84	O ^{Note2}	O	100mm	O
EWA24A	85	O ^{Note2}	O	100mm	O
EWA36A	86	O ^{Note2}	O	100mm	O

Note1: It is necessary to return the controller to manufacturer, to rewrite ROM data.

Note2: It is necessary to use with exchange cable "EWTk".

Note3: The cable length of the products manufactured after June 2005 is 100mm.

3. NS Sliders

(1) Point data input type controller

Actuator model code	Actuator No.	Controller model (version) + cable model				Actuator cable length	RoHS responding
		EWHC-H(~V1.01) + EWHK-□L	EWHC-H(V1.02~) + EWHK-□L	EWHC-NH(V2.00~) + EWHK-□L	EWHC-NH(V2.00~) + EWHK-□L		
EWM5□□□	30, 31, 32, 33	O ^{Note1}	O ^{Note1}	O	X	100mm	O
EWM5□□A		O ^{Note1,2}	O ^{Note1,2}	O ^{Note2}	O	100mm	O

(2) Pulse input type controller

Actuator model code	Actuator No.	Controller model (version) + cable model		Actuator cable length	RoHS responding
		EWHCP-NH(V1.00~) + EWHK-□L	EWHCP-NH(V1.00~) + EWHKA-□L		
EWM5□□□	30, 31, 32, 33	O	X	100mm	O
EWM5□□A		O ^{Note2}	O	100mm	O

Note1: It is necessary to return the controller to manufacturer, to rewrite ROM data.

Note2: It is necessary to use with exchange cable "EWTk".

4. Teaching Box

Model code	Version	Controller model						RoHS responding
		EWC-R + EWHK-□L	EWHC-R + EWHK-□L	EWHC-NH + EWHK-□L	EWHC-NH + EWHK-□L	EWHCP-R + EWHK-□L	EWHCP-R + EWHK-□L	
EWTB	Ver. 1.00	O	O ^{Note3}	O ^{Note2}	X	X	X	X
	Ver. 2.00	O	O	O ^{Note2}	X	X	X	X
EWHB	Ver. 1.00	X	O	O ^{Note2}	O ^{Note1}	O ^{Note1}	O ^{Note1}	O
	Ver. 2.00	X	O	O	O ^{Note1}	O ^{Note1}	O ^{Note1}	O
	Ver. 3.00	X	O	O	O ^{Note1}	O	O ^{Note1}	O
	Ver. 4.00	X	O	O	O	O	O	O

Note1: It is necessary to return the teaching box to manufacturer, to rewrite ROM data.

Note2: When connecting actuator is EWA12, it is available. When connecting actuator is EWA24, EWA36, it is not available.

Note3: It is available except for additional function of controller

Creceed Electric Actuators **ELEWAVE Series**

●NS Sliders ●Electric Rotary Actuators ●Electric Hands

Environmentally friendly
RoHS Compliant Product



New Variation

●NS Sliders
●Electric Hands EWA24 and 36



Electric Actuators ELEWAVE



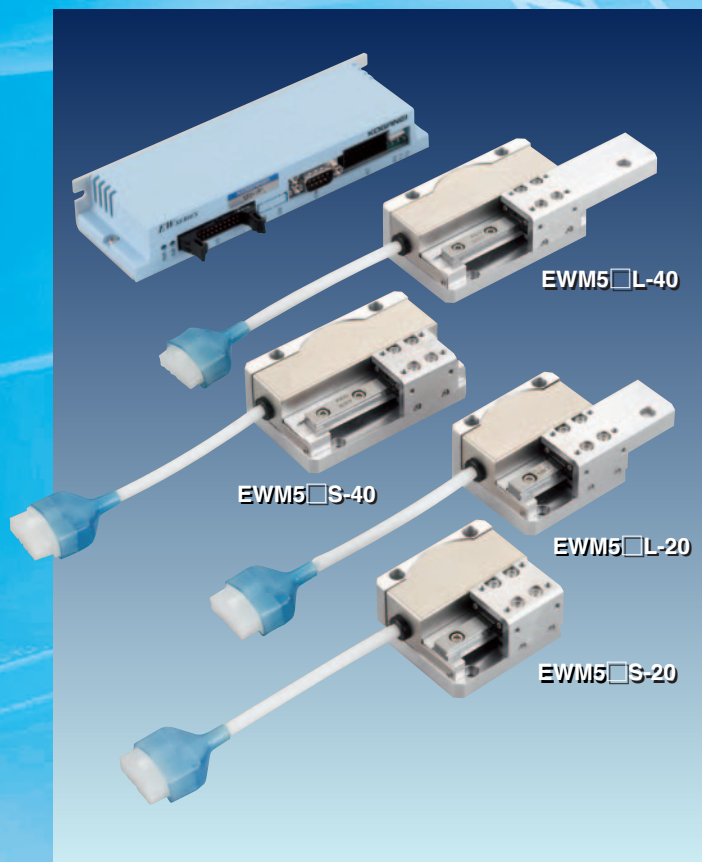
Environmentally friendly **RoHS** compliant product!

NS Sliders

NEW

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Compact, thin-type square actuators expand your creativity.

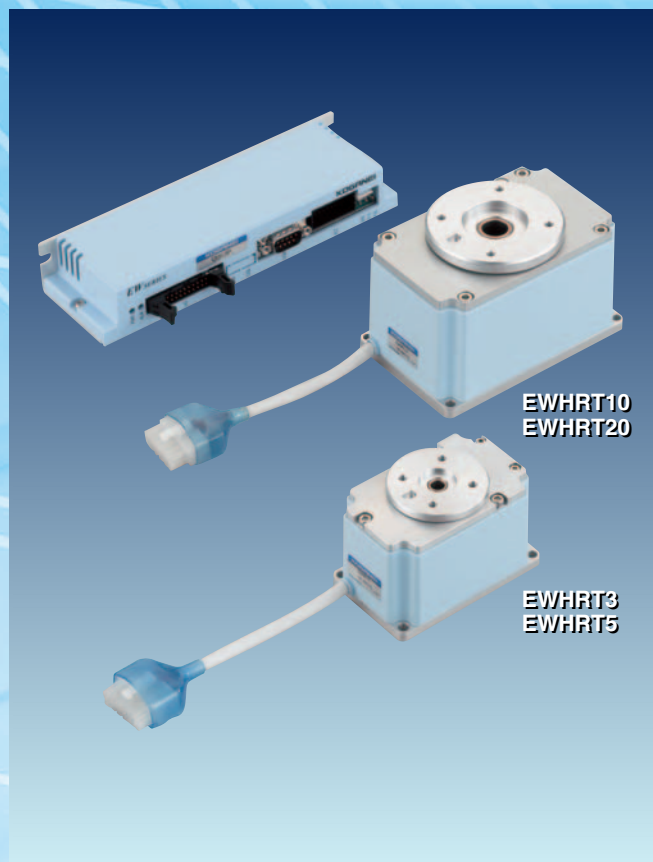


- High-speed type (120mm/s [4.72in./sec.]) and high-thrust type (50N [11.2lbf])
- Short stroke actuator minimizes dead space in stroke direction (st.20,40 [0.79, 1.57in.])
- Long table type selection available, suitable for push control
- Multipoint positioning operation available (64 points)
- Shockless start and stop
- Desired acceleration and deceleration (smooth, shockless operation even at low speed)
- Soft contact to workpiece through desired speed control
- Linear guide improves precision and rigidity
- Mode selection available for positioning and thrust control
- Stepping motor and encoder for force control and missed step detection
- Communication function enables push position sensing (with distance measurement function)
- 1 ● Output Judgment enables workpiece selection

Electric Rotary Actuators

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Table type Rotary Actuators with 4 torque capacity ranges (using hollow shaft)



0.25N·m [2.2in·lbf], 0.5N·m [4.4in·lbf], 1.0N·m [8.9in·lbf], 2.0N·m [17.7in·lbf]
Shaft thru hole diameter $\phi 6$ [0.236in.], $\phi 12$ [0.472in.]

- High precision, high resolution positioning (Koganei's unique construction eliminates backlash)
- Stepping motor and missed step detection encoder
- Desired swing angle setting (64 points)
- Shockless start and stop
- Desired acceleration and deceleration (smooth, shockless operation even at low speed)
- Continuous operation in the same direction
- Brake attachment (optional)

Series



Caution

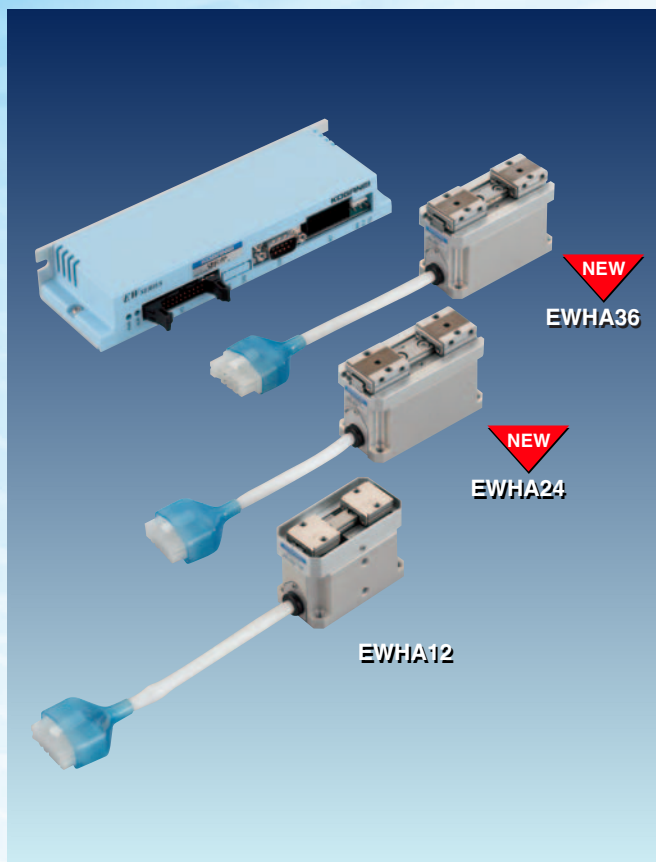
Before use, be sure to read the "Safety Precautions" on p. 3.

Offering compact, lightweight, and low priced products.
The Koganei electric actuator, Elewave Series.

Electric Hands

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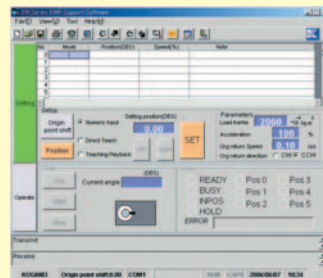
Various gripping force products
for ease of use



- Compact, lightweight type (EWHA 12), and high gripping force and long stroke type (EWHA 24, 36)
- Soft contact to workpiece through desired speed control
- Desired stroke setting
- Linear guide improves precision and rigidity
- Mode selection available for positioning and gripping force control
- Stepping motor and encoder for force control and missed step detection
- Shockless start and stop
- Communication function enables measurement of gripping position
- Output judgment enables workpiece selection

Support Software

Support software for NS Sliders, Electric Rotary Actuators and Electric Hands



Free

- Dedicated support software for the Elewave Series
- Free downloads from Koganei Website
- Support software enables parameter and point data editing
- Support software enables operation on specified points

Teaching Box

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Teaching Box for NS Sliders, Electric Rotary Actuators and Electric Hands



- Enables parameter and point data settings
- Enables point movement and teaching movement
- Installs simple programming function

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Before selecting and using the products, please read all the Safety Precautions carefully to ensure proper product use.

The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to you, other people, and assets beforehand.

Follow the Safety Precautions for: JIS B 8433 (Manipulating industrial robots—Safety)

The directions are ranked according to degree of potential danger or damage:

“DANGER!”, “WARNING!”, “CAUTION!”, and “ATTENTION!”

 DANGER	Expresses situations that can be clearly predicted as dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
 WARNING	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
 CAUTION	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in light or semi-serious injury. It could also result in damage or destruction of assets.
 ATTENTION	While there is little chance of injury, this content refers to points that should be observed for appropriate use of the product.

■ This product was designed and manufactured as parts for use in General Industrial Machinery.

- In the selection and handling of the equipment, a system designer or other person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, Owner's Manual and other literature before commencing operation. Making mistakes in handling is dangerous.
- The customer should take responsibility to verify that the product is compatible with the customer's systems. Use the product based on your good judgment.
- After reading the Owner's Manual, Catalog, etc., always place them where they can be easily available for reference to users of this product.
- If transferring or lending the product to another person, always attach the Owner's Manual, Catalog, etc., to the product where they are easily visible, to ensure that the new user can use the product safely and properly.
- The danger, warning, and caution items listed under these “Safety Precautions” do not cover all possible cases. Read the Catalog and Owner's Manual carefully, and always keep safety first.



DANGER

- Do not use the product for the purposes listed below:
 1. Medical equipment related to maintenance or management of human lives or bodies.
 2. Mechanical devices or equipment designed for the purpose of moving or transporting people.
 3. Critical safety components in mechanical devices.
 This product has not been planned or designed for purposes that require advanced stages of safety. It could cause injury to human life.
- Do not use the product in locations with or near dangerous substances such as flammable or ignitable substances. It could ignite or burst into flames.
- Do not enter the machine's operating area while the product is in operation, or while it is in an operation-ready state. In addition, do not make any adjustments to the interior or to the attached mechanism of the product in operation. The actuator can move suddenly, possibly resulting in injury.
- Persons who use a pacemaker, etc., should keep a distance of at least 1 meter [3.28ft.] away from the product. There is a possibility that the pacemaker will malfunction due to the strong magnet built into the product.
- When mounting the product and workpiece, always firmly support and secure them in place. Dropping or falling the product or improper operation could result in injury.
- Never attempt to remodel the product. It could result in abnormal operation leading to injury, electric shock, fire, etc.
- Never attempt inappropriate disassembly, or assembly of the product relating to basic construction, or to its performance or to functions. It could result in injury, electric shock, fire, etc.
- Do not splash water on the product. Spraying it with water, washing it, or using it underwater could result in malfunction of the product leading to injury, electric shock, fire, etc.



WARNING

- Do not use the actuator as a device for absorbing the shocks and vibrations of mechanical equipment. The actuator could be damaged, resulting in injury or in damage to mechanical equipment.
- Do not use the product in excess of its specification range. Such use could result in product breakdowns, function stop, damage, or drastically reduce the operating life.
- Design safety circuits and equipment systems so as to avoid

equipment damage or personal injury when the machine is shut down due to an emergency stop, power outages, or other system abnormalities.

- If using the product in the locations listed below, implement adequate shielding measures.
Failure to implement these measures may lead to erratic operation that could cause equipment damage or personal injury:
 1. Locations subject to large electric current or magnetic fields
 2. Locations subject to noise due to static electricity, etc.
 3. Locations with the possibility of exposure to radiation
- Always implement D-class grounding work (ground resistance 100Ω or less).
Current leakage could cause electric shock or erratic operation.
- Before installing products to the equipment, always check that the mounting and wiring, and operation command are correct. If not checked, it could result in injury and could cause equipment damage by coming in contact with moving parts.
- Before supplying electricity to the device and before starting operation, always conduct a safety check of the area of machine operation. Unintentional supply of electricity could possibly result in electric shock, or in injury caused by contact with moving parts.
- Do not touch the terminals and the miscellaneous switches, etc., while the device is powered on. There is a possibility of electric shock and abnormal operation.
- Avoid scratching the cords of cables, etc.
Letting the cords be subject to scratching, excessive bending, pulling, rolling up, or being placed under heavy objects or squeezed between 2 objects, may result in current leaks or defective continuity that lead to fire, electric shock, or abnormal operation.
- If abnormal noise occurs or vibrations are excessive, immediately cease operation. Continued use in this condition may result in abnormal operation or runaway that could lead to product damage or destruction.
- Do not throw the product into fire. The product could explode and/or release toxic gases.
- Do not sit on the product, place your foot on it, or place other objects on it. Accidents such as falling and tripping over could result in injury. Dropping the product may result in injury, or also damage or break the product resulting in abnormal or erratic operation, or runaway, etc.
- For inspection, maintenance, replacement, or other kinds of operations related to the product, always completely cut off the power supply before proceeding.
- Operate within the recommended loads and specified speeds.



CAUTION

- Do not use the product in locations that are subject to direct sunlight (ultraviolet rays), dust, salt, iron powder, high humidity, or in the media and/or the ambient atmospheres that include organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, acids, etc. It could lead to early shutdown of function or a sudden degradation of performance, and result in a reduced operating life.
- Do not use the product in atmospheres subject to corrosive gases, flammable gases, flammable liquids, etc. It could lead to a decrease in strength due to rust, or to risk of the motor igniting or product exploding.
- Always use the controller designated for the product. Use of a non-designated controller could lead to product breakdown or runaway operation.
- Install the main unit and controller in locations with as little dust or dirt as possible. Installation in locations subject to lots of dust or dirt can lead to erratic operation.
- Do not install the product in locations subject to heavy vibrations (4.9m/s² [0.5G] or more). Transmission of heavy vibrations to the product could lead to erratic operation.
- When mounting the product, leave room for adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- Do not bring floppy disks or magnetic media, etc., within 1 meter [3.28ft.] of the product. There is a possibility that the data on the floppy disks will be destroyed due to the magnetism of the magnet.
- Do not scratch, dent, or deform the driving portion by stepping on the product, using it as a scaffold, or placing objects on top of it. It could lead to damaged or broken products that result in operation shutdown or degraded performance.
- Always post an "operations in progress" sign for installations, adjustments, or other operations, to avoid unintentional supplying electrical power, etc. Such accidental supplies may cause electrical shock, or sudden activation of the actuator that could result in physical injury.



ATTENTION

- When considering the possibility of using this product in situations or environments not specifically noted in the Catalog or Owner's Manual, or in applications where safety is an important requirement such as in an airplane facility, combustion equipment, leisure equipment, safety equipment, and other places where human life or assets may be greatly affected, take adequate safety precautions such as an application with enough margins for ratings and performance or fail-safe measure. Be sure to consult us with such applications.
- Use a protective cover, etc., to ensure that the operating portions of mechanical devices, etc., are isolated and do not come into direct contact with human bodies.
- Do not control the product in a way that would cause a workpiece to fall during a power failure. Take control measures so that they prevent the workpiece, etc., from falling during a power failure or emergency stop of the mechanical devices.
- Always check the Owner's Manual and other reference materials for product wiring and piping.
- When handling the product, wear protective gloves, safety glasses, safety shoes, etc., to keep safety.
- Perform daily inspections to check that system functions are performing as required to prevent accidents from happening beforehand.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- For inquiries about the product, consult your nearest Koganei sales office or Koganei overseas department. The address and telephone number are shown on the back cover of this catalog.



OTHERS

- Always observe the following items.
 1. When using this product into systems, always use genuine KOGANEI parts or compatible parts (recommended parts). When performing maintenance and repairs, always use genuine KOGANEI parts or compatible parts (recommended parts). Always observe the required methods and procedure.
 2. Never attempt inappropriate disassembly or assembly of the product relating to basic construction, or its performance or functions.

Koganei cannot be responsible if these items are not properly observed.

Handling Instructions and Precautions



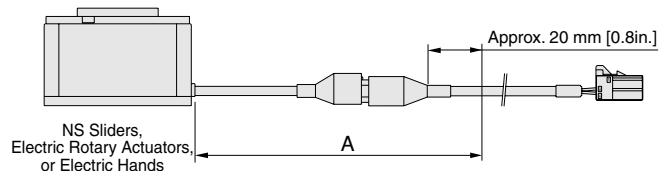
General precautions

Environment

1. Avoid using the main unit and controller in locations subjected to dripping water or oil, or in dusty locations.
2. Avoid using the product in locations where sulfuric acid, hydrochloric acid, or other corrosive gases are present.
3. Avoid using the product in locations subject to strong vibrations or shocks.

Wiring

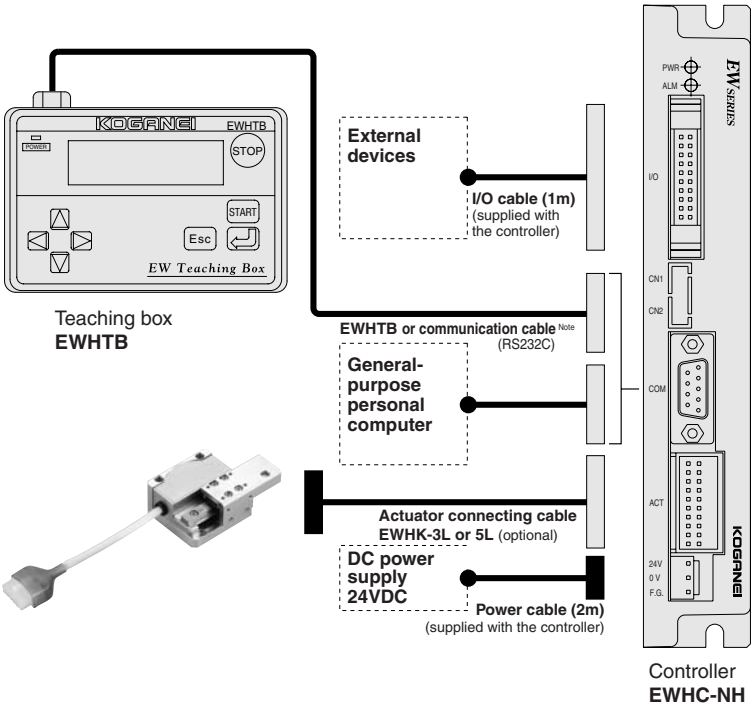
1. The I/O wiring connection method for connecting the controller to a programmable controller or other external equipment differs between the previous controllers, **EW-C-R** (for Electric Rotary Actuators) and **EW-C-H** (for Electric Hands), and the current controllers, **EWHC-R** (for Electric Rotary Actuators) and **EWHC-NH** (for NS Sliders and Electric Hands). When replacing the previous controller with the current controller, always refer to the Owner's Manual to check the connection method.
2. Do not use the cable applied repetitive bending between the main unit and connector (shown in the portion A in the diagram below).



Other

Before use, always read the Owner's Manual provided with the main unit and controller.

●System Configuration



Note: RS232C cable (reference)
Specifications: D-sub 9 pin↔D-sub 9 pin and cross cable
Model: C06N-09FS-09FS-CROSS
Manufacturer: Misumi Corp.
Regarding the communication cable, please purchase it separately.

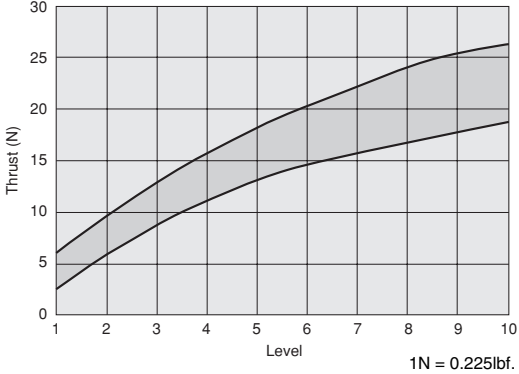


Selection

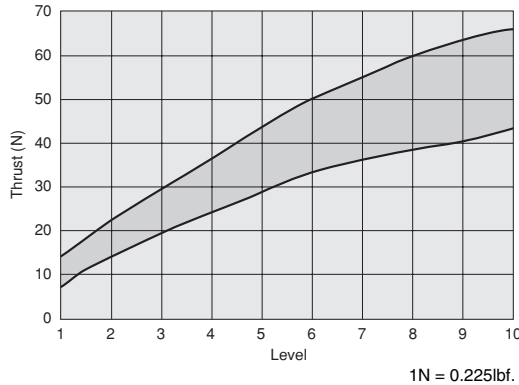
●NS Sliders

●Thrust

EWM5H



EWM5S



●NS Sliders 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					
Remark	—		—		Suitable for soft pushing with high cycle operation

Caution: Pushing mode changes from C to O, and O to C cannot be performed.

● Electric Rotary Actuators

- When using a bolt to secure a workpiece to the electric rotary actuator table, be sure to hold either the table or the workpiece during tightening.

● Duty cycle limits

Use the electric rotary actuator with a duty cycle of 50% or less.

$$\text{Duty cycle} = \frac{\text{Operating time}}{\text{Operating time} + \text{Down time}} \times 100 (\%)$$

● Limits on load torque and speed

When mounting the product on the table in a vertical position, design the workpiece so that it will not exert load torque as much as possible. Limit the load torque to 60% or less of the actuator's maximum torque.

Caution: When a load torque is applied, limit the speed settings as shown below.

Load ratio (%)	20	40	60
Speed setting (%)	Max. 50	Max. 33	Max. 25

$$\text{Load ratio} (\%) = \frac{\text{Load torque}}{\text{Maximum torque}} \times 100 (\%)$$

● Calculation examples for moment of inertia

Caution: Moment of inertia of the workpiece should always be at or below the maximum load inertia.

1. Disk-shaped load rotating about its axis

Load material: Aluminum alloy (density $2.7 \times 10^3 \text{ kg/m}^3$)

$$I = \frac{md^2}{8}$$

I : Moment of inertia rotating about its axis ($\text{kg} \cdot \text{m}^2$)

d : Disk diameter (m)

m : Mass (kg)

$d = 0.16 \text{ m [0.525 ft.]}$

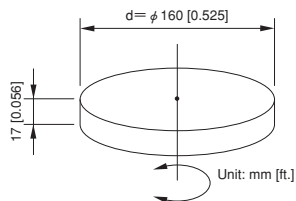
$$m = \frac{\pi \times 0.16^2}{4} \times 0.017 \times 2.7 \times 10^3$$

$$= 0.92 \text{ kg [0.063 lbf. sec}^2/\text{ft.]}$$

$$I = \frac{0.92 \times 0.16^2}{8}$$

$$= \boxed{3.0 \times 10^{-3} (\text{kg} \cdot \text{m}^2)}$$

$$\boxed{2.2 \times 10^{-3} \text{ lbf-ft-sec}^2}$$



This is the maximum load inertia for **EWHRT5**.

2. Rectangular load offset from its rotating axis

Load material: Aluminum alloy (density $2.7 \times 10^3 \text{ kg/m}^3$)

$$I = \frac{m}{12} (a^2 + b^2) + mL^2$$

I : Moment of inertia rotating about its axis ($\text{kg} \cdot \text{m}^2$)

a, b : Length of sides (m)

L : Offset distance from its rotating axis to the center of load (m)

m : Mass (kg)

$$m = 0.22 \times 0.1 \times 0.03 \times 2.7 \times 10^3$$

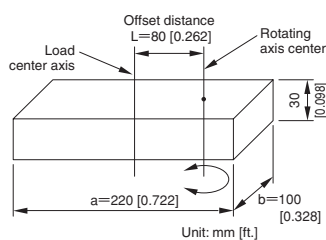
$$= 1.78 \text{ kg [0.122 lbf-ft-sec}^2]$$

$$I = \frac{m}{12} (a^2 + b^2) + mL^2$$

$$= \frac{1.78}{12} (0.22^2 + 0.1^2) + (1.78 \times 0.08^2)$$

$$= \boxed{2.0 \times 10^{-2} (\text{kg} \cdot \text{m}^2)}$$

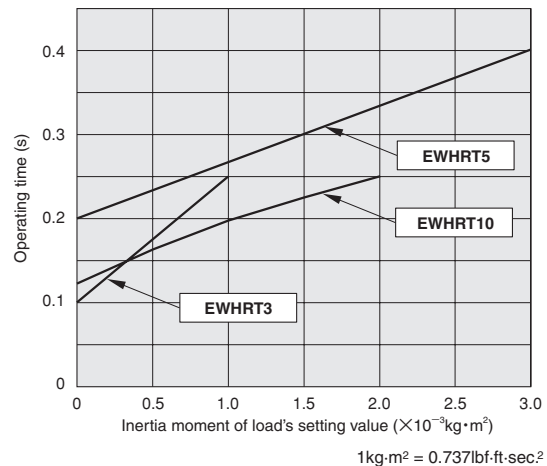
$$\boxed{1.5 \times 10^{-2} \text{ lbf-ft-sec}^2}$$



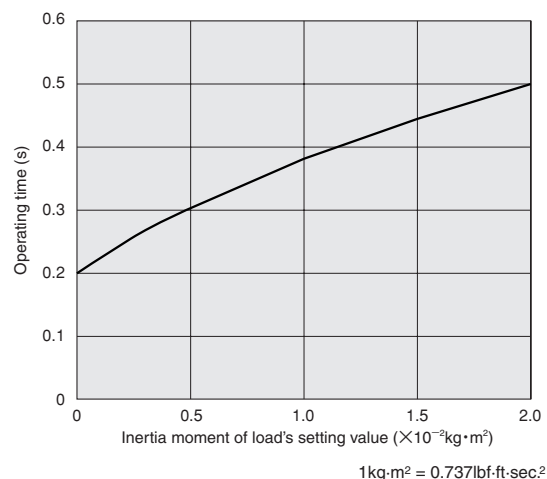
This is the maximum load inertia for **EWHRT20**.

● Operating time (operating angle 90°)

EWHRT3, EWHRT5, EWHRT10



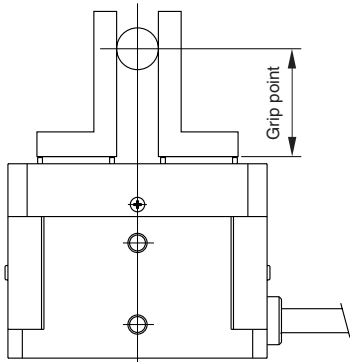
EWHRT20



Remark: Graphs obtained at the maximum speed and the maximum acceleration (when no load torque is applied)

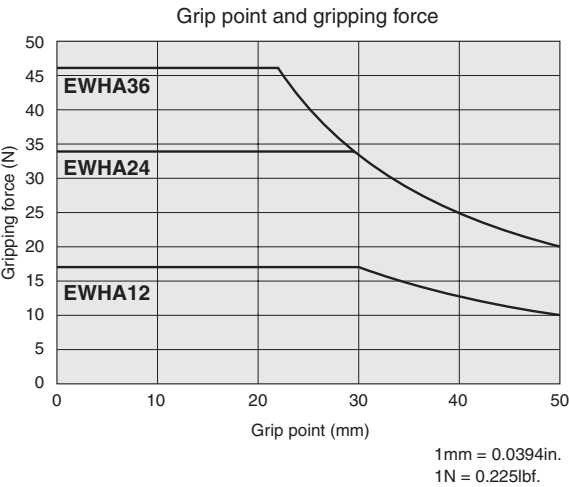
●Electric Hands

●Limits on gripping force at grip points



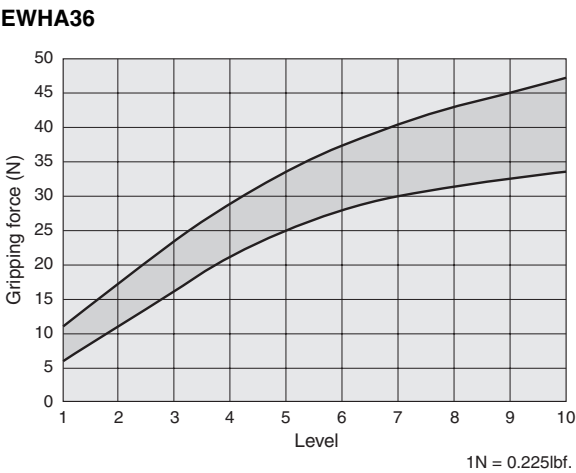
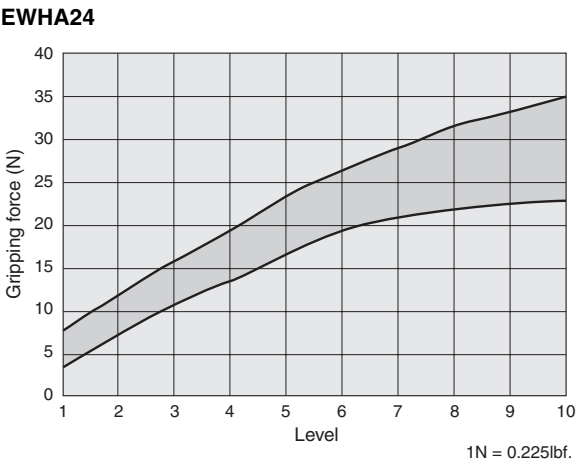
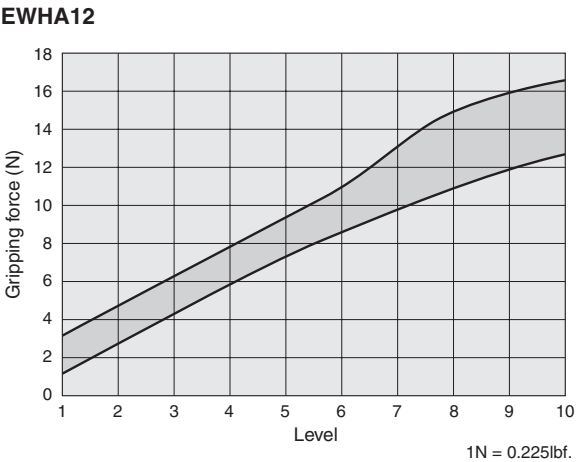
※Set the gripping force at the grip points within the range shown in the graph below

Allowable moment — **EWHA12** : 0.51N・m [4.5in・lbf]
 EWHA24, 36 : 1.0N・m [8.9in・lbf]

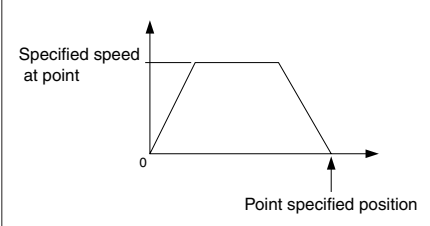
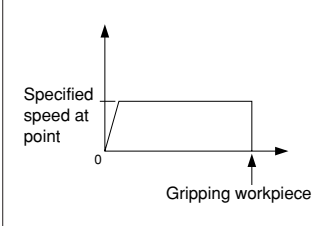
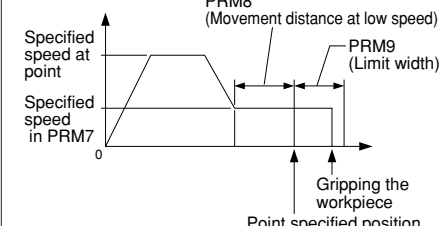


●Range of gripping force

Forces are generated within the range shown in the graphs below at each set level. Note that the gripping force repeatability at the same position is 5% or less.

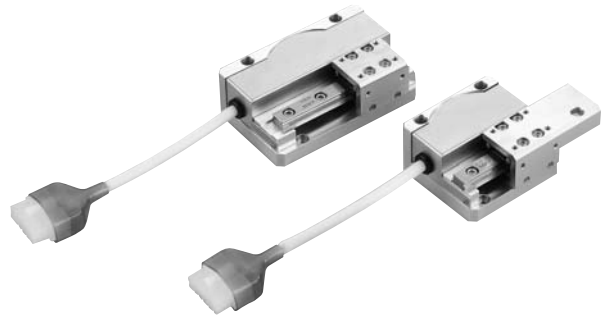


● Electric Hands operation mode

Mode	Positioning		Gripping ^{Note}		Gripping with acceleration/deceleration movement
	Moves to the specified point with acceleration/deceleration, and then stops.		Operates at constant speed, and grips at the set force.		Performs gripping 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 closing side.	Operates to opening side.	Moves to the specified point, and performs gripping operation at the speed set in PRM7 from the distance forward the point set in PRM8.
Operation pattern					
Remark	—		—		Suitable for soft gripping with high cycle operation

Caution: Gripping mode changes from C to O, and O to C cannot be performed.

NS Sliders



Specifications

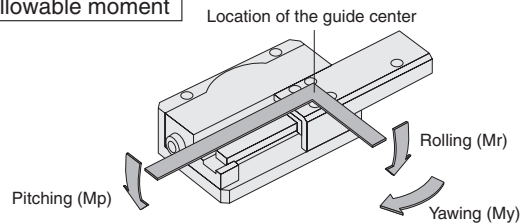
Basic specifications of main unit

Item		Model	EWM5HS · EWM5HL	EWM5SS · EWM5SL
Motor			2-phase stepping motor	
Maximum thrust ^{Note1}		N [lbf.]	18~27 [4.0~6.1]	42~65 [9.4~14.6]
Maximum load mass ^{Note2}		kg [lb.]	1 [2.2] (horizontal), 0.4 [0.9] (vertical)	2 [4.4] (horizontal), 0.8 [1.8] (vertical)
Maximum speed		mm/s [in./sec.]	120 [4.72]	50 [1.97]
Minimum operation time		s	0.25 (st.20), 0.42 (st.40)	0.50 (st.20), 0.90 (st.40)
Minimum speed		mm/s [in./sec.]	1 [0.04]	
Repeatability		mm [in.]	±0.03 [±0.0012]	
Operating temperature range		°C [°F]	0~40 [32~104]	
Allowable moment	My (yawing)	N·m [in·lbf]	1 [8.9]	
	Mp (pitching)	N·m [in·lbf]	1 [8.9]	
	Mr (rolling)	N·m [in·lbf]	1.5 [13.3]	
Mass		kg [lb.]	0.27 [0.60] (st.20, short table type), 0.30 [0.66] (st.20, long table type)	
			0.35 [0.77] (st.40, short table type), 0.40 [0.88] (st.40, long table type)	
Applicable controller			EWHC-NH	

Note: 1. For details of the thrust, see the graphs on p.5.

2. Holding function cannot be performed when the power is switched off.

Allowable moment



For the controller specifications, see p.16.

Order Codes

EWM5

Elewave
NS Sliders

Type

H : High speed type
S : High thrust type

Table

S : Short table
L : Long table

Stroke

20 : 20mm [0.787in.]
40 : 40mm [1.575in.]

Controller type

Blank : No controller
C : With EWHC-NH

Cable length

Blank : No cable
3L : 3m [118in.]
5L : 5m [197in.]

Additional Parts

Controller

EWHC - NH

Cable

EWHK -

Cable length

3L : 3m [118in.]
5L : 5m [197in.]

Teaching
box^{Note}

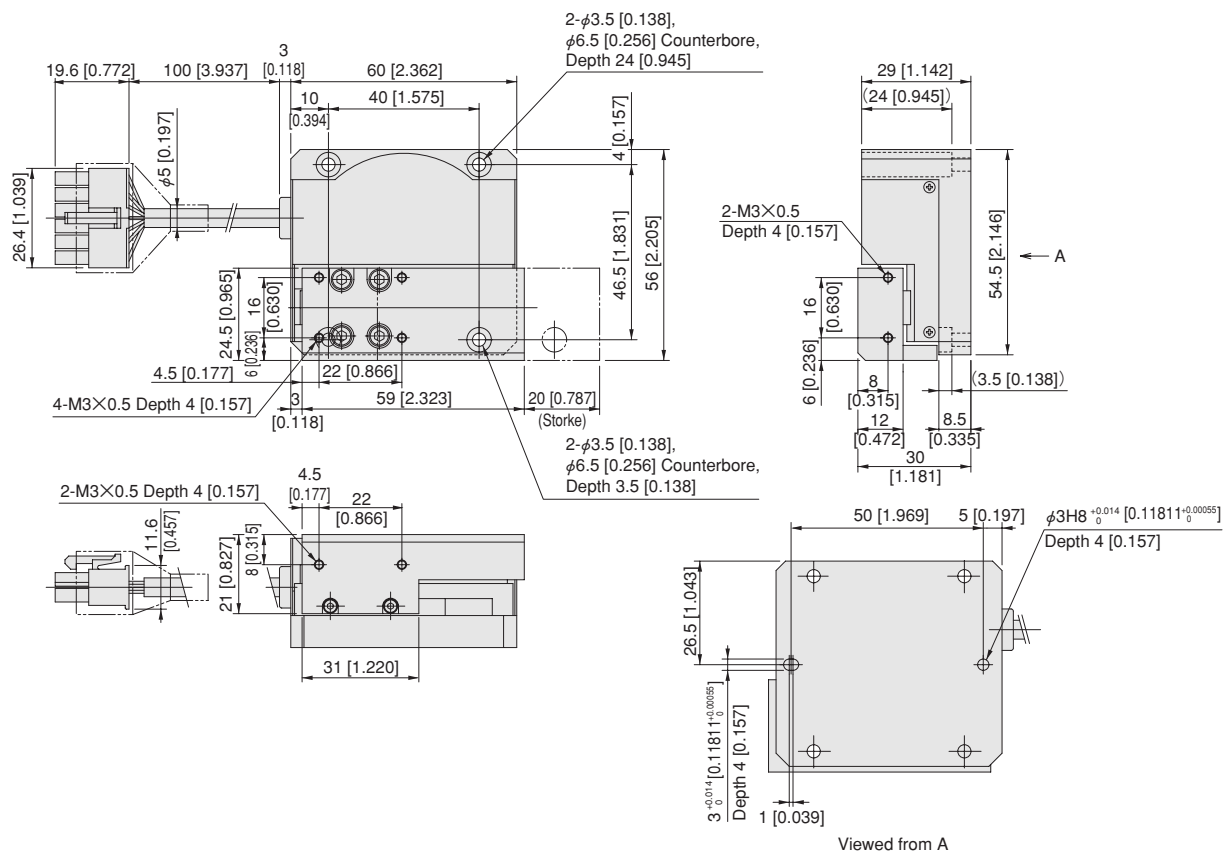
EWHTB

Note: For specifications and dimensions, see p.19.



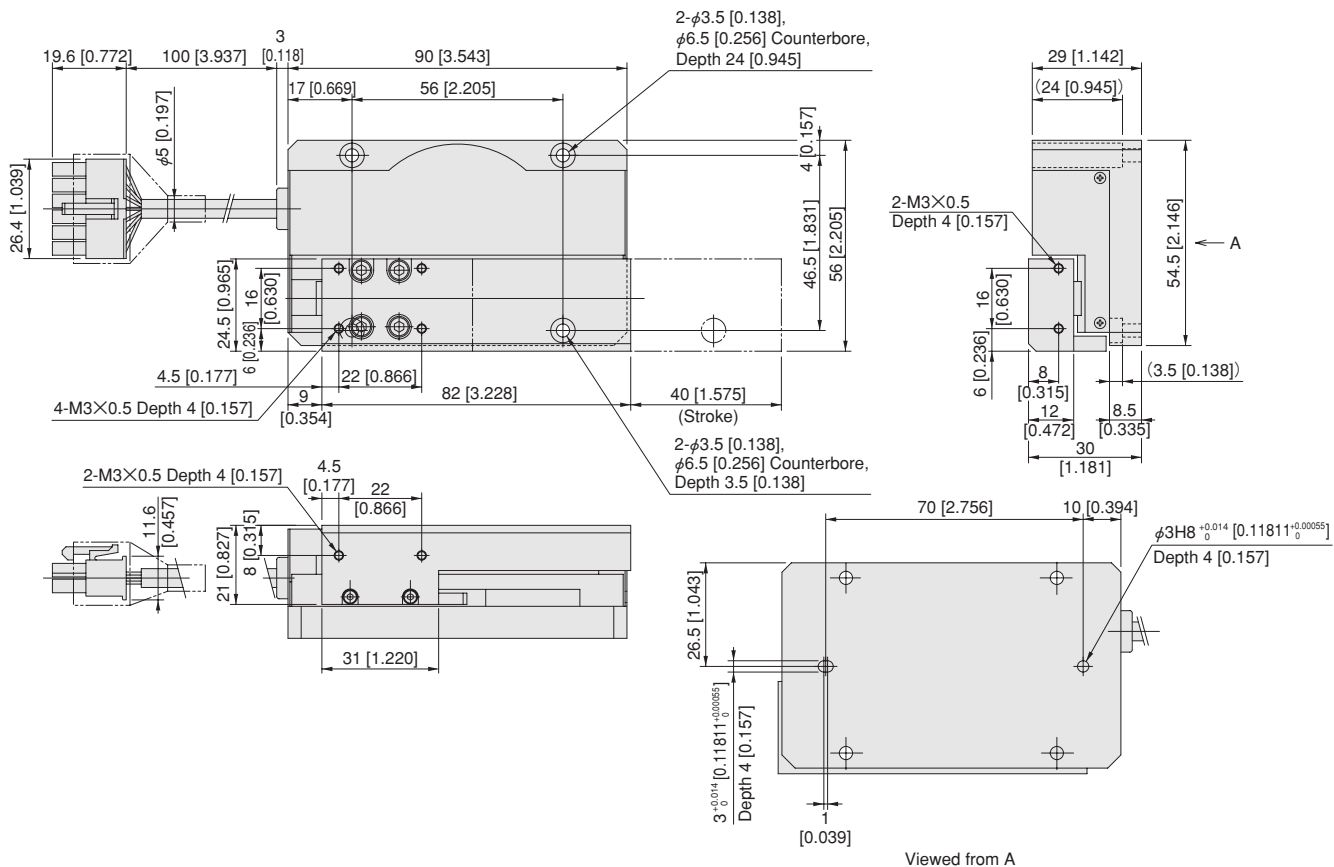
EWM5HL-20

EWM5SL-20

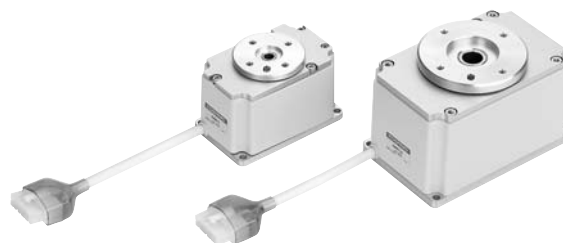


EWM5HL-40

EWM5SL-40



Electric Rotary Actuators



Specifications

● Basic specifications of main unit

Item	Model	EWHRT3	EWHRT5	EWHRT10	EWHRT20
Motor		2-phase stepping motor			
Maximum torque	N・m [in・lbf]	0.25 [2.2]	0.5 [4.4]	1.0 [8.9]	2.0 [17.7]
Repeatability ^{Note1}		±0.02°			
Angle detection		Optical encoder			
Maximum load inertia ^{Note2}	kg・m ² [lbf・ft・sec ²]	1.0×10 ⁻³ [0.74×10 ⁻³]	3.0×10 ⁻³ [2.21×10 ⁻³]	2.0×10 ⁻³ [1.47×10 ⁻³]	2.0×10 ⁻² [1.47×10 ⁻²]
Minimum operation time ^{Note3}	(90°, at no load) s	0.1	0.2	0.12	0.2
	(90°, at maximum load) s	0.25	0.4	0.25	0.5
Operating temperature range	°C [°F]	0~40 [32~104]			
Allowable thrust load	N [lbf.]	100 [22.5]		200 [45.0]	
Allowable radial load	N [lbf.]	100 [22.5]		200 [45.0]	
Allowable moment	N・m [in・lbf]	2.5 [22.1]		5.5 [48.7]	
Mass ^{Note4}	kg [lb.]	0.34 [0.75] (0.4 [0.9])		0.8 [1.8] (0.9 [2.0])	
Applicable controller		EWHC-R			

Notes: 1. Repeatability at one direction swing.

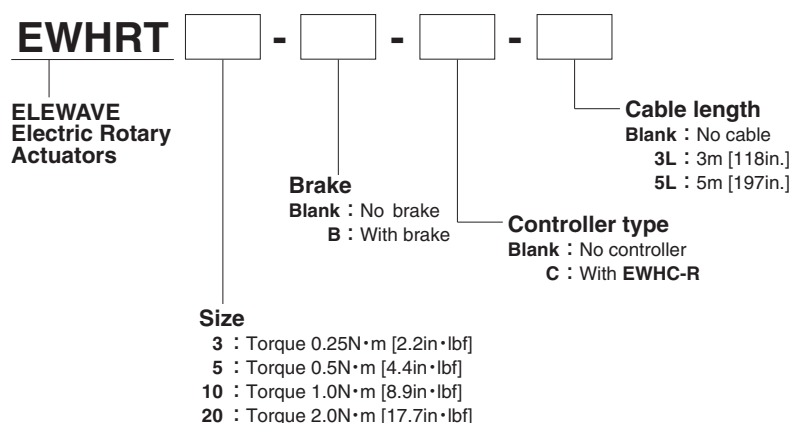
2. The workpiece moment of inertia should always be at or below the maximum load inertia.

3. Values are for no load torque applied.

4. Figures in parentheses show the mass with-brake.

● For the controller specifications, see p.16.

Order Codes



● Additional Parts

Controller **EWHC - R**

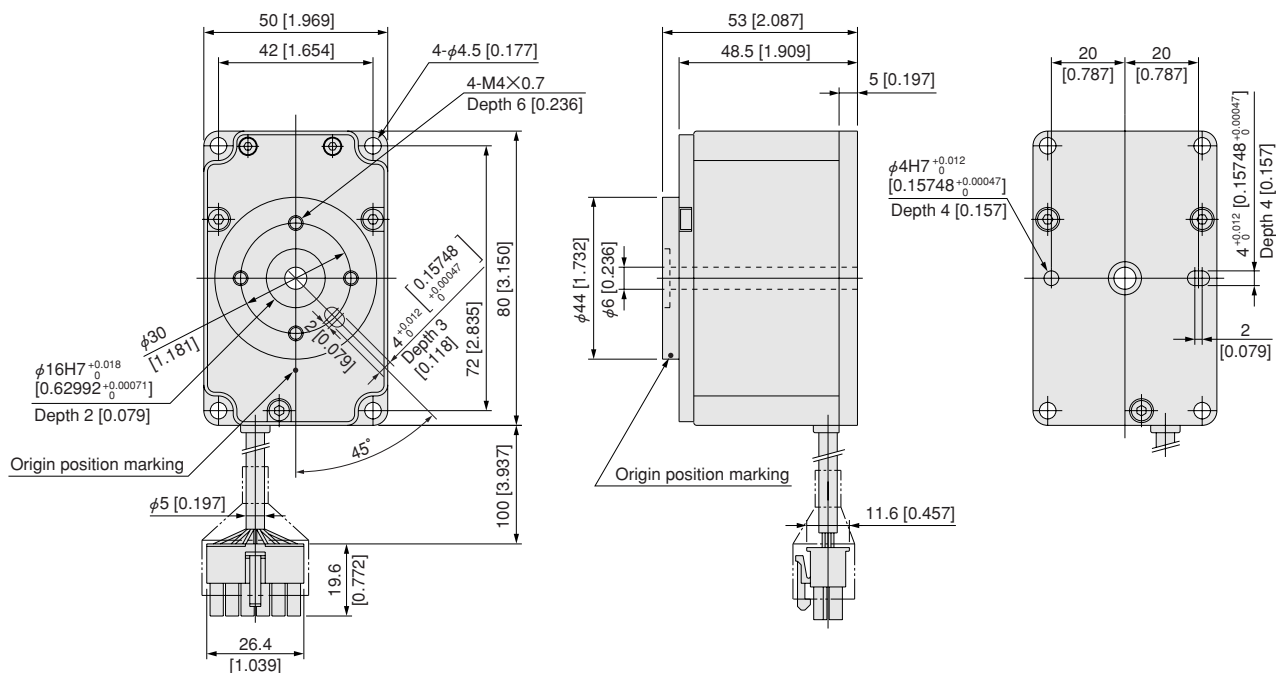
Cable **EWHK -** **Size**

Cable length
 3L : 3m [118in.]
 5L : 5m [197in.]

Teaching box^{Note} **EWHTB**

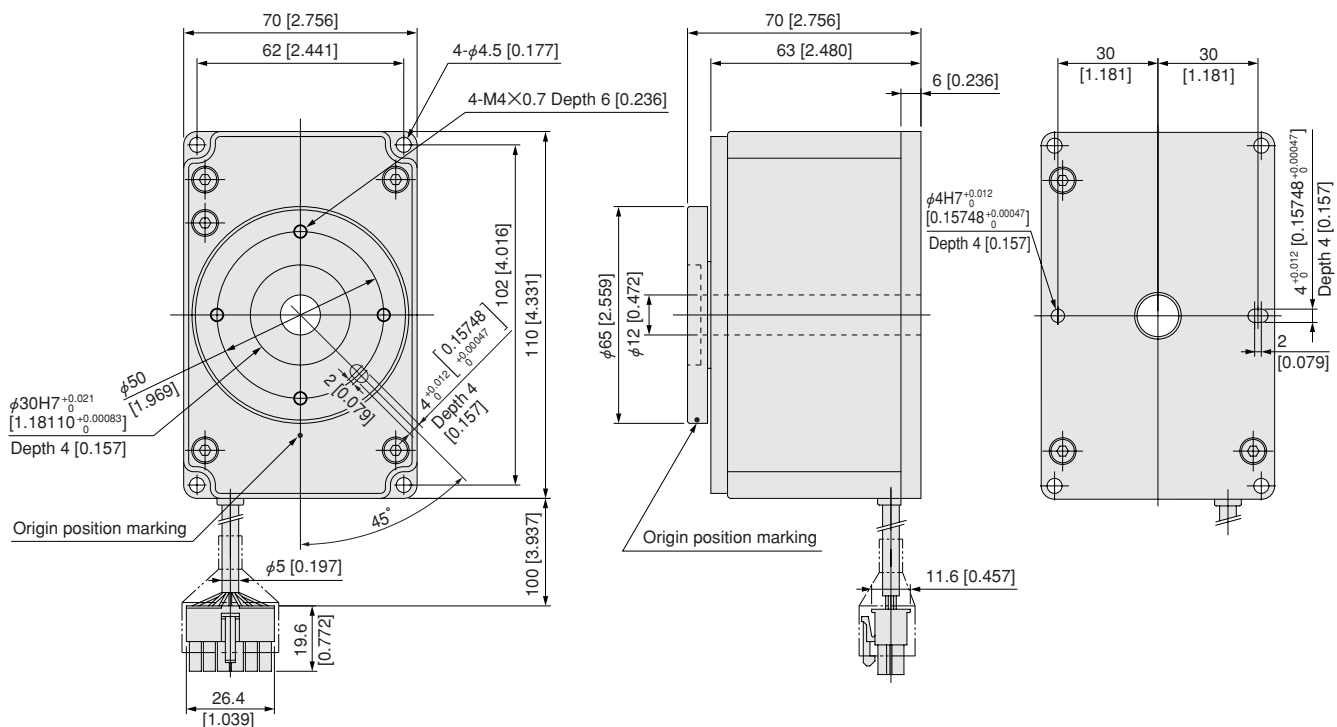
Note: For specifications and dimensions, see p.18.

EWHRT3 EWHRT5



Note: The table origin position is when the locating dowel pin oval hole is at the position shown in the above drawing.

EWHRT10 EWHRT20



Note: The table origin position is when the locating dowel pin oval hole is at the position shown in the above drawing.

Electric Hands



Specifications

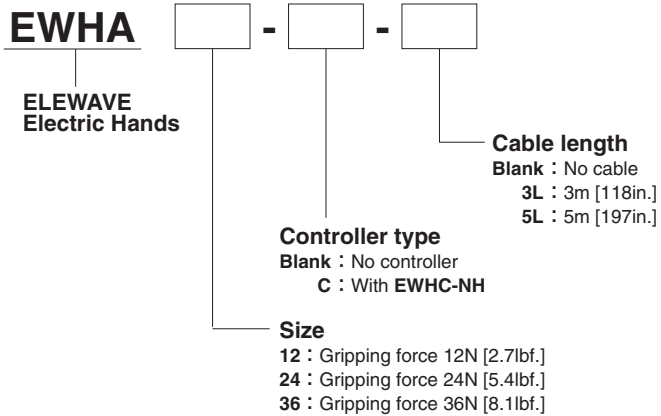
● Basic specifications of main unit

Item	Model	EWHA12	EWHA24	EWHA36
Motor		2-phase stepping motor		
Maximum speed	mm/s [in./sec.]	70 [2.76] (Speed at the one side)	35 [1.38] (Speed at the one side)	24 [0.94] (Speed at the one side)
Minimum speed	mm/s [in./sec.]	1 [0.04] (Speed at the one side)		
Effective gripping force ^{Note}	N [lbf.]	12~17 [2.7~3.8]	22~35 [4.9~7.9]	33~47 [7.4~10.6]
Operating temperature range	°C [°F]	0~40 [32~104]		
Open/closed stroke	mm [in.]	14 [0.551] (One side 7mm [0.276in.])	20 [0.787] (One side 10mm [0.394])	
Repeatability	mm [in.]	±0.03 [±0.0012]	±0.05 [±0.0020]	
Mass	kg [lb.]	0.17 [0.37]	0.26 [0.57]	
Applicable controller		EWHC-NH		

Note : For more information about gripping force, see the graphs on p.7.

● For the controller specifications, see p.16.

Order Codes



● Additional Parts

Controller **EWHC - NH**

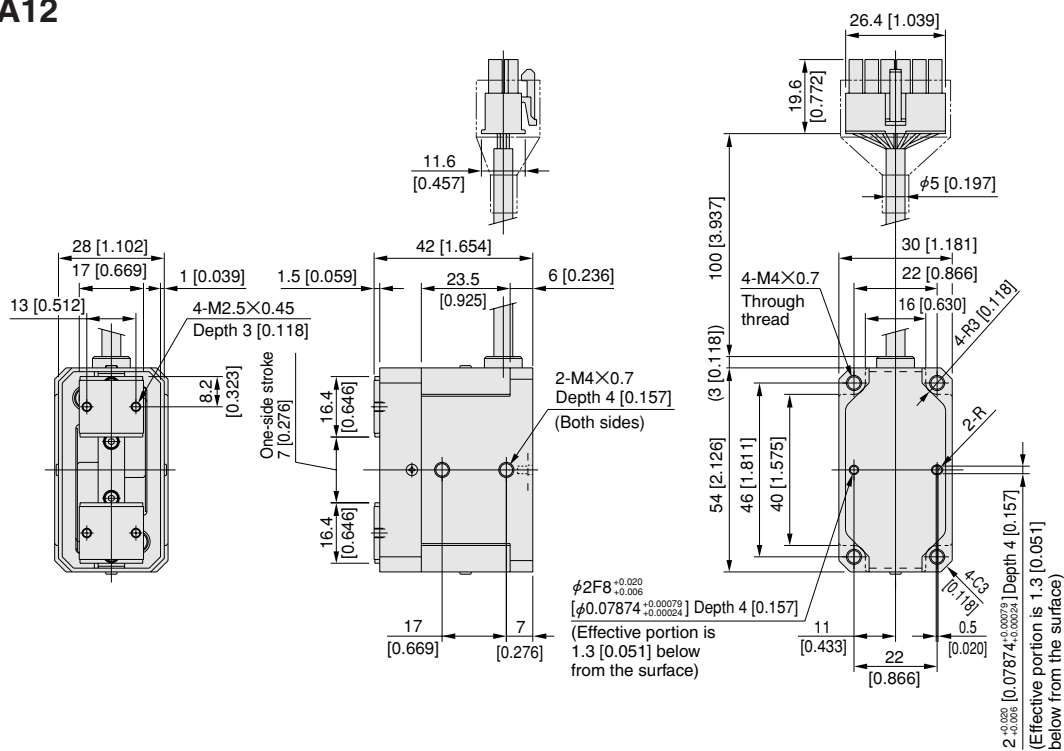
Cable **EWHK - []**

Cable length
3L : 3m [118in.]
5L : 5m [197in.]

Teaching box^{Note} **EWHTB**

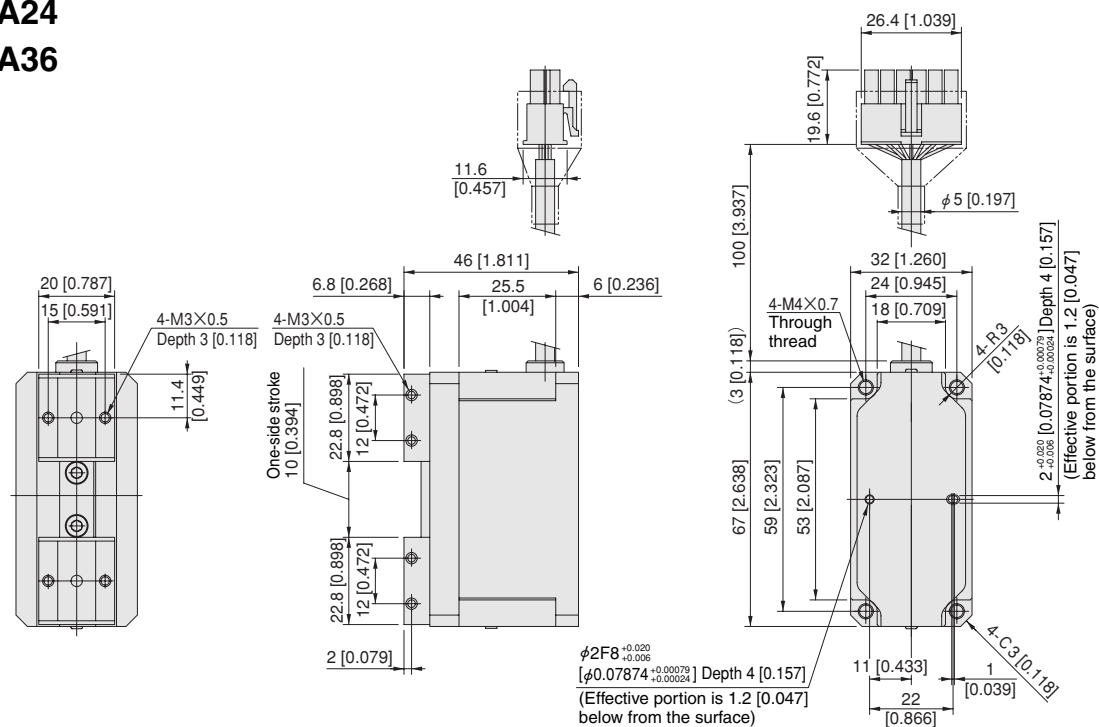
Note: For specifications and dimensions, see p.18.

EWHA12

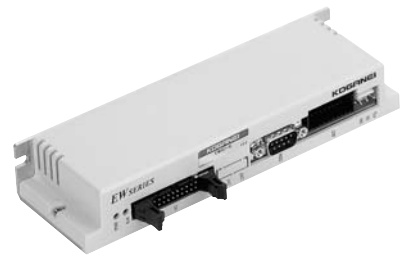


EWHA24

EWHA36



Controller

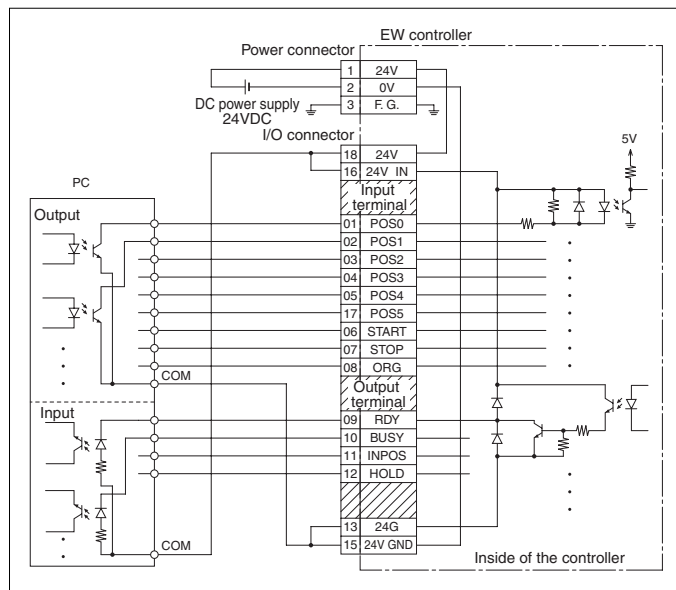


Specifications

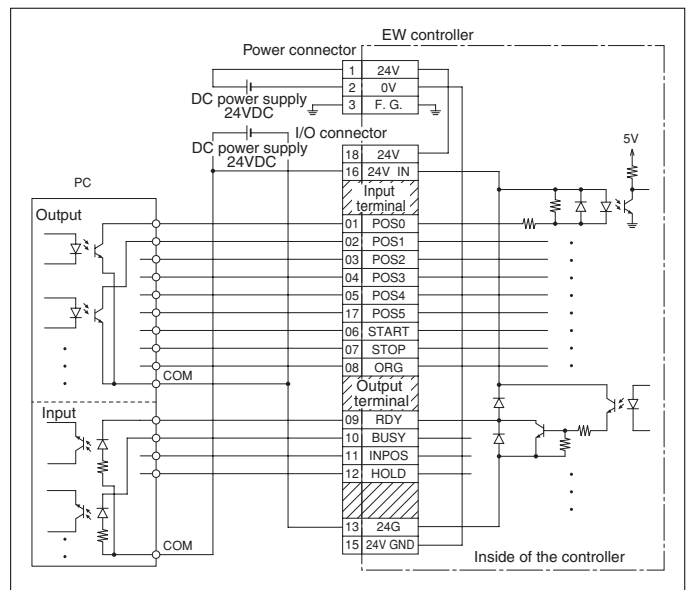
Item	Model	EWHC-NH	EWHC-R
Axis control	Motor drive method	Microstep drive	
	Control method	Closed loop control	
	Operation method	PTP, force control	PTP
	Origin detection method	Detection at stroke end	Encoder Z phase
	Position detection method	Encoder A, B phase output	
	Minimum setting distance/angle	0.01 mm [0.0004in.]	0.01°
	Acceleration setting	1~100%	1~100% (Automatic setting based on load inertia)
	Point setting	64 points	
	Point input method	Numeric input, teaching input, direct teaching	
External input/output	Point setting input	6 inputs, optoisolator couplings, 5mA TYP/1 input	
	Control input	3 inputs (ORG, START, STOP), optoisolator couplings, 5mA TYP/1 input	
	Control output	4 outputs (READY, BUSY, HOLD, INPOS), 30mA MAX./1 output	3 outputs (READY, BUSY, INPOS), 30mA MAX./1 output
	Abnormality detection output	Overload, disconnection, incorrect data, system abnormality	
	External communications	RS232C 1ch (Communication with a personal computer and Teaching Box)	
	Motor drive output	Dedicated cable (with F.G.)	
	Encoder input	Dedicated cable (with shield)	
General specifications	Mass	0.2kg [0.44lb.]	
	Power supply	24VDC $\pm$ 10% 0.6A MAX. (Motor and I/O share the same power supply)	24VDC $\pm$ 10% 1A MAX. (Motor and I/O share the same power supply)
	Operating temperature	0~40°C [32~104°F]	
	Operating humidity	35~85% RH(no condensation allowed)	
	Storage temperature	-10~65°C [14~149°F]	
	Back-up	EEPROM used to maintain setting conditions	
	Noise resistance	IEC61000-4-4 level 2	
	Accessories	I/O cable, power cable	

Controller Wiring

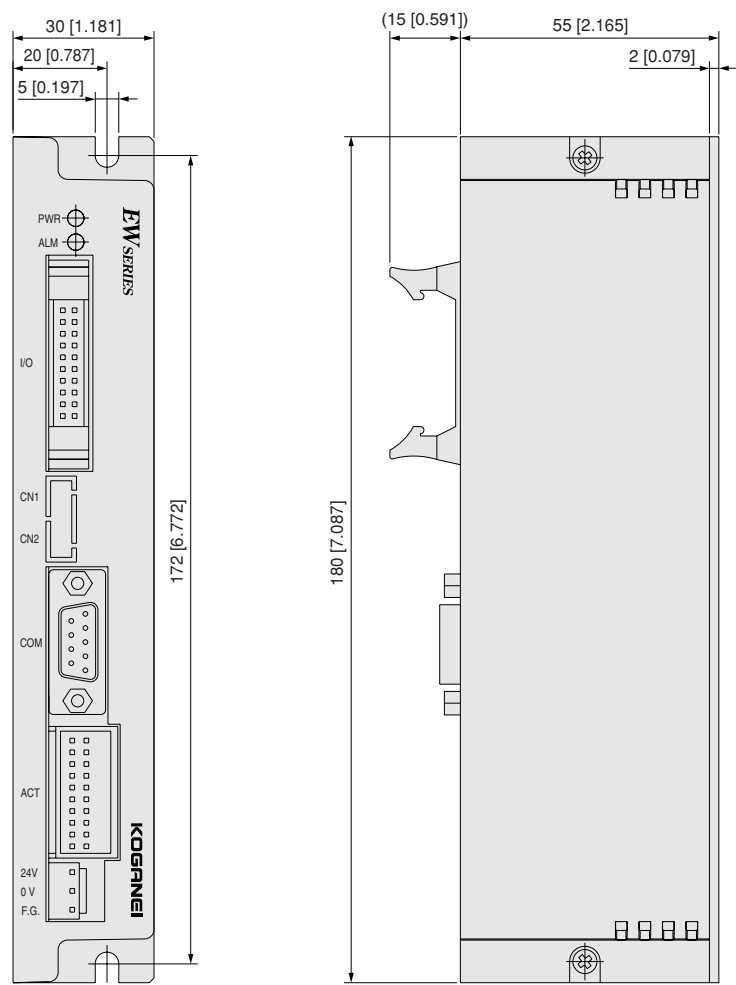
1. Wiring system when using the controller's internal power supply



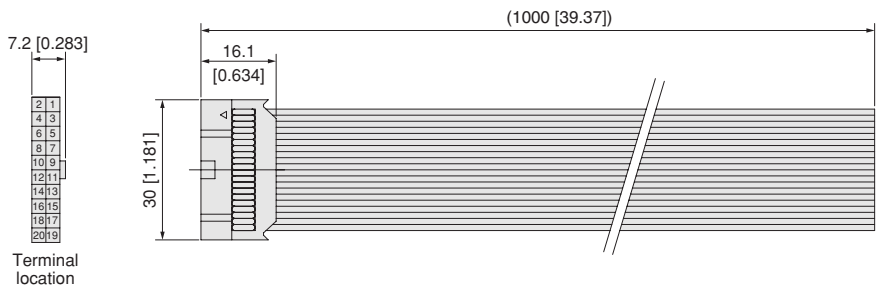
2. Wiring system when using another power supply in place of the controller's internal power supply



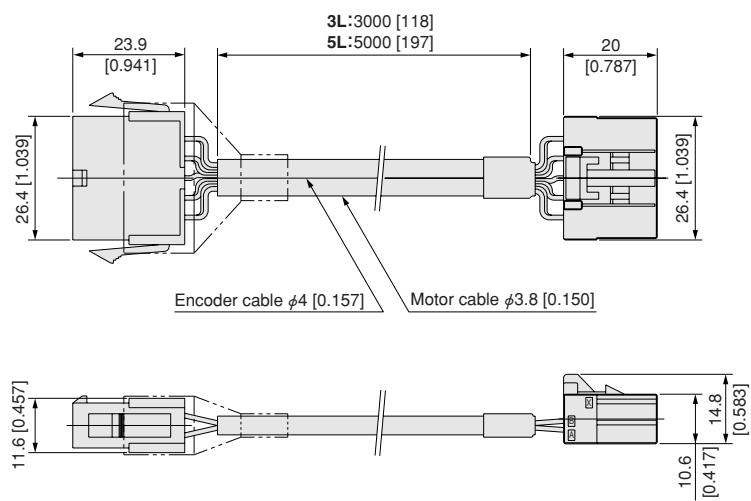
EWHC-NH
EWHC-R



I/O cable for controller



● Cable
EWHK-□



A photograph of the KOGANEI EW Teaching Box. It is a grey, rectangular device with a small LCD screen in the center. Above the screen, the brand name "KOGANEI" is printed in large, bold letters. To the right of the screen, the words "EWRITE" and "STOP" are printed. Below the screen, there are four directional arrow buttons (up, down, left, right) and two buttons labeled "F1" and "F2". The text "EW Teaching Box" is printed at the bottom of the device. A coiled grey cable is connected to the top of the box, ending in a multi-pin connector.

Item		Model	EWHTB
Power supply	Voltage	12VDC (Supplied from the controller)	
	Power consumption	50mA MAX.	
Indicator	Setting display	LCD 16 characters × 2 lines	
	Power indicator	When power is supplied, LED lights up (Internal 5V).	
General specifications	Setting method	Key operation: 8 buttons	
	Communication method	RS232C (serial transmission)	
	Cable length	3m [118in.]	
	Mass	Body: 200g [7.05oz.]	
	Operating temperature	0~40°C [32~104°F]	
	Operating humidity	35 to 80% RH (no condensation allowed)	
	Storage temperature	-10~65°C [14~149°F]	

Technical drawing of the EW Teaching Box, showing front, side, and top views with dimensions in mm and inches.

Front View Dimensions:

- Overall width: 125 [4.921]
- Overall height: 82 [3.228]
- Top section height: 45.1 [1.776]
- Top section width: 21 [0.827]
- Bottom section height: 7 [0.276]

Side View Dimensions:

- Overall width: 30 [1.181]
- Overall height: 16.5 [0.650]
- Top section width: 15 [0.591]

Top View Dimensions:

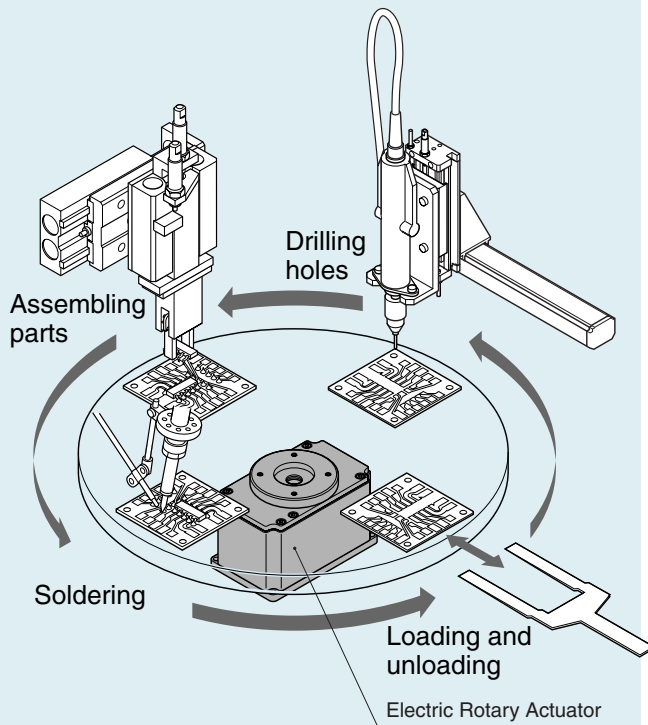
- Overall width: 125 [4.921]
- Overall height: 82 [3.228]

Labels and Features:

- RS232C cable (serial transmission)
- POWER
- LCD screen
- STOP
- START
- Esc
- EW Teaching Box

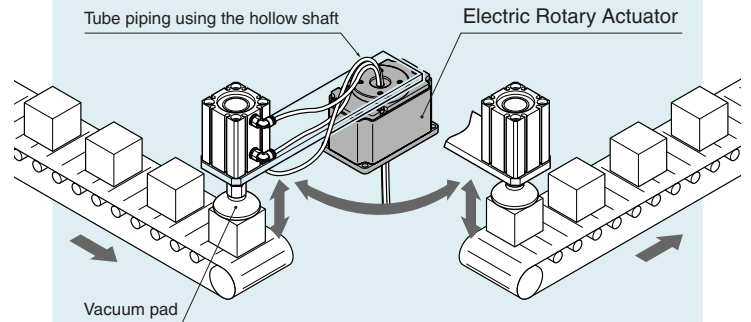
Application Examples

Indexing table for automatic assembly



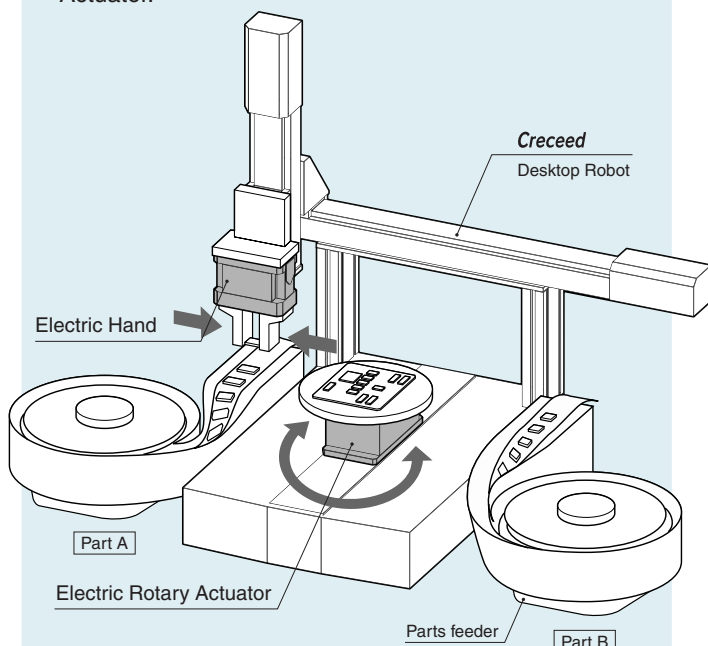
Swing loading the workpiece

This shows an example of tube piping using a hollow shaft.



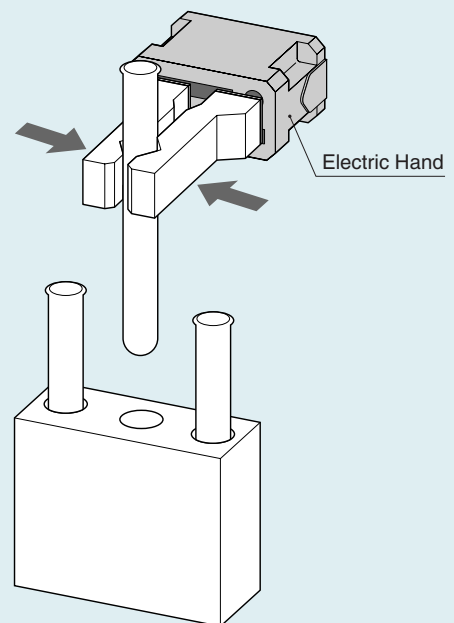
Loading device for different-shaped parts

The example shows a loading device for different-shaped parts, in combination with the **Creceed Desktop Robot**, the **Electric Hand**, and the **Electric Rotary Actuator**.



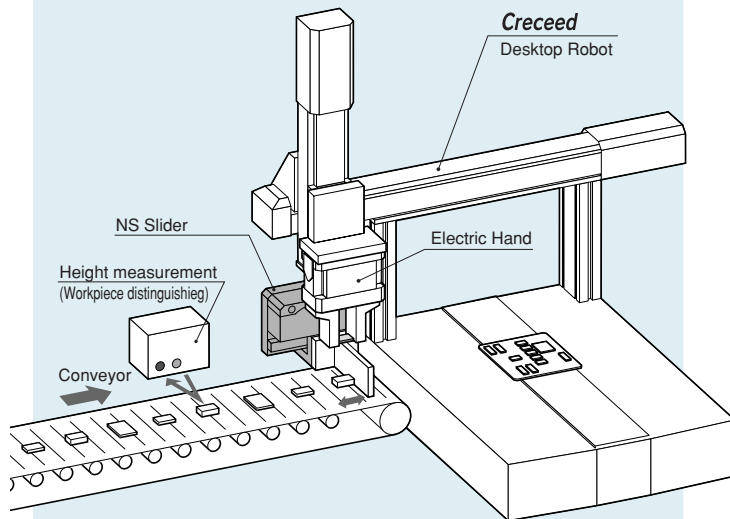
Gripping a test tube

The example shows a gripping operation for delicate workpieces such as test tubes.



Positioning mechanism for workpiece loading

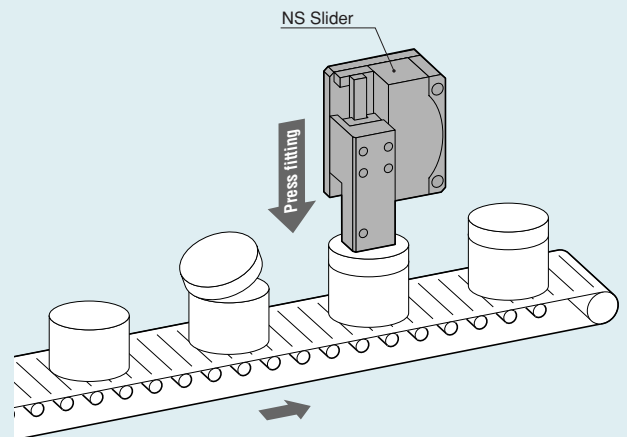
Application example for loading a workpiece to the Cell Master.
Distinguishes between workpiece types in the previous stage, moves to the position required for the workpiece, and stops.



Capping operation

Application example for pharmaceutical product capping or crimping operations.

Addition of judgment function enables detection of workpiece protrusion and missing caps.



MEMO

[illegible]

MEMO

[illegible]

Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

ISO9001
ISO14001



- ISO 9001 certified offices are Main Office, Tokyo Plant, Komagane Plant and Sales Offices.
- ISO 14001 certified offices are Main Office, Tokyo Plant and Komagane Plant.

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