

# Final Control Components

## Electric Actuators



This symbol identifies those products which contains less than the maximum levels of the 10 restricted substances specified by the RoHS Directive.



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### Product videos are on our website!



**STEPTOP Electric Actuator**  
Revolution of Electric Control Valves



Free from Requirements of Instrument Air Systems  
Control Valves with STEPTOP Electric Actuators



**STEPTOP Electric Actuator**  
1/1000 Resolution Demo Kit



Control Valves with STEPTOP Electric Actuators  
Application Examples Pulp & Paper Mill

● Please visit our website: [https://www.mgco.jp/video\\_e/index.html](https://www.mgco.jp/video_e/index.html)

**MG CO., LTD.**  
(formerly M-System Co., Ltd.)  
[www.mgco.jp](http://www.mgco.jp)

Make Greener automation

# Electric Actuators Lineup



Linear motion type

## MSP Series

Open network interface  
CC-Link DeviceNet



150 N ● 33.7 lbf      300 N ● 67 lbf      500 N ● 112 lbf      700 N ● 157 lbf

600 N ● 135 lbf

Open network interface  
CC-Link DeviceNet



150 N ● 33.7 lbf      300 N ● 67 lbf      500 N ● 112 lbf      700 N ● 157 lbf

Open network interface  
Modbus  
Auto-setup function



150 N ● 33.7 lbf      300 N ● 67 lbf

Open network interface  
Modbus  
Auto-setup function



450 N ● 101 lbf      600 N ● 135 lbf      740 N ● 166 lbf

Thrust

150 N      300 N      500 N      700 N

Torque

5 N·m      10 N·m      16 N·m      24 N·m      33 N·m

## MRP Series

MRP4 Page 19  
CE UK CA IP66



MRP5  
CE UK CA IP66 Open network interface  
CC-Link DeviceNet  
Page 19

Open network interface  
CC-Link DeviceNet

10 N·m ● 7.38 lbf-ft



MRP6  
CE UK CA IP66 Open network interface  
CC-Link DeviceNet  
Page 19

5 N·m ● 3.69 lbf-ft      10 N·m ● 7.38 lbf-ft      16 N·m ● 11.8 lbf-ft      24 N·m ● 17.7 lbf-ft      33 N·m ● 24.3 lbf-ft



Rotary motion type

MRP10  
CE UK CA IP66 Open network interface  
Modbus  
Terminal box with LED  
Page 21



6 N·m ● 4.43 lbf-ft      16 N·m ● 11.8 lbf-ft      33 N·m ● 25.8 lbf-ft

●Please consult with us for customized products.

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators

Linear Motion Electric Actuators

- MSP Series
- MSP10
- PSN Series

Rotary Motion Electric Actuators

- MRP Series
- MRP10
- PRP Series
- Position Sensors
- Valve Positioners MEX Series
- Manual Loading Stations

Open network interface  
CC-Link  
DeviceNet

**MSP6**  
CE UKCA IP66  
Page 10

1200 N ●  
270 lbf

1800 N ●  
405 lbf

2500 N ●  
562 lbf

**PSN Series**

**PSN1 PSN1G**  
CE IP66  
Page 15

1500 N ●  
337 lbf

3000 N ●  
674 lbf

PSN1G: 3000 N

**PSN3**  
CE IP66  
Page 15

5000 N ●  
1124 lbf

1500 N ● 337 lbf

3000 N ● 674 lbf

5000 N ● 1124 lbf

**MSP10**  
CE UKCA IP66  
Page 13

Open network interface  
**Modbus**  
Auto-setup function  
Terminal box with LED

1300 N

780 N ● 175 lbf

1200 N ● 270 lbf

1400 N ● 315 lbf

2300 N ● 517 lbf

2500 N ● 562 lbf

1200 N      1800 N      2500 N      3000 N      5000 N

70 N·m      100 N·m      200 N·m      600 N·m

**PRP Series**

**PRP-0**  
CE IP66  
Page 23

100 N·m ●  
73.8 lbf-ft

**PRP-1**  
CE IP66  
Page 23

200 N·m ●  
148 lbf-ft

**PRP-2**  
CE IP66  
Page 25

600 N·m ●  
443 lbf-ft

**EAR70**  
AC reversible motor type  
CE IP66

70 N·m ●  
51.6 lbf-ft

50 N·m ●  
36.9 lbf-ft

●Conformance with CE/UKCA depends upon models. Please refer to the data sheets for details.

# Application Examples in Various Demanding Process Fields

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

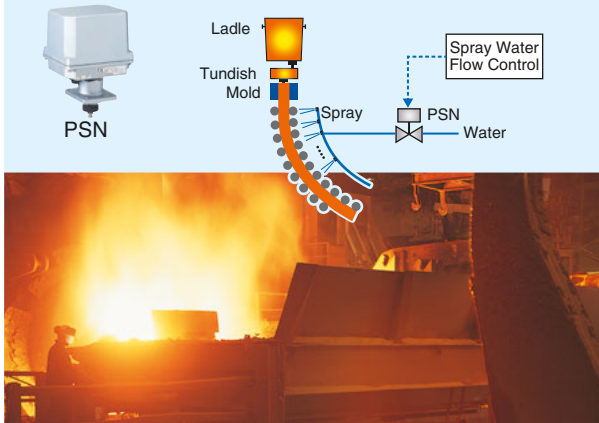
Valve Positioners MEX Series

Manual Loading Stations

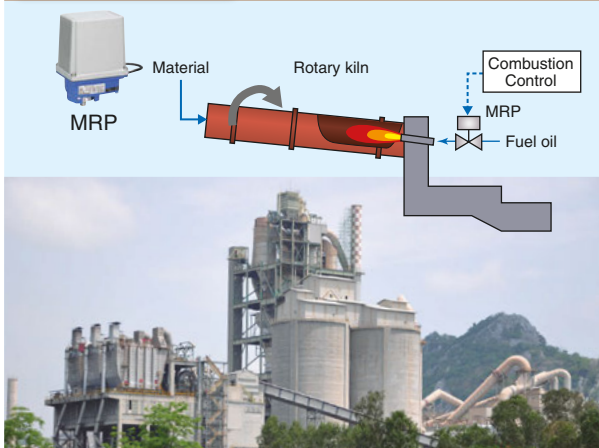
Linear Motion Electric Actuators

Rotary Motion Electric Actuators

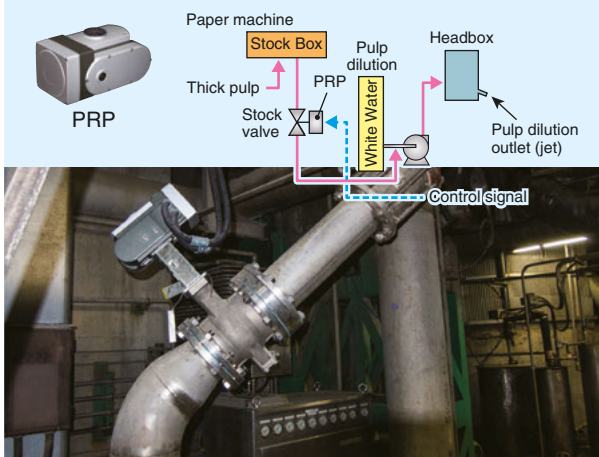
## STEEL Water Flow Control in Continuous Casting Line



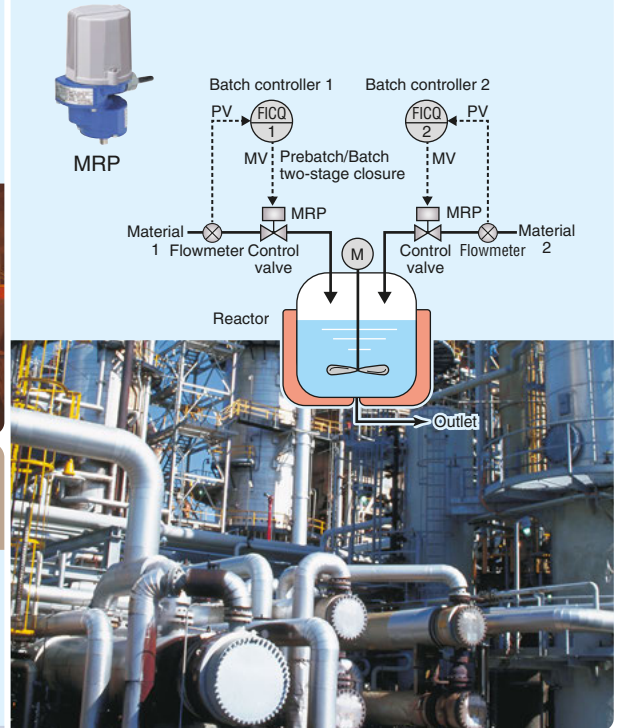
## CEMENT Fuel Flow Control in Rotary Kiln



## PAPER Basis Weight Control

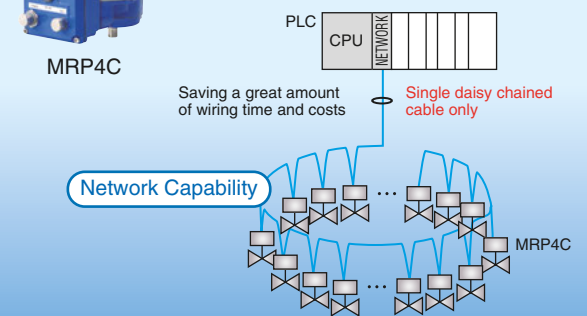


## CHEMICAL Batch Control



## PAPER Paper Profile Control

CP Control (Consistency Profiling): Basis weight control applied in CP (Cross Paper) direction. Called also CD (Cross Direction) profile control.



CP control unit. Image by Kobayashi Engineering Works Ltd.

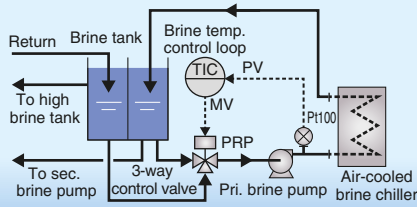


**ENVIRONMENTAL TEST CHAMBER**

Brine Temperature Control in an Environmental Test Chamber



PRP

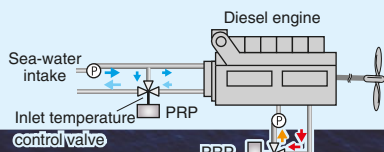


**SHIP**

Diesel Engine Cooling System



PRP



Lloyd's Register approved  
Lloyd's Register approved type available (Environmental categories ENV3)

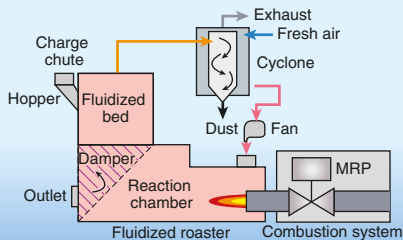


**FOOD**

Gas Flow Control in Combustion System for Roasting Machine



MRP



NHPC burner  
Image by OGCTS Co., Ltd.

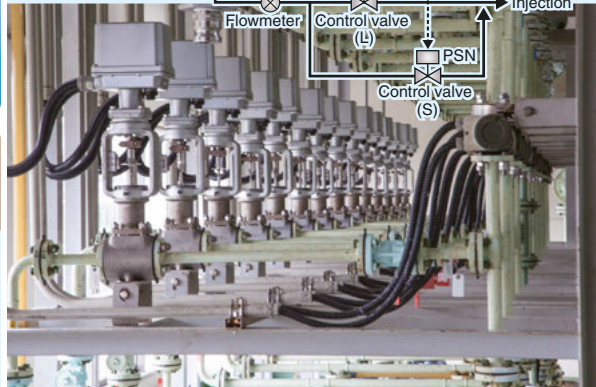
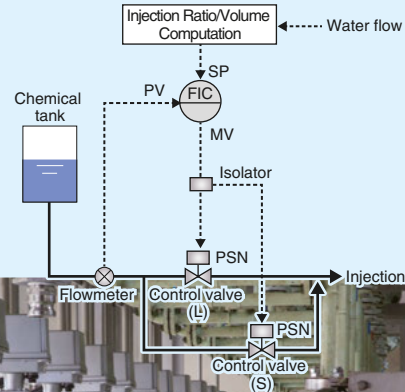


**WATER TREATMENT**

Chemical Injection Ratio Control



PSN

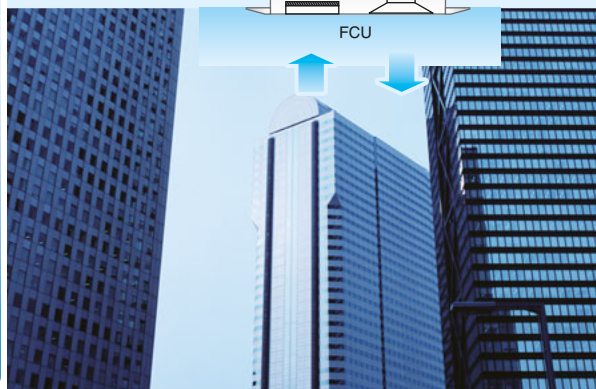
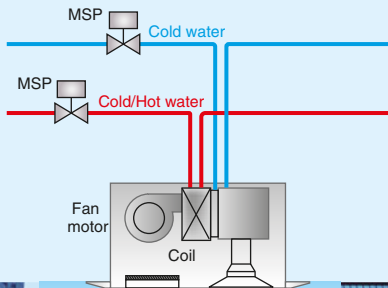


**BUILDING HVAC**

Cold/Hot Water Control for Fan Coil Unit



MSP



MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners  
MEX Series

Manual Loading Stations

# Electric valves can reduce the equipment cost to 1/5<sup>\*1</sup> and

### PNEUMATIC

The pneumatic control valve requires complicated equipment and consumes plenty of power.

**Control signal**  
4 - 20 mA DC

**Ancillary Equipment**

**Instrument Air System**

**Power supply**

**Pneumatic Control Valve**

**I/P transducer** 20 - 100 kPa

**P/P positioner**

**Compressor** **Aftercooler** **Air receiver** **Prefilter** **Mist separator** **Dryers** **After filter**

**Pressure reducing valve with filter** **Stop valve** **Air header** **Drain**

A compressor entails equipment costs as well as troublesome maintenance work! What is more, it results in high electricity bills!

### ELECTRIC

The electric control valve does not require incidental equipment, and consumes less power.

**Control signal**  
4 - 20 mA DC or open network

**The electric control valve**

**Control valve**

**Power source**

No Need of instrument air system nor ancillary equipment!

Equipment cost ↓ 1/5<sup>\*1</sup>  
Energy consumption ↓ 1/10<sup>\*1</sup>

Only standby power<sup>\*2</sup> is consumed when the control loop is in a steady state.

Instrument air system and ancillary equipment can be eliminated by switching pneumatic valves to electric ones.

\*1. The data surveyed by us.  
\*2. Maximum power consumption: 240 VA Standby power: 20 VA  
The data is provided on the condition that the PSN1 Electric Actuator is used.

## Mechanism that achieves high precision and high resolution control

High resolution & precision

**Micro-processor based Electronic Motor Driver Circuit**

Precisely tracking target position by feedback control in combination with predictive control.

**High Precision Position Sensor**

High torque  
1/1000 high resolution

**Stepping Motor**

Motor rotation control resolution of 1.8 degrees per pulse  
*See Page 7*

High precision torque control

**3-step Reduction Gear Mechanism**

High precision gear system with minimum backlash

Compactly designed

**Worm Gear Mechanism**

High reduction ratio despite the compact size

Model: PRP

Worm      Worm wheel

Output shaft

Linear Motion Electric Actuators

MSP Series

MSP10

PSN Series

Rotary Motion Electric Actuators

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

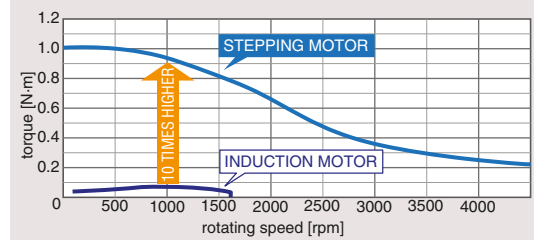
the energy consumption to  $1/10^{*1}$  compared from those of pneumatic valves.

### Features of Stepping Motor

#### Comparing to an induction motor

A stepping motor has the following advantages compared to an induction motor. It is most suitable as an actuating drive for small mechanisms including control valves.

- High torque for small size (approx. 10 times greater than an induction motor of the same mass)
- High torque at startup; with little torque variation during acceleration
- Variable rotating speed
- Rotating speed unaffected by load changes
- High precision positioning by acceleration/deceleration control
- Unaffected by voltage or frequency variations by the power source

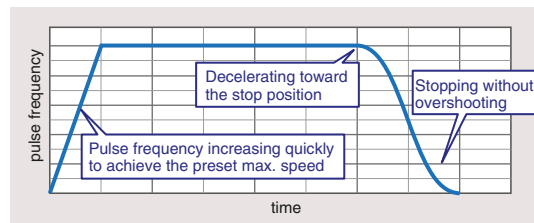


#### Predictive control enabling the motor to stop without overshooting

Basic rotating step per pulse of the two-phase stepping motor employed by the electric actuators is 1.8 degrees, thus requiring 200 pulses to complete a full 360-degree rotation.

The exact number of pulses is controlled by a micro-processor.

The "Predictive Control" employed as a part of its control algorithm enables the actuator to smoothly stop at an exact position (angle) without overshooting.



### Mechanism of Stepping Motor

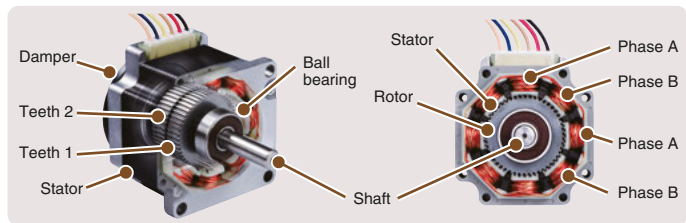
The below illustrations show cross section images of a stepping motor, called also "stepper motor" or "step motor."

The stepping motor consists of two major components: a stator (stationary part) and a rotor (rotating part).

The rotor is a permanent magnetic rotating shaft, surrounded by eight electromagnets or coils of two phases (A and B).

Each electromagnet is energized in turn, attracting and repulsing the rotor to rotate its shaft.

The motor shaft is connected to a damper that enhances the torque characteristics of the motor at high speed.



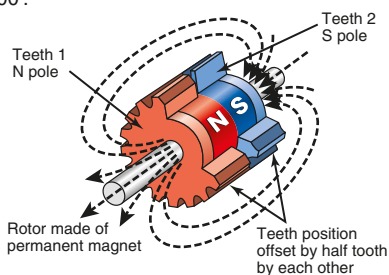
### How Stepping Motor Works 1/1000 Resolution

The N pole and S pole toothed gears are engaged with an offset of half tooth. The bottom of a N pole tooth is aligned with the top of a S pole tooth.

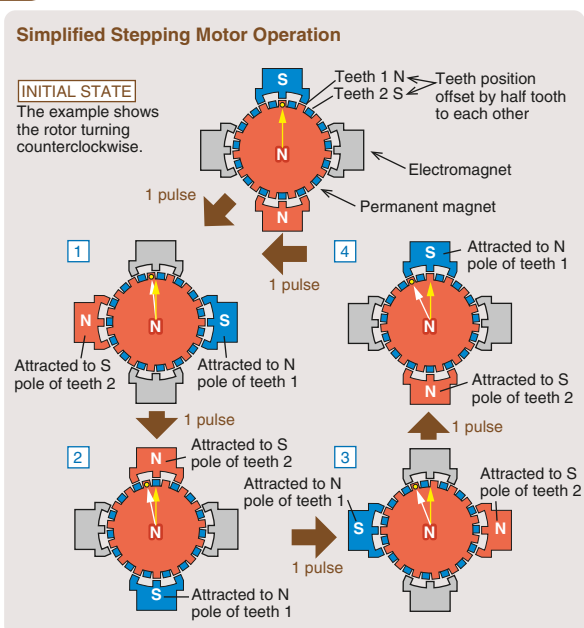
Each pulse moves the shaft by a quarter (1/4) tooth pitch while the N pole teeth and the S pole teeth are attracted and repulsed in turn. Each of those rotations is called a "step".

The motor has 50 teeth around the wheel, turning 1.8 degrees per step, requiring 200 pulses to make a complete rotation with an integer number of steps. In this way the motor can be turned by a precise mechanical angle in high resolution.

The motor shaft rotates more than 100 times while the actuator travels the entire stroke/span. The calculated resolution is greater than 1/20000'.



\* The nominal resolution described in the actuator data sheet is 1/1000, considering additional influencing factors such as the accuracy of the position detecting sensor, backlash of the reducing gear mechanism.



● The actuator rotor has 50 teeth. The above is a simplified example with 15 teeth.

Linear Motion Electric Actuators

- MSP Series
- MSP10

Rotary Motion Electric Actuators

- PSN Series
- MRP Series
- MRP10
- PRP Series
- Position Sensors
- Valve Positioners MEX Series
- Manual Loading Stations

Compact Linear Motion Electric Actuators

LINEAR MOTION

# MSP Series

High Resolution of 1/1000  
 Long Life Operation  
 Open Network Capable Actuator

### Stepping Motor Drive

Mechanical contacts reduced to the limit ensures long operating life.

### Open Network Capable

Wiring cost can be reduced by the daisy-chained cable connection. Consult with us for open networks other than CC-Link, DeviceNet or Modbus.



**2500 N**  
**562 lbf**  
 MAX THRUST

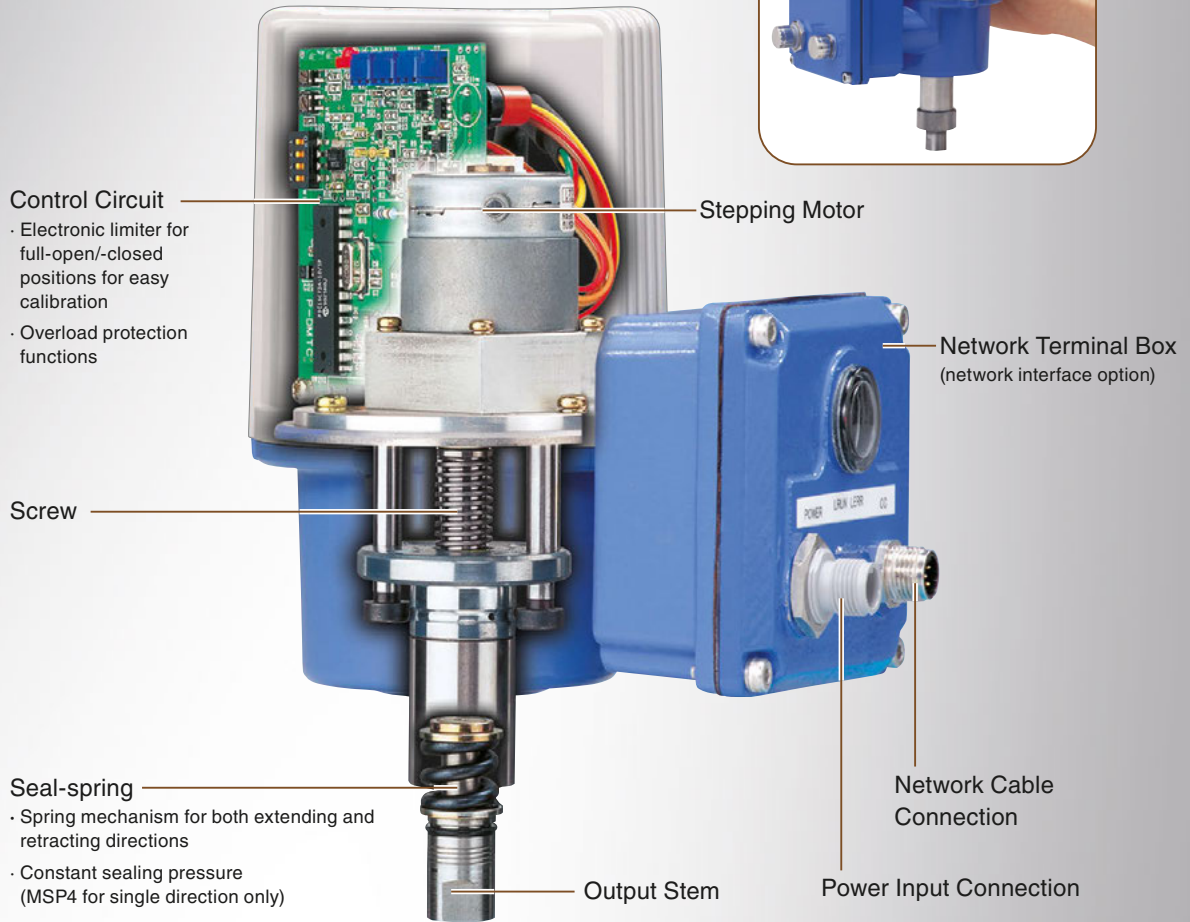
**40 mm**  
**1.57 in**  
 MAX STROKE

**AC**  
**DC**  
 POWERED



· Varies with the mode

Compact Size



Transparent image of MSP5D

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators



## Linear Motion MSP Series

### Analog I/O Type MSP Common Specifications

<b>Input signal</b>	: 4 - 20 mA or 1 - 5 V DC
<b>Power input</b>	: 24 V AC (only for MSP6, not selectable for CE) 100 - 120 V AC (not selectable for CE and UKCA) 200 - 240 V AC (not selectable for CE and UKCA) 24 V DC
<b>Full-open/-closed signals</b>	: Limit switch contact (Option)
<b>Forced open/close signal</b>	: Dry contact inputs (Option)
<b>Manual operation function</b>	: Option (MSP4, MSP5)
<b>Degree of protection</b>	: IP66
<b>Wiring</b>	: Cable, terminal box (Option)
<b>Drive</b>	: Stepping motor
<b>Position detection</b>	: Potentiometer
<b>Position output</b>	: 1 - 5 V DC (Not isolated)
<b>Operating temperature</b>	: -5 to +55°C (23 to 131°F)
<b>Vibration</b>	: 0.5 G (4.9 m/s <sup>2</sup> ) max.

### Open Network Capable Type MSP Common Specifications

<b>Power input</b>	: 24 V DC
<b>Degree of protection</b>	: IP66, IP67 (MSPxD connector)
<b>Wiring conduit</b>	: Microconnector (MSP4C, MSP5C, MSP6C, MSP4D, MSP5D, MSP6D)
<b>Drive</b>	: Stepping motor
<b>Position detection</b>	: Potentiometer
<b>Operating temperature</b>	: -5 to +55°C (23 to 131°F)
<b>Vibration</b>	: 0.5 G (4.9 m/s <sup>2</sup> ) max.

		MSP Series			
External View		 MSP4      MSP4C2      MSP4C MSP4D		 MSP5      MSP5C2      MSP5C MSP5D	
Model No.	Analog Type	<b>MSP4</b>		<b>MSP5</b>	
	Network Capable Type	<b>MSP4C2</b> <b>MSP4C</b>	<b>MSP4D</b> (IP67 connector)	<b>MSP5C2</b> <b>MSP5C</b>	<b>MSP5D</b> (IP67 connector)
Operation Time @ 10 mm		5 sec. / 150 N (33.5 lbf) 9 sec. / 300 N (67 lbf) 18 sec. / 700 N (157 lbf)	24 sec. / 500 N (112 lbf) 30 sec. / 700 N (157 lbf)	5 sec. / 150 N (33.5 lbf) 9 sec. / 300 N (67 lbf) 18 sec. / 700 N (157 lbf)	12 sec. / 300 N (67 lbf) 24 sec. / 500 N (112 lbf) 30 sec. / 700 N (157 lbf)
Stroke		15 mm (0.59")		20 mm (0.79")	
Approx. Weight (network capable type)		1.4 kg [3.09 lb] (1.5 kg [3.3 lb], 1.8 kg [4.0 lb] (MSPx2))			
Resolution		1/1000 or 0.015 mm, whichever is greater, with 0.1 % deadband setting			
External Dimensions <sup>*1</sup> (unit: mm [inch])		MSPxC, MSPxD 		MSx2 	
		*29 [1.14] max. for the stroke 5 - 10 mm		*29 [1.14] max. for the stroke 5 - 10 mm	

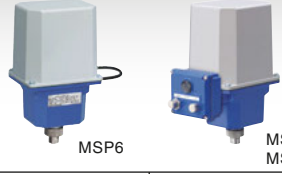







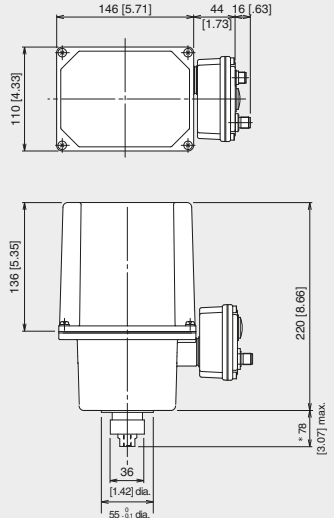
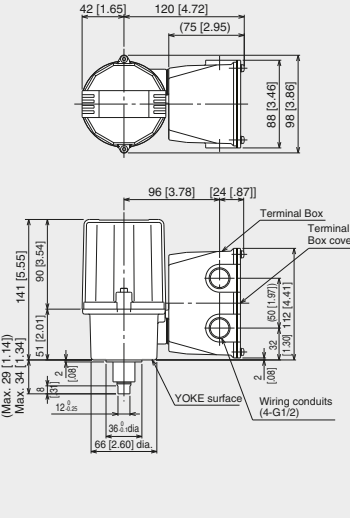
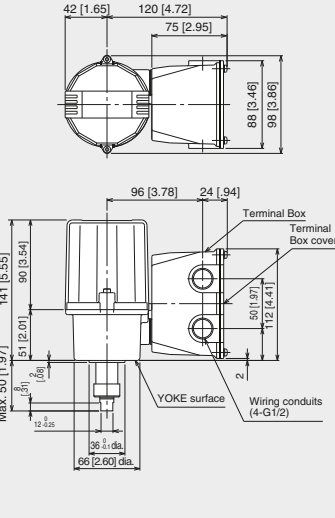

\*1. Dimensions for network capable types.      \*2. 50 [1.97] max. for MSP5C, MSP5D (40 [1.57] max. for 5-10 mm stroke)  
 \*3. 50 [1.97] max. for MSP5C2 (40 [1.57] max. for 5-10 mm stroke)

Linear Motion Electric Actuators	MSP Series
	MSP10
	PSN Series
	MRP Series
Rotary Motion Electric Actuators	MRP10
	PRP Series
	Position Sensors
	Valve Positioners MEX Series
	Manual Loading Stations

## Linear Motion MSP Series

### Modbus Type with Auto-Setup Function Common Specifications

<b>Input signal</b>	: 4 - 20 mA or 1 - 5 V DC	<b>Alarm output (triggered when the output stem is locked)</b>	
<b>Power input</b>	: 24 V DC	• <b>Output type</b>	: Photo MOSFET relay
<b>Degree of protection</b>	: IP66	• <b>Rated load</b>	: 160 V 150 mA AC/DC at peak
<b>Wiring conduit</b>	: 4-G 1/2	• <b>ON resistance</b>	: 8 Ω max.
<b>Drive</b>	: Stepping motor	• <b>Leakage current during opening/closing</b>	: 2 μA max.
<b>Position detection</b>	: Conductive potentiometer	<b>Operating temperature</b>	: -5 to +55°C (23 to 131°F)
<b>Position output</b>	: 4 - 20 mA DC or 20 - 4 mA DC (non-isolated) 1 - 5 V DC or 5 - 1 V DC (non-isolated)	<b>Vibration resistance (Sweep endurance test (IEC 61298-3 compliant))</b>	
		• <b>Acceleration</b>	: 19.6 m/s <sup>2</sup> (2 G)

		MSP Series			
External View					
Model No.	Analog Type <b>MSP6</b>  Network Capable Type <b>CC-Link MSP6C</b>  <b>DeviceNet MSP6D</b>  (IP67 connector)	<b>Modbus Type with Auto-Setup Function Common Specifications MSP40</b> 		<b>Modbus Type with Auto-Setup Function Common Specifications MSP50</b> 	
Operation Time (10 mm/Max. Thrust)	5 sec. / 600 N (135 lbf) 8 sec. / 1200 N (270 lbf) 15 sec. / 2500 N (562 lbf)	9 sec. / 600 N (125 lbf) 18 sec. / 1,200 N (270 lbf) 24 sec. / 1,800 N (405 lbf) 36 sec. / 2,500 N (562 lbf)	5 sec. / 150 N (33.5 lbf) 9 sec. / 300 N (67 lbf) 18 sec. / 700 N (157 lbf)	5 sec. / 150 N (33.5 lbf) 9 sec. / 300 N (67 lbf) 18 sec. / 700 N (157 lbf)	
Stroke	40 mm (1.57")		15 mm (0.59")	20 mm (0.79")	
Approx. Weight (Network capable type)	3.6 kg [7.9lb] (2.8 kg [6.17 lb])		1.9 kg (4.2 lb)	1.9 kg (4.2 lb)	
Resolution	1/1000 or 0.015 mm (MSP6, MSP6D 0.02 mm), whichever is greater, with 0.1 % deadband setting				
External Dimensions <sup>*1</sup> (Unit: mm [inch])	 <p>*58 [2.28] max. for the stroke 10 - 20 mm</p>		 <p>The dimension in ( ) is when the stroke is set to 5 to 10 mm</p>		 <p>The dimension in ( ) is when the stroke is set to 5 to 10 mm.</p>
Accessory	Yoke set Model: <b>YSS</b>		Programming Unit Model: <b>PU-2A</b> 		

\*1. Dimensions for network capable types.

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators

## AUTO-SETUP FUNCTION: MSP40 / MRP50

Auto-setup is the function for automatically adjusting the full-closed/-open positions and the seal spring pressure when the actuator is mounted on a valve.

By entering the valve stroke length and the necessary seal spring contraction amount using the Programming Unit (Model: PU-2A) or via Modbus communication, adjustments are performed automatically, saving manual calibrations and reducing commissioning time.



### You do not have to have the Programming Unit to use the auto-setup function.

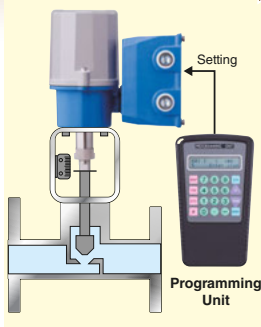
If you do not have the Programming Unit or do not wish to use Modbus communication, all you have to do is filling values of the valve stroke length and the necessary seal pressure in Ordering Information Sheet when you order the product. Our factory will proceed with all settings for you for free of charge.

Auto-setup can be also performed by manipulating DIP switches equipped on the actuator unit.

#### Example with MSP40

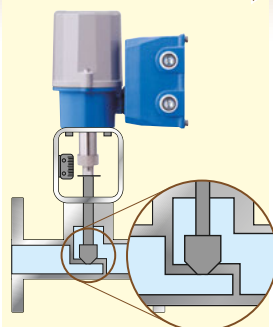
Calibration is processed and completed automatically.

#### 1 Connecting to the valve



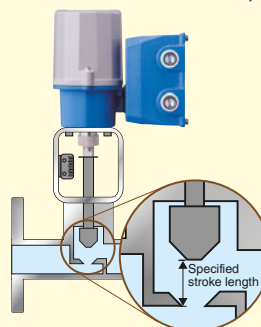
With the MSP40 mounted onto the valve, enter the stroke length and the seal spring contraction amount (extended stem) on the Programming Unit (Model: PU-2A).

#### 2 Setting the full-closed position



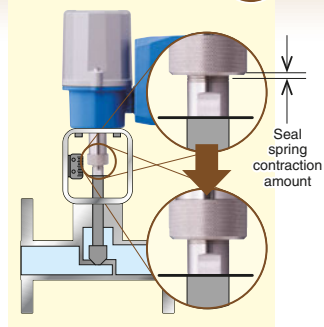
Start the auto-setup process. Firstly, the stem moves downward until the plug hits the valve seat. (If it reaches the extended end before hitting the valve seat, the process is aborted as an error.)

#### 3 Setting the full-open position



Secondly, it moves upward for a distance of the specified stroke. (If it hits the upper side of the valve seat before reaching the specified length, the process is aborted as an error.)

#### 4 Pressing on seal spring Finish



Then it moves downward again to the valve seat position and presses further on by the specified seal spring contraction amount. If there is no abnormality, the setting is saved and the stem goes back to 50% position to complete the setup.

Calibration is processed automatically by pressing keys on the Programming Unit after the actuator is mounted on a valve.

MSP Series

Linear Motion Electric Actuators

MSP10

PSN Series

MRP Series

Rotary Motion Electric Actuators

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuator

LINEAR MOTION

# MSP10

High resolution 1/1000, Modbus communication, Easy installation and maintenance

### Auto-setup Function


The time and effort required to adjust the valve opening is greatly reduced. Those for maintenance work can be also saved.

### Convenient Terminal Box

Terminal blocks, switches, buttons and LEDs are all housed in the terminal box for the ease of installation and maintenance.

### Modbus Communication

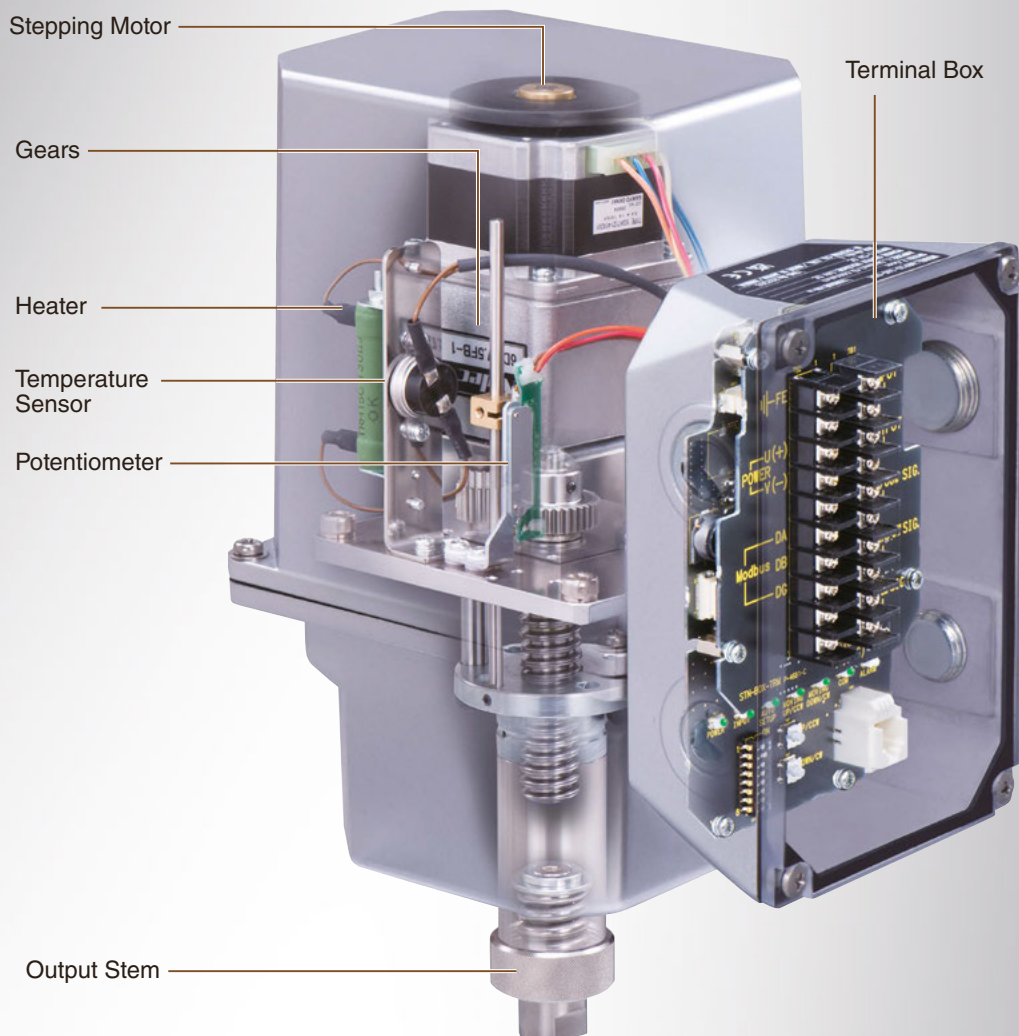
Directly connectable to PLC/PC network  
Actuators' operation data can be accumulated while in the normal operation.

 LINEAR MOTION	<b>2500 N</b> <b>562 lbf</b> MAX THRUST	<b>40 mm</b> <b>1.57 in</b> MAX STROKE	<b>24 V</b> <b>DC</b> POWERED
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· Varies with the model



Transparent image of MSP10

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

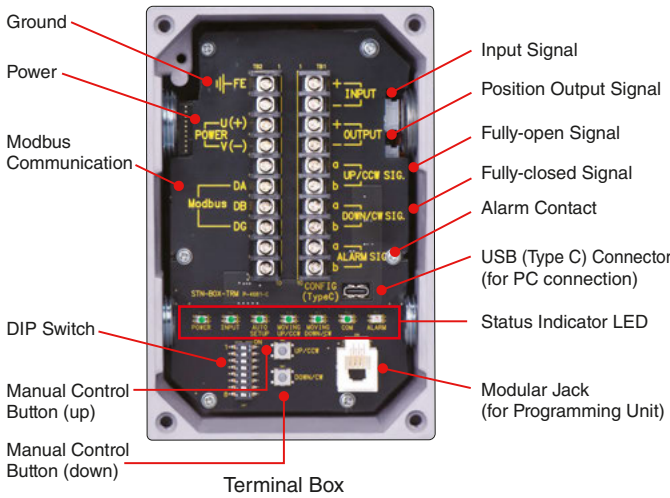
Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators



### All Control Circuits Housed in the Terminal Box



#### 1. Easy wiring

The terminal box is separate from the main unit to make wiring work easier.

#### 2. Operation can be checked at a glance

LEDs for operating status indication can be checked through the rugged, transparent polycarbonate cover.

#### 3. Easy parameter setting

Various parameters can be set with DIP switches or by using the Programming Unit (PU-2A) connected to the modular jack in the terminal box, without opening the cover of the main actuator body. In addition, parameters can also be set from a PC using the configurator software (Model: STCFG).<sup>\*1</sup>

## Linear Motion MSP10

### Main Specifications

#### GENERAL SPECIFICATIONS

- Degree of protection** : IP66
- Wiring conduits** : G 1/2 female thread and G 3/4 female thread (total four)
- Drive** : Stepping motor
- Position detection** : Conductive potentiometer
- Isolation** : Power voltage or I/O signal to retract/UP signal position to extend/DOWN signal position to alarm signal to Modbus communication to metallic housing

#### Protective functions

- Automatically stops when thrust at lock (abnormal thrust increase)
- A heater is incorporated to use under cold areas.

#### MODBUS COMMUNICATION

- Communication** : Half-duplex, asynchronous, no procedure
- Standard** : TIA/EIA-485-A compatible
- Transmission distance** : 500 meters max.

#### INPUT SPECIFICATIONS

- Input signal** : 4 - 20 mA DC or 20 - 4 mA DC (non-isolated)  
1 - 5 V DC or 5 - 1 V DC (non-isolated)

#### OUTPUT SPECIFICATIONS

- Output signal** : 4 - 20 mA DC or 20 - 4 mA DC (non-isolated)  
1 - 5 V DC or 5 - 1 V DC (non-isolated)

- Alarm output** (triggered when the output stem is locked), **retract/UP signal position, extend/DOWN signal position:**  
Photo MOSFET relay

#### INSTALLATION

- Power input** : 24 V DC
- Operating temperature** : -15 to +66°C (5 to 150.8°F)  
(No direct sunlight, radiant heat or heat transfer.)
- Vibration resistance** (Sweep endurance test (IEC 61298-3 compliant))

- **Acceleration** : 19.6 m/s<sup>2</sup> (2 G)
- **Mounting orientation** : DO NOT mount upside-down
- **Approx. weight** : 4 kg (8.820 lb)

MSP10		External Dimensions (Unit: mm [inch])													
External View															
Model No.	<b>MSP10</b> CE UK CA IP66														
Output Stem Operation Distance	20mm [.79"] (adjustable to 10mm [.39"]) Max. stroke ≤ 20.0mm [.79"] or 40mm [1.57"] (adjustable to 20mm [.79"]) Max. stroke ≤ 40.0mm [1.57"]														
Operation Time <sup>*2</sup> @ 20 mm [.79"] /Thrust (Thrust at Lock)	<table border="1"> <tr> <td>3.2 sec./450N (500N)</td> <td>7 sec./1200N (1500N)</td> <td>13.5 sec./2500N (2700N)</td> </tr> <tr> <td>4 sec./600N (620N)</td> <td>8.4 sec./1300N (1500N)</td> <td>15.2 sec./2500N (2700N)</td> </tr> <tr> <td>5.7 sec./740N (790N)</td> <td>10 sec./1400N (1500N)</td> <td>16.5 sec./2500N (2700N)</td> </tr> <tr> <td>7.4 sec./780N (790N)</td> <td></td> <td>19.5 sec./2300N (2700N)</td> </tr> </table>	3.2 sec./450N (500N)	7 sec./1200N (1500N)	13.5 sec./2500N (2700N)	4 sec./600N (620N)	8.4 sec./1300N (1500N)	15.2 sec./2500N (2700N)	5.7 sec./740N (790N)	10 sec./1400N (1500N)	16.5 sec./2500N (2700N)	7.4 sec./780N (790N)		19.5 sec./2300N (2700N)		
3.2 sec./450N (500N)	7 sec./1200N (1500N)	13.5 sec./2500N (2700N)													
4 sec./600N (620N)	8.4 sec./1300N (1500N)	15.2 sec./2500N (2700N)													
5.7 sec./740N (790N)	10 sec./1400N (1500N)	16.5 sec./2500N (2700N)													
7.4 sec./780N (790N)		19.5 sec./2300N (2700N)													

\*1. The configurator software (Model: STCFG) can be downloaded for free from our web site.

\*2. Operation time can be changed on site using the configuration software (Model: STCFG) or the Programming Unit (Model: PU-2A).  
Be sure to confirm the data sheet.

Linear Motion Electric Actuators  
 MSP Series  
**MSP10**  
 PSN Series  
 Rotary Motion Electric Actuators  
 MRP Series  
 MRP10  
 PRP Series  
 Position Sensors  
 Valve Positioners MEX Series  
 Manual Loading Stations

Linear Motion Electric Actuators

LINEAR MOTION

# PSN Series

High Resolution of 1/1000  
 Programmable opening/closing speed  
 Brushless Angle Sensor

### Long Life and High Precision

Stepping motor drive realizes long life and high precision control.

### Open Network Capable

Contact us for details.

### Quick Start

The actuator starts quickly with a minimal deviation of input signal from valve position.



**5000 N**  
**1124 lbf**  
 MAX THRUST

**60 mm**  
**2.36 in**  
 MAX STROKE

**AC**  
**DC**  
 POWERED



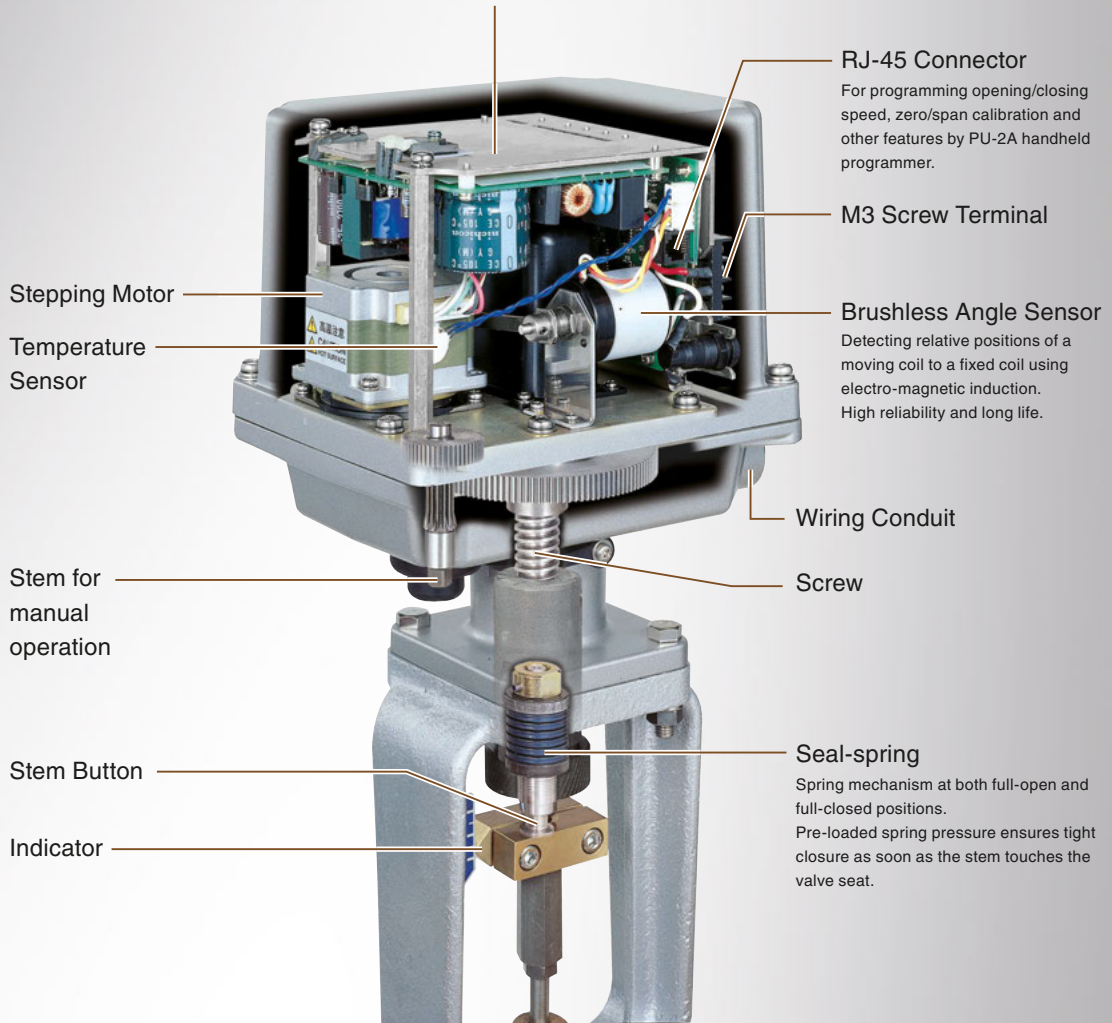
IP66



· Varies with the model

### Environmentally Resistant CPU

High reliability CPU capable of withstanding up to 70°C



Transparent image of PSN1

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators

## Linear Motion PSN Series

### PSN Series Common Specifications

**Input signal** : 4 - 20 mA or 1 - 5 V DC

**Power input** : 100 - 120 V AC (not selectable for CE)  
200 - 240 V AC  
24 V DC

**Degree of protection** : IP66

**Wiring conduits** : G 1/2 female thread (two),  
G 3/4 female thread (two)

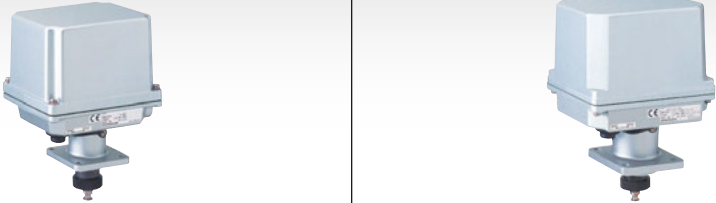

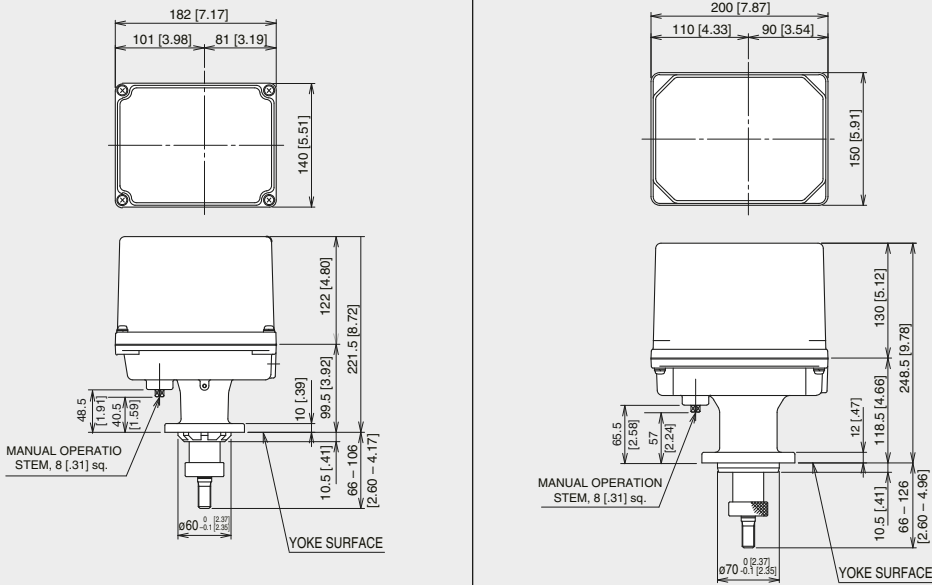


**Drive** : Stepping motor

**Position detection** : Brushless angle sensor

**Manual operation** : Available

**Position signal** : 4 - 20 mA DC

**Vibration** : ≤ 2 G (19.6 m/s<sup>2</sup>)

PSN Series	
External View	
Model No.	<b>PSN1</b> 
Stroke	0 to 40 mm (0" to 1.57")
Max. Thrust	3000N
Opening/closing speed adjustment	0.30 – 5.65 mm/s
Operating temperature	-25 to +55°C (-13 to +131°F)
Approx. Weight	5.9 kg (13.0 lb)
Resolution	0.04 mm
External Dimensions (Unit: mm [inch])	
Accessory	Manual Operation Spanner Model: <b>HPSN2</b> 
	Battery Model Model: <b>PSN-BAT</b>
	Programming Unit Model: <b>PU-2A</b> 

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors



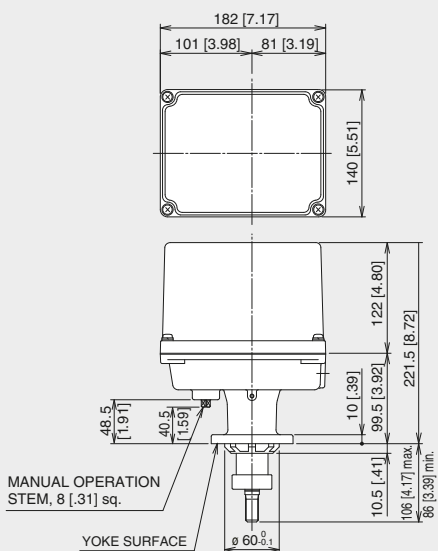



Valve Positioners MEX Series

Manual Loading Stations

## Linear Motion PSN Series

### PSN1G Specifications

<b>Input signal</b>	: 4 - 20 mA DC	<b>Manual operation</b>	: Available
<b>Power input</b>	: 24 V DC	<b>Position signal</b>	: 4 - 20 mA DC
<b>Degree of protection</b>	: IP66	<b>Operating temperature</b>	: -25 to +66°C (-13 to +150.8°F)
<b>Wiring conduits</b>	: G 1/2 female thread (two)	<b>Vibration resistance (Sweep endurance test)</b>	
<b>Drive</b>	: Stepping motor	· <b>Acceleration</b>	: 1 G (9.8 m/s <sup>2</sup> )

PSN1G	
External View	
Model No.	<b>PSN1G</b> IP66 
Output Stem Operation Distance	0-20 mm (0" to .79")
Stroke	—
Max. Thrust	3200 N (reference value)
Operation speed (20 mm)/Max. Thrust	7.5 sec. /3200 N (reference value)
Operating temperature	-25 to +66°C (-13 to +150.8°F)
Approx. Weight	5.7 kg (12.57 lb)
Resolution	0.02 mm
External Dimensions (Unit: mm [inch])	
Accessory	Manual Operation Spanner Model: <b>HPSN2</b>  Programming Unit Model: <b>PU-2A</b>  

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators



## Video Library



### Control Valves with STEPTOP Electric Actuators Application Examples Pulp & Paper Mill

This video introduces our STEPTOP electric actuators, with a focus on application examples in pulp and paper mills.

[https://www.mgco.jp/video\\_e/stepstop\\_application/](https://www.mgco.jp/video_e/stepstop_application/)



### Free from Requirements of Instrument Air Systems Control Valves with STEPTOP Electric Actuators

This video introduces common air systems and how electric control valves with STEPTOP actuators are revolutionizing the control valve industry.

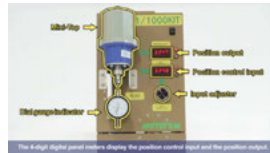
[https://www.mgco.jp/video\\_e/e\\_actuators\\_stepstop/](https://www.mgco.jp/video_e/e_actuators_stepstop/)



### STEPTOP Electric Actuator Revolution of Electric Control Valves

The video compares the control result of an electric control valve with that of a pneumatic control valve, both installed in an actual flow control loop.

[https://www.mgco.jp/video\\_e/e\\_actuators/index.html](https://www.mgco.jp/video_e/e_actuators/index.html)



### STEPTOP Electric Actuator 1/1000 Resolution Demo Kit

The 1/1000 Resolution Demo Kit demonstrates STEPTOP's performance at a glance and shows the innovation in electric control valve technology.

[https://www.mgco.jp/video\\_e/actuators/index.html](https://www.mgco.jp/video_e/actuators/index.html)

## Collaboration Maps

The "Map" brochures explain the functions and applications of electric actuators with "manga" style illustrations.

### ASAHI YUKIZAI CORPORATION



Japan

### TOKO VALEX CO., LTD.



Japan

### Dalian Shuntian Xingda Special Valve Co., Ltd.



China

### Wuxi KELK Apparatus & Valve CO., LTD.



China

### JDV CONTROL VALVES CO., LTD.



Taiwan

### WYECO AUTO VALVES CO., LTD.



Taiwan

Linear Motion Electric Actuators	MSP Series
	MSP10
Rotary Motion Electric Actuators	PSN Series
	MRP Series
	MRP10
Valve Positioners	PRP Series
	Position Sensors
	Valve Positioners MEX Series
Manual Loading Stations	Manual Loading Stations

Compact Rotary Motion Electric Actuators

# MRP Series

High Resolution of 1/1000  
 Long Life Operation  
 Open Network Capable Actuator

### Stepping Motor Drive

Mechanical contacts reduced to the limit ensures long operating life.

### Open Network Capable

Wiring cost can be reduced by the daisy-chained cable connection.  
 Consult with us for open networks other than CC-Link or DeviceNet.

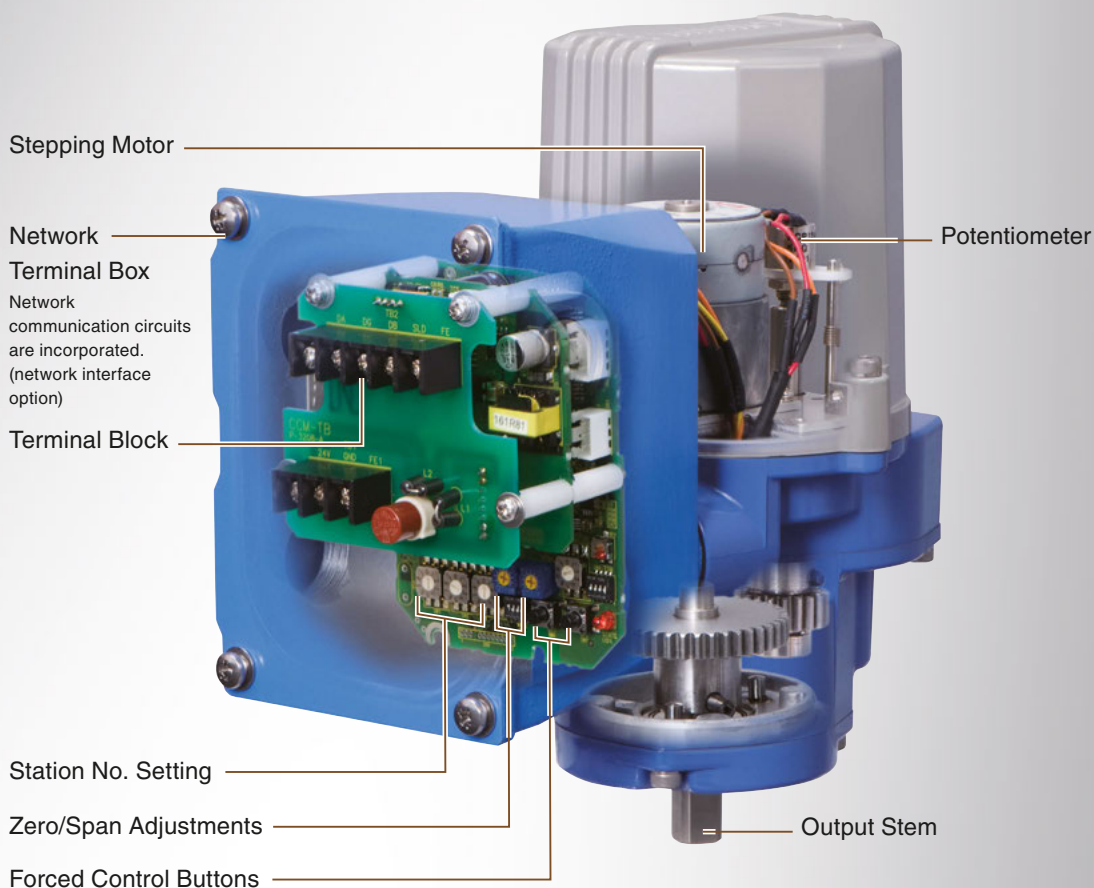
Compact Size



 ROTARY MOTION	<b>33 N·m</b> <b>24.3 lbf·ft</b> MAX TORQUE	<b>90°</b> MAX ANGLE	<b>AC DC</b> POWERED
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· Varies with the mode



Transparent image of MRP5C2

MSP Series	Linear Motion Electric Actuators
MSP10	
PSN Series	
MRP Series	Rotary Motion Electric Actuators
MRP10	
PRP Series	
Position Sensors	
Valve Positioners MEX Series	
Manual Loading Stations	

## Rotary Motion MRP Series

### Analog I/O Type MRP Common Specifications

<b>Input signal</b>	: 4 - 20 mA or 1 - 5 V DC
<b>Power input</b>	: 100 - 120 V AC (Not selectable for CE and UKCA) 200 - 240 V AC (Not selectable for CE and UKCA) 24 V DC
<b>Degree of protection</b>	: IP66
<b>Wiring</b>	: Cable Terminal box (Option)
<b>Drive</b>	: Stepping motor
<b>Position detection</b>	: Potentiometer
<b>Position output</b>	: 1 - 5 V DC (not isolated)
<b>Full-open / -closed signals</b>	: Limit switch contact (Option)
<b>Forced open/close signal</b>	: Dry contact (Option)
<b>Operating temperature</b>	: -5 to +55°C (23 to 131°F)
<b>Vibration</b>	: 0.5 G (4.9 m/s <sup>2</sup> ) max.

### Open Network Capable Type MRP Common Specifications

<b>Power input</b>	: 24 V DC
<b>Degree of protection</b>	: IP66 IP67 (MRPxD connector)
<b>Wiring conduits</b>	: Microconnector (MRP4C, MRP5C, MRP6C, MRP4D, MRP5D, MRP6D) With terminal block (MRP4C2, MRP5C2)
<b>Drive</b>	: Stepping motor
<b>Position detection</b>	: Potentiometer
<b>Operating temperature</b>	: -5 to +55°C (23 to 131°F)
<b>Vibration</b>	: 0.5 G (4.9 m/s <sup>2</sup> ) max.

		MRP Series					
External View							
Model No.	Analog Type	<b>MRP4</b>		<b>MRP5</b>		<b>MRP6</b>	
	Network Capable Type	<b>MRP4C2</b> <b>MRP4C</b>		<b>MRP4D</b> (IP67 connector)		<b>MRP5C2</b> <b>MRP5C</b>	
Operation Time (90°) /Torque		7 sec. /5 N-m (3.69 lbf-ft) 13 sec. /5 N-m (3.69 lbf-ft)		12 sec. /5 N-m (3.69 lbf-ft)		13 sec. /10 N-m (7.38 lbf-ft)	
Span		45 to 90 degrees, 90 to 180 degrees		45 to 90 degrees		45 to 90 degrees, 90 to 180 degrees	
Approx. Weight (network capable type)		1.3 kg [2.87 lb] (1.4 kg [3.1 lb], 1.7 kg [3.7 lb] (MRP4C2))		1.7 kg [3.7 lb] (1.8 kg [4.0 lb], 2.0 kg [4.4 lb] MRP5C2))		2.8 kg (3.0 kg)	
Resolution		1/1000 or 0.09°, whichever is greater, with 0.1 % deadband setting					
External Dimensions <sup>1</sup> (Unit: mm [inch])							

\*1. Applicable to network capable type

MSP Series

Linear Motion Electric Actuators

MSP10

PSN Series

MRP Series

Rotary Motion Electric Actuators

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Rotary Motion Electric Actuator

ROTARY MOTION

# MRP10

High resolution 1/1000, Modbus communication, Easy installation and maintenance

### Convenient Terminal Box

Terminal blocks, switches, buttons and LEDs are all housed in the terminal box for the ease of installation and maintenance.



**50 N·m**  
**36.9 lbf·ft**  
MAX TORQUE

**90°**  
MAX ANGLE

**24 V DC**  
POWERED

### Modbus Communication

Directly connectable to PLC/PC network  
Actuators' operation data can be accumulated while in the normal operation.



IP66



- Varies with the mode

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

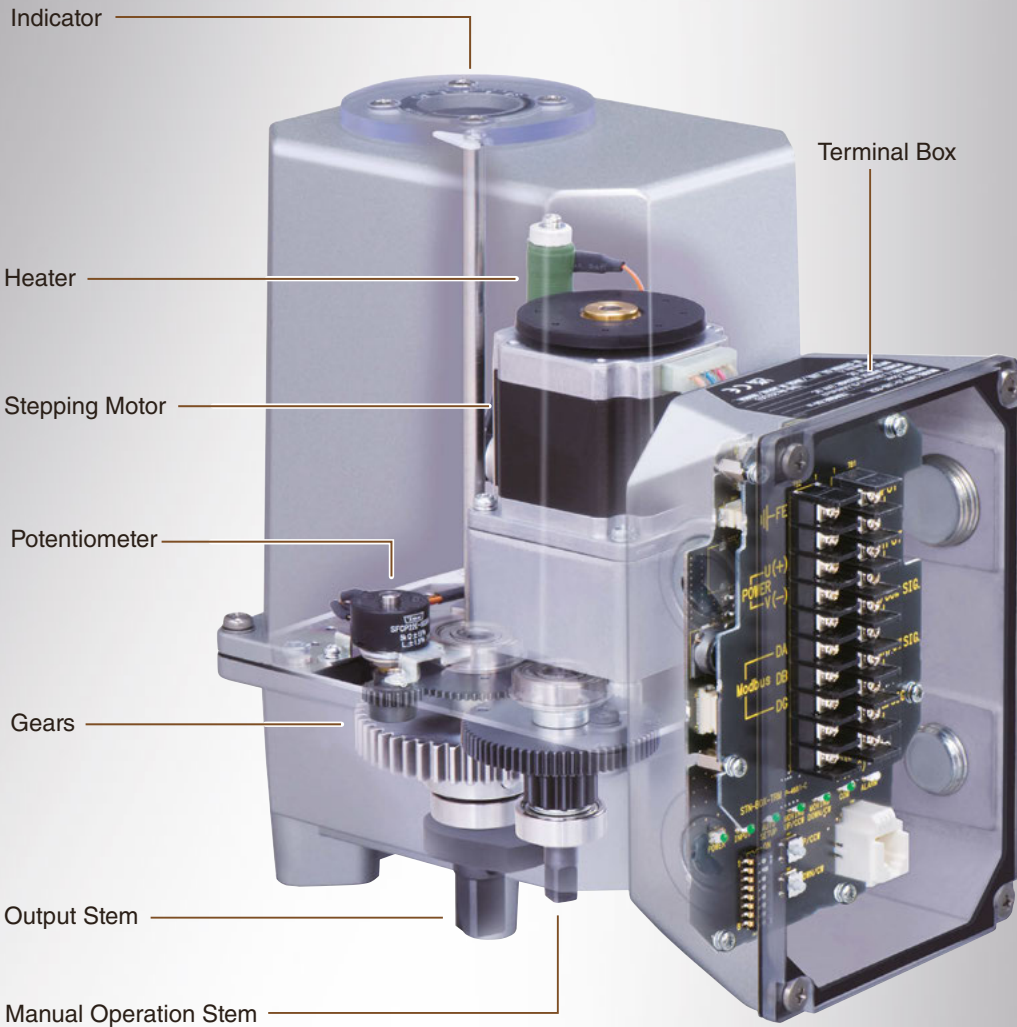
Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

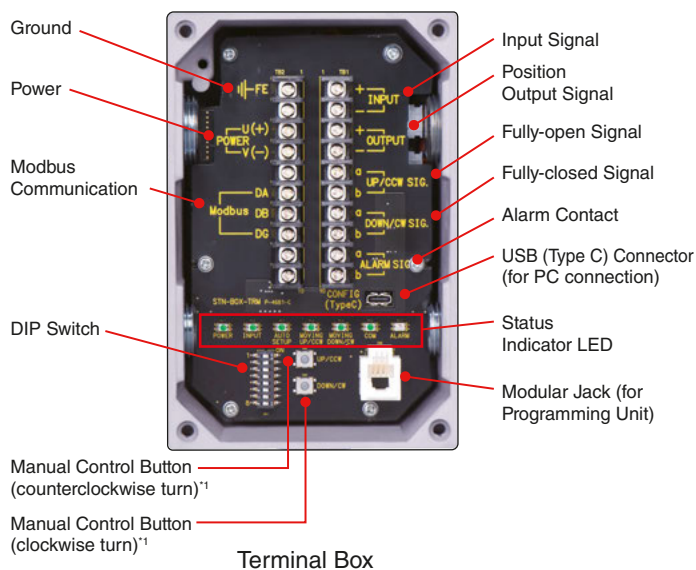
Rotary Motion Electric Actuators



Transparent image of MRP10



### All Control Circuits Housed in the Terminal Box



#### 1. Easy wiring

The terminal box is separate from the main unit to make wiring work easier.

#### 2. Operation can be checked at a glance

LEDs for operating status indication can be checked through the rugged, transparent polycarbonate cover.

#### 3. Easy parameter setting

Various parameters can be set with DIP switches or by using the Programming Unit (PU-2A) connected to the modular jack in the terminal box, without opening the cover of the main actuator body. In addition, parameters can also be set from a PC using the configurator software (Model: STCFG).<sup>2</sup>

## Rotary Motion MRP10

### Main Specifications

#### ■GENERAL SPECIFICATIONS

- Degree of protection** : IP66
- Wiring conduits** : G 1/2 female thread and G 3/4 female thread (total four)
- Drive** : Stepping motor
- Position detection** : Conductive potentiometer
- Isolation** : Power voltage or I/O signal to full-open signal position to full-close signal position to alarm signal to Modbus communication to metallic housing

#### ■Protective functions

- Automatically stops when torque at lock
- A heater is incorporated to use under cold areas.

#### ■MODBUS COMMUNICATION

- Communication** : Half-duplex, asynchronous, no procedure
- Standard** : TIA/EIA-485-A compatible
- Transmission distance** : 500 meters max.

#### ■INPUT SPECIFICATIONS

- Input signal** : 4 - 20 mA DC or 20 - 4 mA DC (non-isolated)  
1 - 5 V DC or 5 - 1 V DC (non-isolated)

#### ■OUTPUT SPECIFICATIONS

- Output signal** : 4 - 20 mA DC or 20 - 4 mA DC (non-isolated)  
1 - 5 V DC or 5 - 1 V DC (non-isolated)

**Alarm output** (triggered when the output stem is locked), **Full-open signal, full-close signal**: Photo MOSFET relay

#### ■INSTALLATION

- Power input** : 24 V DC
- Operating temperature** : -25 to +66°C (-13 to 150.8°F)  
(No direct sunlight, radiant heat or heat transfer.)
- Vibration resistance** (Sweep endurance test (IEC 61298-3 compliant))

- **Acceleration** : 19.6 m/s<sup>2</sup> (2 G)
- **Mounting orientation** : DO NOT mount upside-down
- **Approx. weight** : 4.4 kg (8.820 lb)

MRP10		External Dimensions (Unit: mm [inch])
External View		
Model No.	MRP10	
Operation Torque (torque at lock (approx.)) / Operation Time (90 degrees)	6 N·m (8 N·m) / 2.5 sec. 16 N·m (18 N·m) / 3.5 sec. 35 N·m (44 N·m) / 7.5 sec. 50 N·m (55 N·m) / 9.5 sec.	

\*1. Indicates the direction in which the output stem rotates when viewed from the top of the product cover.  
\*2. The configurator software (Model: STCFG) can be downloaded for free from our web site.

Linear Motion Electric Actuators	MSP Series
	MSP10
Rotary Motion Electric Actuators	PSN Series
	MRP Series
	MRP10
	PRP Series
	Position Sensors
	Valve Positioners MEX Series
	Manual Loading Stations

Rotary Motion Electric Actuators

ROTARY MOTION

# PRP Series

High resolution 1/1000, High speed operation 8.5 sec./90°, Freely selectable opening/closing speed

### Long Life and High Precision

Stepping motor drive realizes long life and high precision control.

### IP66

IP66 degree of protection

### Open Network Capable

Contact us for details.

### Lloyd's Register Type Approval

Lloyd's Register approved type available (Environmental categories ENV3)



**200 N·m**  
**148 lbf·ft**  
MAX TORQUE



**90°**  
MAX ANGLE

**AC**  
POWERED

Actuator mounting dimensions compliant with ISO 5211/Table 1, 2 F7 (PRP-1)



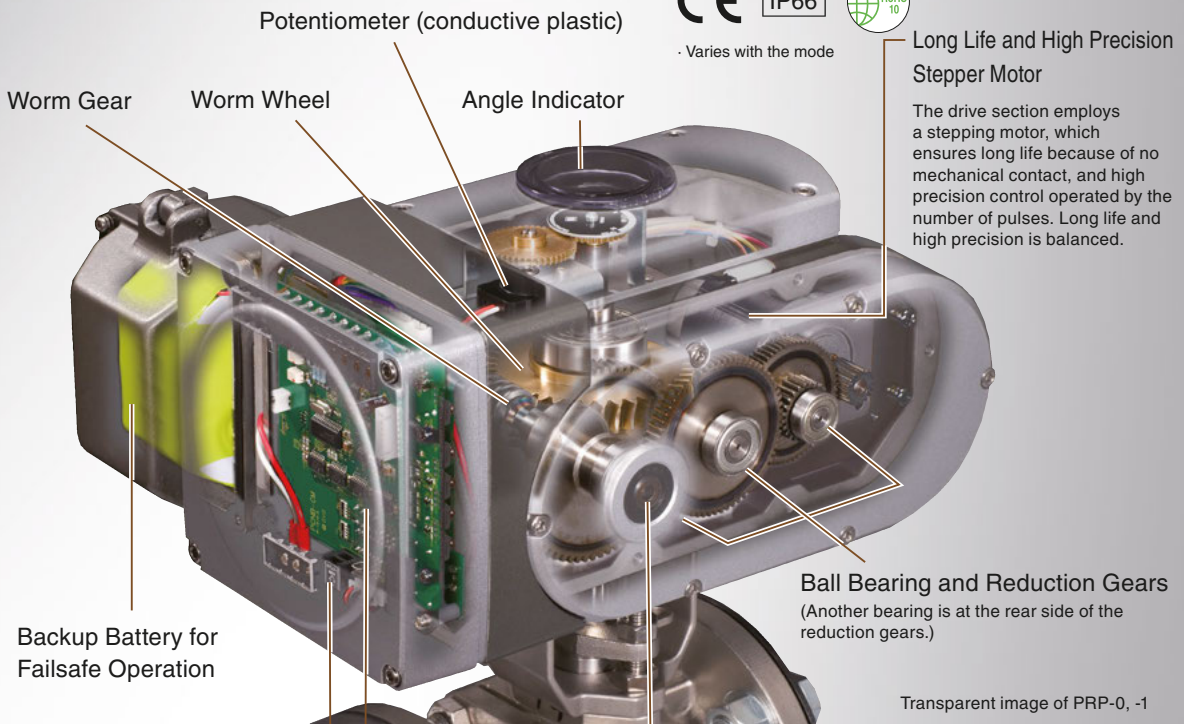
IP66



· Varies with the mode

### Long Life and High Precision Stepper Motor

The drive section employs a stepping motor, which ensures long life because of no mechanical contact, and high precision control operated by the number of pulses. Long life and high precision is balanced.



Transparent image of PRP-0, -1

**RJ-45 Connector**  
For programming with PU-2A hand held programmer

- User-configurable items:
- Full-closed/open position
  - Opening/closing speed
  - Closed/open side limiter
  - Full-closed/open signal
  - Split range and point
  - Deadband
  - Restart limiting timer

### High Speed Opening/Closing 8.5 to 125 sec./90°

Opening/closing speed can be changed on site.

### Heater with Temperature Sensor Contributing to Energy Saving

A typical countermeasure for cold environment is a heater working on for 24 hours/365 days, which inevitably wastes energy to some extent. The PRP is equipped with a temperature sensor attached to its stepping motor, and supplies current to the motor to heat it to maintain the internal temperature.

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators

## Rotary Motion PRP Series

### PSN Series Common Specifications

**Input signal** : 4 - 20 mA or 1 - 5 V DC

**Power input** : 100 - 120 V AC (Not selectable for CE)  
200 - 240 V

**Degree of protection** : IP66

**Wiring conduits** : G 1/2 female thread (two)

**Drive** : Stepping motor

**Position detection** : Potentiometer



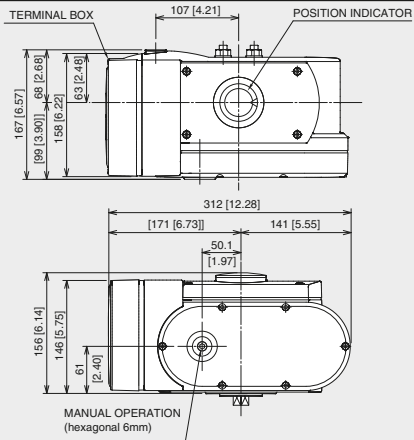
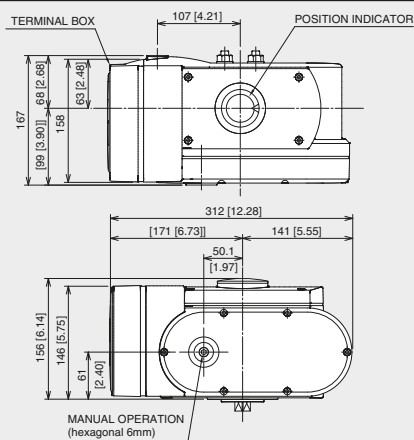

**Manual operation** : Available

**Position output** : 4 - 20 mA DC

**Operating temperature** : -20 to +55°C (-4 to +131°F) (Standard models)  
5 to 70°C (41 to +158°F) (Lloyd's Register approved)

**Vibration: Passed test condition below**

· **Acceleration** : 2 G (19.6 m/s<sup>2</sup>) (Standard models)  
0.7 G (6.9 m/s<sup>2</sup>) (Lloyd's Register approved)

PRP Series	
External View	
Model No. Standard models	<b>PRP-0x</b> CE IP66 
Model No. Lloyd's Register approved (Environmental categories ENV3)	<b>PRP-0xx-x/LR</b>
Operational Angle	90°
Max. Torque	100 N·m
Operation Time (90°)	12 sec. (PRP-01) 24 sec. (PRP-03) 8.5 - 125 sec. (PRP-00) 16 sec. (PRP-11) 24 sec. (PRP-13) 16 - 125 sec. (PRP-10)
Approx. Weight	10.8 kg (23.8 lb)
Resolution	1/200 with 0.5 % deadband (factory setting); 1/1000 with 0.1 % deadband
External Dimensions (Unit: mm [inch])	 
Accessory	Battery Model: <b>PSN-BAT</b> Programming Unit Mode: <b>PU-2A</b> CE 

### Rotary Motion Electric Actuators

#### EAR Series



#### Insulation class B (130°C)

AC reversible motor enhances reliability against heat.

#### Suitable for outdoor environment

IP66 degree of protection

#### Resistant to vibration

Normal operation confirmed in vibration testing for 2 G in three dimensions

\* Refer to data sheet for external dimensions.

**Input signal** : 4 - 20 mA or 1 - 5 V DC

**Power supply voltage** : 100 V AC±10%  
200 V AC±10%

**Position detection** : Potentiometer (conductive plastic)

**Manual operation** : Available

**Operating temperature** : -10 to +60°C (14 to 140°F)

**Sweep endurance test condition (IEC 61298-3 compliant)**

· **Acceleration** : 19.6 m/s<sup>2</sup> (2 G)

**Torque** : 70 N·m

**Operational Angle** : 90° (direct and reverse rotation)

**Approx. weight** : 4.7 kg (10.4 lb)

**Linear resolution** : 1/200

Product name	Model No.
EAR Series	<b>EAR70</b>

MSP Series

MSP10

PSN Series

MRP Series

MRP10

**PRP Series**

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Rotary Motion Electric Actuator

ROTARY MOTION

# PRP-2

High torque 600 N·m and high resolution 1/1000

### High torque 600 N·m

Planetary gear mechanism for speed reduction realizes the high torque of 600 N·m despite its compact size.

### Long Life and High Precision

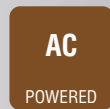
Stepping motor drive realizes long life and high precision control.

### Manual Handle Locked During Motor Operation

The worm gear for manual operation is locked to prevent the manual handle from turning during normal operation.

### Open network interface

HART 7 Under development



Angle Indicator

Stepping Motor

Thermal Control

Potentiometer for Position Detection

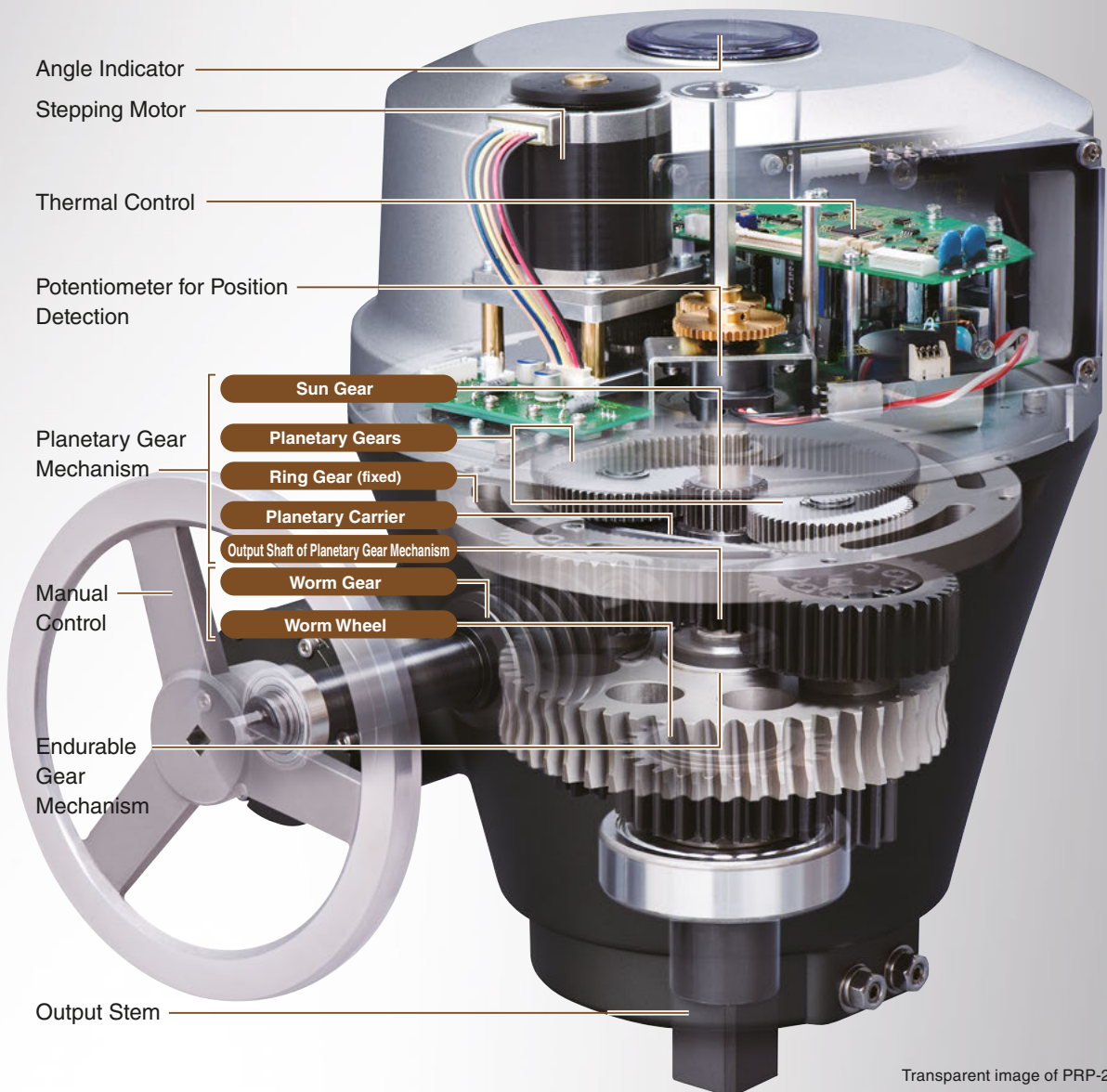
Planetary Gear Mechanism

Manual Control

Endurable Gear Mechanism

Output Stem

- Sun Gear
- Planetary Gears
- Ring Gear (fixed)
- Planetary Carrier
- Output Shaft of Planetary Gear Mechanism
- Worm Gear
- Worm Wheel



Transparent image of PRP-2

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

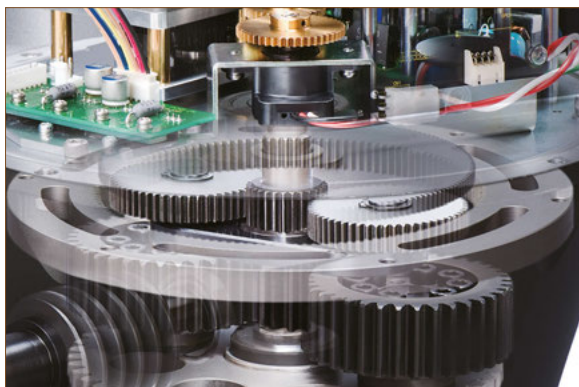
Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators



### Planetary Gear Mechanism



A planetary gear mechanism consists of two gears (the "planet") revolving around the center of the other (the "sun"), just like the planets revolve around the sun. A planetary carrier connects to the centers of the two planetary gears and rotates, to rotate the output shaft of the mechanism in turn.

The planetary gear mechanism can yield higher torque with a smaller number of gears compared from that required by a combination of spur gears, resulting in compact size and small backlash.

### Stepping Motor



The drive section employs a stepping motor featuring no mechanical contact structure and long life. The minimum rotating angle of the motor is 1.8 degrees per pulse, enabling high accuracy opening control.

### Thermal Control



The motor control circuit board is separated from the other electronic circuits. The heat dissipation efficiency of the board itself is also improved.

### Endurable Gear Mechanism



Dry bearings needing no lubrication are employed to balance robustness of the bearings and high reliability/long life.

### Potentiometer for Position Detection




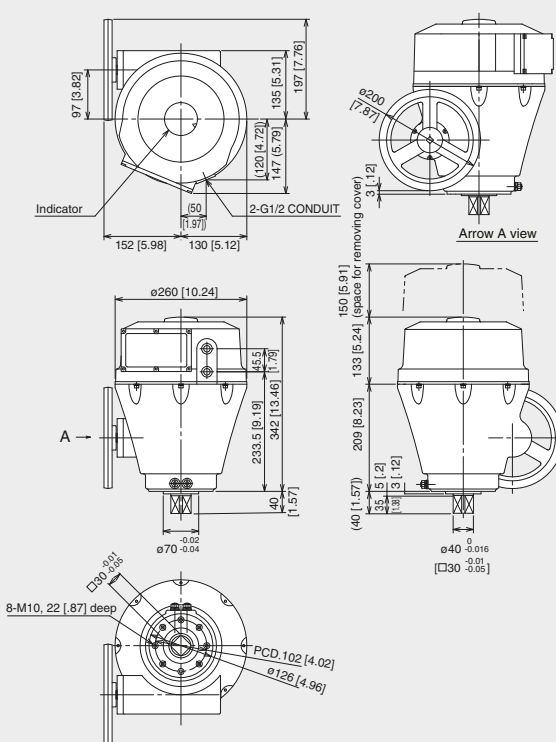

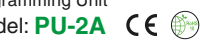
The class of potentiometer typically used for industrial vehicles or construction machines is used to realize vibration resistance, high quality and long life.

## Rotary Motion PRP-2

### Main Specifications

**Input signal** : 4 - 20 mA or 1 - 5 V DC  
**Power input** : 100 - 120 V AC or 200 - 240 V AC  
**Degree of protection** : IP66  
**Wiring conduits** : G 1/2 female thread (two)  
**Drive** : Stepping motor  
**Position detection** : Potentiometer (conductive plastic type)

**Manual operation** : Available  
**Position output** : 4 - 20 mA DC  
**Operating temperature** : -20 to +55°C (-4 to +131°F)  
**Vibration: Passed test condition below**  
**(Fixed frequency endurance test, Sweep endurance test)**  
 · **Acceleration** : 2 G (19.6 m/s<sup>2</sup>)

PRP-2		External Dimensions (Unit: mm [inch])	
External View			
Model No.	PRP-2 		
Operational Angle	90°		
Max. Torque	600 N·m		
Operation Time (90°)	50 sec./90° 34 sec./90° Specified time (refer to the instruction manual)		
Approx. Weight	26.5 kg (58.42 lb)		
Linearity resolution adj.	1/300 to 1/1000		
Accessory	Programming Unit Model: PU-2A 		

Linear Motion Electric Actuators	MSP Series
	MSP10
	PSN Series
Rotary Motion Electric Actuators	MRP Series
	MRP10
	PRP Series
Position Sensors	
Valve Positioners MEX Series	
Manual Loading Stations	

# Position Sensors

Reliable brushless construction  
Robust and compact!

Visit our website for details.



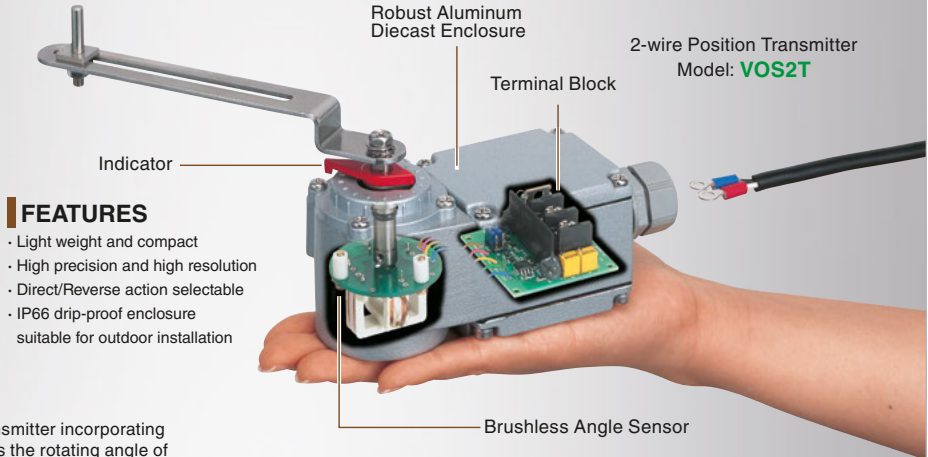
## Long-life Brushless Angle Sensor Incorporated

2-wire position transmitters and limit alarms incorporating a brushless angle sensor are lined up.  
Flame-proof type 2-wire position transmitters are also available.



Brushless Angle Sensor  
Model: **NRA**

**Brushless Angle Sensor .....**  
A type of angle sensor detecting positional relationship between a fixed coil and a movable coil, using the principle of magnetic induction. It has no electrical sliding part, featuring high reliability and long life.



### FEATURES

- Light weight and compact
- High precision and high resolution
- Direct/Reverse action selectable
- IP66 drip-proof enclosure suitable for outdoor installation

The VOS2T is a 2-wire position transmitter incorporating a brushless angle sensor. It detects the rotating angle of pneumatic/electric actuators, and transmits 4 - 20 mA output signal proportional to the angle.

Transparent image of VOS2T

# Valve Positioners MEX Series

Position Control Using Direct/Reverse Acting Motors

Visit our website for details.



## Multiple High Performance Functions

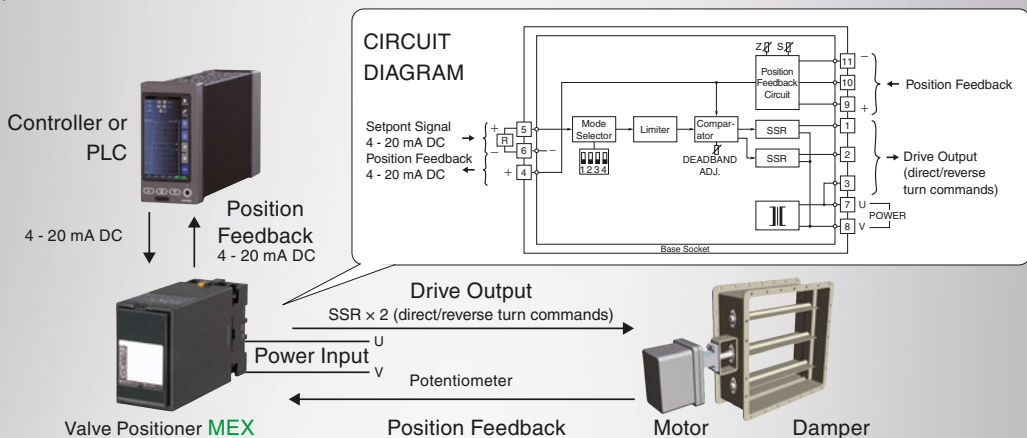
Deadband adjustment, timer adjustment, electronic limits

## High Accuracy Positioning

A model for high accuracy positioning by employing reverse-phase breaks is available.

## Various Mounting Options

Panel mount type with manual control function, device built-in type, and other types



The MEX compares a setpoint signal from the controller or PLC and a position feedback signal from the position sensor, and controls SSR or 24 V AC dry contact switches to match both signals.

MSP Series

MSP10

PSN Series

MRP Series

MRP10

PRP Series

Position Sensors

Valve Positioners MEX Series

Manual Loading Stations

Linear Motion Electric Actuators

Rotary Motion Electric Actuators

# Manual Loading Stations

Visit our website for details.

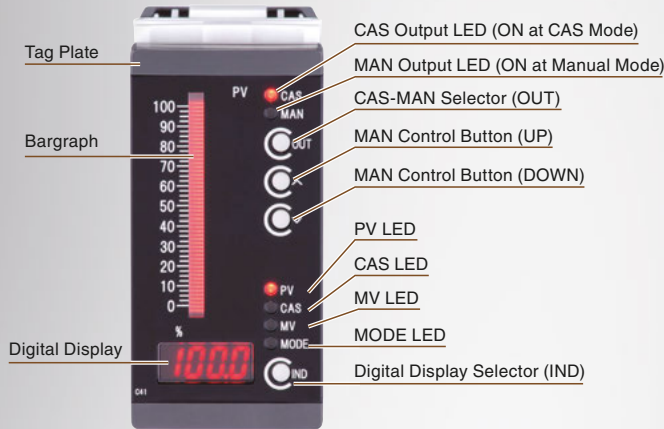


## Holding the Signal Before Control Output Failure

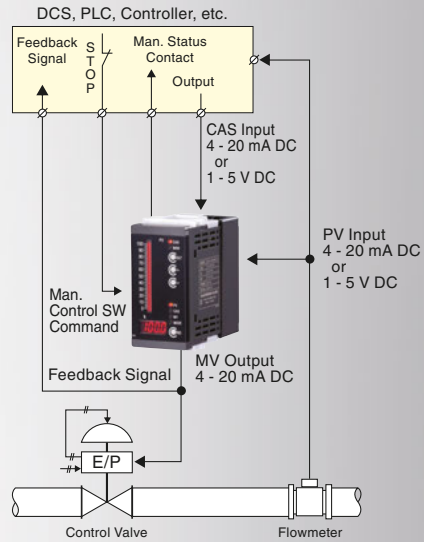
### Backup, Hold and Manipulation of MV Output Signal

Used as a backup of DCS, PLC or a PID controller  
 MV output signal is held when an "abnormality" signal (contact) or manual switching command contact is received.  
 Final control element can be manually controlled by increasing/decreasing MV output signals using external UP/DOWN switches.

**AC  
DC  
POWERED**



Analog Backup Station  
 Model: **ABF3**



## Manual Loader SM10

### Manual Loading Station with Backup

The analog (MV) output (4 - 20 mA or other current/voltage range) of the SM10 can be used to track a cascade (CAS) input (e.g. MV output from an external controller), or to provide a specific value for manual control.  
 Users can choose their own scaleplate specifications using Scale Plate Designer on our website and confirm the final design at site.

Product name	Model No.
MANUAL LOADER (with 4-digit digital meter, LED bar indicator)	<b>SM10</b>

- Linear Motion Electric Actuators
  - MSP Series
  - MSP10
  - PSN Series
- Rotary Motion Electric Actuators
  - MRP Series
  - MRP10
  - PRP Series
- Position Sensors
- Valve Positioners
  - MEX Series

Manual Loading Stations



Website



Request Info

MG CO., LTD.  
(formerly M-System Co., Ltd.)  
[www.mgco.jp](http://www.mgco.jp)

Your local representative: