MSYSTEM

2019-01 Rev. 1
EC-Z707 500541 01

Electric Actuators
Final Control Components

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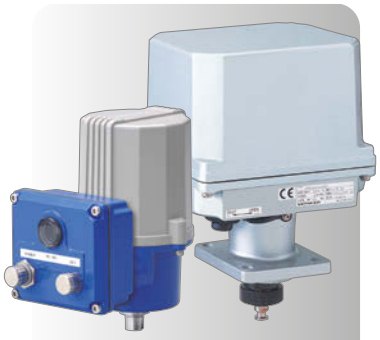
M-SYSTEM CO., LTD.
www.m-system.com

M-System Electric Actuators Lineup



LINEAR MOTION

MSP Series

Open network capable electric actuators using stepping motors.
Compact size, long life and high resolution of 1/1000.

MSP4 Page 8,10

Consult M-System for other network options

Open network optional CC-Link DeviceNet

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

Consult M-System for other network options

Open network optional CC-Link DeviceNet

600 N (135 lbf) ● 1200 N (270 lbf)

MSP5 Page 8,10

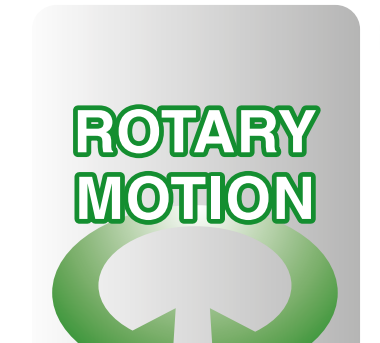
Consult M-System for other network options

Open network optional CC-Link DeviceNet

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

THRUST: 150 N (33.7 lbf) / 300 N (67 lbf) / 500 N (112 lbf) / 700 N (157 lbf) / 1200 N (270 lbf)

TORQUE: 5 N·m (3.69 lbf·ft) / 10 N·m (7.38 lbf·ft) / 16 N·m (11.8 lbf·ft)



ROTARY MOTION

MRP4 Page 12,14

Open network optional CC-Link DeviceNet

Consult M-System for other network options

5 N·m (3.69 lbf·ft)

MRP5 Page 12,14

Consult M-System for other network options

Open network optional CC-Link DeviceNet

10 N·m (7.38 lbf·ft)

MRP6 Page 12,14

Open network optional CC-Link DeviceNet

Consult M-System for other network options

10 N·m (7.38 lbf·ft) ● 16 N·m (11.8 lbf·ft)

MRP Series

Open network capable electric actuators using stepping motors.
Compact size, long life and high resolution of 1/1000.

PSN Series

Stepping motor realizing high resolution of 1/1000.
Opening/closing speed programmable.
Brushless angle sensor.

CSP Series

Thrust range up to 12000 N (2698 lbf).
High durability.

MSP6
Page 8,10
1800 N ● 2500 N ●
404 lbf 562 lbf

PSN1
Page 9,11
1500 N ● 3000 N ●
337 lbf 674 lbf

PSN3
Page 9,11
1500 N ● 3000 N ● 5000 N ●
337 lbf 674 lbf 1124 lbf

CSP
Page 11
12000 N ●
2698 lbf

1800 N 404 lbf | 2500 N 562 lbf | 3000 N 674 lbf | 5000 N 1124 lbf | 12000 N 2698 lbf

24 N·m 17.7 lbf·ft | 33 N·m 24.3 lbf·ft | 100 N·m 73.8 lbf·ft | 200 N·m 148 lbf·ft | 600 N·m 443 lbf·ft

24 N·m ● 33 N·m ●
17.7 lbf·ft 24.3 lbf·ft

PRP-0, PRP-1
Page 13,15

100 N·m ● 200 N·m ●
73.8 lbf·ft 148 lbf·ft

NEW **PRP-2**
Page 13,15

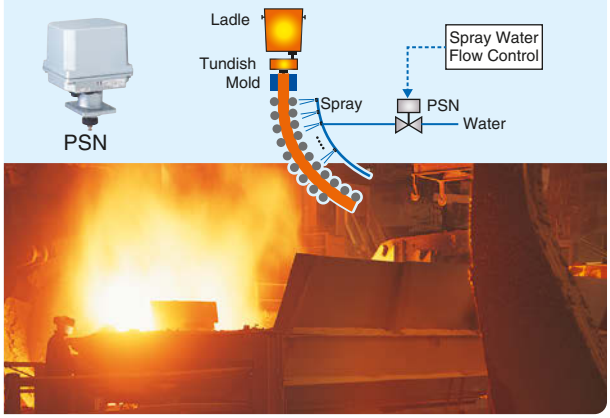
600 N·m ●
443 lbf·ft

PRP Series

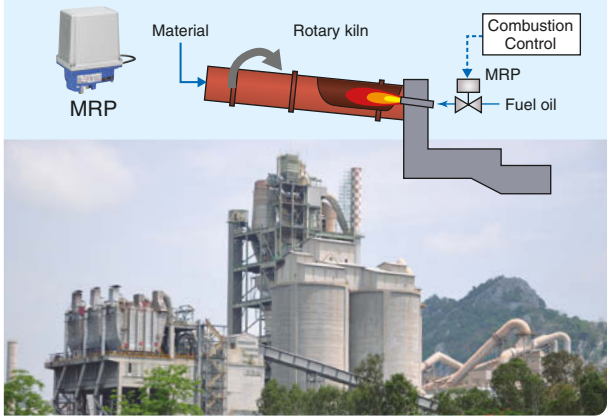
Stepping motor realizing high resolution of 1/1000.
Opening/closing speed programmable (8.5 to 125 sec/90°).

Proven Reliability. Application Examples in Various Demanding Process Fields.

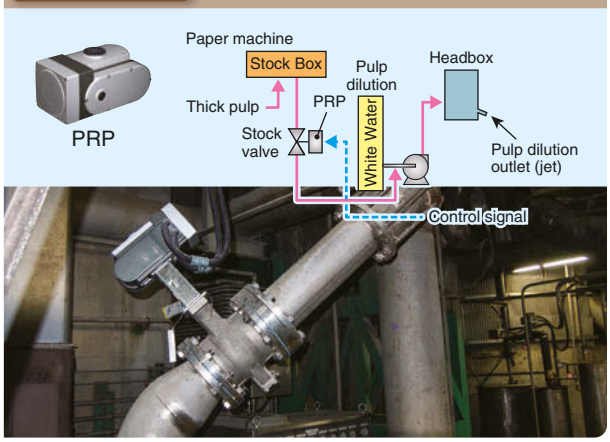
STEEL — Water Flow Control in Continuous Casting Line



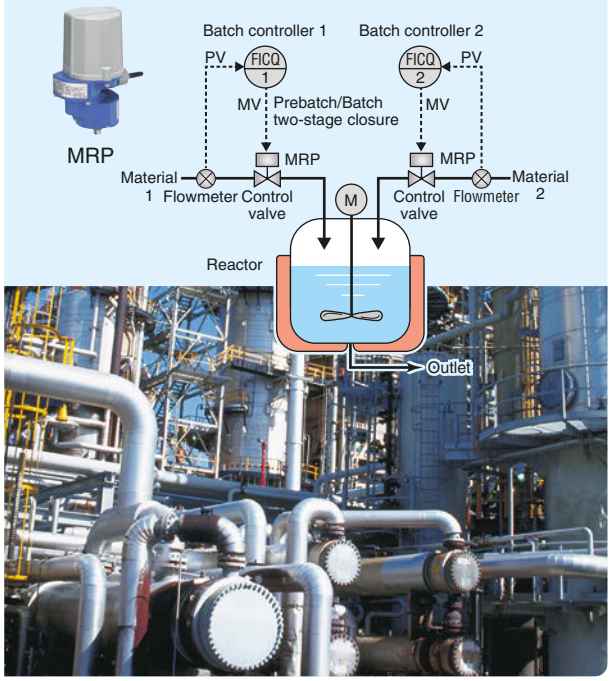
CEMENT — Fuel Flow Control in Rotary Kiln



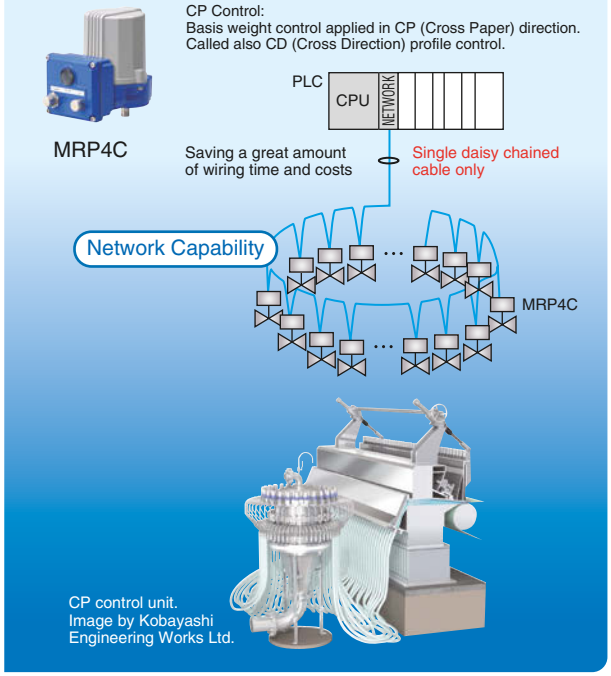
PAPER — Basis Weight Control



CHEMICAL — Batch Control

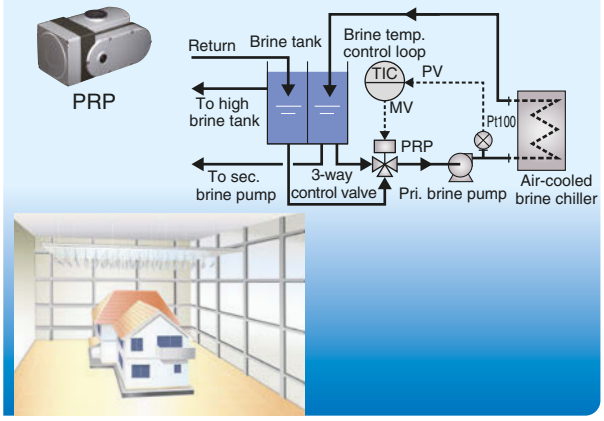


PAPER — Paper Profile Control



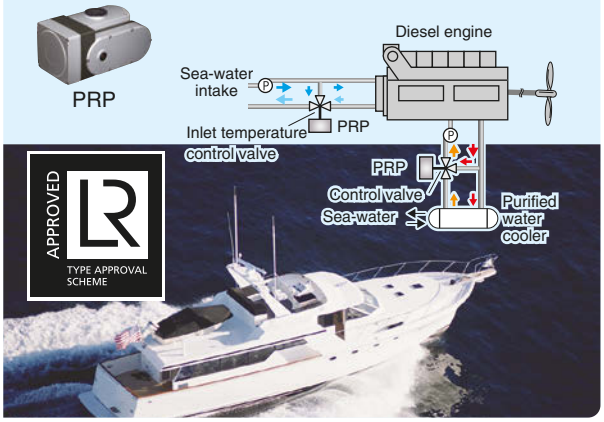
ENVIRONMENTAL TEST CHAMBER

Brine Temperature Control in an Environmental Test Chamber



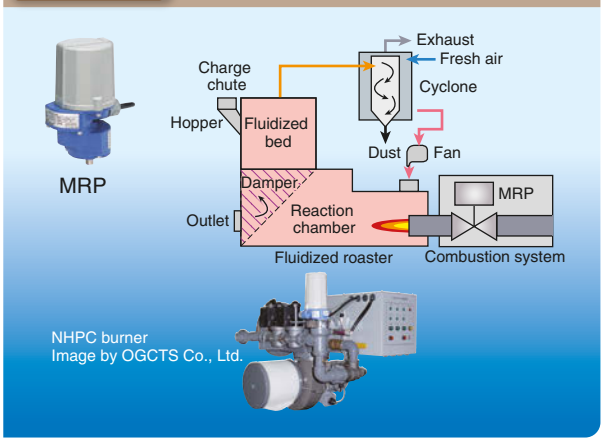
SHIP

Diesel Engine Cooling System



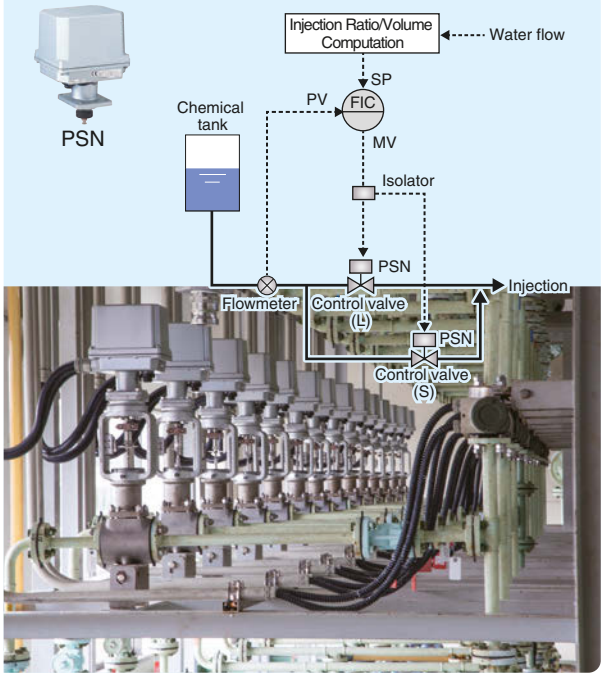
FOOD

Gas Flow Control in Combustion System for Roasting Machine



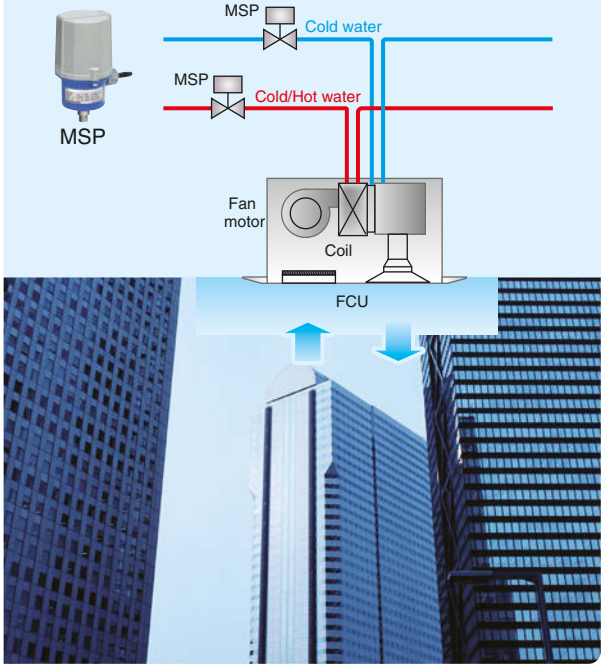
WATER TREATMENT

Chemical Injection Ratio Control



BUILDING HVAC

Cold/Hot Water Control for Fan Coil Unit

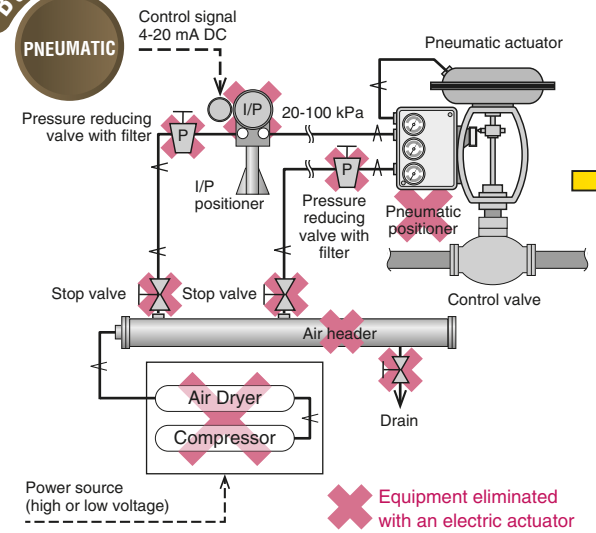


A Simple, Life-cycle Cost Saving Solution.

Pneumatic actuator requires a complex system and high electricity cost.

Before

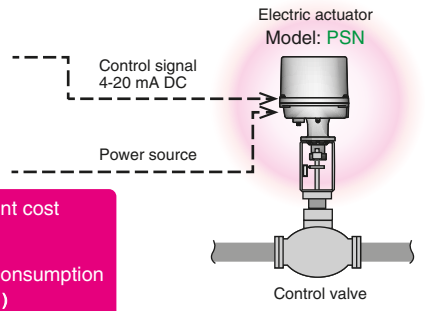
PNEUMATIC



Electric actuators consume less energy, without needing auxiliary equipment

After

ELECTRIC



Equipment cost
↓1/5 (*1)

Energy consumption
↓1/10 (*1)

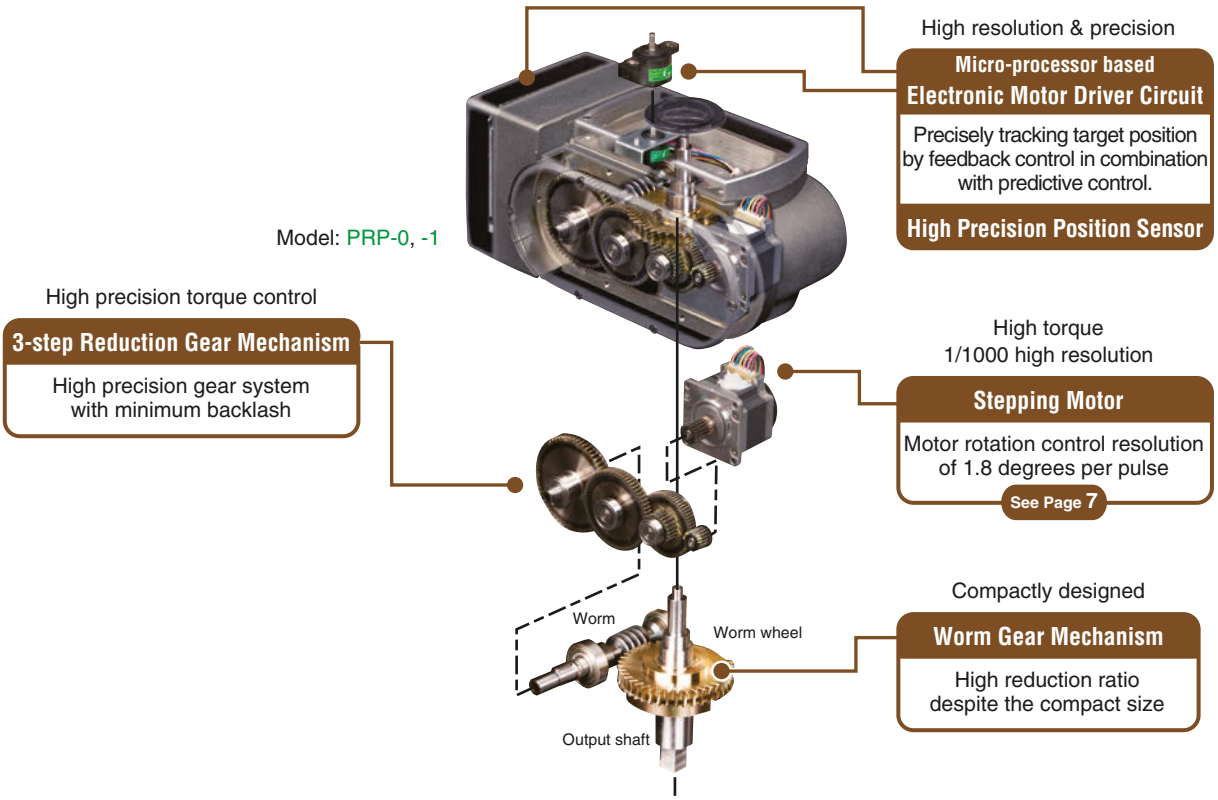
(*1) The data surveyed by M-System.

Open network type is available for selected models.

Open networks including DeviceNet and CC-Link, are available. Consult with M-System for other network protocols.

Emergency failsafe operation at power loss can be chosen with selected models using a backup battery (full-open, full-close, hold or specific position).

Mechanism that achieves high precision and high resolution control

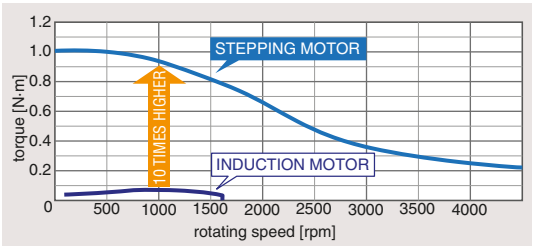


Features of Stepping Motor

Comparing to an induction motor

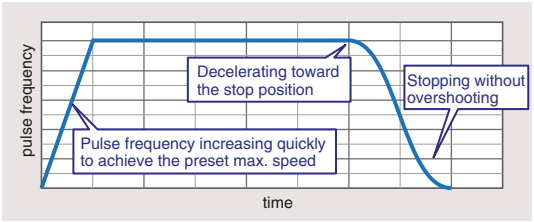
A stepping motor has the following advantages compared to an induction motor. It is most suitable as an actuating drive for small mechanisms including control valves.

- 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



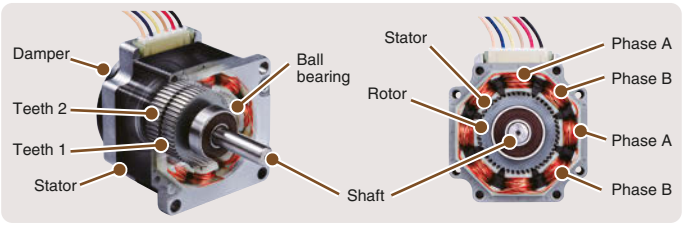
Predictive control enabling the motor to stop without overshooting

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

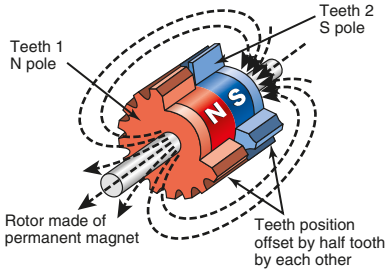
The below illustrations show cross section images of a stepping motor, called also "stepper motor" or "step motor."
The stepping motor consists of two major components: a stator (stationary part) and a rotor (rotating part).
The rotor is a permanent magnetic rotating shaft, surrounded by eight electromagnets 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

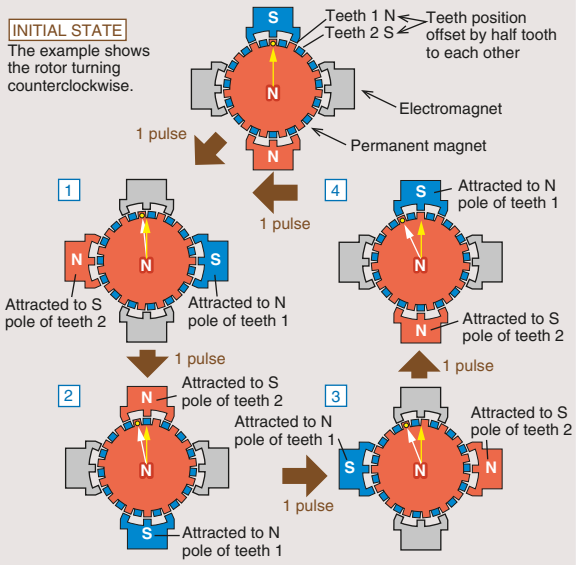
1/1000 Resolution

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.

Simplified Stepping Motor Operation



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

Compact Linear Motion Electric Actuators

MSP Series

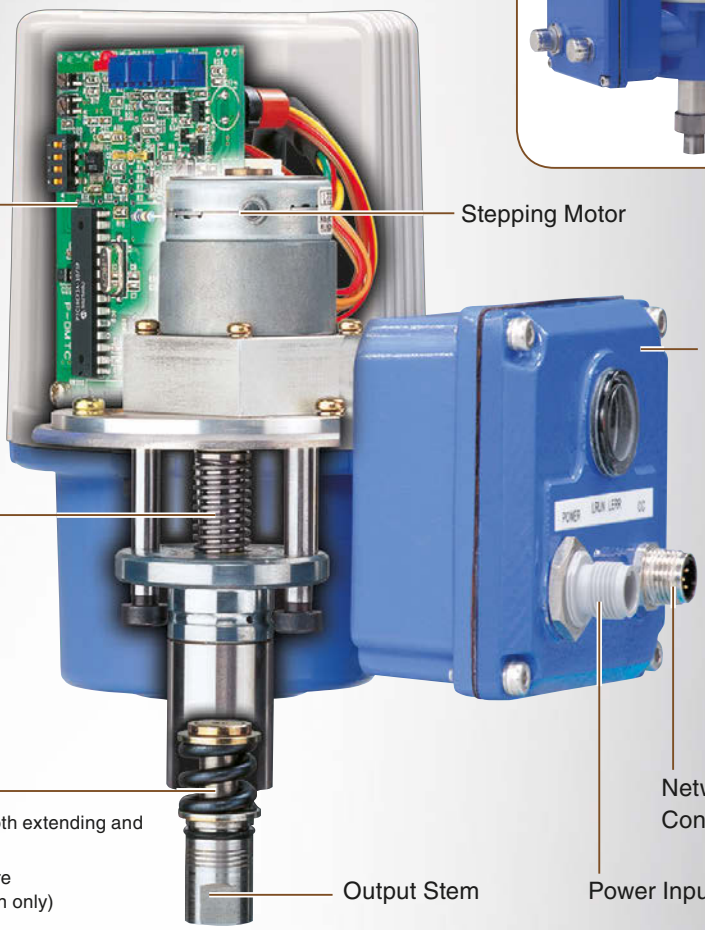
High Resolution of 1/1000
Long Life Operation
Open Network Capable Actuator

- High resolution positioning for superior control
- Built-in feedback positioner and electric limiter
- Brushless stepping motor assures long-life operation
- 1/1000 resolution
- Optional network interface with CC-Link, DeviceNet

LINEAR MOTION | 2500 N 562 lbf MAX THRUST | 40 mm 1.57 in MAX STROKE | AC DC POWERED

CE IP66

Compact Size



Control Circuit
- Electronic limiter for full-open/-closed positions for easy calibration
- Overload protection functions

Stepping Motor

Network Terminal Box
(network interface option)

Screw

Seal-spring
- Spring mechanism for both extending and retracting directions
- Constant sealing pressure (MSP4 for single direction only)

Output Stem

Network Cable Connection

Power Input Connection

Transparent image of MSP5D

Linear Motion Electric Actuators

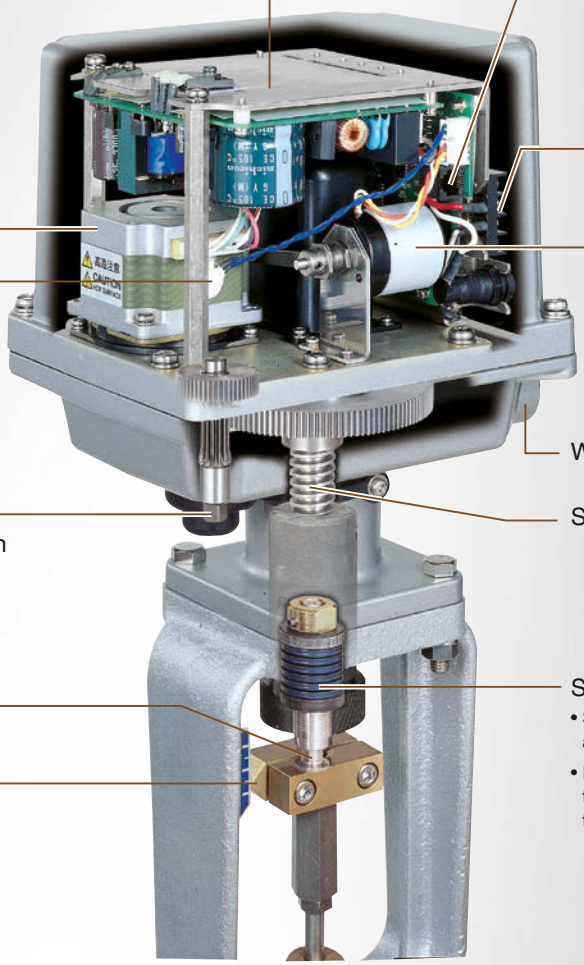
PSN Series

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

- Brushless angle sensor eliminates problems with mechanical potentiometer feedback sensing
- Opening/closing speed, split range and failsafe position programmable by hand-held programmer
- Internal temperature sensor to control heater in cold climate and to prevent motor from overheating
- AC reversible motor type, CSP, is also available.

LINEAR MOTION | 5000 N 1124 lbf MAX THRUST | 60 mm 2.36 in MAX STROKE | AC DC POWERED

CE IP66



Environmentally Resistant CPU

RJ-45 Connector
For programming opening/closing speed, zero/span calibration and other features by PU-2A hand-held programmer.

M3 Screw Terminal

Stepping Motor

Temperature Sensor

Brushless Angle Sensor
- Detecting relative positions of a moving coil to a fixed coil using electro-magnetic induction.
- High reliability and long life.

Wiring Conduit

Stem for manual operation

Screw

Stem Button

Indicator

Seal-spring
- Spring mechanism at both full-open and full-closed positions.
- Pre-loaded spring pressure ensures tight closure as soon as the stem touches the valve seat.

Transparent image of PSN1

Linear Motion Electric Actuators Specifications



	MSP4	MSP5	MSP6
Model No.	MSP4D (DeviceNet)	MSP5D (DeviceNet)	MSP6D (DeviceNet)
	MSP4C, MSP4C2 (CC-Link)	MSP5C, MSP5C2 (CC-Link)	MSP6C (CC-Link)
Stroke	15 mm (0.59”)	20 mm (0.79”)	40 mm (1.57”)
Position Detection	Potentiometer		
Thrust	700 N	700 N	2,500 N
	157 lbf	157 lbf	562 lbf
Drive	Stepping motor		
Sealing pressure	Spring at the full-closed position		
Motor Protection	Overload (lock) protection		
	Restart limiting timer		
	—		
	—		
Operation Time @10 mm	MSP4, MSP4C, MSP4C2	MSP5, MSP5C, MSP5C2	MSP6, MSP6C
	5 sec. / 150 N 9 sec. / 300 N 18 sec. / 700 N	5 sec. / 150 N 9 sec. / 300 N 18 sec. / 700 N	5 sec. / 600 N 8 sec. / 1,200 N 15 sec. / 2,500 N
	MSP4D	MSP5D	MSP6D
	24 sec. / 500 N 30 sec. / 700 N	12 sec. / 300 N 24 sec. / 500 N 30 sec. / 700 N	9 sec. / 600 N 18 sec. / 1,200 N 24 sec. / 1,800 N 36 sec. / 2,500 N
Resolution	1/1,000 or 0.015 mm (deadband set to 0.1 %)		1/1,000 or 0.02 mm (deadband set to 0.1 %)
Input Signal	4-20 mA or 1-5 V DC		
	DeviceNet for MSP×D, CC-Link for MSP×C		
Position Signal	1-5 V DC		
	DeviceNet for MSP×D, CC-Link for MSP×C		
Sequential Control Signal	“Full-open” and “full-closed” contact output Limit switch: 125 V AC @0.75 A, 30 V DC @0.6 A		
Forced Operation	Contact signal input: 5 V DC @2.5 mA		
Failsafe Operation (optional)	—		
Manual Operation	—		
Operating Temperature	-5 to + 55 °C (23 to 131 °F)		
Degree of Protection	IP66		
Power Input	100 - 120 V AC, 200 - 240 V AC (not available for MSP×D or MSP×C)		
	24 V DC		
Housing Material	Diecast aluminum		
Vibration	0.5 G		
Weight	1.2 kg (DC powered) 1.4 kg (AC powered)	1.2 kg (DC powered) 1.4 kg (AC powered)	2.7 kg (DC powered) 2.8 kg (AC powered)
	1.5 kg (MSP4D, MSP4C) 1.8 kg (MSP4C2)	1.5 kg (MSP5D, MSP5C) 1.8 kg (MSP5C2)	3.0 kg (MSP6D, MSP6C)
Standards & Approvals	CE	CE	CE

			
PSN1	**PSN3**	**CSP**	Model No.
—	—	—	
—	—	—	
40 mm (1.57”)	60 mm (2.36”)	75 mm (2.95”)	Stroke
Brushless angle sensor		Potentiometer	Position Detection
3,000 N	5,000 N	12,000 N	Thrust
674 lbf	1,124 lbf	2,698 lbf	
Stepping motor		AC motor	Drive
Spring at both full-closed and full-open positions		—	Sealing pressure
Abnormal temperature increase (overload) detection		Overload (lock) protection by torque switches	Motor Protection
Restart limiting timer		Restart limiting timer	
Overheat detection		—	
Motor preheat function		—	
0.30 - 5.65 mm/s	0.22 - 4.02 mm/s	34 sec. @20 mm (50 Hz) 29 sec. @20 mm (60 Hz) (for 10,000 N)	Operation Time @10 mm
0.04 mm	0.06 mm	Hysteresis 1 mm or less	Resolution
4-20 mA or 1-5 V DC			Input Signal
4-20 mA DC			Position Signal
“Full-open”, “full-closed” and “alarm” contact output Open collector: 30 V DC @100 mA max.			Sequential Control Signal
Contact signal input: 5 V DC @2.5 mA		—	Forced Operation
Rechargeable Nickel-cadmium battery		—	Failsafe Operation (optional)
Available	Available	Available	Manual Operation
-25 to + 55 °C (-13 to + 131 °F)	-15 to + 55 °C (5 to 131 °F)	-10 to + 60 °C (14 to 140 °F)	Operating Temperature
IP66		IP56	Degree of Protection
100 - 120 V AC, 200 - 240 V AC		100 V AC, 110 V AC 200 V AC, 220 V AC	Power Input
24 V DC			
Diecast aluminum	Aluminum alloy	Body: Aluminum alloy Cover: Steel	Housing Material
2 G	2 G	2 G	Vibration
5.9 kg 7.2 kg (with failsafe function)	8.9 kg 10.2 kg (with failsafe function)	15 kg	Weight
CE	CE	—	Standards & Approvals

Compact Rotary Motion Electric Actuators

MRP Series

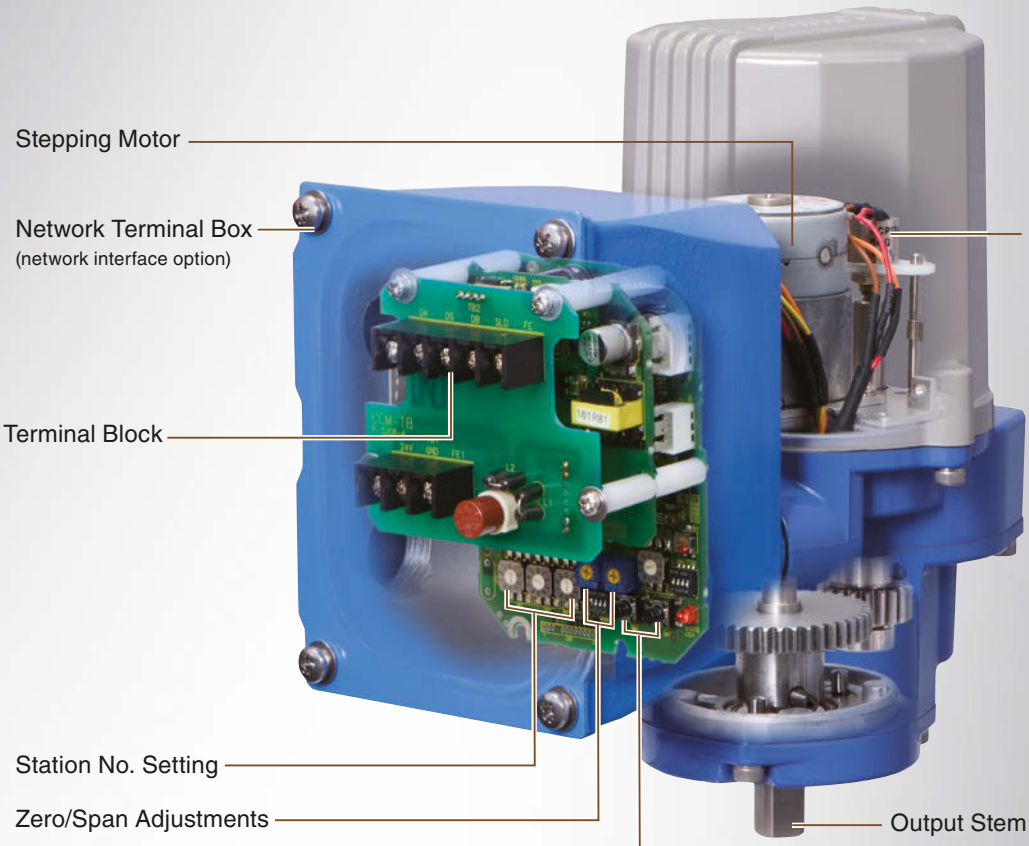
High Resolution of 1/1000
Long Life Operation
Open Network Capable Actuator

- High resolution positioning for superior control
- Built-in feedback positioner and electric limiter
- Brushless stepping motor assures long-life operation
- 1/1000 resolution
- Optional network interface with CC-Link, DeviceNet

ROTARY MOTION | 33 N·m 24.3 lbf·ft MAX TORQUE | 90° MAX ANGLE | AC DC POWERED

CE IP66

Compact Size



Transparent image of MRP5C2

Rotary Motion Electric Actuators

PRP Series

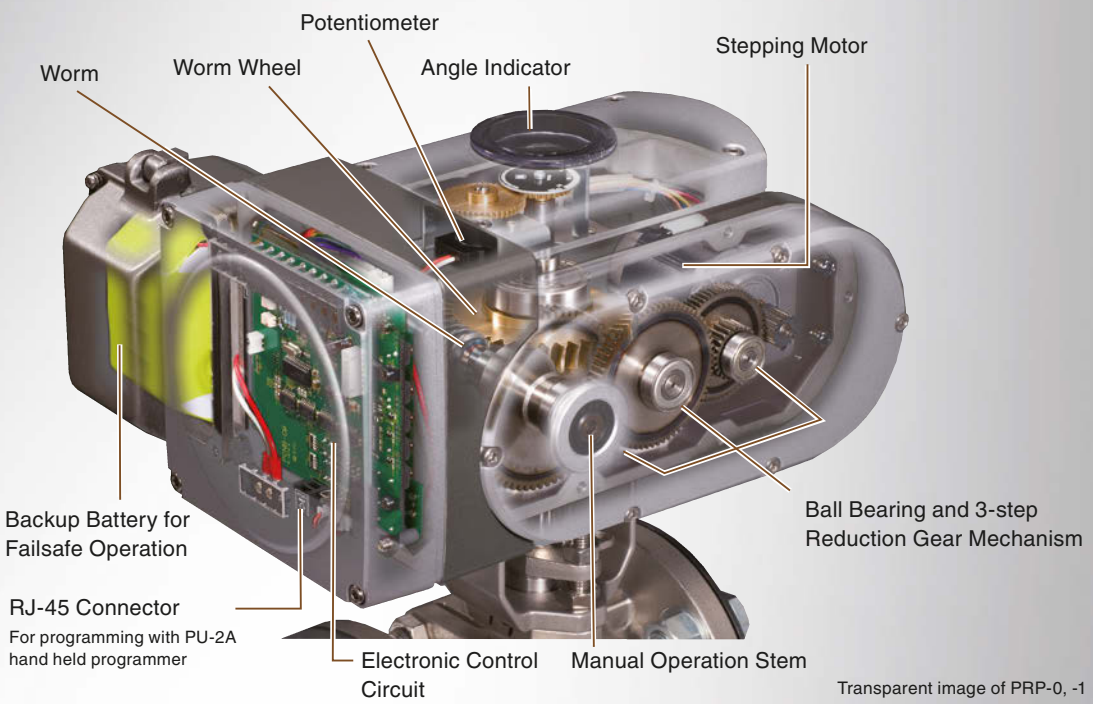
High Resolution of 1/1000
Programmable opening/closing speed

APPROVED TYPE APPROVAL SCHEME

- Opening/closing speed, split range and failsafe position programmable by hand-held programmer
- Internal temperature sensor to control heater in cold climate and to prevent motor from overheating
- Lloyd's Register type approved (PRP-0, PRP-1)

ROTARY MOTION | 600 N·m 443 lbf·ft MAX TORQUE | 90° MAX ANGLE | AC POWERED

IP66



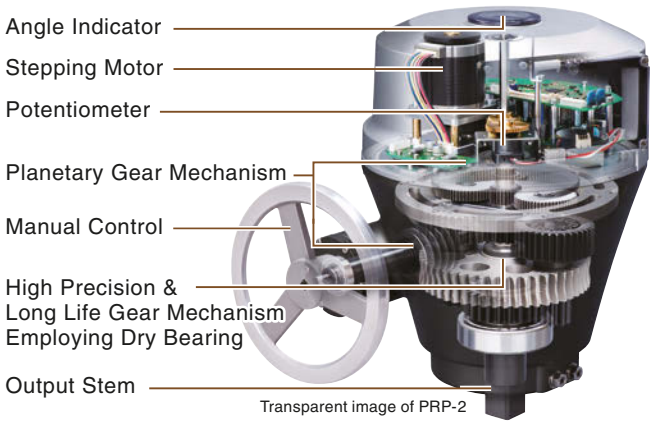
Transparent image of PRP-0, -1

Rotary Motion Electric Actuator
PRP-2 NEW

Planetary gear mechanism realizing the compact package with the maximum torque of 600 N·m

HART 7 Under development

HART COMMUNICATION PROTOCOL



Transparent image of PRP-2

Rotary Motion Electric Actuators Specifications

			
Model No.	**MRP4**	**MRP5**	**MRP6**
	MRP4D (DeviceNet)	MRP5D (DeviceNet)	MRP6D (DeviceNet)
	MRP4C, MRP4C2 (CC-Link)	MRP5C, MRP5C2 (CC-Link)	MRP6C (CC-Link)
Rotation Angle	90°, 180°	90°	90°, 180°
Position Detection	Potentiometer		
Torque	5 N·m	10 N·m	33 N·m
	3.69 lbf·ft	7.38 lbf·ft	24.3 lbf·ft
Drive	Stepping motor		
Motor Protection	Overload (lock) protection		
	—		
	Restart limiting timer		
	—		
Operation Time @90°	MRP4, MRP4C, MRP4C2	MRP5, MRP5C, MRP5C2	MRP6, MRP6C
	7 or 13 sec.	13 sec.	4, 7 or 13 sec.
	MRP4D	MRP5D	MRP6D
	12 sec.	22 sec.	7, 14, 18, 27 sec.
Resolution	1/1,000 or 0.09° (deadband set to 0.1 %)		
Input Signal	4-20 mA or 1-5 V DC		
	DeviceNet for MRP×D, CC-Link for MRP×C		
Position Signal	Potentiometer		
	DeviceNet for MRP×D, CC-Link for MRP×C		
Sequential Control Signal	"Full-open" and "full-closed" contact output Limit switch: 125 V AC @0.75 A, 30 V DC @0.6 A "Overload" relay contact output: 250 V AC @1 A, 30 V DC @1 A		
Forced Operation	Contact signal input, 5 V DC @2.5 mA		
Failsafe Operation (optional)	—		
Manual Operation	—	—	Available
Operating Temperature	-5 to + 55 °C (23 to 131 °F)		
Degree of Protection	IP66		
Power Input	100 - 120 V AC, 200 - 240 V AC (not available for MRP×D or MRP×C)		
	24 V DC		
Housing Material	Diecast aluminum		
Vibration	0.5 G		
Weight	1.1 kg (DC powered) 1.3 kg (AC powered)	1.5 kg (DC powered) 1.7 kg (AC powered)	2.7 kg (DC powered) 2.8 kg (AC powered)
	1.4 kg (MRP4D, MRP4C) 1.7 kg (MRP4C2)	1.8 kg (MRP5D, MRP5C) 2.0 kg (MRP5C2)	3.0 kg (MRP6D, MRP6C)
Standards & Approvals	CE	CE	CE

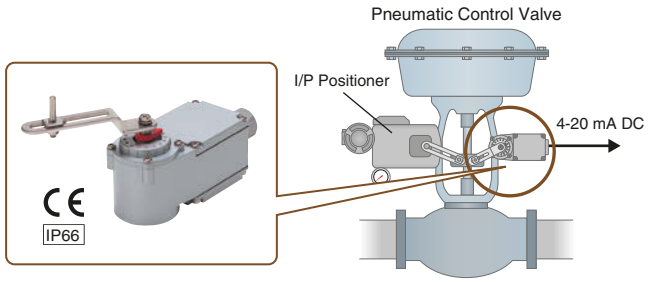
			
PRP-0	**PRP-1**	**PRP-2**	Model No.
—	—	—	
—	—	—	
90°	90°	90°	Rotation Angle
Potentiometer			Position Detection
100 N·m	200 N·m	600 N·m	Torque
73.8 lbf·ft	148 lbf·ft	443 lbf·ft	
Stepping motor			Drive
Overload (lock) protection			Motor Protection
Abnormal temperature increase (overload) detection		Abnormal temperature increase protection for the motor	
Restart limiting timer			
Motor preheat function			
8.5 to 125 sec. adjustable; factory set to 12 or 24 sec.	16 to 125 sec. adjustable; factory set to 16 or 24 sec.	34 to 270 sec. adjustable; factory set to 34 or 50 sec.	Operation Time @90°
1/1,000 with 0.1 % deadband, 1/200 with 0.5 % deadband		1/300 to 1/1,000	Resolution
4-20 mA or 1-5 V DC			Input Signal
4-20 mA DC (300 Ω)			Position Signal
"Full-open", "full-closed" and "alarm" contact output Open collector: 30 V DC @100 mA max.			Sequential Control Signal
Contact signal input, 5 V DC @2.5 mA			Forced Operation
Rechargeable Nickel-cadmium battery		—	Failsafe Operation (optional)
10 turns @90°		15 turns @90°	Manual Operation
-20 to + 55 °C (-4 to 131 °F)			Operating Temperature
IP66			Degree of Protection
100 - 120 V AC, 200 - 240 V AC			Power Input
Diecast aluminum Baked acrylic resin coating		Aluminum alloy (type: ADC12) Baked acrylic resin coating	Housing Material
2 G			Vibration
10.8 kg (12.1 kg with failsafe operation)		26.5 kg	Weight
Lloyd's	Lloyd's	—	Standards & Approvals

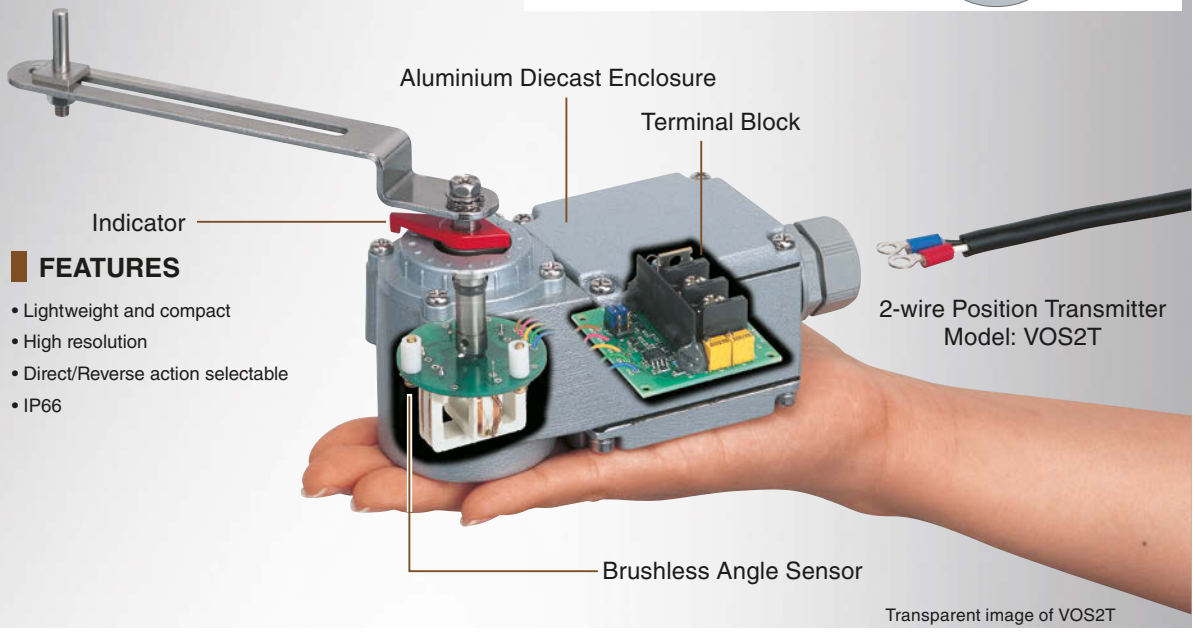
Position Sensors

Brushless Design for Long Lasting Reliability
Lightweight & Compact

- Detecting mechanical position of pneumatic and electric actuators to send a proportional 4-20 mA signal
- Linear motion type (±22.5°) or rotary motion type (±45°)

Remote Monitoring of Pneumatic Control Valve Position





Transparent image of VOS2T

FEATURES

- Lightweight and compact
- High resolution
- Direct/Reverse action selectable
- IP66

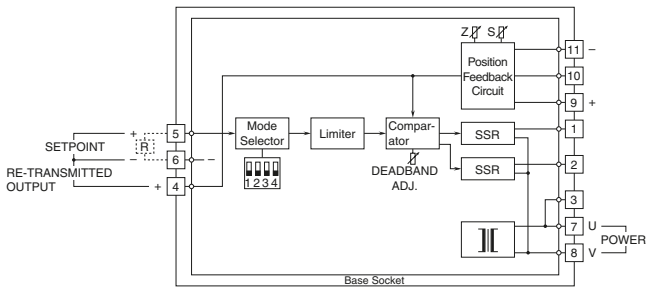
PRODUCT	MODEL	FEATURES
2-WIRE POSITION TRANSMITTER (linear motion type; 45 degrees) CE IP66	VOS2T	• Linear motion type, two-wire position transmitter (45-degree detection) incorporating a brushless angle sensor • Sensing the position of a linear motion actuator and converting it into a proportional 4 to 20 mA signal • Retransmitted position output for a pneumatic valve
2-WIRE POSITION TRANSMITTER (rotary motion type; 90 degrees) CE IP66	VOS2T-R	• Rotary motion type, two-wire position transmitter (90-degree detection) incorporating a brushless angle sensor • Sensing the angle of a rotary motion actuator or a rotating machine and converting it into a proportional 4 to 20 mA signal

Valve Positioners

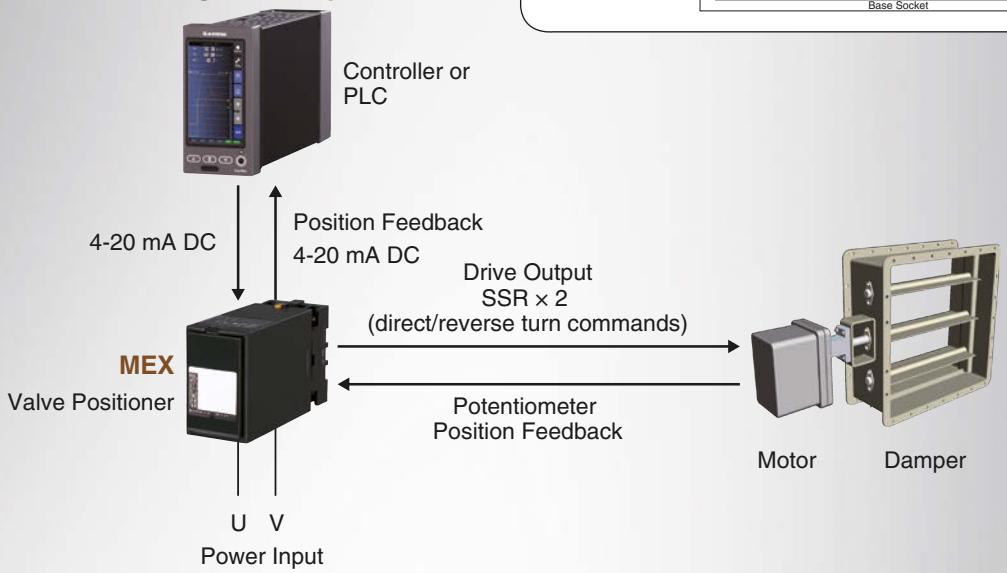
Positioning of Valve and Damper Can be Controlled with a Direct/Reverse Turn Motor

- Positioning of valve and damper can be controlled with a direct/reverse turn motor
- Remote 4-20 mA positioning input, SSR or 24 V AC dry contact switch output
- Adjustable deadband, timer, electronic limits and other additional functions depending upon models

CIRCUIT DIAGRAM



Positioning of a Damper

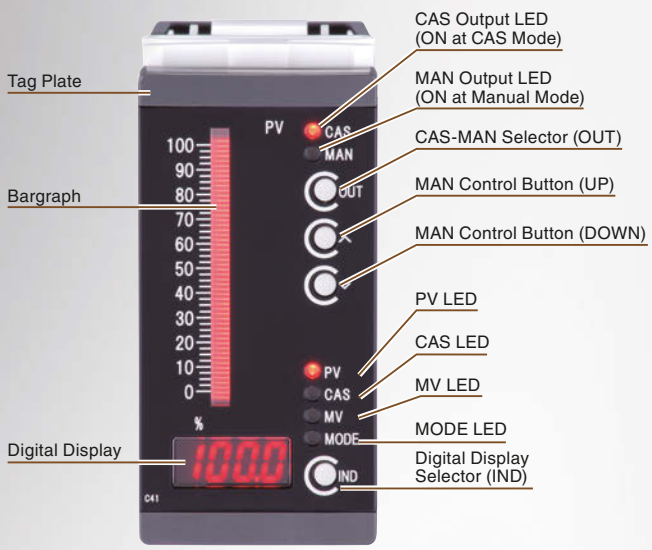


PRODUCT	MODEL	FEATURES
POSITIONER BACKUP STATION (with bargraph/digital indicator) CE IP65 	ABM2	• I/I positioner incorporated • Bargraph indicator for PV input • Digital display indicating PV/CAS/MV selectable Position setpoint input: 4 - 20 mA DC, 1 - 5 V DC, -10 - +10 V DC, -5 - +5 V DC Position feedback input: 4 - 20 mA DC, 1 - 5 V DC, Potentiometer Re-transmitted output: 4 - 20 mA DC Power input: 100 - 240 V AC, 24 V DC Degree of protection: IP65 (front panel)
VALVE POSITIONER 	MEX Series	Position setpoint input: 4 - 20 mA DC, 1 - 5 V DC, Modbus, LonWorks Position feedback input: Potentiometer, 4 - 20 mA DC Re-transmitted output: 4 - 20 mA DC Control output: SSR (internal or external), 24 V AC dry contact Power input: 100, 110, 120, 200, 220, 240 V AC or 24 V DC

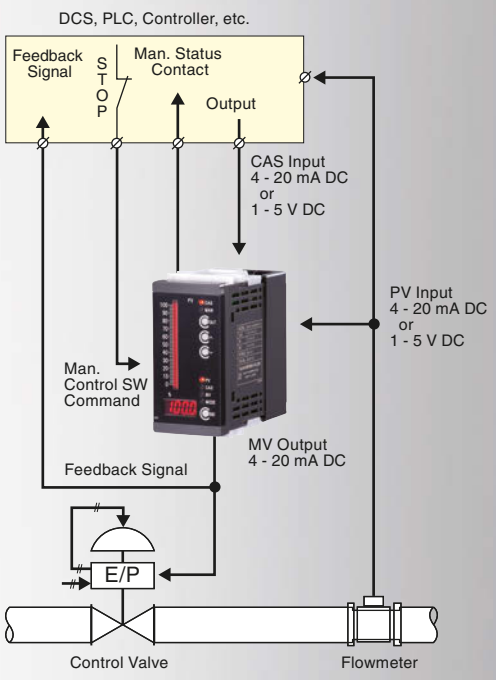
Manual Loading Stations

Holding Control Signals in Case of Computer or DCS Failure

- Holding control signals in case of computer or DCS failure
- ON/OFF signal input or analog signal input
- Manual control with an external Up/Down contact signal or with the front manual loader
- Ramp rate adjustable



Analog Backup Station
Model: ABF3



IP55

MANUAL LOADER (with 4-digit digital meter, LED bar indicator)
SM10

Backup and Manual Loading Station

- MV output (4 - 20 mA DC or other current/voltage signals) is used to track an external controller signal (CAS input) or for manual control.
- Custom bargraph scale and engineering unit at no extra charge
- Auxiliary panel operation instruments in the uniformed design with the SC Series Multi-function PID Controllers

MANUAL LOADING STATIONS

PRODUCT	MODEL	FEATURES

ANALOG BACKUP STATION 	JB2	• Holding MV output signal from DCS, PLC or a controller and enabling manual control of a final control element
		• CAS input signal passes through during auto operation.
		• MV output modes in case of abnormality in the controller:
		  • Holding CAS input status
		  • Holding CAS input status of the moment reversing back for preset time
		  • Preset MV output
		• Bumpless transition
		• Isolated re-transmitted output

ANALOG BACKUP STATION (front configurable) CE 	MXAB	• Holding MV output signal from DCS, PLC or a controller and enabling manual control of a final control element • Manual operation by the ST/STL terminal • MV output in engineering unit display at the front • Moving average selectable for MV output • Loop test output function
ANALOG BACKUP STATION 	AB2	• Holding MV output signal from DCS, PLC or a controller and enabling manual control of a final control element • Manual operation by the ST/STL terminal • Wide selection of input and output ranges
COMPUTER BACKUP STATION (front configurable) CE 	MXCB	• Enabling MV output control by contact signals from DCS or PLC • Holding MV output signal in case of DCS/PLC failure or in the manual operation mode and enabling manual control by external UP/DOWN contact signals • Manual operation by the ST/STL terminal • MV output in engineering unit display at the front
COMPUTER BACKUP STATION 	CB2	• Holding MV output signal from DCS, PLC or a controller and enabling manual control of a final control element • Manual operation by the ST/STL terminal • Wide selection of output ranges

ANALOG BACKUP STATION (with bargraph/digital indicator) IP65 	ABF3	• Holding MV output signal from DCS, PLC or a controller and enabling manual control of a final control element
		• MV output modes in case of abnormality in the controller:
		  • Holding CAS input status
		  • Holding CAS input status of the moment reversing back for preset time
		  • Preset MV output
		• MV value can be manually controlled by using the front control buttons while monitoring PV value on the meter.
		• Bumpless transition
		• Custom bargraph scale and engineering unit at no extra charge

PARAMETER GENERATORS

PRODUCT	MODEL	FEATURES
PARAMETER GENERATOR (with digital displays) CE IP66 	ABS3	• Two digital meters for measured value (PV) and setpoint value (SV) • SV (4 - 20 mA DC or 1 - 5 V DC) can be controlled with UP/DOWN buttons while monitoring PV value. • 1/16 DIN panel cutout • IP66 front panel

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