

Smart Positioner (Lever type/Rotary type)



IP8001/8101 Series

- Auto calibration
- Enclosure: JISF8007 IP65(conforms to IEC 60529)
- Explosion-proof construction/ATEX intrinsically safe explosion-proof construction (II 1G Ex h ia IICT4/T5/T6 Ga)
- HART transmission function
- Monitoring function

How to Order

ATEX Directive Intrinsically Safe Explosion proof

Standard

Lever type IP8001

Rotary type IP8101

Type

001	Smart lever type
101	Smart rotary type

Pressure gauge

Symbol	Pressure gauge	Applicable model
1	0.2 MPa	● —
2	0.3 MPa	● —
3	1.0 MPa	● ●

Specifications

0	Basic type
2	With output function (Analog (4 to 20 mA DC) output + Alarm output x 2)
3	With HART transmission function

ATEX directive compliance

52	ATEX directive category 1 Intrinsically safe explosion-proof item
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ATEX temperature

Symbol	ATEX temperature	Applicable model
Nil	T4	● ●
T6	T5/T6	● ●

Made to Order (p.142 to 145-1)

X405 Exterior covering enclosure: JISF8007 IP66 (Conforms to IEC60529)

X419 External input signal (remote) type

CE/UKCA marking

Nil	—
Q	CE/UKCA marked product

Connection

Symbol	Air	Electric
Nil	Rc1/4	G1/2
M ^{Note)}	Rc1/4	M20 x 1.5
N	Rc1/4	1/2NPT
1	1/4NPT	G1/2
2 ^{Note)}	1/4NPT	M20 x 1.5
3	1/4NPT	1/2NPT
4	G1/4	G1/2
5 ^{Note)}	G1/4	M20 x 1.5
6	G1/4	1/2NPT

Note) When the symbol is M, 2, or 5 for 52-ATEX directive items, a blue cable gland is included with the electrical connection.

Accessories ^{Note 1)}

Symbol	Accessories	Applicable model
Nil	None (Standard)	● ●
C	Fork lever-type fitting M	— ●
D	Fork lever-type fitting S	— ●
E	For stroke 35 to 100 mm with lever unit ^{Note 2)}	● —
F	For stroke 50 to 140 mm with lever unit ^{Note 2)}	● —
H	With external scale plate ^{Note 3)}	— ●
W	Body with LCD window	● ●

Note 1) If two or more accessories are required, the part numbers should be given in alphabetical order. (ex. IP8101-010-CH)

Note 2) Standard lever is not attached.

Note 3) For side mounting, select "W" and check the control position by viewing the LCD display value.

IP
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IL1□
IL2□
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Specifications Note 1)

Type	IP8000		IP8100		IP8001	IP8101
	Electro-Pneumatic Positioner				Smart Positioner	
	Lever type lever feedback		Rotary type cam feedback		Lever type	Rotary type
Item	Single action	Double action	Single action	Double action	Single action / Double action	
Input current	4 to 20 mA DC (Standard) <small>Note 2)</small>					
Min. operating current	—				3.85 mA DC or more	
Intra-terminal voltage	—				12 V DC (equivalent to 600 Ω input resistance, at 20 mA DC)	
Max. supplied power	—				1 W (Imax: 100 mA DC, Vmax: 28 V DC)	
Input resistance	235 ± 15 Ω (4 to 20 mA DC)				—	
Supply air pressure	0.14 to 0.7 MPa				0.3 to 0.7 MPa	
Standard stroke	10 to 85 mm (Allowable deflection angle 10 to 30°)		60 to 100° <small>Note 3)</small>		10 to 85 mm (Allowable deflection angle 10 to 30°) 60 to 100° <small>Note 3)</small>	
Sensitivity <small>Note 4)</small>	Within 0.1% F.S.		Within 0.5% F.S.		Within 0.2% F.S.	
Linearity <small>Note 4)</small>	Within ±1% F.S.		Within ±2% F.S.		Within ±1% F.S.	
Hysteresis <small>Note 4)</small>	Within 0.75% F.S.		Within 1% F.S.		Within 0.5% F.S.	
Repeatability <small>Note 4)</small>	Within ±0.5% F.S.					
Coefficient of temperature	Within 0.1% F.S./°C				Within 0.05% F.S./°C	
Supply pressure fluctuation	Within 0.3% F.S./0.01 MPa <small>Note 5)</small>					
Output flow <small>Note 6)</small>	80 L/min (ANR) or more (SUP = 0.14 MPa)				200 L/min (ANR) or more (SUP = 0.4 MPa)	
Air consumption <small>Note 6)</small>	5 L/min (ANR) or less (SUP = 0.14 MPa) 11 L/min (ANR) or less (SUP = 0.4 MPa)				2 L/min (ANR) or less (SUP = 0.14 MPa) 4 L/min (ANR) or less (SUP = 0.4 MPa) 11 L/min (ANR) or less (SUP = 0.4 MPa)	
Ambient and fluid temperature	TIIS explosion-proof: -20 to 60°C ATEX intrinsically safe explosion-proof: -20 to 80°C (T5) -20 to 60°C (T6) -40 to 60°C (T6)-L type low-temperature specification				General structure: -20 to 80°C ATEX intrinsically safe explosion-proof -20 to 80°C (T4/T5) -20 to 60°C (T6)	
Explosion proof construction <small>Note 7)</small>	TIIS explosion-proof construction (Exd II BT5) ATEX intrinsically safe explosion-proof construction (II 2G Ex h Ib IIC/T5/T6 Gb)				ATEX intrinsically safe explosion-proof construction (II 1G Ex h ia IIC/T4/T5/T6 Ga)	
ATEX intrinsically safe explosion-proof parameter (current circuit)	Ui ≤ 28 V, Ii ≤ 125 mA, Pi ≤ 1.2 W Ci ≤ 0 nF, Li ≤ 0 mH				Ui ≤ 28 V, Ii ≤ 100 mA, Pi ≤ 0.7 W Ci ≤ 12.5 nF, Li ≤ 1.5 mH	
Exterior covering enclosure <small>Note 8)</small>	JISF8007, IP65 (conforms to IEC Pub.60529)					
Transmission method <small>Note 7)</small>	—				HART transmission	
Air connection port <small>Note 9)</small>	Rc 1/4 female thread, NPT 1/4 female thread, G 1/4 female thread					
Electrical connection port <small>Note 9)</small>	G 1/2 female thread, M20 x 1.5 female thread, NPT 1/2 female thread					
Material/coating	Aluminum diecast body/baking finish with denatured epoxy resin					
Weight	2.4 kg (Without terminal box)/2.6 kg (With terminal box)				2.6 kg	

Note 1) Specification values are given at normal temperature (20°C).
 Note 2) 1/2 Split range (Standard). For operation with 1/2 split range, the linearity and hysteresis should be 1% higher than the above specifications.
 Note 3) Stroke adjustment: 0 to 60°, 0 to 100°
 Note 4) Characteristics relating to accuracy differ depending on combination with other constituent loop equipment, such as positioners and actuators.

Note 5) While there is no output changes due to pressure fluctuations, when the pressure supply setting is changed following calibration, once again adjust balance current and perform calibration.
 Note 6) Air consumption is due to exhaust from nozzle. And (ANR) indicates JIS B0120 standard air.
 Note 7) Model selection required for explosion proof construction and HART transmission.
 Note 8) For IP66 compliant products, refer to pages 142 to 145.
 Note 9) Thread type can be specified by model selection.

Optional Specifications

Type	IP8100-01-JJR (Non-explosion proof)		IP8001-01-02 (Non-explosion proof)	52-IP8001-0-04
	Electro-Pneumatic Positioner		Smart Positioner	
Analog output	Wiring	2-line		
	Output signal	4 to 20 mA DC		
	Power supply voltage	12 to 35 V DC	10 to 28 V DC	
	Load resistance	(Power supply voltage - 12 V) ÷ 20 mA DC or less	0 to 750 Ω	
	Accuracy	±2% F.S. or less <small>Note 1)</small>	±0.5% F.S. or less <small>Note 2)</small>	
	Hysteresis	Within 1% F.S.	—	
Alarm output 1, 2	Wiring	2-line		
	Applicable standards	— DIN19234/NAMUR Standard		
	Power supply voltage	—	10 to 28 V DC	5 to 28 V DC
	Load resistance	—	10 to 40 mA DC	(Constant current output)
	Alarm ON	—	R = 350 Ω ±10%	≥ 2.1 mA DC
	Alarm OFF (Leakage current)	—	0.5 mA DC or less	≥ 1.2 mA DC
Response time	— 50 msec or less			

Note 1) Indicates analog output accuracy with respect to actuator angle.

Note 2) Indicates analog output accuracy with respect to LCD display position value (P value).

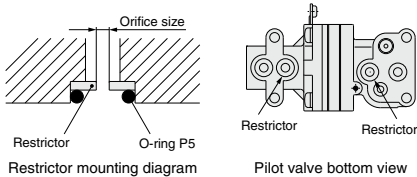
Accessory/Option

Pilot valve with output restriction (IP8000/8100)

In general, mounting on a small-size actuator may cause hunting. For prevention, a pilot valve with a built-in output restriction is available. The restriction is removable.

Actuator capacity	Orifice size	Part number	Pilot unit part number	Model selection accessory
90 cm ³	ø0.7	P36801080	P565010-18	A
180 cm ³	ø1	P36801081	P565010-19	B

Note) Output orifice not required for Smart Positioner regardless of actuator capacity.

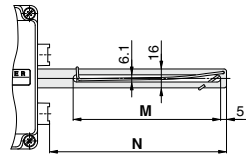


External feedback lever (IP8000/8001)

Different feedback levers are available dependent upon valve strokes. Order according to the valve stroke.

Feedback lever types

Stroke	Unit number		Size M	Size N	Model selection accessory
	IP8000	IP8001			
10 to 85 mm	P368010-20	P565010-323	125	150	Standard accessory
35 to 100 mm	P368010-21	P565010-324	110	195	E
50 to 140 mm	P368010-22	P565010-325	110	275	F
6 to 12 mm	P368010-260	P565010-329	75	75	Available as special order



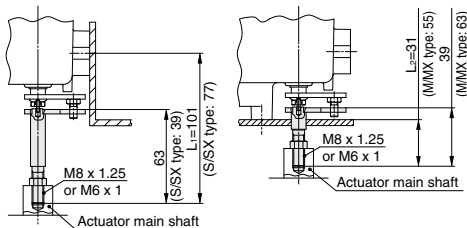
Fork lever-type fittings (IP8100/8101)

2 kinds of rotary type IP8100/8101 fork lever-type fittings, that differ by installation dimensions dependent on bracket installation method, and 2 kinds of installation portion thread sizes, are available.

When installing on the side surface, using fork lever assembly M provides interchangeability with the installation dimensions of SMC IP610 positioner. When installing on the rear surface, using fork lever assembly S also provides interchangeability with the installation dimensions of SMC IP610 positioner.

Part name	Unit number	Installation portion thread size	Model selection accessory
Fork lever assembly M	P368010-24	M8 x 1.25	C
Fork lever assembly S	P368010-25		D
Fork lever assembly MX	P368010-36	M6 x 1	C (Note)
Fork lever assembly SX	P368010-37		D (Note)

Note) Installation portion thread size is M6 x 1 for IP8100-0□0-X14 when accessory C or D are selected.



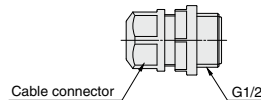
Side mounting with the fork lever assembly M/MX

Rear mounting with the fork lever assembly S/SX

Resin connector (Non-explosion proof specification)

Optional cable connectors are available for different cable sizes. These are not for explosion proof applications. Recommended for use with indoor applications.

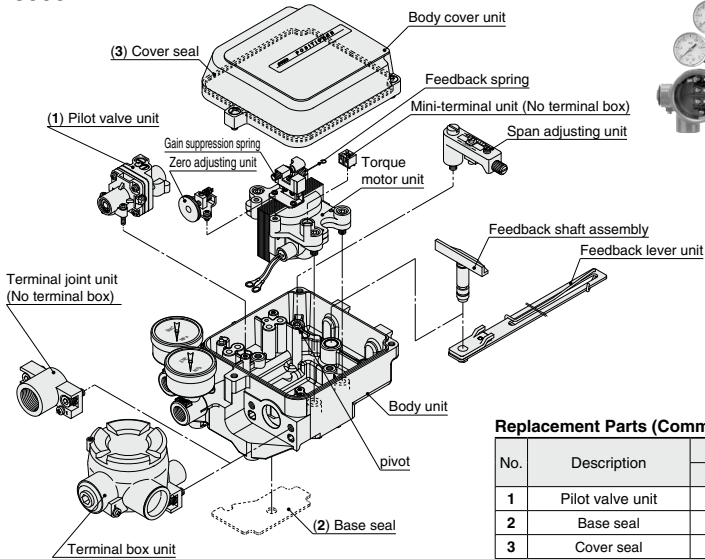
Part name	Part number	Suited cable outer diameter
Resin-made cable clamp unit (A)	P368010-26	ø7 to ø9
Resin-made cable clamp unit (B)	P368010-27	ø9 to ø11



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Exploded View

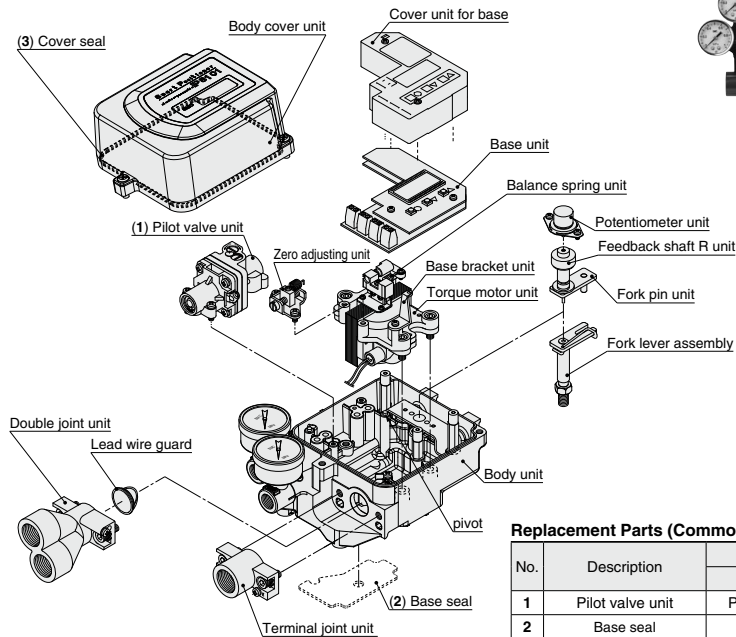
IP8000



Replacement Parts (Common for IP8000/8100)

No.	Description	Part no.	
		IP8000/8100	IP8000/8100-□-X14-L
1	Pilot valve unit	P565010-7	P565010-48
2	Base seal	P565010-108	
3	Cover seal	P56501013	

IP8101



Replacement Parts (Common for IP8001/8101)

No.	Description	Part no.	
		IP8001	IP8101
1	Pilot valve unit	P565010-322	P565010-303
2	Base seal	P565010-108	
3	Cover seal	P56501013	

Piping Note) When the input signal is discontinued, the pressure of OUT1 decreases, and the pressure of OUT2 increases.

IP8000/Lever type

	Single action	Double action
Positive operation	<p>When the input signal is increased, the stem moves as allow mark.</p> <p>OUT2 is plugged.</p>	<p>When the input signal is increased, the stem moves as allow mark. (Positive valve operation by its reverse operation mode)</p> <p>OUT1 is plugged.</p>
Reverse operation	<p>When the input signal is increased, the stem moves as allow mark. (Reverse valve operation by its positive operation mode)</p> <p>OUT1 is plugged.</p>	<p>When the input signal is increased, the cylinder rod moves as allow mark.</p> <p>OUT2 is plugged.</p>

IP8100/Rotary type

	Single action	Double action
Positive operation	<p>When the input signal is increased, the actuator shaft rotates in a clockwise direction.</p> <p>OUT1 is plugged.</p>	<p>When the input signal is increased, the actuator shaft rotates in a clockwise direction. (Positive valve operation by its reverse operation mode)</p> <p>OUT2 is plugged.</p>
Reverse operation	<p>When the input signal is increased, the actuator shaft rotates in a counter clockwise direction. (Reverse valve operation by its positive operation mode)</p> <p>OUT2 is plugged.</p>	<p>When the input signal is increased, the actuator shaft rotates in a counter clockwise direction.</p> <p>OUT1 is plugged.</p>

- IP**
- IW**
- 1301**
- AW**
- IL1**
- IL2**
- IT**
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- VFN**
- IN-T**

Piping

Note) When the input signal is discontinued, the pressure of OUT1 decreases, and the pressure of OUT2 increases.
 Caution is also similarly required when changing the control direction in parameter mode.

IP8001/Lever type

	Single action	Double action	
Positive operation	<p>When the input signal is increased, the stem moves as allow mark.</p> <p>OUT2 is plugged.</p>	<p>When the input signal is increased, the stem moves as allow mark. (Positive valve operation by its reverse operation mode)</p> <p>OUT1 is plugged.</p>	<p>When the input signal is increased, the cylinder rod moves as allow mark.</p>
Reverse operation	<p>When the input signal is increased, the stem moves as allow mark. (Reverse valve operation by its positive operation mode)</p> <p>OUT1 is plugged.</p>	<p>When the input signal is increased, the stem moves as allow mark.</p> <p>OUT2 is plugged.</p>	<p>When the input signal is increased, the cylinder rod moves as allow mark.</p>

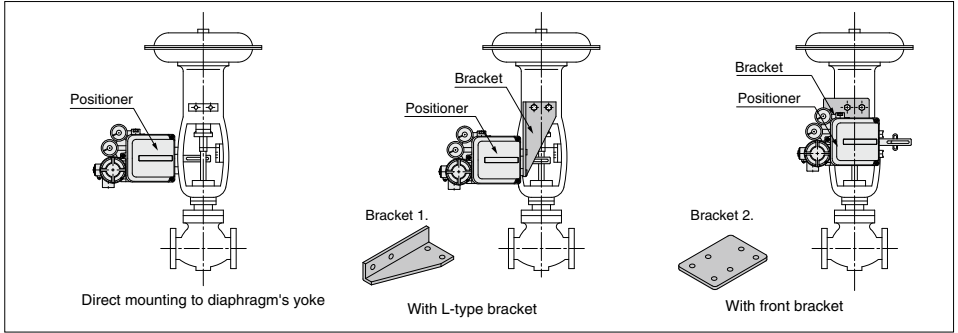
IP8101/Rotary type

	Single action	Double action	
Positive operation	<p>When the input signal is increased, the actuator shaft rotates in a clockwise direction.</p> <p>OUT2 is plugged.</p>	<p>When the input signal is increased, the actuator shaft rotates in a clockwise direction. (Positive valve operation by its reverse operation mode)</p> <p>OUT1 is plugged.</p>	<p>When the input signal is increased, the actuator shaft rotates in a clockwise direction.</p>
Reverse operation	<p>When the input signal is increased, the actuator shaft rotates in a counter clockwise direction. (Reverse valve operation by its positive operation mode)</p> <p>OUT1 is plugged.</p>	<p>When the input signal is increased, the actuator shaft rotates in a counter clockwise direction.</p> <p>OUT2 is plugged.</p>	<p>When the input signal is increased, the actuator shaft rotates in a counter clockwise direction.</p>

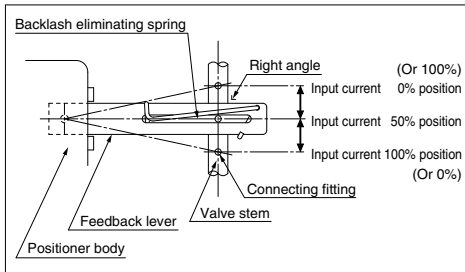
Installation

IP8000/8001 (Lever type)

1. Create brackets that are appropriate for the positioner and diaphragm valve mounting methods, and affix it firmly using the mounting hole on the side or rear surface.

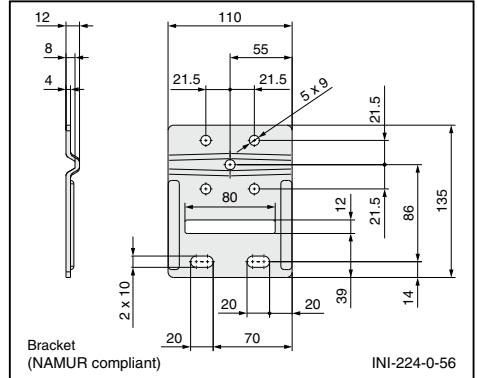


2. The feedback lever that detects the displacement of valve stems should be mounted at a position so that the lever is at right angles to the valve stem for an input current of 50%. The figure is the configuration viewed from the front.



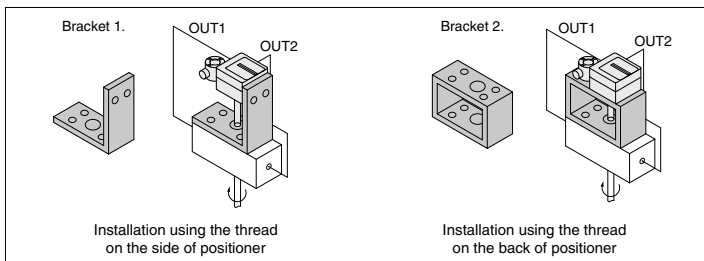
3. Brackets for lever type positioners, which are compliant with NAMUR and DIN/IEC 60534-6-1 are now available.

Description	Part no.
Bracket (NAMUR compliant) single unit	INI-224-0-56



IP8100/8101 (Rotary type)

1. The positioner should be mounted so that the feedback shaft is aligned with the shaft of the rotary actuator.



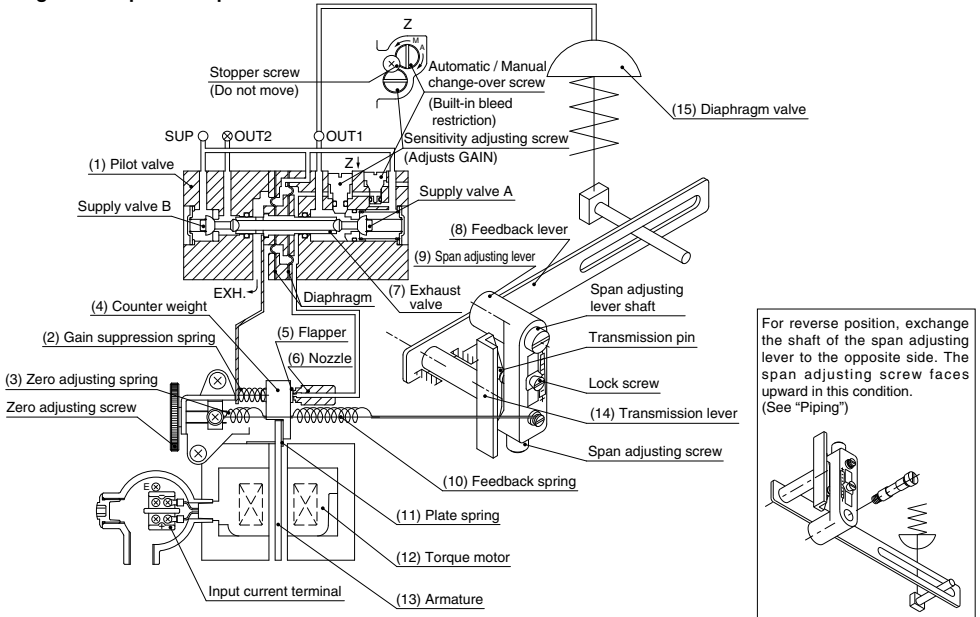
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Principle of Operation

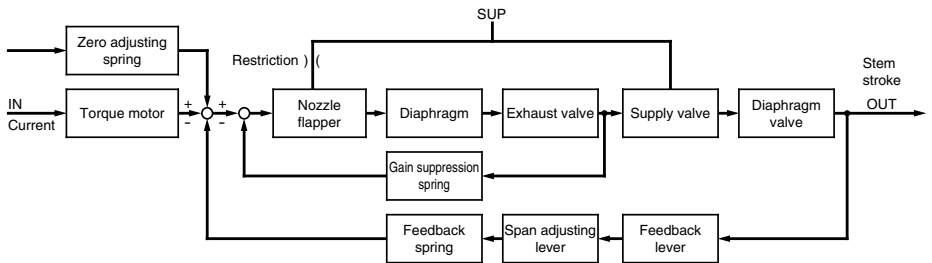
IP8000/Lever type

When the input current increases, (11) the plate spring of (12) the torque motor will work as a pivot, (13) armature will receive a counter clockwise torque, (4) the counter weight will be pushed to the left, the clearance between (6) the nozzle and (5) the flapper will increase, and the nozzle back pressure will decrease. Consequently, (7) the exhaust valve of (1) the pilot valve moves to the right, the output pressure of OUT1 increases and (15) the diaphragm moves downwards. The motion of (15) the diaphragm acts on (10) the feedback spring through (8) the feedback lever, (14) the transmission lever and (9) the span adjustment lever to rest at the balance position generated by the input current. (2) The gain suppression spring is for direct feedback of the motion of (7) the exhaust valve to (4) the counter weight to increase the stability of the loop. The zero point should be adjusted by change of (3) the zero adjustment spring tension.

Single action positive operation



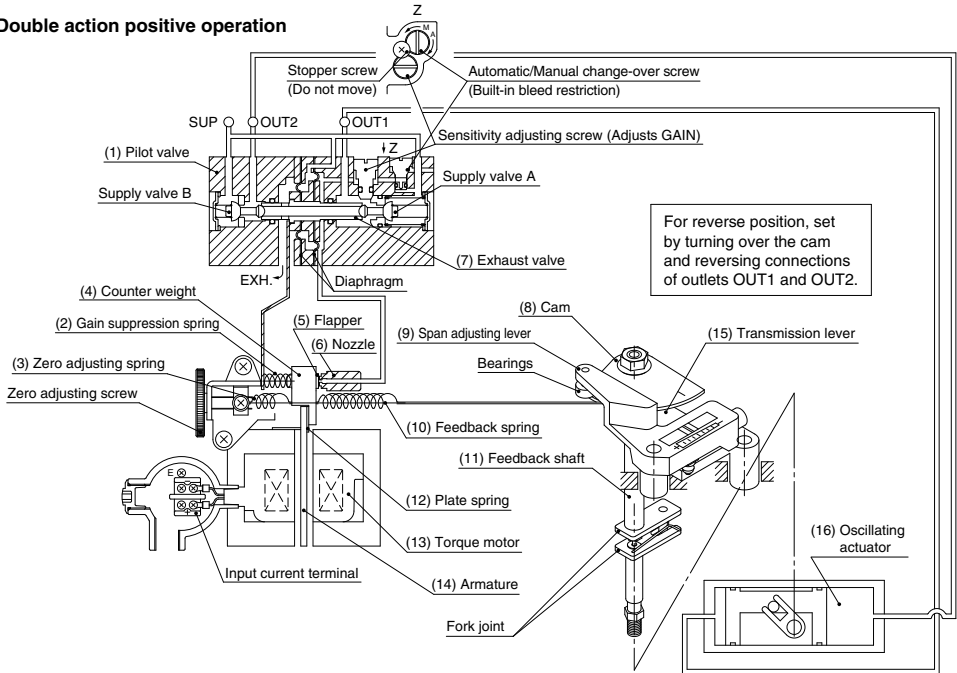
Block diagram



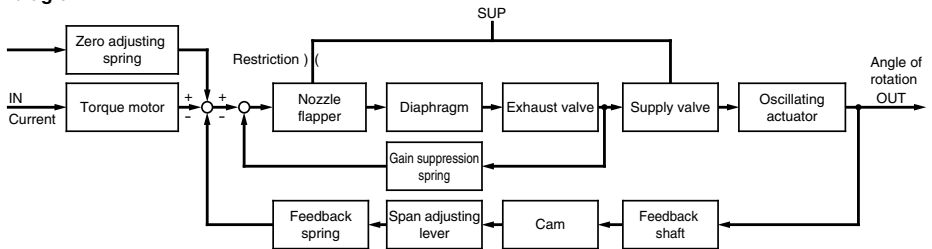
IP8100/Rotary type

When the input current increases, (12) the plate spring of (13) the torque motor will work as a pivot, (14) armature will receive a counter-clockwise torque, (4) the counter weight will be pushed to the left and the clearance between (6) the nozzle and (5) the flapper will increase, and the nozzle back pressure will decrease. Consequently, (7) the exhaust valve of (1) the pilot valve moves to the right, the output pressure of OUT1 increases that of OUT2 decreases and (16) the rotary actuator moves. The motion of (16) the actuator acts on (10) the feedback spring through (11) the feedback shaft, (8) the cam, (9) the span adjustment lever and (15) transmission lever to rest at the balance position generated by the input current. (8) the cam is set on the DA surface and operates positively while (16) the oscillating actuator shaft rotates in a clockwise direction when the input signal is increased. (2) The gain suppression spring is for direct feedback of the motion of (7) the exhaust valve to (4) the counter weight to increase the stability of the loop. The zero point should be adjusted by change of (3) the zero adjustment spring tension.

Double action positive operation



Block diagram

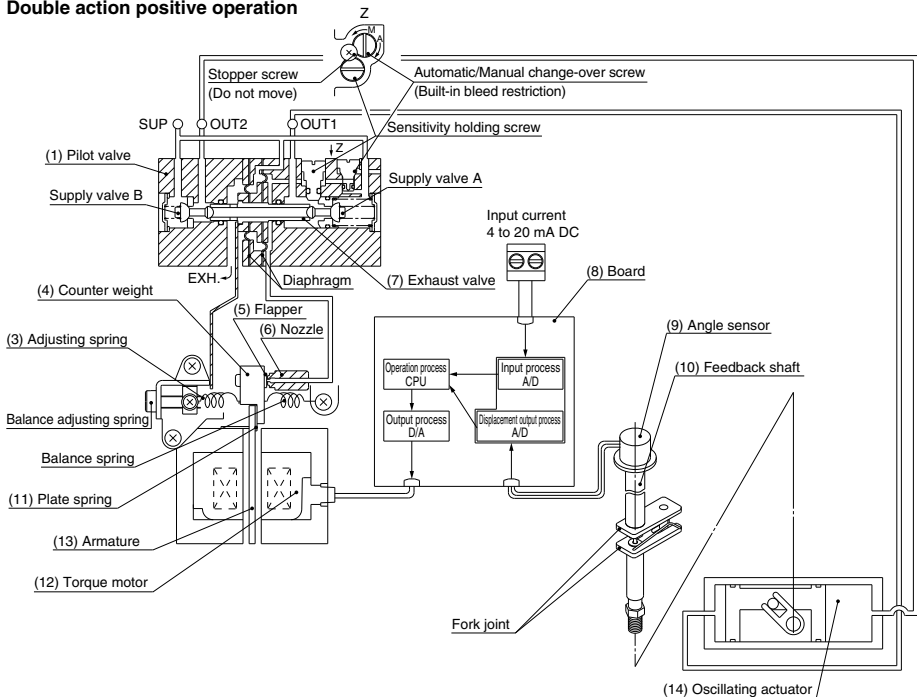


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IP8101/Rotary type

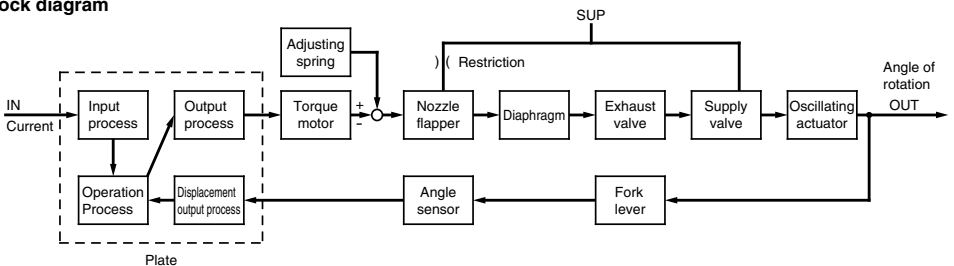
When the input current increases, the electrical current inside (12) the torque motor coil will change through (8) the plate's input process, operation process and output process, and (13) the armature will oscillate, with (11) the plate spring as its base. As a result, the clearance between (6) the nozzle and (5) the flapper will increase, and the nozzle back pressure will decrease. Consequently, (7) the exhaust valve of (1) the pilot valve moves to the right, the output pressure of OUT1 increases and causes the output pressure of OUT2 to decrease, causing (14) the oscillating actuator to move. The motion of (14) the oscillating actuator is transmitted to the fork lever-type fitting, (10) the feedback shaft (9) angle sensor, and the displacement output process of (8) the board, and output position will match the input current.

Double action positive operation



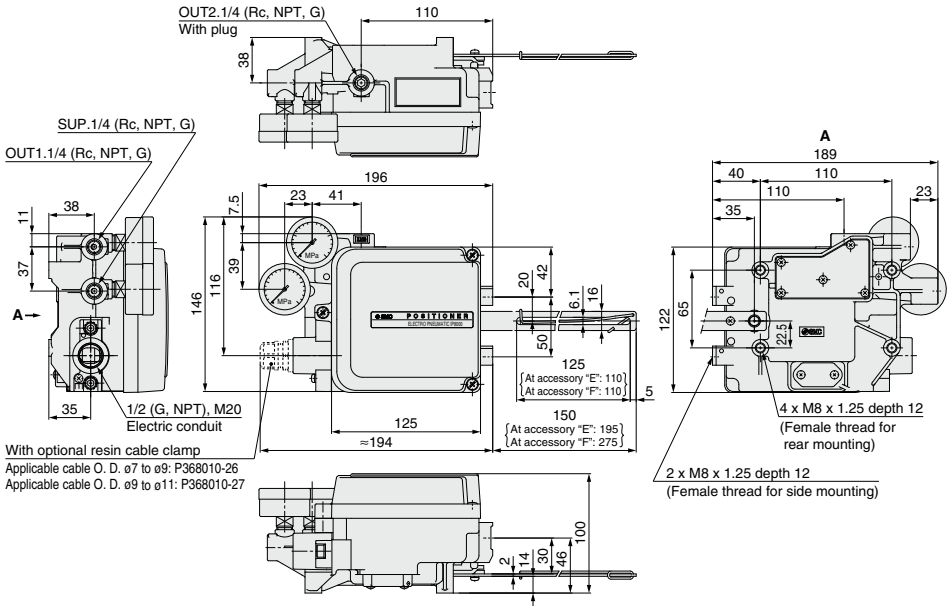
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Block diagram

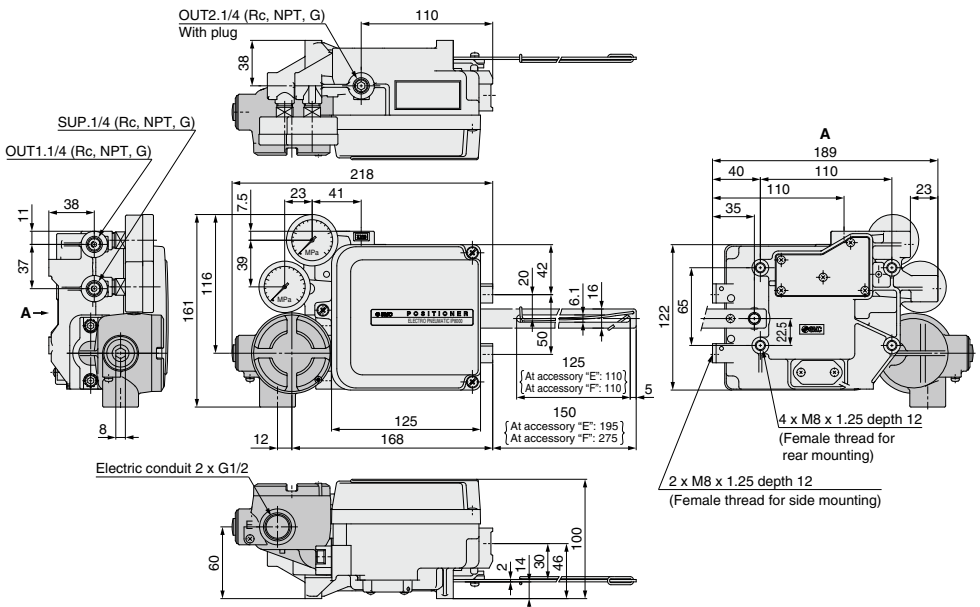


Dimensions/IP8000 (Lever type)

IP8000-0□0 (Without terminal box)

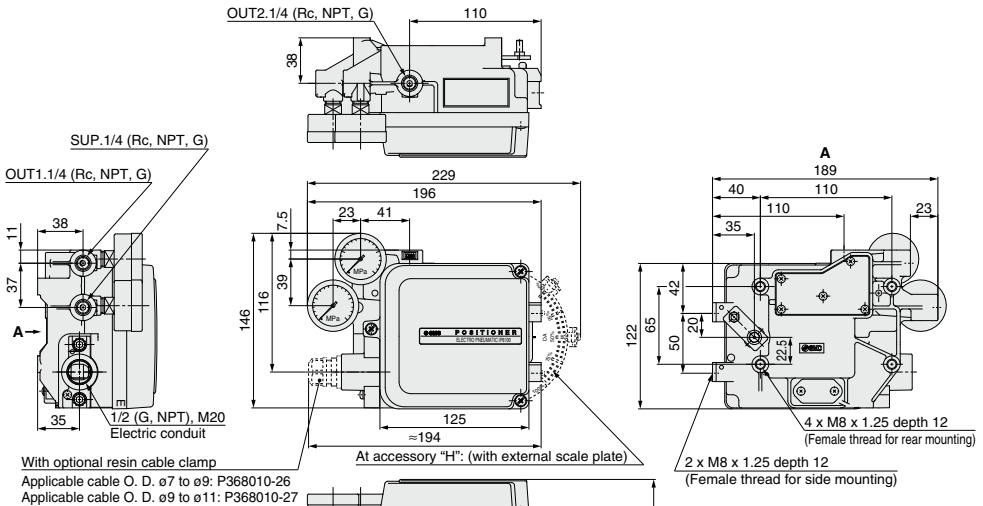


IP8000-0□1 (With terminal box)

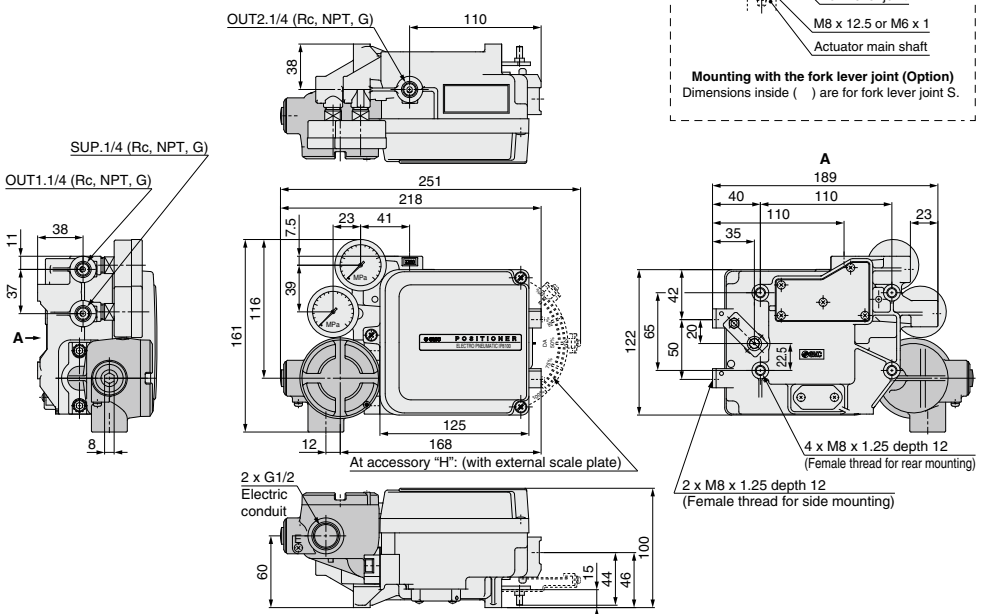


Dimensions/IP8100 (Rotary type)

IP8100-0□0 (Without terminal box)



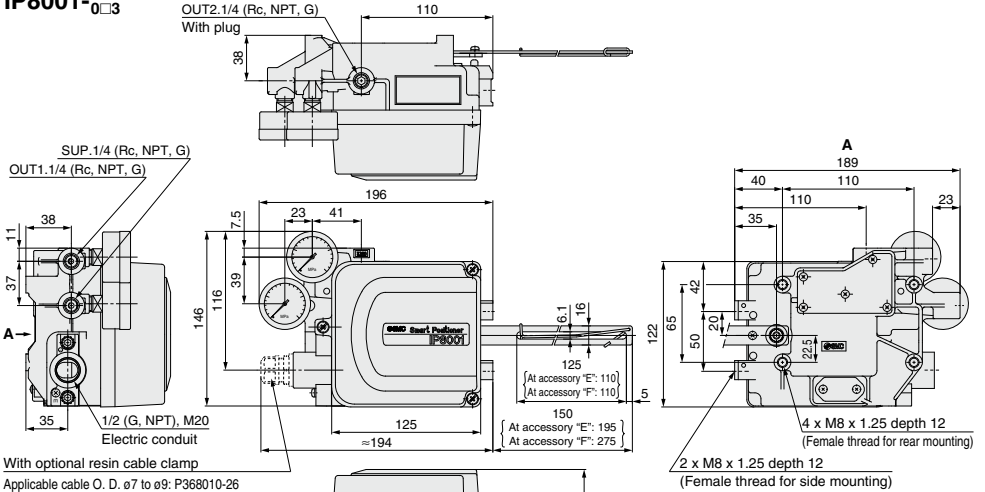
IP8100-0□1 (With terminal box)



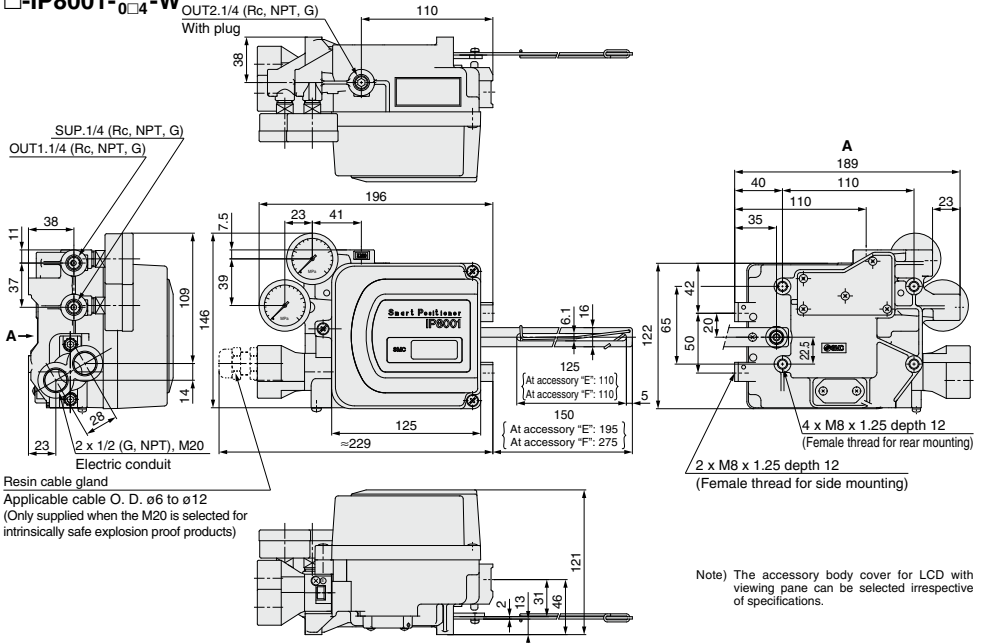
- IP**
- IW**
- 1301**
- AW**
- IL1**
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- IT**
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- IS**
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Dimensions/IP8001 (Lever type)

IP8001- $\frac{0}{0}$ $\frac{0}{0}$



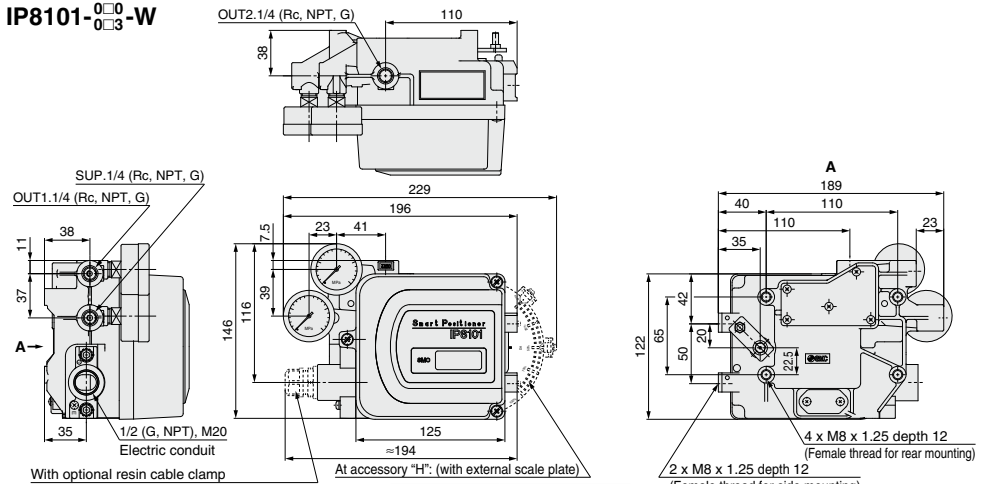
IP8001- $\frac{0}{0}$ $\frac{0}{4}$ -W



Note) The accessory body cover for LCD with viewing pane can be selected irrespective of specifications.

Dimensions/IP8101 (Rotary type)

IP8101-0-0-3-W

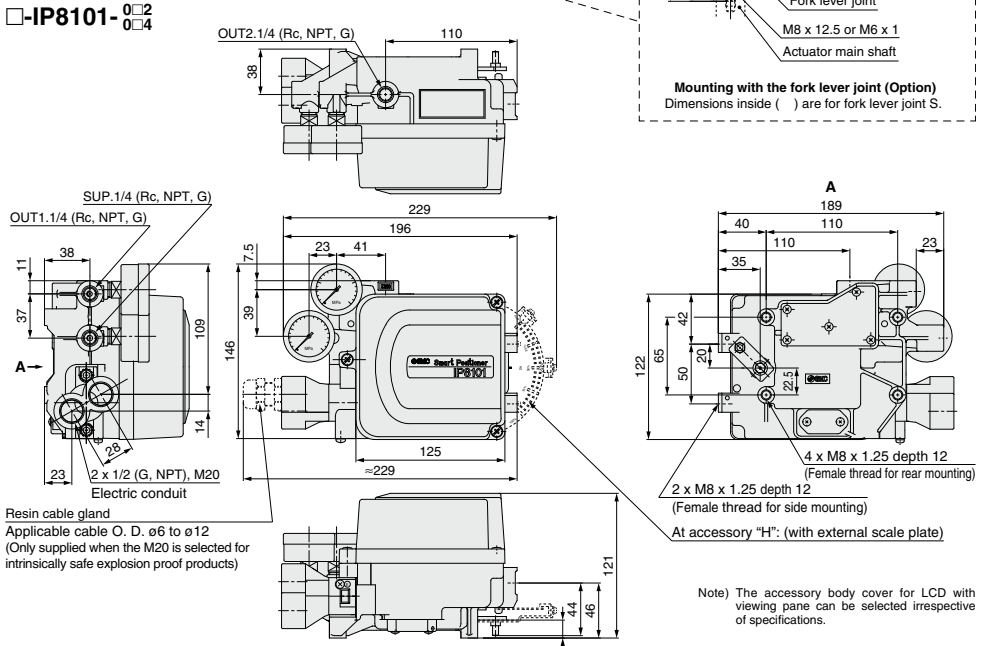


With optional resin cable clamp

Applicable cable O. D. ø7 to ø9: P368010-26

Applicable cable O. D. ø9.1 to ø11: P368010-27

-**IP8101-0-4**



- IP**
- IW**
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- AW**
- IL1**
- IL2**
- IT**
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- VFN**
- IN-**

Note) The accessory body cover for LCD with viewing pane can be selected irrespective of specifications.

Electro-Pneumatic Positioner (Lever type/Rotary type)

Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.



Water Resistant Type

1 Exterior Covering Enclosure: JISF8007 IP66 (Conforms to IEC60529)

* Same as the standard, other than the IP66 compliant protective cover.

How to Order

IP8000/Lever type

IP8000 - 0 [] [] - [] - [] - X310 - P - []

Lever type

Pressure gauge (SUP, OUT1)

Construction		Accessories		Connection ^{Note 2)}		CE/UKCA marking						
0	None	0	No terminal box (With non-explosive proof connector)	NII	None (With standard lever)	Air	Electric	NII	—			
1	0.2 MPa	A	No terminal box (With non-explosive proof connector)	A	ø0.7 Output restriction with pilot valve	NII	Rc1/4	G1/2	Q	CE/UKCA marked product		
2	0.3 MPa	B		ø1.0 Output restriction with pilot valve	M	Rc1/4	M20 x 1.5	N			Rc1/4	1/2NPT
3	1.0 MPa	1	With terminal box (Exd II BT5)	E	For stroke 35 to 100 mm with lever unit (Standard lever is not attached.)	1	1/4NPT					
				F	For stroke 50 to 140 mm with lever unit (Standard lever is not attached.)	2	1/4NPT	M20 x 1.5				
				G	Compensation spring (A) (It is mounted to the body as a replacement of the standard compensation spring.)	3	1/4NPT	1/2NPT				
						4	G1/4	G1/2				
						5	G1/4	M20 x 1.5				
						6	G1/4	1/2NPT				

Note 1) If two or more accessories are required, the part numbers should be given in alphabetical order.
 Note 2) If 1 is selected for Construction, M, N, 2, 3, 5, 6 cannot be selected for Connection.

IP8100/Rotary type

IP8100 - 0 [] [] - [] - [] - X310 - P - []

Rotary type

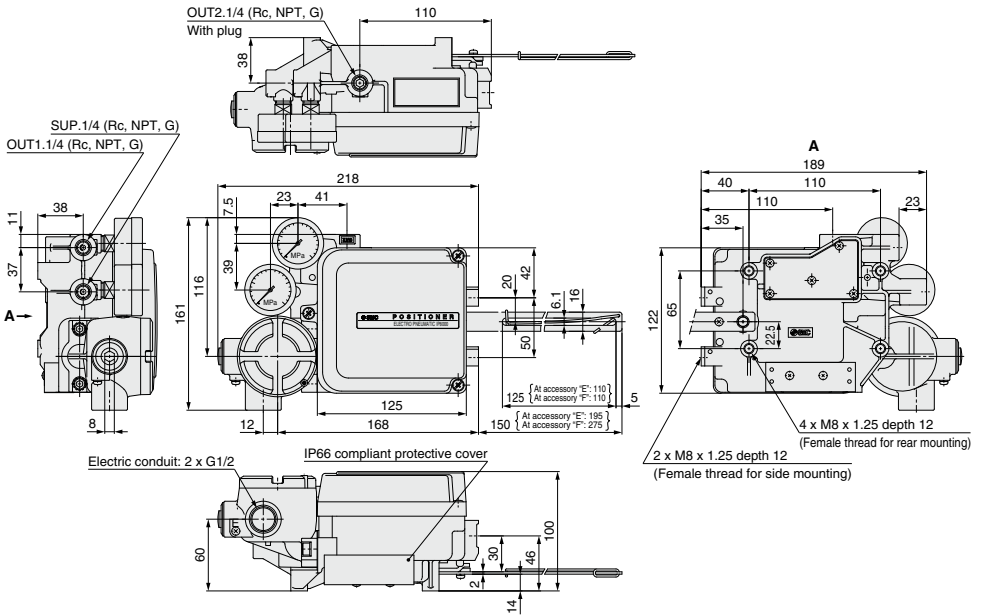
Pressure gauge (SUP, OUT1)

Construction		Accessories		Connection ^{Note 2)}		CE/UKCA marking						
0	None	0	No terminal box (With non-explosive proof connector)	NII	None (With standard lever)	Air	Electric	NII	—			
1	0.2 MPa	A	No terminal box (With non-explosive proof connector)	A	ø0.7 Output restriction with pilot valve	NII	Rc1/4	G1/2	Q	CE/UKCA marked product		
2	0.3 MPa	B		ø1.0 Output restriction with pilot valve	M	Rc1/4	M20 x 1.5	N			Rc1/4	1/2NPT
3	1.0 MPa	1	With terminal box (Exd II BT5)	C	Fork lever assembly M	1	1/4NPT					
				D	Fork lever assembly S	2	1/4NPT	M20 x 1.5				
				G	Compensation spring (A) (It is mounted to the body as a replacement of the standard compensation spring.)	3	1/4NPT	1/2NPT				
						4	G1/4	G1/2				
						5	G1/4	M20 x 1.5				
				H	With external scale plate	6	G1/4	1/2NPT				
				J	With opening current transmission (4 to 20 mA DC, with terminal box, non-explosion proof)/Positive operation							
				JR	With opening current transmission (4 to 20 mA DC, with terminal box, non-explosion proof)/Reverse operation							

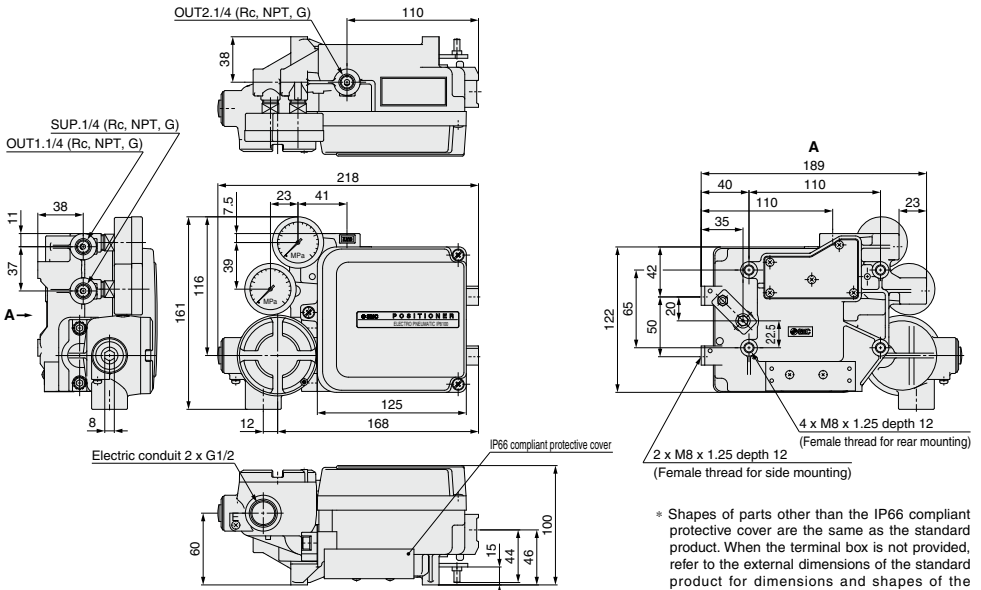
Note 1) If two or more accessories are required, the part numbers should be given in alphabetical order.
 Note 2) Symbol J/JR is with terminal box, non-explosion proof specification. Select 1 for Construction.
 Note 3) If 1 is selected for Construction, M, N, 2, 3, 5, 6 cannot be selected for Connection.

Dimensions

P8000-X310-P



IP8100-X310-P



* Shapes of parts other than the IP66 compliant protective cover are the same as the standard product. When the terminal box is not provided, refer to the external dimensions of the standard product for dimensions and shapes of the electric wiring parts.

IP
IW
1301
AW
IL1 <input type="checkbox"/>
IL2 <input type="checkbox"/>
IT
CP <input type="checkbox"/>
IS
VFN
IN- <input type="checkbox"/>
T <input type="checkbox"/>

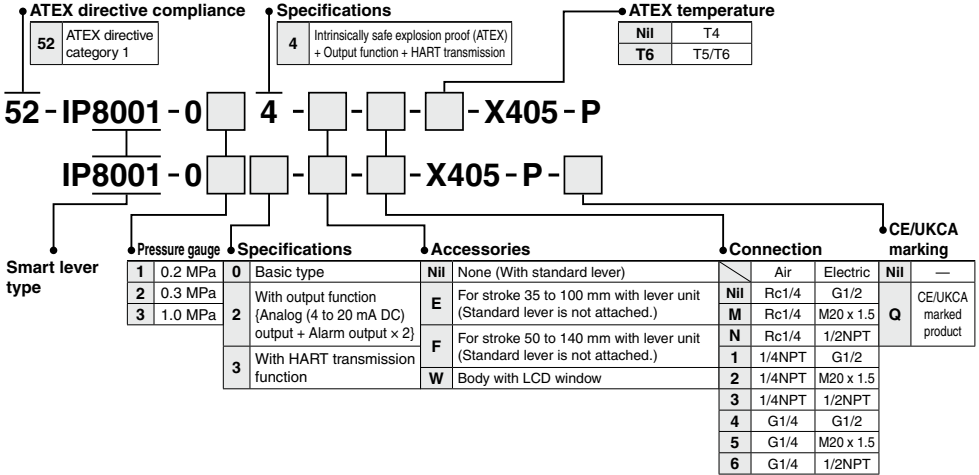
Water Resistant Type

2 Exterior Covering Enclosure: JISF8007 IP66 (Conforms to IEC60529)

* Same as the standard, other than the IP66 compliant protective cover.

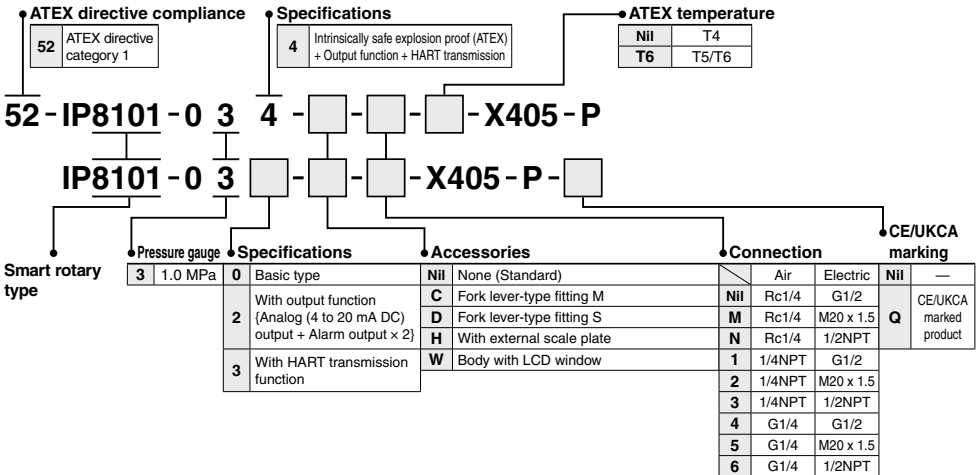
How to Order

IP8001/Lever type



Note 1) If two or more accessories are required, the part numbers should be given in alphabetical order.
 Note 2) If a connecting port is M20 x 1.5, a blue cable gland is included.

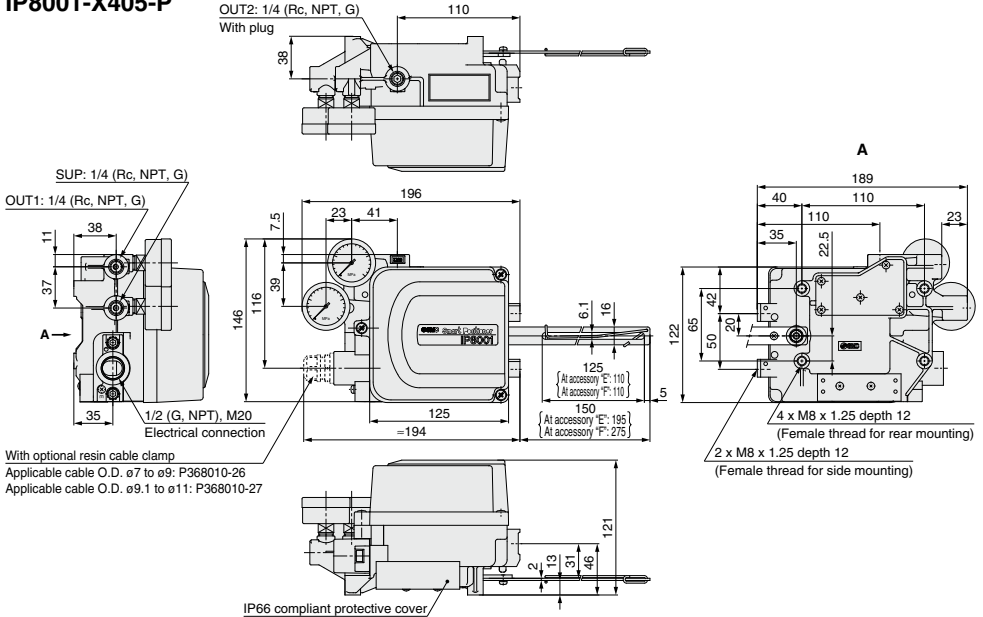
IP8101/Rotary type



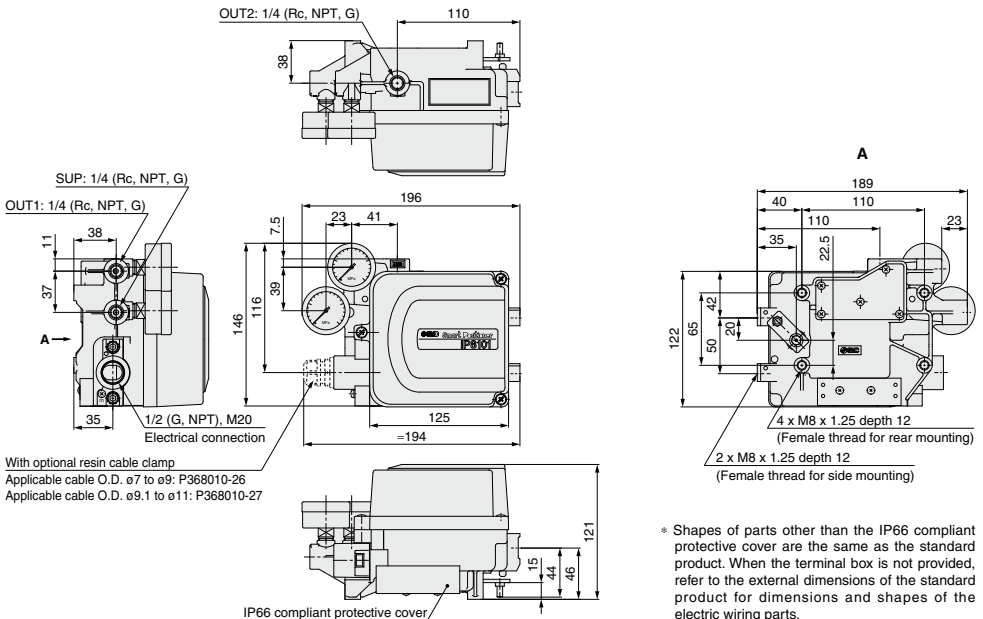
Note 1) If two or more accessories are required, the part numbers should be given in alphabetical order.
 Note 2) If a connecting port is M20 x 1.5, a blue cable gland is included.

Dimensions

IP8001-X405-P



IP8101-X405-P



* Shapes of parts other than the IP66 compliant protective cover are the same as the standard product. When the terminal box is not provided, refer to the external dimensions of the standard product for dimensions and shapes of the electric wiring parts.

- IP**
- IW**
- 1301**
- AW**
- IL1**
- IL2**
- IT**
- CP**
- IS**
- VFN**
- IN-**
- T**

3 External Input Signal (Remote) Type

How to Order

IP8101-032-W--X419-

Pressure gauge

3	1.0 MPa
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Construction

2	With output function (Analog (4 to 20 mA DC) output + Alarm output x 2)
----------	---

Accessories

W	Body cover with LCD window
----------	----------------------------

CE/UKCA marking

Nil	—
Q	CE/UKCA-marked product

Connection

	Air	Electric
Nil	Rc1/4	G1/2
M	Rc1/4	M20 x 1.5
N	Rc1/4	1/2NPT
1	1/4NPT	G1/2
2	1/4NPT	M20 x 1.5
3	1/4NPT	1/2NPT
4	G1/4	G1/2
5	G1/4	M20 x 1.5
6	G1/4	1/2NPT

Specifications

Positioner Specifications

Input current	4 to 20 mA DC*1 (2-line, Separate power source unnecessary)
Input feedback signal	4 ±1 to 20 ±1 mA DC
Piping length	10 m or less
Tubing size	O.D.: 8 mm, I.D.: 5 mm
Min. operating current	3.85 mA DC or more
Voltage between terminals	12 VDC (Equivalent to 600 Ω input resistance, at 20 mA DC)
Max. supply power	1 W*2 (Imax: 100 mA DC, Vmax: 28 VDC)
Supply air pressure	0.3 to 0.7 MPa
Sensitivity	Within ±0.2% F.S.*3
Linearity*3	Within ±1% F.S. (Noise interference-free environment) Within ±8% F.S. (For "-Q"/use in an environment with noise interference)
Hysteresis	Within 0.5% F.S.*3
Repeatability	Within ±0.5% F.S.*3
Temperature coefficient	Within 0.05% F.S./°C*3
Max. output flow	200 L/min (ANR) or more (SUP = 0.4 MPa)*4
Air consumption	Within 11 L/min (ANR) (SUP = 0.4 MPa)*4
Ambient and fluid temperatures	-20°C to 80°C (Non-explosion proof)*5, *6
Enclosure	JIS F 8007 IP65 (Compliant with IEC 60529)
Air connection port*7	1/4 (Rc, NPT, G) female thread
Electrical connection port*7	1/2 (G, NPT) female thread, M20 x 1.5 female thread
Material	Body/Cover: Aluminum diecast (Coating: Baking finish with epoxy resin) Thread: Stainless steel
Weight	Approx. 2.6 kg

*1 A 1/2 split range can be selected using the split range setting (Parameter code: 300).

*2 <Example> If an input current of 80 mA DC is input by mistake, damage will not occur as long as the input power supply voltage is below 12.5 VDC.
Max. supply power = 80 mA DC x 12.5 V = 1 W

*3 The linearity value was confirmed with no load using an SMC inspection device (the device with a built-in sensor shown in the table below).
The positioner cannot be used independently; it is meant for use as a part of a loop which includes actuating equipment such as valves, actuators, distributed control systems, etc. Therefore, the values in the table may vary depending on the loop conditions.
The temperature coefficient of the external sensor is not included in the temperature coefficient.
The linearity value of ±8% F.S. or less is based on measurement during EMC-testing under certain electrical noise conditions.
When using in an environment where noise interference is present, we recommend the "-Q" option, not the CE/UKCA-compliant option "Nil."

*4 (ANR) indicates JIS B 0120 standard air.

*5 The LCD display may be difficult to see at low temperatures, but this does not affect positioner operation.

*6 Be aware that temperature fluctuations may affect the voltage between terminals.

*7 The connection port type can be selected during model selection.

External Sensor Specifications (Reference)

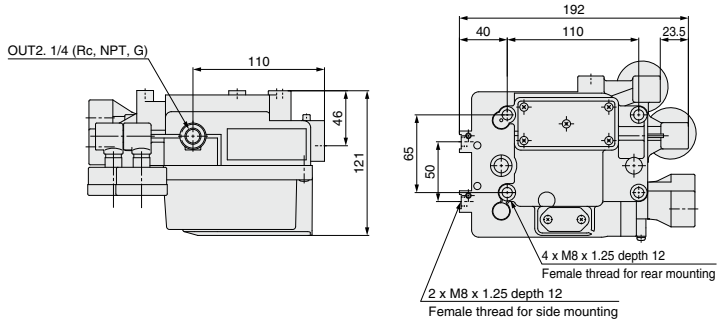
Linearity	±0.05% F.S. or less
Resolution	0.01% F.S. or less
Repeatability	±0.01% F.S. or less
Output signal	4 ±1 to 20 ±1 mA DC

* Be sure to ground the product to prevent malfunction caused by noise or damage caused by static electricity.

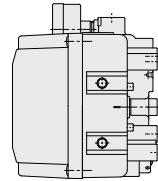
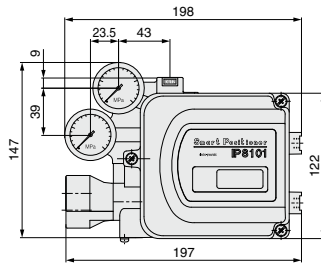
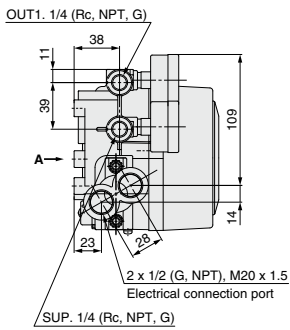
Dimensions

[mm]

IP8101-032-W--X419-



View A



IP
IW
1301
AW
IL1 <input type="checkbox"/>
IL2 <input type="checkbox"/>
IT
CP <input type="checkbox"/>
IS
VFN
IN- T <input type="checkbox"/>

Technical data

Explosion proof

1. IIS explosion-proof construction

The electro-pneumatic positioner IP8000/8100 becomes explosion proof, as certified by IIS, according to the model selected. The explosion-proof grade has the following approval: Exd II BT5.

Take extra care when handling the positioner as explosion-proof equipment

To use as Exd II BT5

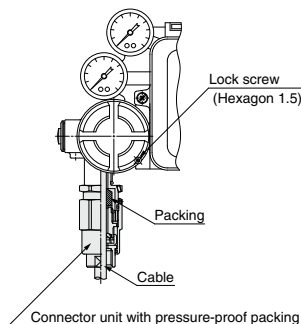
A) Pressure-proof packing

As shown below in the chart, use "Cable gland" (Option).

B) Metal piping

Attach the sealant fitting bracket near the cable port.

(For details, refer to "The guideline on electric equipment explosion proof" published by the Technology Institution of Industrial Safety).



Cable gland with pressure proof packing (Option)

Description	Unit product no.	Applicable outside diameter
Connector unit with pressure proof packing	P368010-32	ø7.0 to ø10.0
	P368010-33	ø10.1 to ø12.0

2. ATEX Intrinsically safe explosion-proof construction

Pneumatic positioners IP8000/8100 and IP8001/8101 Smart Positioners are ATEX compliant, intrinsically safe and explosion proof, as certified by DEKRA, the accreditation body for explosion-proof products. Take extra care when handling these explosion-proof products.

In regards to explosion-proof grades,

The Pneumatic Positioner IP8□00 meets II 2G Ex h ib IIC T5/T6 Gb, and

The Smart Positioner IP8□01 meets the II 1G Ex h ia IIC T4/T5/T6 Ga. Check the positioner's specifications and explosion-proof grades and use in the most optimal environment.

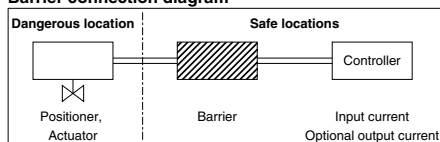
• Wiring

When using the positioner as an intrinsically safe explosion-proof product, always set up a barrier in a **safe environment**, and perform each positioner's wiring through the barrier. Simultaneously, use the provided cable gland (M20 x 1.5) as the extension for the lead wire. If a connecting port other than M20 x 1.5 is selected, the cable gland will not be provided, so use a cable gland with the same or greater explosion-proof grades than this positioner.

• Barrier

Connect the barrier as shown in the diagram below. Moreover, the user must select a barrier that is suitable for each function, based on the ATEX intrinsically safe explosion-proof parameters (current circuit). For IP8001/8101 type smart positioners, use a linear resistant type barrier that is based on the explosion-proof parameters.

Barrier connection diagram



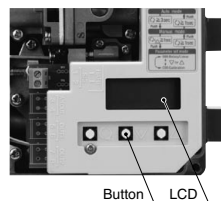
Moreover, at SMC, the barriers listed in the chart below are used to check operations. To purchase, please contact PEPPER + FUCHS Inc. (Germany).

Recommended barriers

	Manufacturer	Model	Note	Applicable model	
				IP8□00-X14	52-IP8□01
For input signal (non HART transmission)	PEPPERL + FUCHS (Germany)	KFD2-CD-Ex1.32	—	○	○
For input signal (for HART transmission)		KFD2-SCD-Ex1 LK KCD2-SCD-Ex1	—	—	○
For analog output		KFD2-STC4-Ex1	—	—	○
For alarm output	FUCHS (Germany)	KFD2-SOT2-Ex2	Transistor Output passive type	—	○
		KFD2-ST2-Ex2	Transistor Output passive type	—	○
		KFD2-SR2-Ex2.W	Relay output	—	○

HART transmission

With smart positioners IP8001/8101, the user can operate the positioner using buttons and change parameter settings by viewing the LCD display (shown the right). Furthermore, depending on the model selected, the same button operation and parameter settings, and monitoring is possible from a remote location via HART transmission.



The table below lists an example of applications that are compatible with smart positioner IP8001/8101. Application selection must be made by the user. Please contact Emerson Process Management for further details.

HART transmission compatible application

Product name ^(Note)	Manufacturer
AMST™ Suite : Intelligent Device Manager® 375/475 Field Communicator	Emerson Process Management (US)

(Note) AMST™ Suite: Intelligent Device Manager® is a registered trademark of Emerson Electric Co.