



CHRYSsafidis

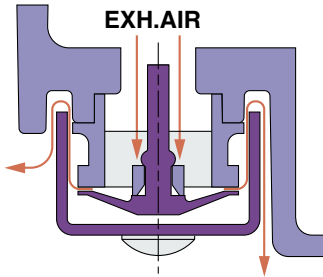
# Electro-Pneumatic Positioner/Smart Positioner

(Lever type / Rotary type)



## Dustproof / Waterproof

Passed by external organization on **JIS F8007** (conforms to IEC 60529) **IP65**



A centralized exhaust system employs the combination of the check valve and the labyrinth effect enhancing both dustproof and waterproof performance.

## Monitoring function

### Electro-Pneumatic Positioner

- Opening current transmission analogue (4 to 20 mA DC) continuous output

### Smart Positioner

- Alarm point output function (2 points)
- Analogue (4 to 20 mA DC) continuous output

## With external scale plate (Rotary type)



### External scale plate

Improved visibility of opening indicator

## Explosion-proof construction

<b>Electro-Pneumatic Positioner</b>	TIIS explosion-proof construction (ExdIIBT5) ATEX intrinsically safe explosion-proof construction (II2G Ex ibIIC T5/T6)
<b>Smart Positioner</b>	ATEX intrinsically safe explosion-proof construction (II1G Ex iaIIC T4/T5/T6)

## With internal opening indicator plate (X14 only)



### Internal opening indicator plate

Opening indicator plate inside body

## Body with LCD window

### (Smart Positioner)



### LCD window

Allows checking of control from outside body

## Electro-Pneumatic Positioner

Universal mechanically controlled type  
**Series IP8000/8100**



**IP8000**  
(Lever type)



**IP8100**  
(Rotary type)

## NEW Smart Positioner

Electronically controlled easy-adjustment transmitting type  
**Series IP8001/8101**



**IP8001**  
(Lever type)



**IP8101**  
(Rotary type)

# Series IP8



CAT.EUS60-18B-UK

# NEW Smart Positioner

Series IP8001/8101 added!

**Built-in microcomputer and sensor allows easy remote parameter change and monitoring.**

- Internal push button for easy setting of various parameters (Refer to parameter list)
- Zero point/span adjustment easier than with previous mechanical positioners



IP8001 (Lever type)

IP8101 (Rotary type)

## Parameter List

Notes	No	Parameter	Description
Standard equipped functions	1	Positive operation/reverse operation setting	Change operation direction with regard to input signal Change to internal components, piping not possible
	2	Split range setting	Change range of input signal
	3	Preferred zero point/span adjustment setting	Change actuator stroke range with regard to input signal
	4	Forced full close/full open setting	To ensure valve closure, force actuator opening to be 0% or 100% with a preferred input signal.
	5	Valve characteristic setting	Select from these 6 valve characteristics Linear characteristic Equality % characteristic (2 types) Quick open characteristic (2 types) User preferred point setting (11 points)
	6	PID constant setting	Change PID constant
	7	Calibration setting	Zero point/span adjustment, Auto PID constant setting, input signal display value calibration, etc.
Optional equipped functions	8	Alarm 1 output setting	Set upper/lower stroke limits for actuator from which alarm is output
	9	Alarm 2 output setting	Set upper/lower stroke limits for actuator from which alarm is output
	10	Analogue (4 to 20 mA DC) output setting	Set increase/decrease direction for 4 to 20 mA DC output with regard to actuator stroke

## Full Output Functions

Selecting models with output functions by model selection selects with alarm point output function (2 points) and analogue (4 to 20 mA DC) continuous output function. This will allow remote detection of operating abnormalities.

## Control State Display

Positioning, deviation, and input value are displayed (numerically) on the internal LCD, allowing visual verification of the control state.



### Display example

Positioning (%)	Input value (%)	Deviation (%)
P 50.0	S 60.0	E 10.0

## Handles 2-line Input for Existing Equipment

Control furnished with conventional 2-line input signal (4 to 20 mA DC) not requiring separate power source.

## HART Transmission Function

HART transmission function can be designated by model selection. Allows remote monitoring and setting change of positioner.

## Intercompatible Installation

Dimensions of mounting parts same as previous mechanical series IP6000/IP8000 Electro-Pneumatic Positioner. External feedback lever and fork lever-type fitting for joining actuator and positioner are also the same.

## Energy-saving

Lever-type features 60% reduced air flow consumption compared with IP8000.





**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
	Single action	Double action	Single action	Double action	Single action / Double action	
Item						
<b>Input current</b>	4 to 20 mA DC (Standard) <small>Note 2)</small>					
<b>Min. operating current</b>	—		—		3.85 mA DC or more	
<b>Intra-terminal voltage</b>	—		—		12 V DC (equivalent to 600 Ω input resistance, at 20 mA DC)	
<b>Max. supplied power</b>	—		—		1 W (Imax: 100 mA DC, Vmax: 28 V DC)	
<b>Input resistance</b>	235 ± 15 Ω (4 to 20 mA DC)				—	
<b>Supply air pressure</b>	0.14 to 0.7 MPa				0.3 to 0.7 MPa	
<b>Standard stroke</b>	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>	
<b>Sensitivity</b> <small>Note 4)</small>	Within 0.1% F.S.		Within 0.5% F.S.		Within 0.2% F.S.	
<b>Linearity</b> <small>Note 4)</small>	Within ±1% F.S.		Within ±2% F.S.		Within ±1% F.S.	
<b>Hysteresis</b> <small>Note 4)</small>	Within 0.75% F.S.		Within 1% F.S.		Within 0.5% F.S.	
<b>Repeatability</b> <small>Note 4)</small>	Within ±0.5% F.S.					
<b>Coefficient of temperature</b>	Within 0.1% F.S./°C				Within 0.05% F.S./°C	
<b>Supply pressure fluctuation</b>	Within 0.3% F.S./0.01 MPa				— <small>Note 5)</small>	
<b>Output flow</b> <small>Note 6)</small>	80 ℓ/min (ANR) or more (SUP = 0.14 MPa)				200 ℓ/min (ANR) or more (SUP = 0.4 MPa)	
<b>Air consumption</b> <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)	11 ℓ/min (ANR) or less (SUP = 0.4 MPa)
<b>Ambient and fluid temperature</b>	General structure: -20 to 80°C					
	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				ATEX intrinsically safe explosion-proof -20 to 80°C (T4/T5) -20 to 60°C (T6)	
<b>Explosion proof construction</b> <small>Note 7)</small>	TIIS explosion-proof construction (ExdIIBT5) ATEX intrinsically safe explosion-proof construction (II2G Ex ibIIC5/T6)				ATEX intrinsically safe explosion-proof construction (II1G Ex iaIIC4/T5/T6)	
<b>ATEX intrinsically safe explosion-proof parameter (current circuit)</b>	Ui ≤ 28 V, li ≤ 125 mA, Pi ≤ 1.2 W, Ci ≤ 0 nF, Li ≤ 0 mH				Ui ≤ 28 V, li ≤ 100 mA, Pi ≤ 0.7 W, Ci ≤ 12.5 nF, Li ≤ 1.5 mH	
<b>Exterior covering enclosure</b>	JISF8007, IP65 (conforms to IEC Pub.60529)					
<b>Transmission method</b> <small>Note 7)</small>	—				HART transmission	
<b>Air connection port</b> <small>Note 8)</small>	Rc 1/4 female thread, NPT 1/4 female thread, G 1/4 female thread					
<b>Electrical connection port</b> <small>Note 8)</small>	G 1/2 female thread, M20 x 1.5 female thread, NPT 1/2 female thread					
<b>Material/coating</b>	Aluminum diecast body/baking finish with denatured epoxy resin					
<b>Weight</b>	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)

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) (ANR) indicates JIS B0120 standard air.

Note 7) Model selection required for explosion proof construction and HART transmission.

Note 8) Thread type can be specified by model selection.

**Optional Specifications**

Type	IP8100-0□1-J/JR (Non-explosion proof)		IP8□01-0□2	52-IP8□01-0□4
	Electro-Pneumatic Positioner		Smart Positioner	
Item				
<b>Analogue output</b>	<b>Wiring</b>	2-line		
	<b>Output signal</b>	4 to 20 mA DC		
	<b>Power supply voltage</b>	12 to 35 V DC	10 to 28 V DC	
	<b>Load resistance</b>	(Power supply voltage - 12 V) ÷ 20 mA DC or less	0 to 750 Ω	
	<b>Accuracy</b>	±2% F.S. or less <small>Note 1)</small>	±0.5% F.S. or less <small>Note 2)</small>	
	<b>Hysteresis</b>	Within 1% F.S.	—	
<b>Alarm output 1, 2</b>	<b>Wiring</b>	2-line		
	<b>Applicable standards</b>	—	—	DIN19234/NAMUR Standard
	<b>Power supply voltage</b>	—	10 to 28 V DC	5 to 28 V DC
	<b>Load resistance</b>	—	10 to 40 mA DC	(Constant current output)
	<b>Alarm ON</b>	—	R = 350 Ω ±10%	≥ 2.1 mA DC
	<b>Alarm OFF (Leakage current)</b>	—	0.5 mA DC or less	≤ 1.2 mA DC
<b>Response time</b>	—	50 msec or less		

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

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

# Series IP8



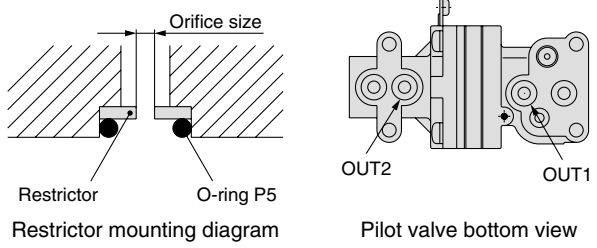
## Accessory / Option

### 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 <sup>3</sup>	ø0.7	P36801080	P565010-18	A
180 cm <sup>3</sup>	ø1	P36801081	P565010-19	B

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

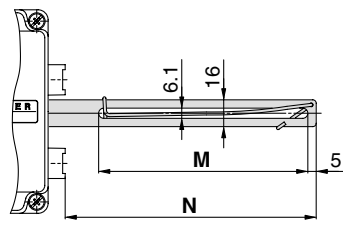


### External feedback lever (IP8000 / 8001)

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

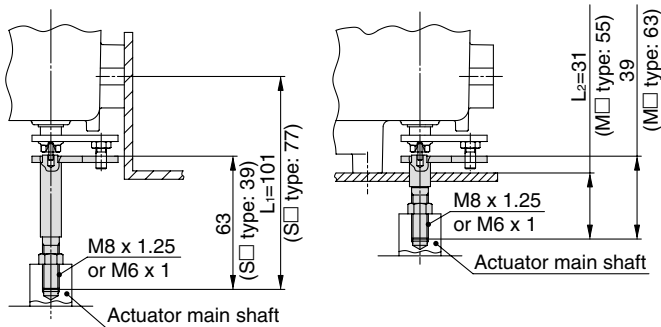


### Fork lever-type fittings (IP8100 / 8101)

2 types of rotary type IP8100/8101 fork lever-type fittings, that differ by installation dimensions dependent on bracket installation method, and 2 types 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 IP6100 positioner. When installing on the rear surface, using fork lever assembly S also provides interchangeability with the installation dimensions of SMC IP6100 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.



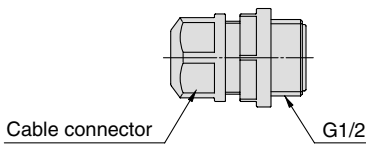
Side mounting with the fork lever assembly M

Rear mounting with the fork lever assembly S

### 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 in 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





-Pneumatic Positioner  
Smart Positioner

Series **IP8** □

## 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>

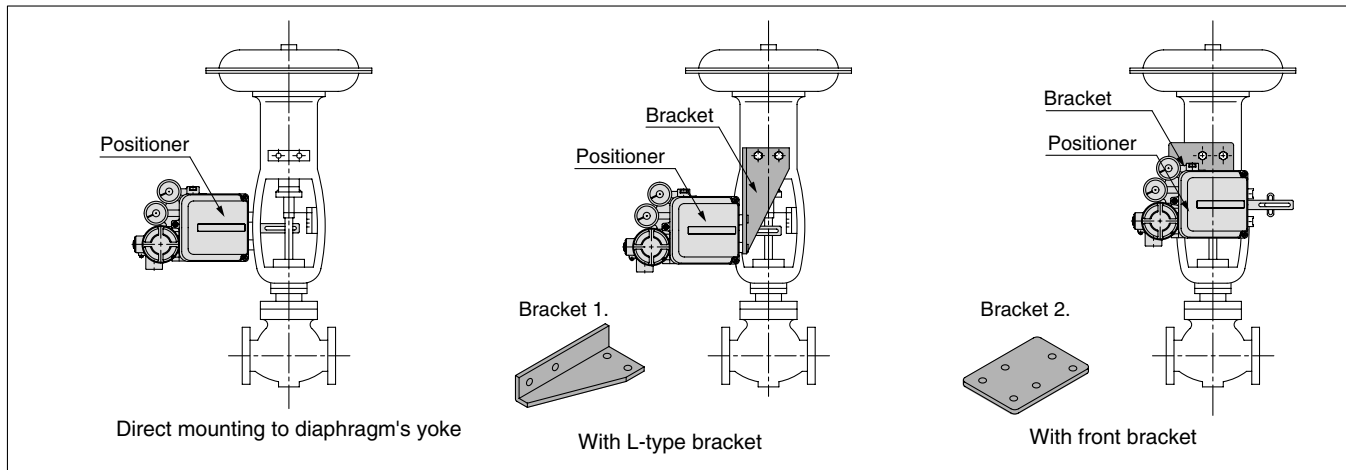
# Series IP8



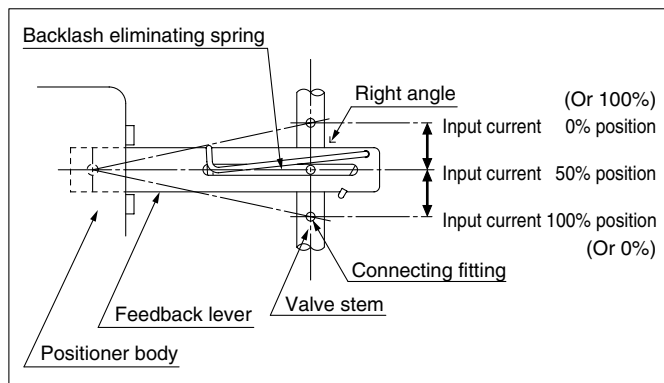
## Installation

### 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.



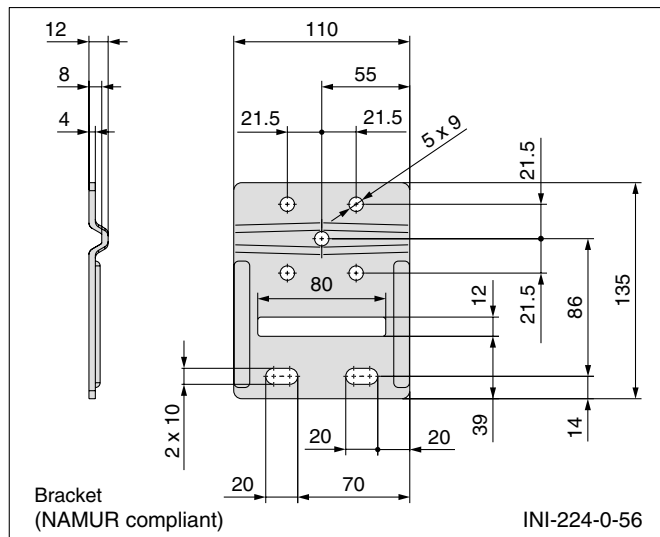
2. The feedback lever that detects the displacement of valve stems should be mounted at a position so that the lever is at right angles to the valve stem for an input current of 50%. The figure is the configuration viewed from the front.



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

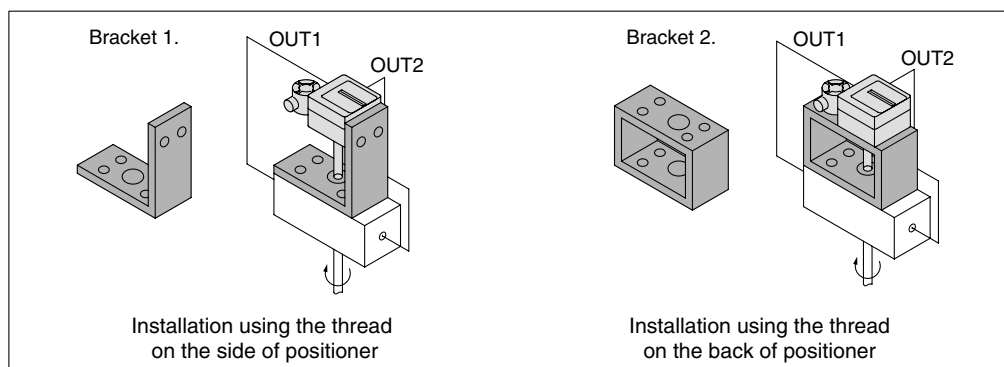
Description	Part no.
Bracket (NAMUR compliant) single unit	INI-224-0-56
Bracket (NAMUR compliant) kit <sup>Note)</sup>	INI-224-0-56-1

Note) Kits that include the bracket (NAMUR compliant) and mounting threads are also available.



### IP8100/8101 (Rotary type)

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







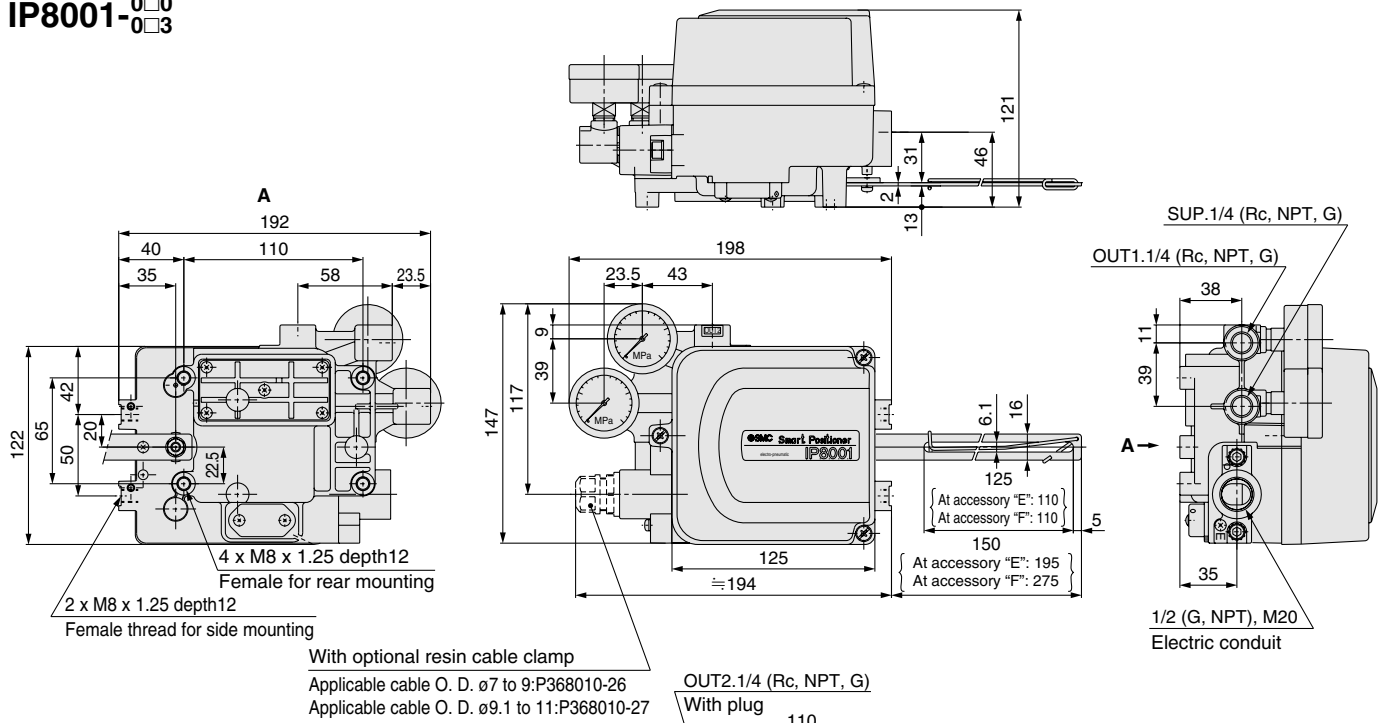


**CHRYSsafidis**

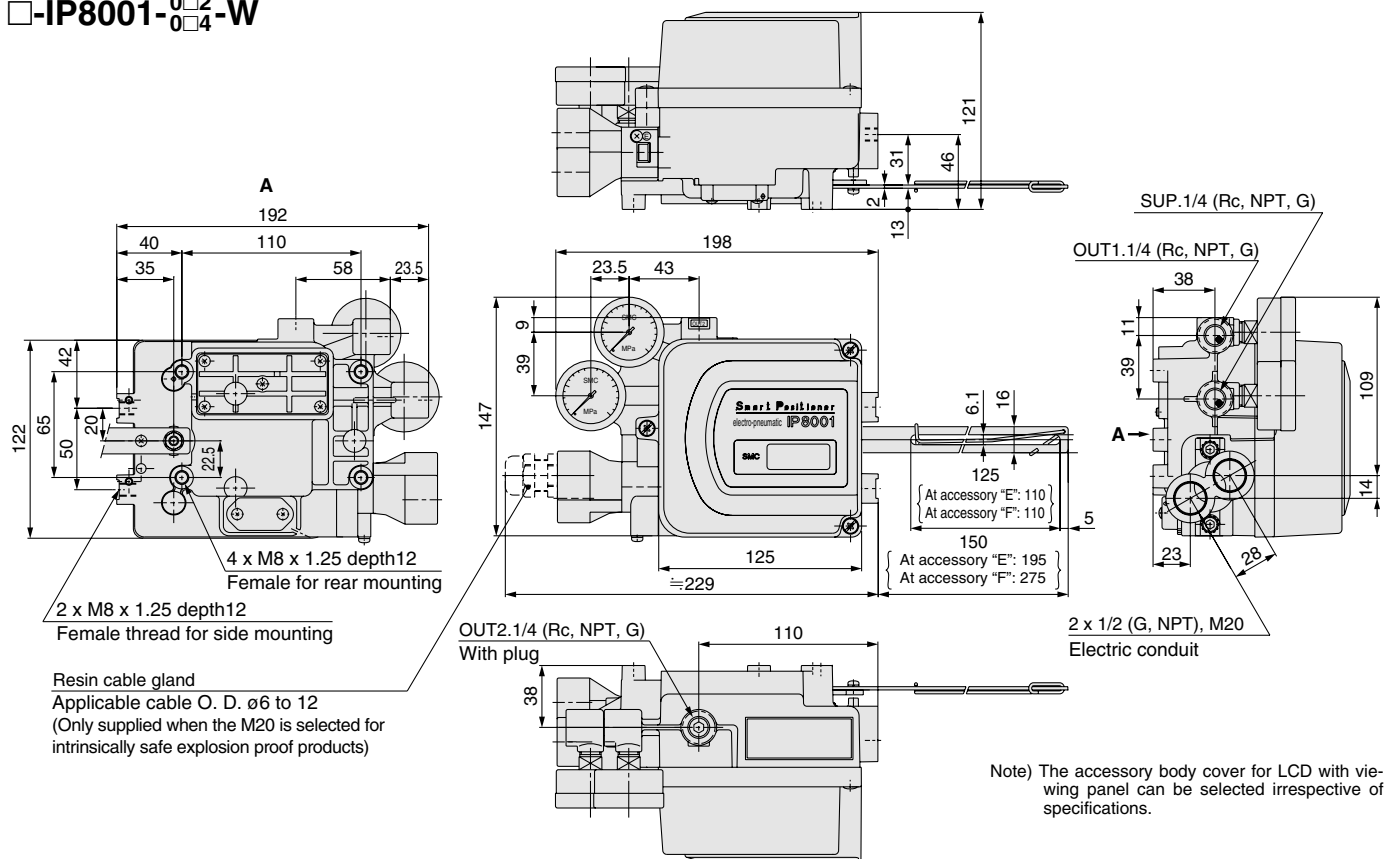
**Electro-Pneumatic Positioner  
Smart Positioner Series IP8**

**Dimensions / IP8001 (Lever type)**

**IP8001-<sup>0□0</sup><sub>0□3</sub>**



**□-IP8001-<sup>0□2</sup><sub>0□4</sub>-W**



# Technical data



## Explosion proof

### 1. TIIS explosion-proof construction

The electro-pneumatic positioner IP8000/8100 becomes explosion proof, as certified by TIIS, according to the model selected. The explosion-proof grade has the following approval: Exd IIBT5.

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

#### To use as ExdIIBT5

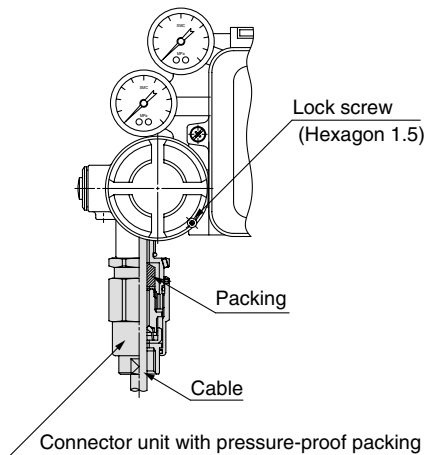
##### A) Pressure-proof packing.

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 packaging (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 KEMA, 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 IIG Ex ib IICT4/T5/T6, and

The Smart Positioner IP8□01 meets the IIG Ex ia IICT4/T5/T6.

Check the positioner's specifications and explosion-proof grades and use in the most optimal environment.

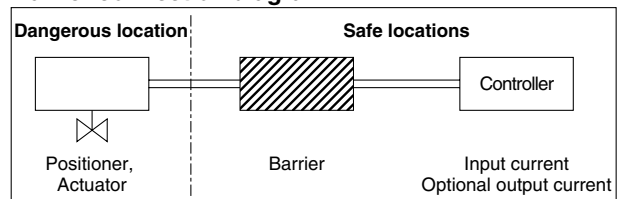
#### • Wiring

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



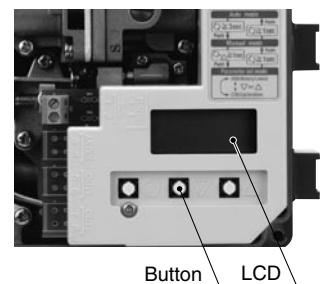
Moreover, at SMC, the barriers listed in the chart below are used to check operations. To purchase, please contact PEPPERL + FUCHS Inc. (Germany).

#### Recommended barriers

	Manu- facturer	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 analogue output		KFD2-STC4-Ex1	—	—	○
For alarm output		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 <sup>Note)</sup>	Manufacturer
AMS™ Suite : Intelligent Device Manager®	Emerson Process Management (US)
375 Field Communicator	

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

