



INSTALLATION AND MAINTENANCE INSTRUCTIONS

“ADCATROL” PNEUMATIC & ELECTROPNEUMATIC POSITIONERS

PP10, PE10, PE10.1

1. DESCRIPTION

The single acting positioners PP10, PE10 and PE10.1 require an input signal of 3÷15 psi / 4÷20 mA for proportional control valves. The positioner compares the output signal from a controller with the position feedback, and varies a pneumatic output signal to the actuator accordingly. The valve position is therefore guaranteed for any controller output signal and the effects of varying differential pressure, stem friction and diaphragm hysteresis are overcome.

2. TECHNICAL DATA

PROTECTION CLASS (acc. to DIN 40.050)		IP55 IP65 (*)
MOUNTING		IEC 534 (NAMUR)
NOMINAL TRAVEL RANGE		from 3 to 7 mm (spring type 1) from 6 to 18 mm (spring type 2) from 9 to 33 mm (spring type 3) from 14 to 53 mm (spring type 5) from 35 to 100 mm (spring type 6) from 100 to >100 mm (*)
PNEUMATIC CONNECTIONS		1/4" NPT
SUPPLY AIR PRESSURE		2...10 bar
OUTPUT		0...100 % of the supply air pressure
REPEATIBILITY	PP10	≤ 0,1 % of full range
	PE10 /:1	≤ 0.2 % of full range
HYSTERESIS	PP10	≤ 0,6 % of full range
	PE10 /:1	≤ 1 % of full range
WEIGHT	PP10	≈ 1,3 Kg
	PE10 /:1	≈ 1,4 Kg
AMBIENT TEMPERATURE	PP10	-20...+80 °C
	PE10 /:1	-20...+70 °C
STORAGE TEMPERATURE		-30...+80 °C
INPUT	PP10	3÷15 Psi (0,2÷1 bar) other input (*)
	PE10 /:1	4 ÷ 20 mA other input(*)
ELECTRIC CONNECTIONS (R01E / R01E.1)		Cable gland PG9 other connections (*)
Ui		≤ 30 V
Ii		≤ 150 mA
Pi		≤ 0,80 W
Impedance		Max 250 Ω
Ci		≈ 0 (negligible)
Li		≈ 0 (negligible)

* On request

2.1 MATERIALS

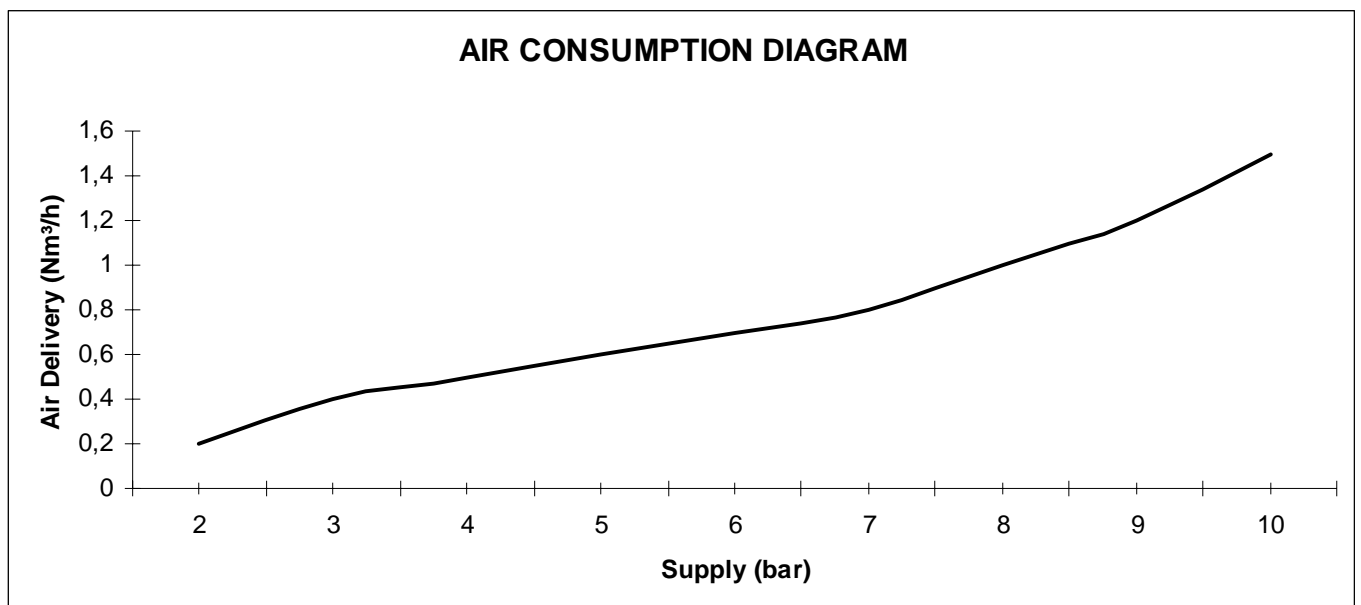
BODY		Die cast aluminium with anti corrosive paint
COVER	PP10 / PE10	Polycarbonate
	PE10.1	Aluminium
SLIDE VALVE		Box: Copper Alloy Pivot: Stainless Steel
RECEIVER DIAPHRAGM		Nitrile Rubber

2.2 PP10 & PE10 AIR DELIVERY

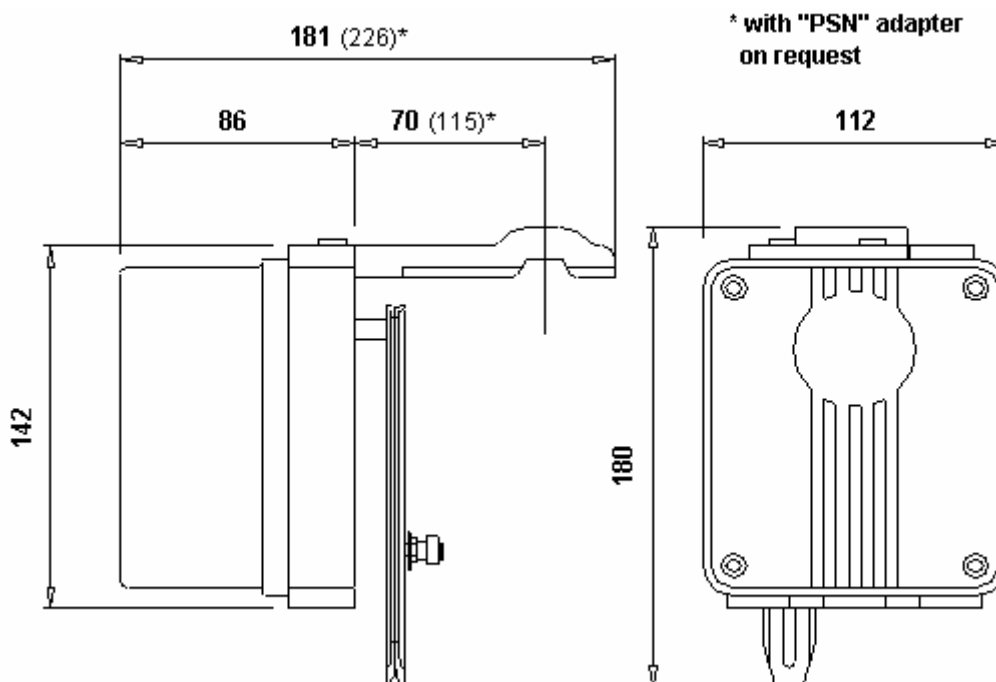
Test effected with pipe 6 x 8 mm	
2 BAR SUPPLY	adjustable from 1 to 10 Nm ³ /h
4 BAR SUPPLY	adjustable from 1 to 16 Nm ³ /h
6 BAR SUPPLY	adjustable from 1 to 22 Nm ³ /h
8 BAR SUPPLY	adjustable from 1 to 28 Nm ³ /h
10 BAR SUPPLY	adjustable from 1 to 34 Nm ³ /h

2.4 PP10 & PE10 AIR CONSUMPTION

Test effected with pipe 4 x 6 mm	
2 BAR SUPPLY	max 0,2 Nm ³ /h
3 BAR SUPPLY	max 0,4 Nm ³ /h
4 BAR SUPPLY	max 0,5 Nm ³ /h
5 BAR SUPPLY	max 0,6 Nm ³ /h
6 BAR SUPPLY	max 0,7 Nm ³ /h
7 BAR SUPPLY	max 0,8 Nm ³ /h
8 BAR SUPPLY	max 1,0 Nm ³ /h
10 BAR SUPPLY	max 1,5 Nm ³ /h



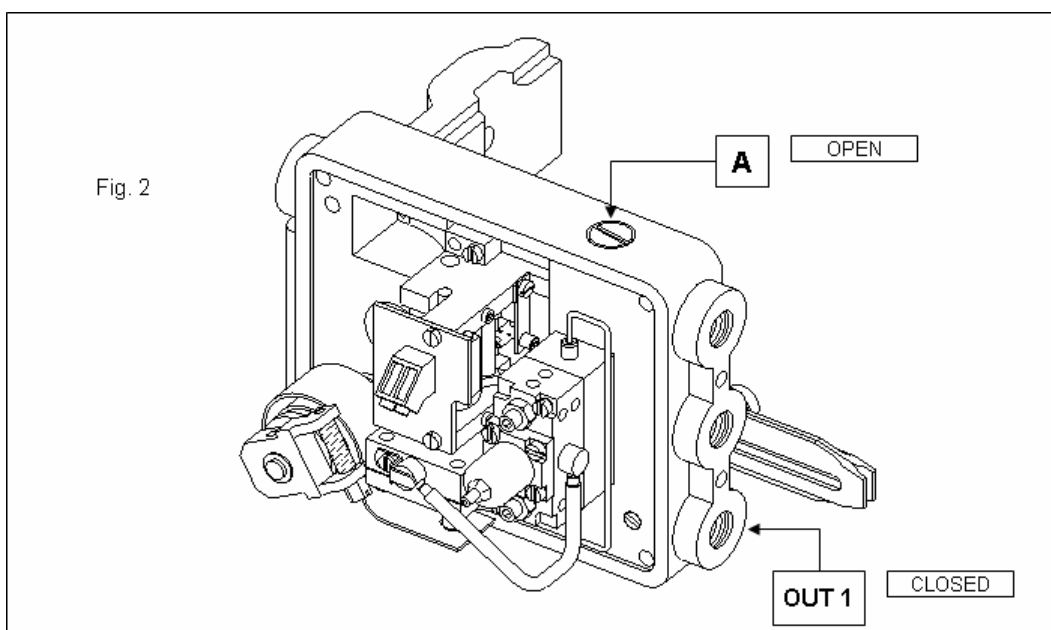
2.5 DIMENSIONS



3. POSITIONER - ACTUATOR COUPLING

3.1 OPERATION

The positioner is normally supplied for single acting operations and direct action. In case the reverse action is required then remove the plug from "A" (Fig. 2) and close the output "OUT1".



	POSITIONER - ACTUATOR COUPLING	FEEDBACK LEVER POSITION	ACTION
Fig. 1.1			<p>Positioner with direct action: Input signal rises, plug stem goes up (actuator springs compressed)</p>
Fig. 1.2			<p>Positioner with direct action: Input signal rises, plug stem goes down (actuator springs compressed)</p>

	POSITIONER - ACTUATOR COUPLING	FEEDBACK LEVER POSITION	ACTION
Fig. 3.1		<p>3 PSI / 4 mA</p> <p>15 PSI / 20 mA</p>	Positioner with reverse action: Input signal rises, plug stem goes down (actuator springs decompressed)
Fig. 3.2		<p>15 PSI / 20 mA</p> <p>3 PSI / 4 mA</p>	Positioner with normal action: Input signal rises, plug stem goes up (actuator springs decompressed)

4. INSTALLATION

4.1 FITTING THE POSITIONER TO PILLAR TYPE ACTUATORS (IEC 534)

1. Check Fig. 4.1 for correct orientation of positioner.

Note: The following instructions assume that the positioner is to be fitted as Fig. 1.1, 1.2, 3.1 and 3.2.

2. Place the two halves of the mounting bracket either side of the pillar and hand tighten the 4 bolts. Slide the bracket to halfway up the pillar.

3. Mount the feedback lever bracket (Fig. 4.3.3)

4.2 FITTING THE POSITIONER TO YOKE TYPE ACTUATORS (IEC 534)

1. Check Fig. 4.2 for correct orientation of positioner.

Note: The following instructions assume that the positioner is to be fitted as Fig. 1.1, 1.2, 3.1 and 3.2.

2. For yoke type actuators the positioner fits directly to the yoke via a central bolt. Using the longer of the two bolts supplied, locate the positioner and tighten.

3. Mount the feedback lever bracket (Fig.4.3.3).

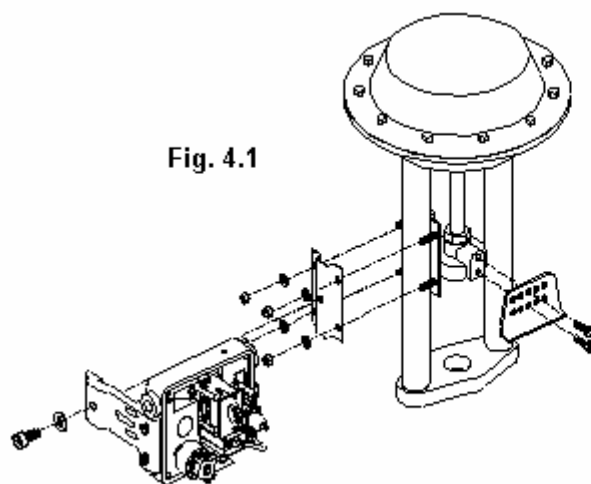


Fig. 4.1

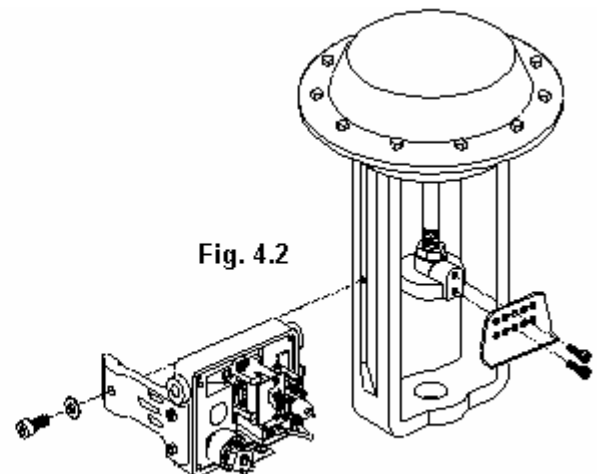


Fig. 4.2

4.3 AVAILABLE FIXING KITS

Different solution of fittings is also available to mount the positioner to any type of valve actuator. See Fig. 4.3.1, 4.3.2 and 4.3.3.

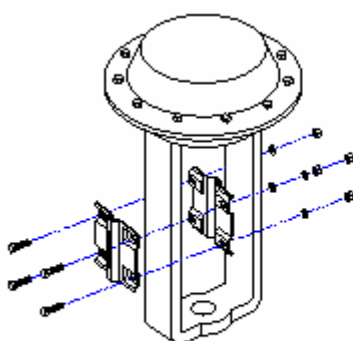


Fig. 4.3.1
Fixing kit 072-55

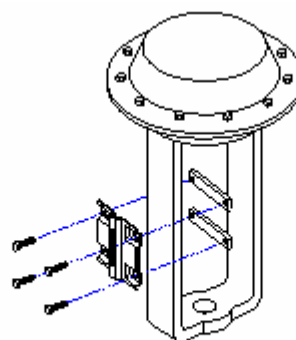


Fig. 4.3.2
Fixing kit 973SUP

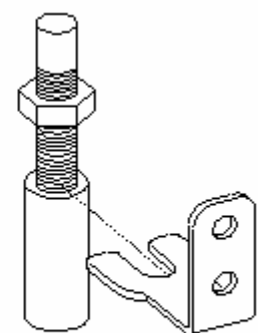


Fig. 4.3.3
Valve spindle adaptor 180-23

5. AIR AND ELECTRICAL CONNECTIONS

All pneumatic connections are easily accessible externally (see Fig. 5)

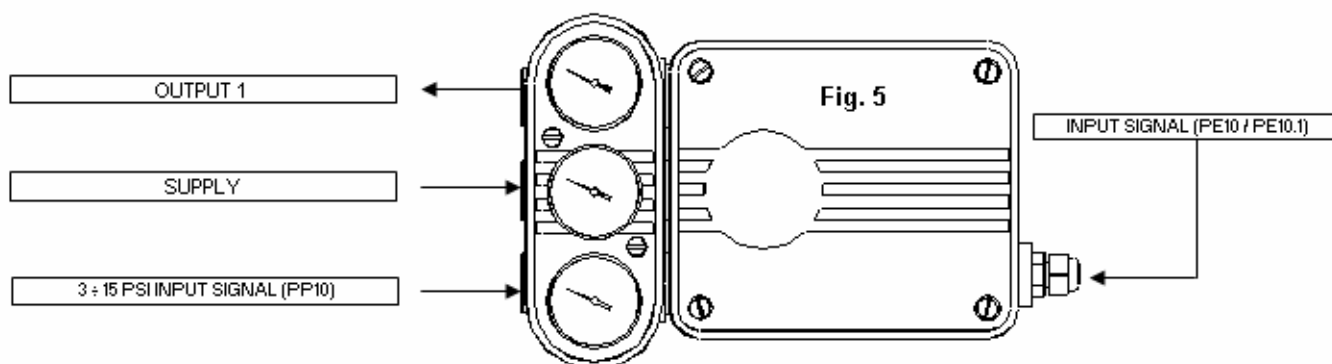
To ensure trouble free use of this positioner, the air supply should be conditioned to remove dirt and moisture. A filter regulator should be fitted upstream of the device.

Electrical connections are made by moving the lid.



CAUTION!

The positioners type PE10.1 (intrinsic safety) must be feed by electric devices certificated in conformity with EN 50.014 and EN 50.020 standards. The devices must comply the electric features mentioned on technical specification (see chapter 2).



6. COMMISSIONING

1. Check that all pneumatic and electrical connections are correct and that the positioner is mounted according to the function you require. Refer to section 3.
2. Inject a signal of 4 mA (or 3psi) and adjust the start screw as per fig. 6.1 such that the position of the valve is at the fully extended position. At this point the valve plug should just be touching its seat and any counter rotation of the start screw causes the valve to retract. Set the valve position indicator.
3. Inject a signal of 20 mA (or 15psi) and slide the feedback lever pin such that the valve is in the fully retracted position (moving the pin towards the end of the lever increases the movement see fig. 6.2). Set the valve position indicator.
4. Adjustment of the feedback pin will effect slightly the adjustment of the start screw so steps 2 and 3 will need to be repeated.
5. With a signal of 20 mA (or 15psi), check that the distance from the lower valve position indicator and the travel indicator corresponds to the travel marked on the label of the valve.
6. As a final check ensure that the valve moves to 50% open with a signal of 12 mA (or 9psi).

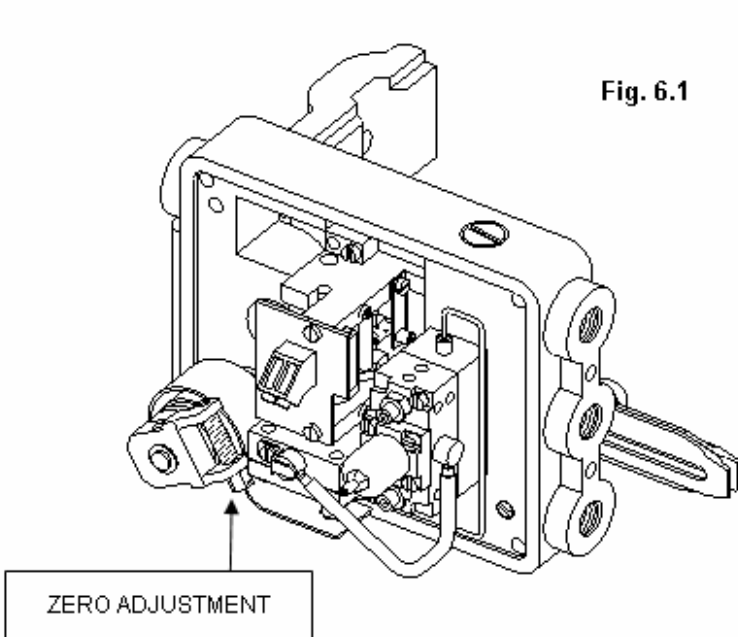


Fig. 6.1

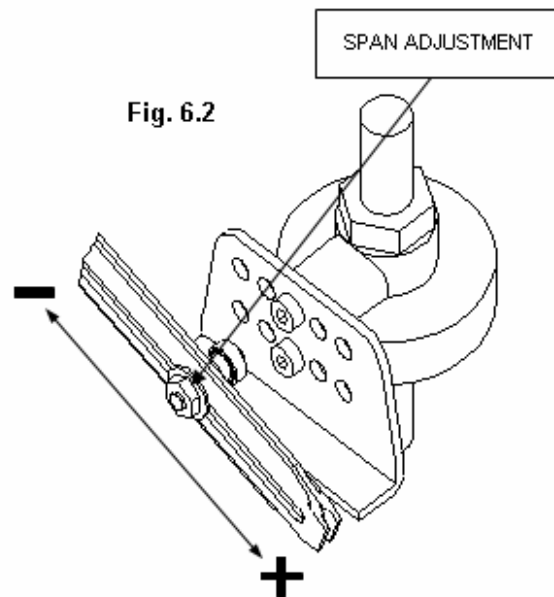


Fig. 6.2

7. VALVE SPEED ADJUSTMENT

A splitted opening / closing speed adjustment of the valve should be made on PP10 and PE10.

To control the actuator speed: operate on screws "B" (see fig. 7).

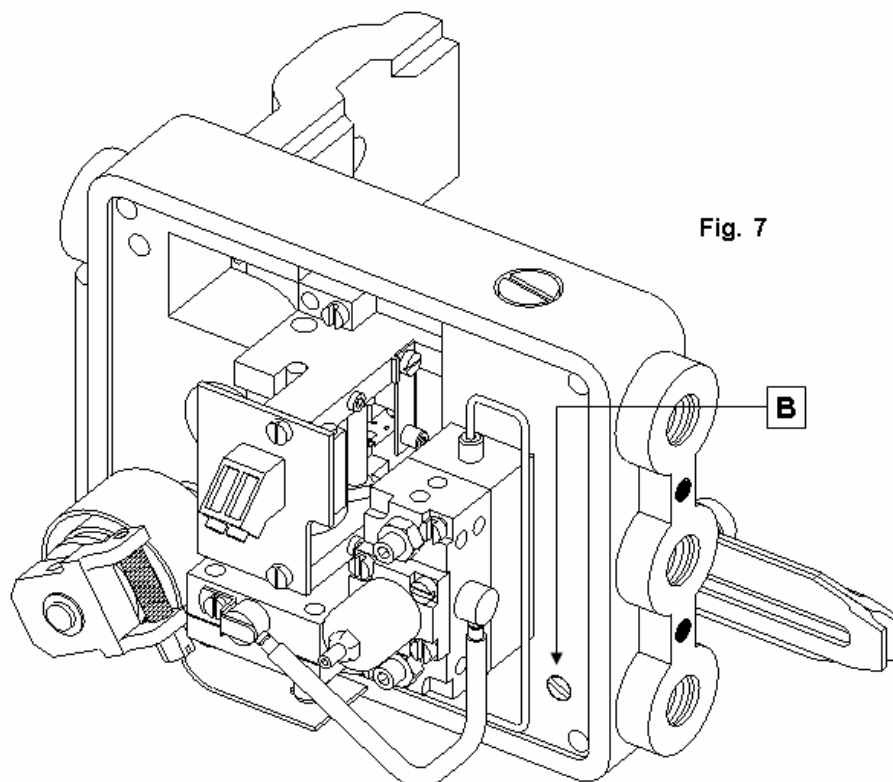


Fig. 7

8. SPLIT RANGE OPERATION

Many applications require the 100% of valve stroke with a 50% reduced input signal (3÷9 psi or 9÷15 psi for PP10; 4÷12mA or 12÷20mA for PE10 & PE10.1). In case this application is required then the stroke span must be adjusted as described on item 6.

9. ACTION REVERSAL

Positioners are provided to operate on a single acting actuator with direct action mode. To reverse the action see the description on item 3.

10. TROUBLE: SYMPTOMS, CAUSES AND ACTION TO TAKE

	<p>CAUTION! Before be over this operate, make sure that the positioner has not in pressure.</p>
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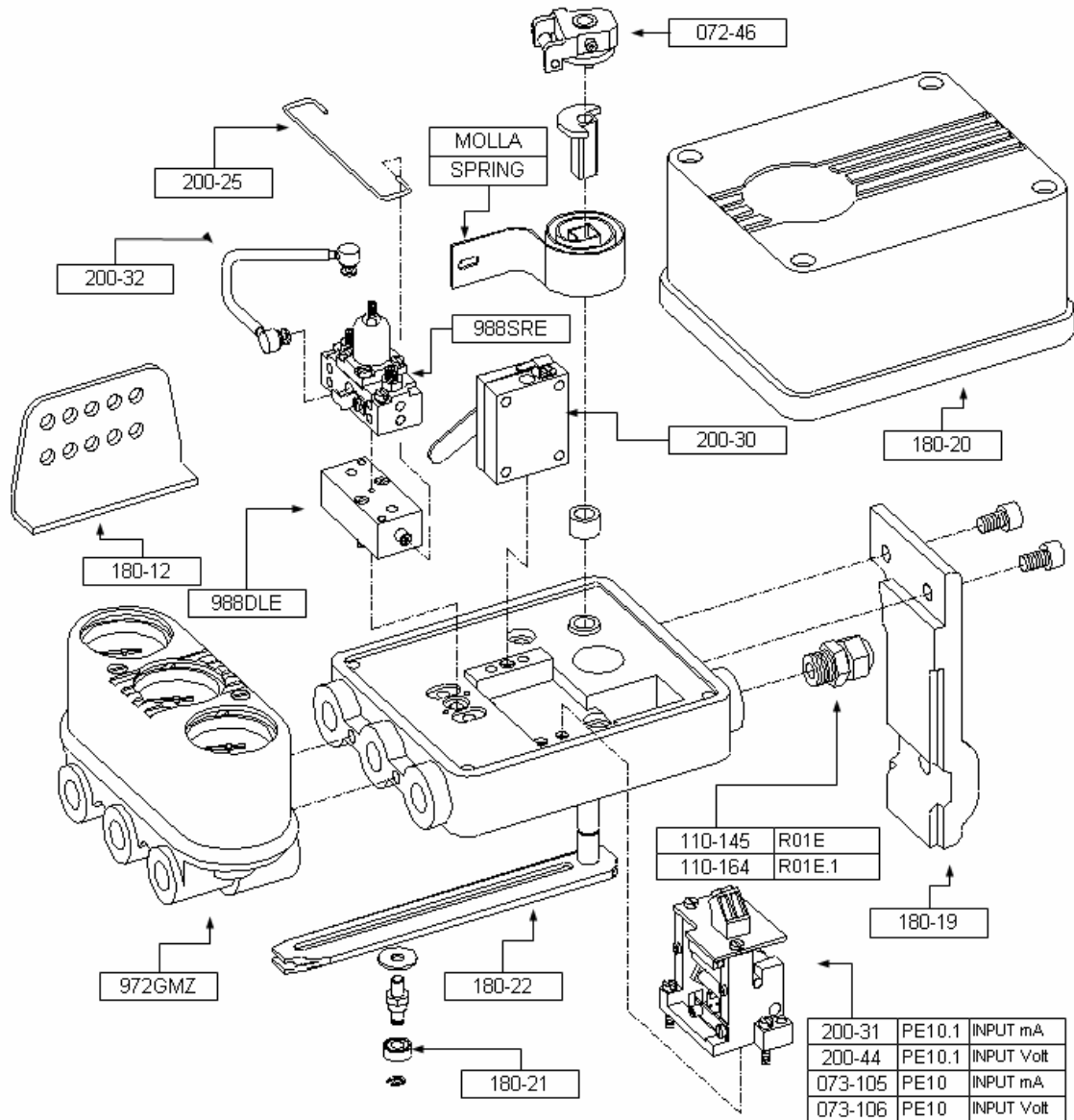
Before operating the unit, please check:

- the unit proper supply
- the pneumatic and process connections
- the good operating conditions and status of the valve.

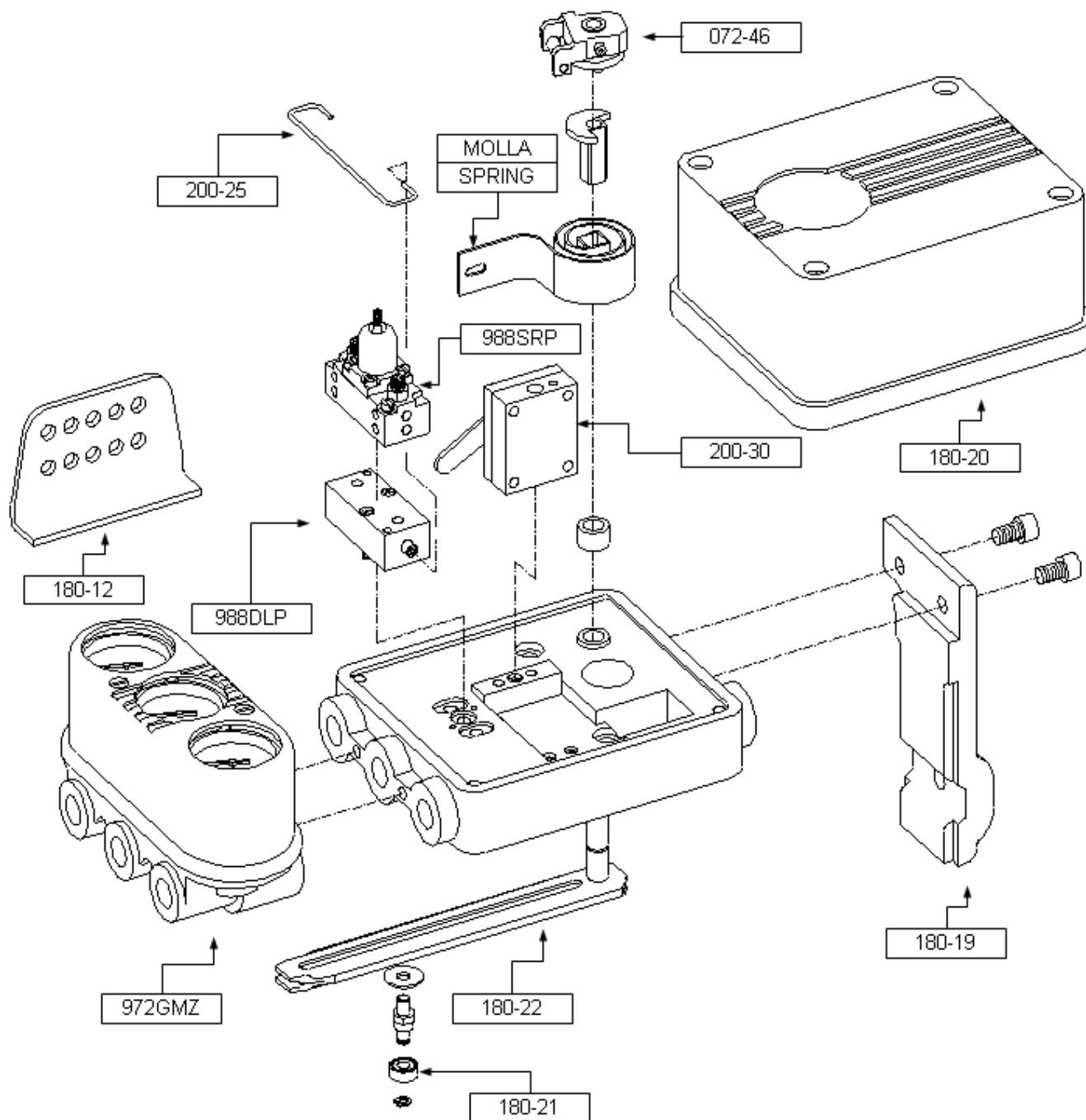
SYMPTOM	CAUSE	ACTION TO TAKE	SYMPTOM	CAUSE	ACTION TO TAKE
Actuator hunting	Opening/Closing valve speed too high	Reduce the speed. See chapter 7	Actuator motion is too high.	Opening/Closing valve speed too high	Reduce the speed. See chapter 7
Actuator motion is too slow.	Opening/Closing valve speed too low	Increase the speed. See chapter 7	Actuator span inadequate	Span adjustment is wrong	Adjust. See chapter 6
Positioner with wrong control action	Pneumatic connection between actuator and positioner has been inverted	Reverse its position See chapter 3	Actuator start point shifted	Zero adjustment missing	Adjust. See chapter 6
	Actuator and positioner coupling is not correct	Adjust. See chapter 3			
	Electric connections has been inverted (RE01 & RE01.1 only)	Adjust. See chapter 5			
	Control signal missing	Check and adjust			
	Supply air missing	Check and adjust			

11. SPARE PARTS

11.1 PE10 and PE10.1



11.2 PP10



12. SAFETY NOTES (ONLY PE10.1)

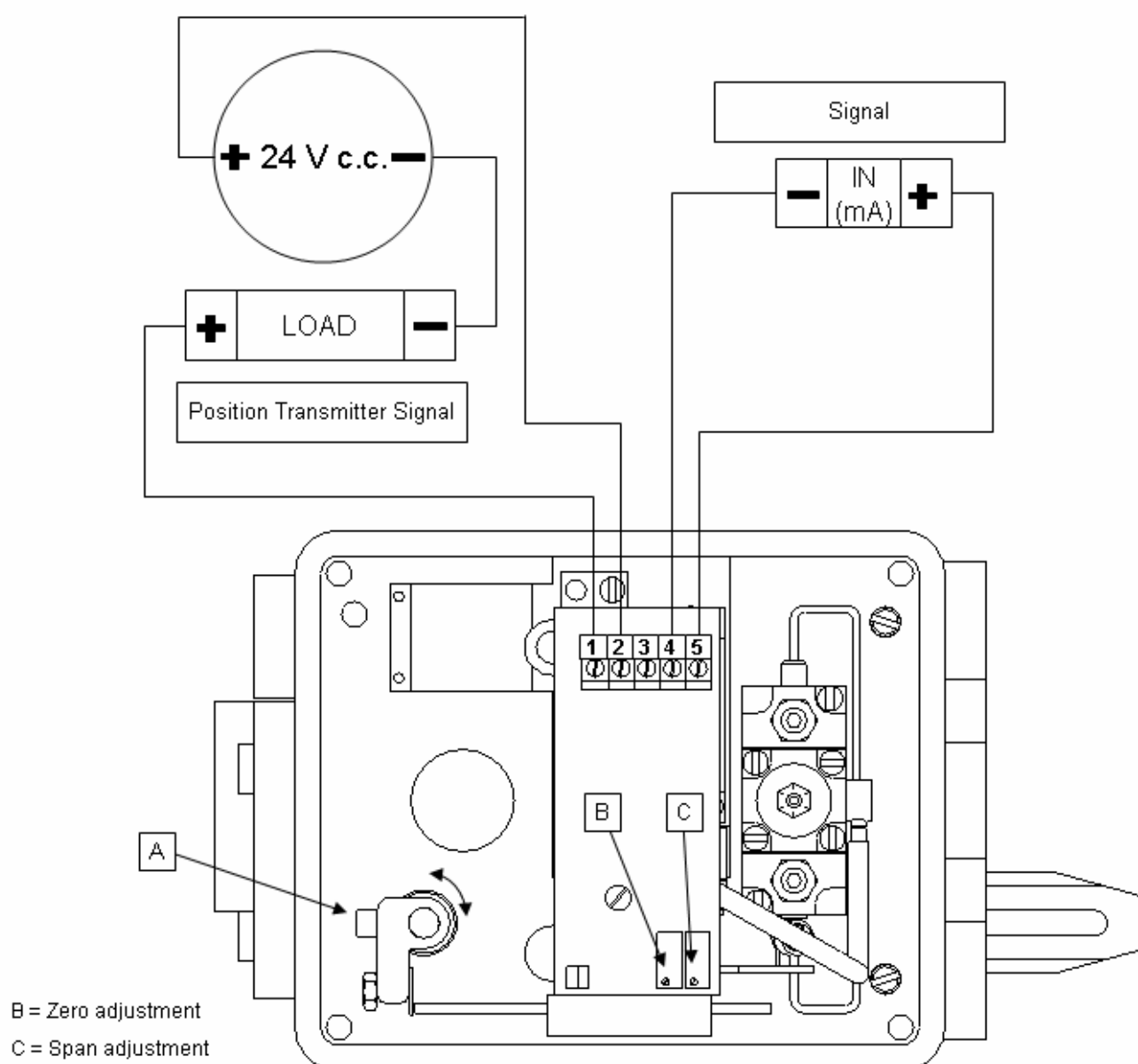
CAUTION!

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13. POSITIONER WITH POSITION TRANSMITTER

Start the position transmitter as follows:

- 1) Perform the connections as shown in Fig. 5.
- 2) Put the valve in non-working position.
- 3) Check that the position transmitter emits a 4mA signal. If the signal is superior to 4mA use the lever "A", if it is inferior to 1mA use the trimmer "C" to eliminate the difference.
- 4) Let the valve perform the stroke required.
- 5) Check that the position transmitter emits a 20mA signal. If it does not, use the trimmer "C".
- 6) When performing the procedure at par.4, a zero shift may occur. In this case, simply repeat the procedure at par.4 by only using the trimmer "B".



14. MAINTENANCE

The incoming air impurities (oil, dust, water, etc...) are the main cause of positioner failures. These impurities seep into the internal parts of equipment which get occluded consequently. The use of an air filter upstream reduces the internal sediments but it does not exclude them completely.

To avoid any failure caused by the impurities then clean periodically the nozzle as follow:

- 1) Stop the air feed
- 2) 2) Unloose the screw "A" (See the following figure)
- 3) Pull out the nozzle plate "B"
- 4) Clean the calibrated orifice with the nozzle cleaner "C" which is located on the positioner cover.

The frequency of such cleaning operation depends on the air feed quality.

