

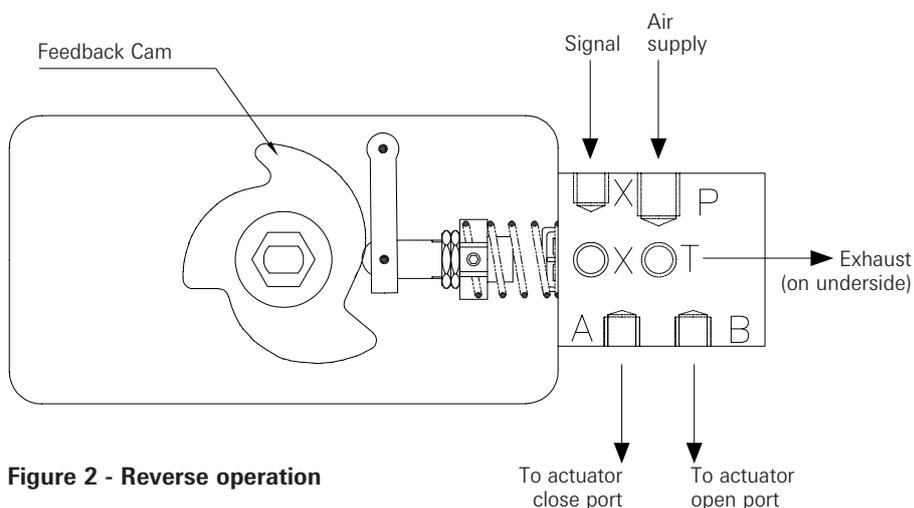
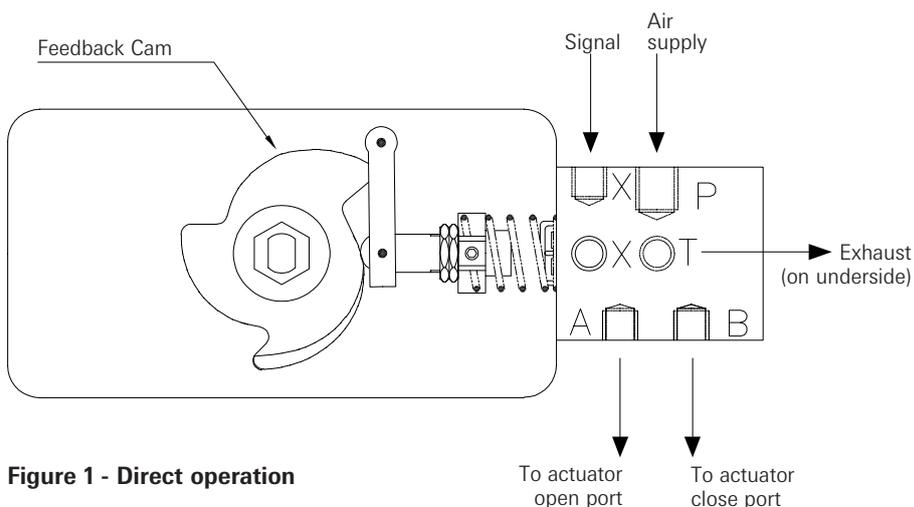
## KEYSTONE



### Operation

#### Mounting to Pentair's PremiAir and Keystone's F79U, F79E, F790 and F796 series actuators.

- For standard direct action operation (increasing signal to open actuator), ensure that the actuator is in its CLOSED (fully clockwise) position, and that the flats on top of the positioner shaft are at right angles to the longitudinal axis of the positioner.  
For reverse action (increasing signal to close actuator), ensure that the actuator is in its OPEN (fully anti-clockwise) position and that the flats on top of the positioner shaft are parallel to the longitudinal axis of the positioner.
- Fit the positioner to the top face of the actuator, using the correct mounting kit, so that the longitudinal axis of the positioner is parallel to the actuator cylinder axis.
- Ensure that the feedback cam in the positioner is correctly fitted with the correct range profile bearing against the feedback arm roller.  
(Positioners are stocked to suit 3-15 psig and direct action).  
For direct action, ensure that anti-clockwise rotation of the positioner shaft will cause the cam to compress the spring.  
For reverse operation, ensure that clockwise rotation of the positioner shaft will cause the cam to compress the spring.
- Connect the air ports as shown in Fig. 1 for direct action and in Fig. 2 for reverse action.



### Setting procedure

In most cases the positioner will be pre-set prior to leaving the factory. If readjustment is necessary, follow the following instructions.

1. With the positioner correctly mounted to the actuator and cover removed, connect the air supply and signal to the positioner.
2. Apply a signal of approximately 9 psig and gradually reduce this to 3 psig. If the actuator just reaches the CLOSED position as the signal reduces to 3 psig, no adjustment is necessary.
3. If the actuator does not close fully at 3 psig, turn the hexagon zero adjusting nut 1/6 of a turn clockwise and repeat step 2. Continue until zero is correctly achieved.
4. If the actuator reaches the CLOSED position before the signal reduces to 3 psig, turn the hexagon zero adjusting nut 1/6 of a turn anti-clockwise and repeat step 2. Continue until zero is correctly achieved.
5. Gradually increase the signal to 15 psig. If the actuator just reaches the OPEN position as the signal reaches 15 psig, then no adjustment is necessary.
6. If the actuator does not reach the OPEN position at 15 psig, this is indicative of the spring rate being too high. Loosen the grubscrew in the range adjustment collar, (see Fig. 3), hold the collar stationary using a hexagon socket wrench, and turn the spring slightly clockwise. This will move the actuator even further away from fully OPEN and the zero adjusting screw must be used to achieve fully OPEN.
7. Conversely, if the actuator reached OPEN position before 15 psig, turn the spring slightly anti-clockwise with respect to the rate adjusting collar. Again re-adjust the zero screw to achieve exact fully OPEN.

The zero and range settings are highly interactive and steps 2 to 7 must be repeated until zero and span are acceptable.

**Note:** In steps 3 to 7, clockwise and anti-clockwise rotations are as viewed from the adjusting nut end of the spring.

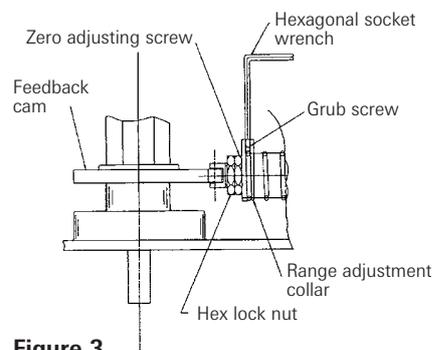


Figure 3



### Warning!

When Pressure Gauge is not required, fit hex head socketed screw from mounting kit using proprietary none hardening sealing compound or tape. If there is a requirement to remove the socket screw for future application, an applied torque of 200 lbs/inch should not be exceeded.

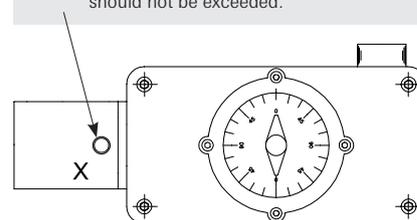


Figure 4 - Direct operation

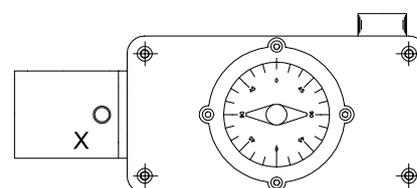


Figure 5 - Reverse operation

### Cover fitting

Ensure that the actuator is in the position corresponding to minimum signal, ie. CLOSED for direct operation (see Fig. 4) and OPEN for reverse operation (see Fig. 5).

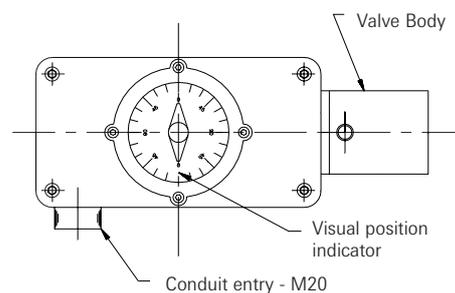
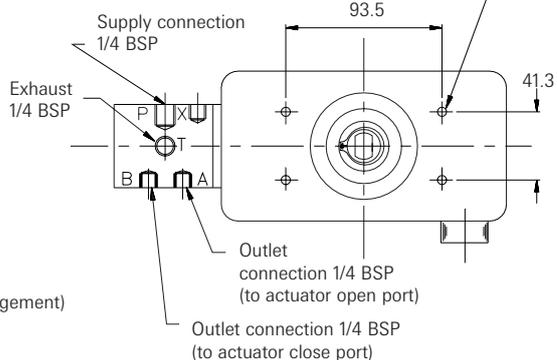
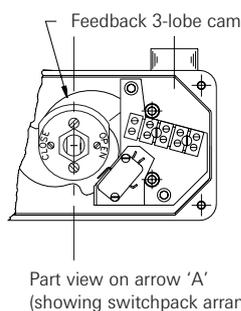
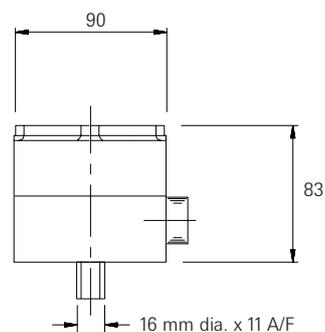
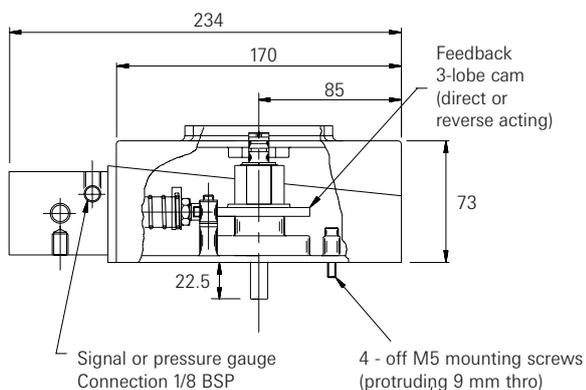
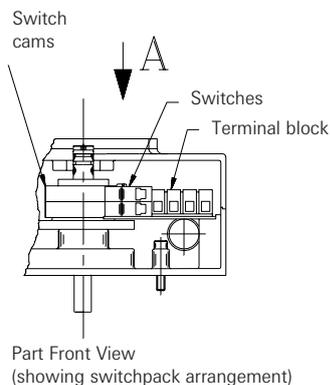
1. Remove the position indicator cover and position indicator from the main cover.
2. Fit the main cover over the shaft and secure to the body using a captive screw in each corner.
3. Fit the position indicator to the double 'D' at the top of the shaft.
4. Fit the position indicator cover to the positioner cover so that the zero degree markings are disposed along the transverse axis of the positioner. Before finally securing the position indicator cover, ensure that the cover is positioned so that the arrow indicates the exact position of the actuator.

### Technical data

<b>Input signal</b>	single range split range cam characteristics	3 - 15 psi (0.2 - 1.0 bar) standard. 3 - 9 psi (0.2 - 0.6 bar) 9 - 15 psi (0.6 - 1.0 bar). linear 3 - lobe cam: curve 1, range: 3 - 15 psi = 90° movement. curve 2, range: 3 - 9 psi or 9 - 15 psi = 65° movement. curve 3, range: 3 - 15 psi = 65° movement. other characteristics on request.
<b>Supply</b>	media supply pressure air consumption	compressed air or gas, dry, dust and oil free with 5 filter element to inlet. 30 - 100 psi (150 psi max.) 2 - 8 bar (10 bar max.). 0.6 cfm in balanced condition with 60 psi (4 bar) supply.
<b>Environmental mounting and connections</b>	environmental temperature mounting position mounting kit air connections	-5° to +160°F (-20° to +70°C). as required. No limitations. universal mounting kit for Fig.790/796 series actuators. supply and output 1/4" BSP, signal 1/8" BSP
<b>Materials of construction</b>	housing diaphragm valve spool cover	anodised aluminium alloy (stainless steel optional). nitrile rubber stainless steel anodised aluminium alloy (stainless steel optional).
<b>Weight</b>		4 lb. (1.85kg)
<b>Options</b>	gauges  integral limit switches	instrument air 0 - 30 psi (0 - 2 bar) - 1 off. supply air 0 - 150 psi (0 - 8 bar) - 2 off. single pole double throw 10A 240V AC inductive proximity sensors type NT2-V3-N.

# Rotary pneumatic positioner F793

## Installation and Maintenance Instructions



Designation of connections: A & B = Working Lines    P - Compressed Air Connection    T - Exhaust Point    X - Control Line

### Switch details

#### Micro-switch details

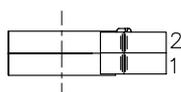
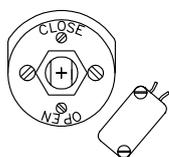
Standard V9 type, single pole double throw (SPDT).

Switch ratings as table below:

Voltage (volts)	Resistive load (Amps)	Tungsten lamp load (Amps)		Inductive load (Amps)
		NC	NO	
<b>AC</b>				
125	10	2	1	10
250	10	1.5	1	10
<b>DC</b>				
Up to 15	15	3	1.5	15
30	10	3	1.5	10
50	3	0.8	0.8	2.5
75	1	0.6	0.6	0.5
125	0.5	0.5	0.5	0.07
250	0.25	0.25	0.25	0.03

#### Proximity switch details

Type	Pepperl & Fuchs NJ2-V3-N or as specified
Quantity	2 switches per unit
Sensing distance	2 mm maximum (metal face). NB. Separate amplifier required
Supply	8 V DC (Ri approx. 1kOhm)
Temperature range	-25°C to +70°C
Repetition	<0.01 mm
Hysteresis	=0.05 mm Typ 3%
Output	Sensor absent - 3mA or above Sensor present - 1mA or below Switching rate - 1kHz maximum.

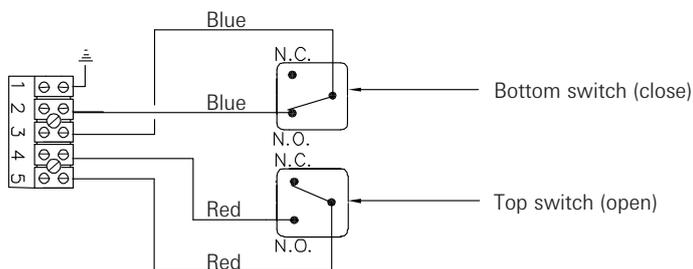


#### Switch identification

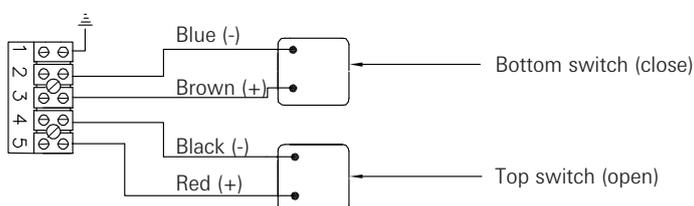
Switch number	Switch function
1	close limit
2	open limit

### Wiring diagrams

#### Wiring diagram for Rotary Pneumatic Positioner with 2 micro-switches



#### Wiring diagram for Rotary Pneumatic Positioner with 2 Proximity switches



### Cam setting procedure

1. Release both clamping screws by turning each screw approximately 1,5 turns anti-clockwise.
2. Operate positioner/actuator to CLOSE position.
3. Adjust "CLOSE" adjusting screw by turning clockwise until lower cam just triggers the lower switch.
4. Operate positioner to OPEN position.
5. Adjust "OPEN" adjusting screw by turning anti-clockwise until upper cam just triggers the upper switch.
6. Tighten both clamping screws to lock the cams in the set position.
7. Operate the positioner/actuator OPEN and CLOSED to check the cam operation and re-adjust if necessary.

### Retrofit procedure

1. Remove positioner cover.
2. Remove circlip from top of camshaft.
3. Remove spacer from camshaft.
4. Fit cam assembly onto hexagon camshaft with adjusting and clamping screws towards the outboard end.  
**Note:** The assembly has been made with a tight fit onto the hexagon shaft in order to eliminate any backlash. It may be necessary to drive the assembly over the shaft. To do this, use the original spacer as a drift and drive the assembly over the shaft using a light hammer.
5. Fit the microswitch/terminal plate as shown, using the two M5 hexagon socket cap screws.
6. Set the cams in accordance with the procedure.
7. Re-fit the cover.

### Sectional plan view

