

CHAPTER 30

Pressure Sensing Devices

DESCRIPTION

The NUTECH Model 40PSR is a three-way adjustable block and bleed pneumatic relay. It is normally used as a high or low-pressure sensing relay that blocks and bleeds the control signal upon abnormal pressure conditions. The PSR relay utilizes the time-tested method of balancing pressure on a piston with an opposing spring force. The relay can be bench set or field set at a desired pressure setting by adjusting the cap by hand.

The sensed pressure acts on the piston, which moves the spool accordingly. When the sensed pressure exceeds the setting, the relay blocks the supply pressure and bleeds the downstream control pressure to the vent port.

FEATURES

Senses pressure ranges from 0.5 psig to 10,000 psig.

Combinations of springs and base pistons deliver optimum performance over a variety of pressure ranges.

Springs can be removed or replaced, without disconnecting sense line or control lines.

The relay can be panel-mounted or locally mounted.

Routine maintenance procedures can be performed without removing the device from its mounting in most applications.

A stainless steel adapter shim is available to retrofit the sensor into existing panel holes larger than 1.50".



Model 40PSR Pressure Sensing Relay (High or Low)

SPECIFICATIONS

| | |
|---------------------------------|---|
| Senses pressure range | 0.5 - 10,000 psig |
| Control Pressure | 125 psig max |
| Repeatability | 1% of range |
| Deadband | |
| 3" base | 3% of range |
| 7/16" and 1-1/8" base | 5% of range |
| 3/16" base | 10% of range |
| Material | 316 SS per ASTM A-276 |
| O-ring | Viton®, Temp. range: -15°F to + 400°F (std.) BUNA-N, Temp. range: -65°F to + 215°F (opt.) HNBR, Temp. range: -40°F to +325°F (opt.) |
| Diaphragm | BUNA-N, Temp. range -65°F to + 215°F (std.) Viton®, Temp. range -15°F to + 400°F (opt.) |
| Adjustment cap | Delrin®(std.); Stainless Steel (opt.) |
| Length (max.) | 10.75" |
| Length (min.) | 9.43" |
| Diameter | 1.75" |
| Control Connections | 1/4" FNPT |
| Sensing Connection | 1/2" MNPT; 1/4" FNPT |
| Weight | 4.1 lb. |
| Weight (diaphragm model) | 6.75 lb. |

Model 40PSR Pressure Sensing Relay (High or Low)

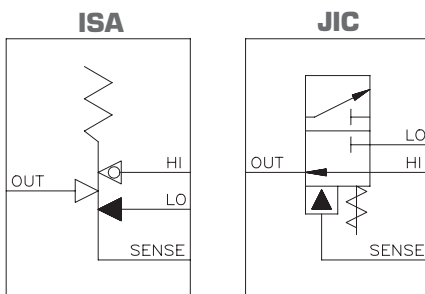
ORDERING INFORMATION

| Item | Qty. | Description | Part/Assy # |
|------|------|--|-------------|
| 1 | 1 | Body | N4087 |
| 2 | 1 | Spool | N4088 |
| 3 | 1 | Spring Housing | N4091 |
| 4 | 1 | Spring/Spring Retainer SubAssy (See Range Chart) | — |
| 5 | 1 | Base Piston Sub-Assembly (See Range Chart) | — |
| 6 | 3 | O-ring | 008 |
| 7 | 1 | Delrin® Cap (Note 1) | N4092 |
| 8 | 1 | Washer | FW002 |
| 9 | 1 | Lock Ring, Stainless Steel | N40901 |
| 10 | 1 | Lock Ring, Delrin® | N40902 |
| | | Repair Kit (Note 2) (For Pilot Piston and 0.187", 0.437" & 1.125" Base Assemblies) | N4000 |
| | | Repair Kit (Note 3) (For Pilot Piston and 3" Base Assembly) | N4300 |

NOTES:

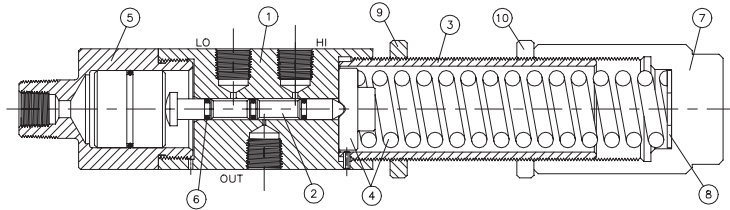
1. Cap is also available in Stainless Steel.
2. Standard O-ring material is Viton®. BUNA-N Is available as an option.
3. Standard diaphragm material is BUNA-N. Viton® Is available as an option.

Shelf Position

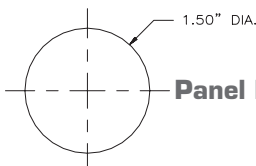
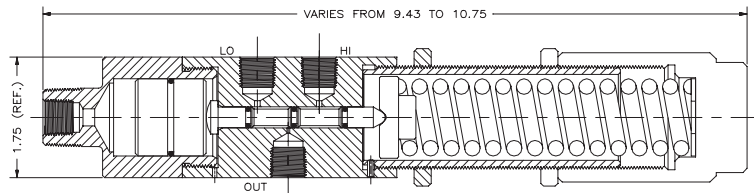


Schematic Representations

Shelf Position Scale – None



In-Service Position Scale – None



Panel Mounting Requirements

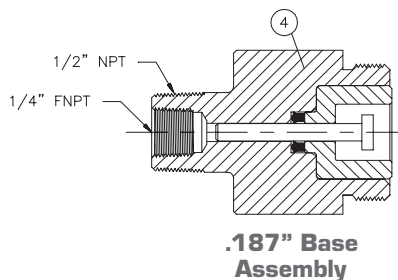
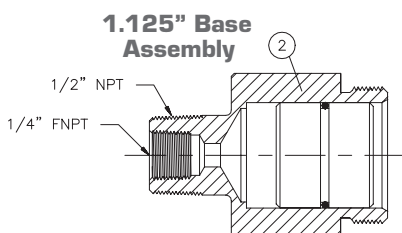
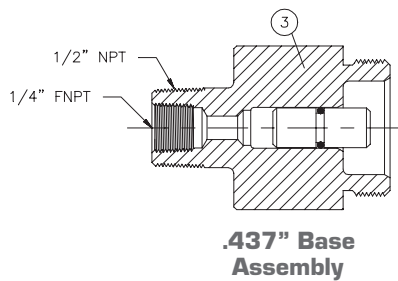
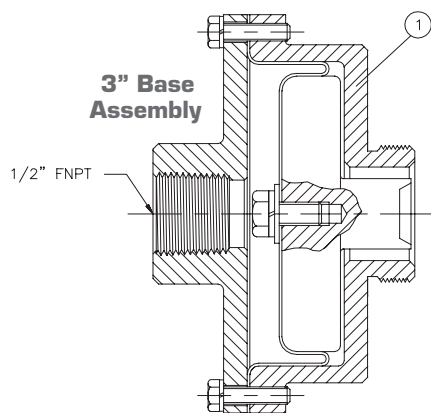
Model 40PSR Pressure Sensing Relay (High or Low)

ORDERING INFORMATION

| Item | Qty. | Description | Part/Assy # |
|------|------|----------------------|-------------|
| 1 | 1 | 3" Base Assembly | N4076 |
| 2 | 1 | 1.125" Base Assembly | N4095 |
| 3 | 1 | 0.437" Base Assembly | N4096 |
| 4 | 1 | 0.187" Base Assembly | N4097 |

RANGE CHART

| Assy P/N | Range (PSI) | Piston | Spring |
|----------|--------------|--------|--------|
| 40PSR1 | 0.5-7 | 3" | White |
| 40PSR2 | 5-20 | 3" | Blue |
| 40PSR3 | 10-40 | 3" | Red |
| 40PSR4 | 30-150 | 1.125" | Blue |
| 40PSR5 | 90-300 | 1.125" | Red |
| 40PSR6 | 200-1,000 | 0.437" | Blue |
| 40PSR7 | 600-2,000 | 0.437" | Red |
| 40PSR8 | 1,200-5,000 | 0.187" | Blue |
| 40PSR9 | 4,000-10,000 | 0.187" | Red |



DESCRIPTION

The NUTECH Model 4065 PMA is two (2) model 40PSR pressure-sensing relays assembled on a manifold with a model 30C1 three-way manual reset relay. The pressure sensors are configured for a high/low pressure sensing application at a single process point. The manual reset relay allows for a local control device that applies the required supply pressure to operate a shutdown valve (SDV). Manual reset requires an operator to physically re-open the system after an abnormal pressure condition has occurred.

FEATURES

Pressure sensing relay

Sense pressure ranges from 30 psig to 10,000 psig.

Combination of springs and pistons deliver optimum performance over a variety of pressure ranges.

Springs can be removed or replaced without disconnecting sense line or control lines.

Routine maintenance procedures can be performed without removing the device from the manifold in most applications.

Three-way relay

Relay design provides center crossover closed condition during spool travel.

Routine maintenance procedures can be performed without removing the device from the mounting in most applications.

Can be upgraded to a 30C1P1 relay with pin latch, or a 30C1W1 relay with pin latch and pilot port indication. Refer to upgrade kit data sheets 30CIPIUK and 30CIWIUK.

DESCRIPTION

The NUTECH model 4065 PMAP is two (2) model 40PSR pressure-sensing relays assembled on a manifold with a model 30C1P1 three-way manual reset relay with pin latch. The pressure sensors are configured for a high/low pressure sensing application at a single process point. The manual reset relay allows for a local control device that applies the required supply pressure to operate an end device, with manual reset and pin latch option. This assembly is suited for applications where pressure sensors and three-way block and bleed of a control signal, such as control of a shutdown valve is required, with lock out capability.

FEATURES

Pressure sensing relay

Sense pressure ranges from 30 psig to 10,000 psig.

Combination of springs and pistons deliver optimum performance over a variety of pressure ranges.

Springs can be removed or replaced without disconnecting sense line or control lines.

Routine maintenance procedures can be performed without removing the device from the manifold in most applications.

Three-way relay

The pin latch provides lock-out capability with automatic unlatching when pilot port pressure is present.

Relay design provides center crossover closed condition during spool travel.

Routine maintenance procedures can be performed without removing the device from the mounting in most applications.

SPECIFICATIONS

| | |
|--------------------------------------|--|
| Operating Pressure Range | 30-10,000 psig (customer specified) |
| Material | 316 SS per ASTM A-276 |
| O-ring | Viton [®] , Temp. range: -15°F to + 400°F (std.) BUNA-N, Temp. range: -65°F to + 215°F (opt.) HNBR, Temp. range: -40°F to +325°F (opt.) |
| Knob (30C1/30C1P1) | Delrin [®] (std.) Stainless Steel (opt.) |
| Adjustment cap (40PSR) | Delrin [®] (std.) Stainless Steel (opt.) |
| Height | 12.0" |
| Width | 10.5" |
| Depth | 6.0" |
| Connections (pilot and relay) | 1/4" FNPT |
| Connections (manifold) | 1/2" FNPT |
| Weight | 17 lbs. |



Model 4065PMA 40PSR High/Low Pilot Manifold Assembly