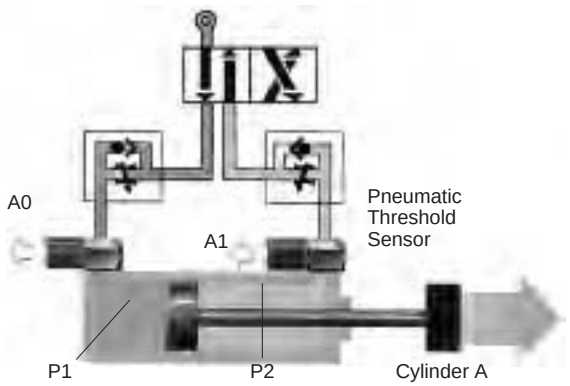
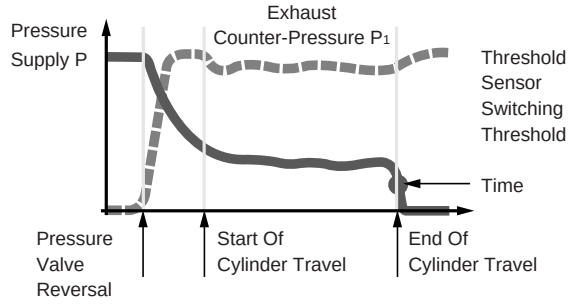
## General Description

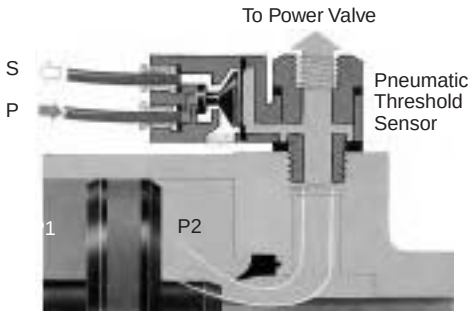
### Threshold Sensors – PWS

The plug-in threshold sensors provide feedback information on pneumatic cylinder status in one of three possible outputs . . . pneumatic, electric, or electronic. Mounted into the cylinder port, these devices monitor the back pressure of the cylinder's exhaust. When the cylinder's piston stops, the back pressure rapidly drops and the threshold sensor provides the desired output. Ideal for variable stroke applications such as robotics where other sensor type devices such as limit switches are impractical, these devices provide a signal whenever the cylinder stops motion.

The threshold sensor consists of two complementary sub assemblies (1) the banjo fitting and (2) the plug-in sensor element. In all cases, the sensor is easily plugged into the banjo fitting and locked in place with a spring clip. The banjo fitting is designed to accept (piggy backed) other functional fittings such as flow controls or blocking valves. Simply select the sensor based on the type feedback signal that best fits the application.




## PWS General Characteristics

| | |
|---|---|
| **Operating Pressure** | 0 to 150 PSI |
| **Permissible Fluids** | Air or neutral gas, 50 µm filtration, lubricated or not |
| **Operating Temperature** | 5° to 140°F (-15° to 60°C) |
| **Storage Temperature** | -40° to 160°F (-40° to 70°C) |
| **Flow** | N/A |
| **Mechanical Life** | 10 Million |
| **Maximum Operating Frequency** | 10Hz |
| **Material:** Body | Thermoplastic |
| Mounting Screw | Brass |
| **Maximum Mounting Torque:** 10-32 UNF and M5 | 88 inch pounds |
| 1/8" | 70 inch pounds |
| 1/4" | 105 inch pounds |
| 3/8" | 265 inch pounds |
| 1/2" | 310 inch pounds |
| **Adjustment** | N/A |
| **Adjustment Locking** | N/A |

## Piloting and De-Piloting Pressure

| Threshold Sensors | Pilot with Operating Pressure of 90 PSI | Depilot with Operating Pressure of 90 PSI |
|---|---|---|
| PWSP111 | 64 PSI | 6 PSI |
| PWSM1012 | 15 PSI | 9 PSI |
| PWSE101 and PWSE111 | 10 PSI | 7 PSI |

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# Threshold Sensors

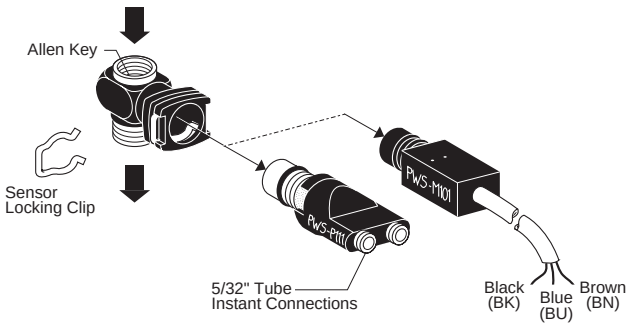

## Model Selection

| Banjo Sockets (with Sensor Clip) | | |
|---|---|---|
| **Port Size** | **Model Number** | **Wrench** |
| 10-32 | **PWSB1557** | 5/16" Hex |
| 1/8" | **PWSB1887** | 3/16" Allen |
| 1/4" | **PWSB1997** | 5/16" Allen |
| 3/8" | **PWSB1337** | 3/8" Allen |
| 1/2" | **PWSB1227** | 1/2" Allen |

| Plug-in Sensors | | |
|---|---|---|
| **Output** | **Model Number** | **Connection** |
| Pneumatic | **PWSP111** | 5/32" push-in |
| Electrical | **PWSM1012** | 3-wire cable (6 ft) |

## Application

The threshold sensor provides electrical or pneumatic feedback information on pneumatic (air) cylinder status. These devices monitor the back pressure of the cylinder's exhausting chamber. When the cylinder stops, the back pressure drops and the threshold sensor provides the desired output. Ideal for variable stroke applications. The banjo fitting and the feedback element are two separate subassemblies, giving the user flexibility between electrical and pneumatic outputs as feedback.

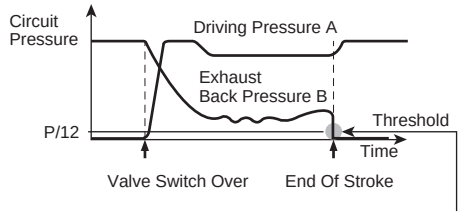



## Mounting

Banjo fittings in 10-32 to 1/2" pipe sizes are designed to be installed directly into actuator ports (up to 5" bore cylinders). The banjo fitting can accommodate other functional fittings and components such as right angle flow control valves or blocking valves. Banjo fittings screw into actuators using an Allen wrench or 5/16" hex head wrench for 10-32 size. Electrical or pneumatic feedback element snaps into place using a locking clip.

## Operation

Pneumatic sensors have a continuous pressure signal applied to the sensor device. Electrical sensors have a continuous electrical signal applied to the sensor device. The threshold sensor assembly mounted directly into the cylinder Port provides an output signal S, which can be pneumatic or electrical, when the falling back pressure in the exhausting chamber of the cylinder reaches the operating threshold (approximately 6-9 PSIG). (The device is a normally passing device. The output is only on when there is nearly zero pressure at the cylinder.)

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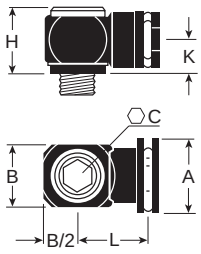
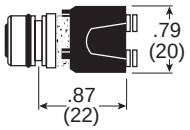
Pneumatic Division
Richland, Michigan
www.wattsfluidair.com

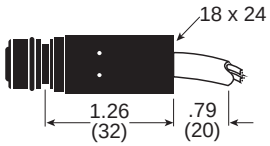
## Dimensions




**Banjo Socket**




**PWSP111**




**PWSM1012**

| Model | A | B | C | H | K | L |
|---|---|---|---|---|---|---|
| PWSB1557 | .98 (25) | .43 (11) | 5/16" Hex | .79 (20) | .40 (10) | .67 (17) |
| PWSB1887 | .98" (25) | .63 (16) | 3/16" Allen | .71 (18) | .40 (10) | .79 (20) |
| PWSB1997 | .98 (25) | .83 (21) | 5/16" Allen | .71 (18) | .40 (10) | .87 (22) |
| PWSB1337 | .98 (25) | 1.10 (28) | 3/8" Allen | .79 (20) | .47 (12) | .98 (25) |
| PWSB1227 | .98 (25) | 1.30 (33) | 1/2" Allen | .93 (24) | .55 (14) | 1.02 (26) |

inches
(mm)

## Specifications

**Operating Pressure** ..... 0 to 150 PSIG (0 to 10 bar)

**Temperature Range** .....5°F to 140°F (-15°C to 60°C)

⚠ ***CAUTION:*** **If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.**

**Maximum Operating Frequency** ..... 10 Hz

**Pilot Pressure (PWSP111)** ..... >64 PSIG (4.4 bar)

**Threshold Pressure** ..... 6 to 9 PSIG (.4 to .6 bar)

**Output Flow Rate (PWSP111)** .....3 SCFM at 90 PSIG

**Current Rating (PWSM1012) –**
5 VA, 250 VAC
5W, 48 VAC

**Materials –**
Body.....Thermoplastic
Mounting Screw & Threads.....Brass

**Life Expectancy –**
10 million cycles with dry air at 90 PSIG, 68°F, and 1 Hz operating frequency

**Voltage Range (PWSM1012) –**
12 - 240 VAC
12 - 48 VDC

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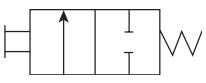
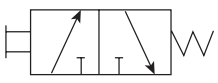
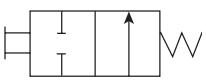
| Universal Description | Electrical | | Fluid Power | | |
|---|---|---|---|---|---|
| | Function | Symbol | Function | Symbol | |
| Normally Non-Passing (NNP) | Normally Open (N.O.) |  | Normally Closed (N.C.) | 2-Way  | 3-Way  |
| Normally Passing (NP) | Normally Closed (N.C.) |  | Normally Open (N.O.) |  |  |