User’s Guide

PSW-141 Series

Low Differential Pressure Switch

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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.
INSTALLATION OF PSW-141 PRESSURE SWITCH

NOTE: Each switch is calibrated in the vertical position. It is recommended the switch be mounted in the vertical position, as viewed in Figure 1. Any adjustments to the setpoint or deadband should be performed with the instrument in the mounted position.

The PSW-141 differential pressure switch is suitable for clean air or inert gas applications. If dust is present, a small in-line filter is recommended to insure long, trouble-free operation. The normal operating temperature range is from 0°C to 45°C (32°F to 115°F), and the normal humidity range from 10% to 90% R.H.

Air connections are by means of 3/16” (4.75mm) barbed fittings suitable for 1/4” O.D. polyethylene tubing (6mm), 1/8” I.D. Tygon or polyurethane tubing (3-4mm). The two mounting holes are 0.19” (4.8mm) in diameter and are suitable for #8 or #10 mounting screws.

Electrical connections are by means of 3/8” terminal strips with #6 screws.

Spacing between mounting holes: 4.75 inches (121 mm).

Care should be taken not to exceed the maximum overpressure.

<table>
<thead>
<tr>
<th>Maximum Safe Momentary Overpressure Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
</tr>
<tr>
<td>English</td>
</tr>
<tr>
<td>0.1” to 1.0” H₂O</td>
</tr>
<tr>
<td>2.0” to 10.0” H₂O</td>
</tr>
<tr>
<td>11” H₂O to 5 PSID</td>
</tr>
<tr>
<td>6 PSID to 15 PSID</td>
</tr>
<tr>
<td>16 PSID to 30 PSID</td>
</tr>
</tbody>
</table>

Power consumption is .35 W for the DC powered units, 1.70 W for the 24 Vac and 1.90 W for the 120 Vac.

The power supply leads are connected to the two leftmost terminals (terminals 1 and 2) on the terminal strip. The relay terminals are accessed across terminals 3, 4, and 5, refer to Figure 1.

The pressure switch comes with Setpoint and Deadband Adjustments. These are adjusted at the factory to activate on either falling or rising pressure. The factory is set to activate at the maximum pressure. The deadband is set to 5% of the maximum pressure.

SETPOINT/DEADBAND ADJUSTMENT PROCEDURE

The setpoint and deadband are field adjustable so long as an accurate pressure source is available and a qualified technician performs the adjustments. The low pressure switches are extremely sensitive to sudden pressure changes.

To gain access to the Setpoint or Deadband potentiometers remove the black hole plugs above the Setpoint and Deadband labels, located on the top left of the instrument. To access either potentiometer use a slotted 3/32” screw driver.

Connect the switch to its appropriate power supply.

Connect an ohmmeter to the relay contacts “common” and “normally closed” or “normally open”. If a switch was ordered with a relay activated on “Rising Pressure” and the ohmmeter terminals are connected to the “normally closed” and “common” of the relay, with no pressure applied, the ohmmeter should read 0 or closed, refer to Table 2.

Deadband Adjustment

To set the deadband to zero, turn the Deadband potentiometer fully counter-clockwise. Zero deadband will cause the relay to chatter. It is recommended that some amount of deadband be used. Turning the deadband potentiometer clockwise increases the deadband.

Table 2

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Rising Pressure</th>
<th>Falling Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>Closed (0)</td>
<td>Open (OL)</td>
</tr>
<tr>
<td>Full</td>
<td>Open (OL)</td>
<td>Closed (0)</td>
</tr>
</tbody>
</table>

Setpoint Adjustment

Apply full pressure, (or the pressure at which the setpoint is to activate). Rotate the 20 turn Setpoint potentiometer, until the ohmmeter changes state. Turn clockwise to increase the setpoint and counter-clockwise to decrease the setpoint.

Slowly decrease the pressure until the relay deactivates. The difference between the pressure at which the relay deactivates and the pressure at which the relay activates is the deadband. If more deadband is required, turn the deadband potentiometer and repeat the previous steps. Adjustment of the deadband will have a slight effect on the setpoint, therefore it will be necessary to repeat these steps several times.

RELAY SPECIFICATIONS

The output of the SPDT (1 Form C) relay contact is rated at:

- 5A @ 30 VDC/120 VAC Resistive
- 4A @ 240 VAC Resistive

Gold-plated relay contacts.

Electrical life expectancy: 100 x 10⁴ ops. minimum @ 5A
Isolation between coil and contacts: 2000 VAC 1 minute
Maximum switched power: 600 VA (AC) or 120 W (DC)

Operate Time: 8 ms, max (Excluding Bounce)
Release Time: 4 ms, max (Excluding Bounce)
WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA’s Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA’s customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA’s WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA’s control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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**RETURN REQUESTS / INQUIRIES**

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. **BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS).** The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available **BEFORE** contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available **BEFORE** contacting OMEGA:
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA’s policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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