# User's Guide


omega.com™
OMEGA®

***www.omega.com***
***e-mail: info@omega.com***

# PSW-141 Series
# Low Differential Pressure Switch

omega.com™
OMEGA®

| OMEGAnet® On-Line Service<br>www.omega.com | Internet e-mail<br>info@omega.com |
|---|---|

## Servicing North America:

**USA:**
ISO 9001 Certified
One Omega Drive, P.O. Box 4047
Stamford CT 06907-0047
TEL: (203) 359-1660 FAX: (203) 359-7700
e-mail: info@omega.com

**Canada:**
976 Bergar
Laval (Quebec) H7L 5A1
TEL: (514) 856-6928 FAX: (514) 856-6886
e-mail: info@omega.ca

## For immediate technical or application assistance:

**USA and Canada:** Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®
Customer Service: 1-800-622-2378 / 1-800-622-BEST®
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®
TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

**Mexico:**
Tel: (001) 800-826-6342 FAX: (001) 203-359-7807
En Español: (001) 203-359-7803 e-mail: espanol@omega.com
info@omega.com.mx

## Servicing Europe:

**Benelux:**
Postbus 8034, 1180 LA Amstelveen, The Netherlands
TEL: +31 (0)20 6418405 FAX: +31 (0)20 6434643
Toll Free in Benelux: 0800 0993344
e-mail: nl@omega.com

**Czech Republic:**
Rudé armády 1868, 733 01 Karviná
TEL: +420 (0)69 6311899 FAX: +420 (0)69 6311114
Toll Free in Czech Rep.: 0800-1-66342 e-mail: czech@omega.com

**France:**
9, rue Denis Papin, 78190 Trappes
TEL: +33 (0)130 621400 FAX: +33 (0)130 699120
Toll Free in France: 0800-4-06342
e-mail: france@omega.com

**Germany/Austria:**
Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
TEL: +49 (0)7056 3017 FAX: +49 (0)7056 8540
Toll Free in Germany: 0800 TC-OMEGA℠
e-mail: germany@omega.com

**United Kingdom:**
ISO 9002 Certified
One Omega Drive, River Bend Technology Centre
Northbank, Irlam, Manchester
M44 5EX, United Kingdom
TEL: +44 (0)161 777 6611 FAX: +44 (0)161 777 6622
Toll Free in the United Kingdom: 0800 488 488
e-mail: sales@omega.co.uk

## 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.

| Maximum Safe Momentary Overpressure Table | | | |
|---|---|---|---|
| **Range** | **Overpressure** | | |
| English | Metric | English | Metric |
| 0.1" to 1.0" $H_2O$ | 25 to 250 Pa | 8" $H_2O$ | 2 kPa |
| 2.0" to 10.0" $H_2O$ | 0.5 to 2.5 kPa | 5 PSID | 35 kPa |
| 11" $H_2O$ to 5 PSID | 2.7 to 35 kPa | 20 PSID | 140 kPa |
| 6 PSID to 15 PSID | 40 to 100 kPa | 30 PSID | 200 kPa |
| 16 PSID to 30 PSID | 110 to 200 kPa | 60 PSID | 420 kPa |

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 setpoint is factory set to activate at the maximum pressure. The deadband is set to 5% of the maximum pressure.

### SETPOINT/DEADBAND ADJUSTMENT PROCEDURE

The set point 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.

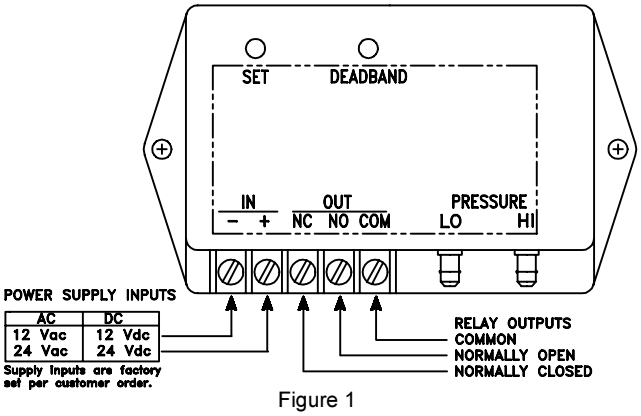



Figure 1

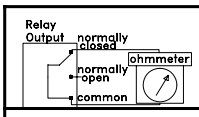
|   | **Ohmmeter Output: Relay Common and Normally Closed** | |
|---|---|---|
| Pressure | Rising Pressure | Falling Pressure |
| No Applied Pressure | Closed (0) | Open (OL) |
| Full Pressure | Open (OL) | Closed (0) |

Table 2

**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 set point and counter-clockwise to decrease the set point

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 set point, 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 Resisitive
4A @ 240 VAC Resistive
Gold-plated relay contacts.
Electrical life expectancy: 100 x $10^3$ 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)

MADE IN USA

## 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.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

## 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.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

# Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

## TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

## PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

## FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

## pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

## DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

## HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

## ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments