



# WPR2 SERIES

Installation & Operation Instructions

Phone: 1-888-967-5224  
Website: workaci.com

## GENERAL INFORMATION

The ACI WPR2 Series Remote Wet to Wet Differential Pressure Transmitter is designed to reduce installation time and provide mounting flexibility, often eliminating the need for additional plumbing. They accurately measure wet media pressures in a variety of applications. Commonly used for monitoring pumps, these devices are also ideal for measuring pressure across filters, heat exchangers and compressors. The dual remote sensors are based on a ceramic capacitive sensing element with 1/4"-18 NPT male (304 stainless steel) fittings. The WPR2's enclosure opens conveniently to allow it to be reconfigured between three additional ranges and outputs of 4 to 20 mA, 0 to 5 VDC, or 0 to 10 VDC (default). The different configurations in this series can measure both uni or bi-directional pressure ranges as low as 3 psi and as high as 300 psi, depending on the unit.

### Precautions:

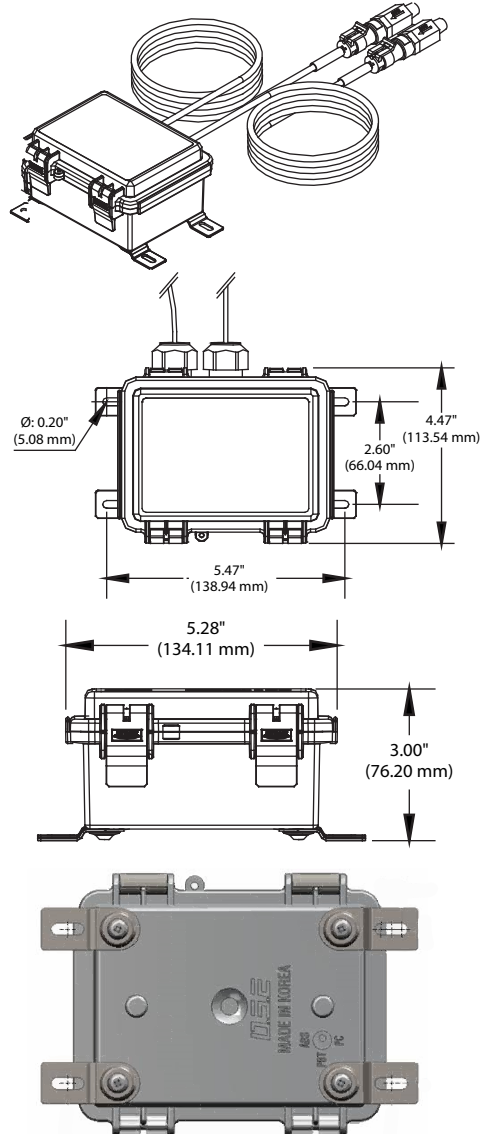
- Do not switch pressure range and output mode when power is on. Make sure to power off the unit first, then move jumpers to the correct positions and then power on the transmitter.
- Do not apply any external voltage to zero terminals.
- Do not replace pressure sensors with any other sensors. Do not interchange the high and low sensors. The high and low sensors are specifically calibrated to the WPR2 unit.

Any changes to the sensors will void the product warranty

## MOUNTING INSTRUCTIONS

The WPR2 is supplied with 4 mounting flanges. The mounting flanges must be installed onto the bottom of the enclosure. Align the mounting flanges with the threaded insert on the bottom of the enclosure. Insert and tighten down the screws. Find a suitable location for the enclosure. Drill

FIGURE 1: ENCLOSURE DIMENSIONS

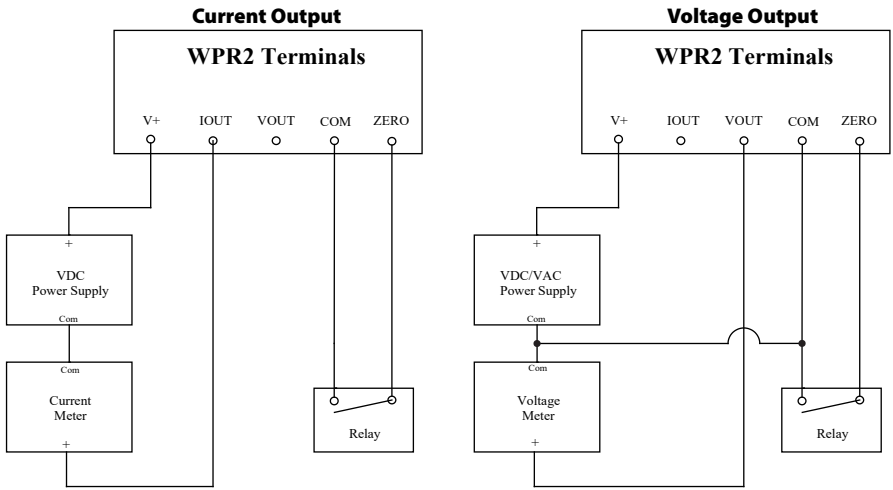


pilot holes for the (4) mounting screws. Use the enclosure flange as a guide, or use the dimensions listed below to measure out.

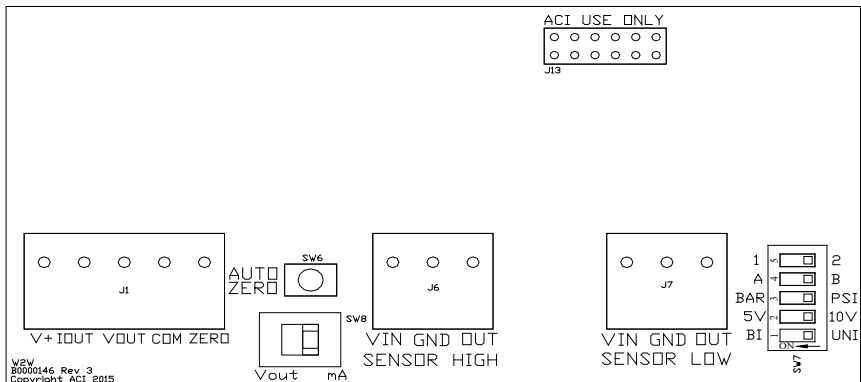
**TABLE 1: WIRING CONNECTIONS**

OUTPUT SIGNAL (SW8)	OUTPUT MODE (SW7 Position 2)	SUPPLY VOLTAGE	WIRE CONNECTIONS		
			V+	COM	VOULT
Vout	0-5 VDC (5V)	VAC/VDC	V+	COM	VOULT
Vout	0-10 VDC (10V)	VAC/VDC	V+	COM	VOULT
mA	4-20 mA	VDC	V+	-----	IOULT
mA	4-20mA	VAC	V+	COM	IOULT

**FIGURE 2: WIRING DIAGRAM**



**FIGURE 3: PCB CONNECTIONS**



V2V  
B0000146 Rev. 3  
Copyright © Acti 2015

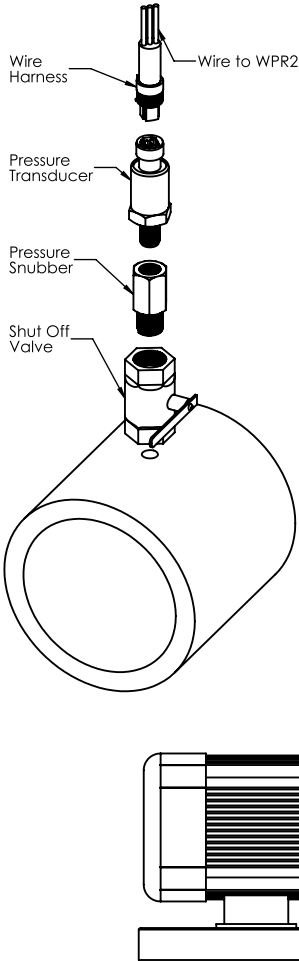


# WIRING INSTRUCTIONS

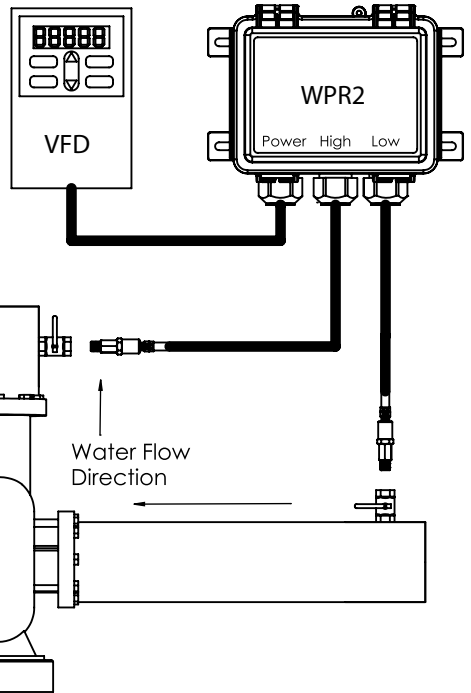
## PRECAUTIONS

- Do not run the temperature sensor wiring in any conduit with line voltage (24/120/230 VAC) if utilizing resistance temperature signal.
- Remove power before wiring. Never connect or disconnect wiring with power applied.
- When using a shielded cable, ground the shield only at the controller end. Grounding both ends can cause a ground loop.
- It is recommended you use an isolated UL-listed class 2 transformer when powering the unit with 24 VAC. Failure to wire the devices with the correct polarity when sharing transformers may result in damage to any device powered by the shared transformer.
- If the 24 VDC or 24VAC power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC/AC Transorb, Transient Voltage Suppressor (ACI Part: 142583), or diode placed across the coil or inductor. The cathode, or banded side of the DC Transorb or diode, connects to the positive side of the power supply. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.

**FIGURE 4: SENSOR INSTALLATION**



Open the cover of the enclosure. ACI recommends 16 to 26 AWG twisted pair wires or shielded cable



for all transmitters. Twisted pair may be used for 2-wire current output transmitters or 3-wire for voltage output. All wiring must comply with local and National Electric Codes. After wiring, close the cover.

Each WPR2 unit can be configured to three output modes: 4-20mA, 0-5V and 0-10V. Use the Wiring Connections table to determine the proper wiring for your application. See **TABLE 1** for Output Mode and Output Signal switch positions.

**Note:** The WPR2 units are shipped from the factory set up with a 0-10 VDC output.

## ZERO FUNCTION

The WPR2 unit should be “ZEROED” before pressure transducers are installed on the pipes. The Auto zero button and remote zero are both used to cancel out the offsets caused by installation and sensor drift.

**Note:** Make sure a minimum of 10 minutes of warm-up time elapse before adjustment to the ZERO. The Zero adjustment must be performed with NO pressure applied to both sensors.

### Directions:

- **Shut off your main pressure valve and open a shutoff valve with hose drain to equalize the pressure in the line to your atmosphere.**
- **Remove the sensors from the system to remove pressure from each sensor to achieve equal pressure.**
- **Push “ZERO” button or “SHORT ZERO PIN” for 2 seconds to “COM PIN” before installation or when it is necessary.**

For units with LCD display, “ZERO” icon will be on when the unit enters zero mode. If zeroing process is successful, the “ZERO” icon will flash twice.

- **Reapply the pipe tape, thread sealant, or pipe compound before sensor installation.**

## PRESSURE CONNECTIONS

The WPR2 Series have 1/4"-18NPT male fittings. The sensors are labeled “SENSOR HIGH” and “SENSOR LOW”. Make sure the sensors are wired to the corresponding terminal block inside the housing. Otherwise, ACI will not guarantee the accuracy specifications. **DO NOT REPLACE SENSORS WITH ANY OTHER SENSORS. THE WPR2 UNITS ARE CALIBRATED WITH THE HIGH AND LOW SENSORS SUPPLIED WITH THE UNIT.** Standard pipe fittings and installation procedures should be used during installation. Install pipe tape, thread sealant or other suitable pipe compound when connecting the sensor to the pressure source or any of the accessories. Recommended torque specification is 150 in lbs (16.95 Nm). If after connecting the pipe, the unit outputs out-of-range signal OVR on display only, turn off the unit, disconnect the pipe or shut down the valves immediately and check the pressure input with a gauge or other test instrument.

**Note:** ACI recommends to mount the pressure transducers on the top side of the pipe. Side mounts are also acceptable. Refrain from mounting underneath the pipes so that any moisture, sediments, or other contaminants cannot run down or drip directly onto the sensor.

A Pressure Snubber is included with each sensor to dampen pressure surges. A pigtail siphon should be used to lower the media temperature below 257°F (125°C) to prevent damage to the pressure sensor.

## INPUT RANGE ADJUSTMENT

- Do not switch pressure range and output mode when power is on. Make sure power to the unit is off. Failure to do so will not allow any new switch settings to take place.
- Choose differential range based on the expected differential pressure in your application. Move switches to the correct positions and then power on the transmitter.

The WPR2 can operate in either unidirectional mode (0 – X PSI) or bidirectional mode ( $\pm$  X PSI). The unit will set at unidirectional mode after factory calibration. Refer to **TABLE 2** (p. 5) and **FIGURES 5** (p. 5).

### Unidirectional Mode

- DIP switch SW7 position five set at **UNI** side.
- DIP switch SW7 positions 4 and 5 are for Range Selection

## Bidirectional Mode

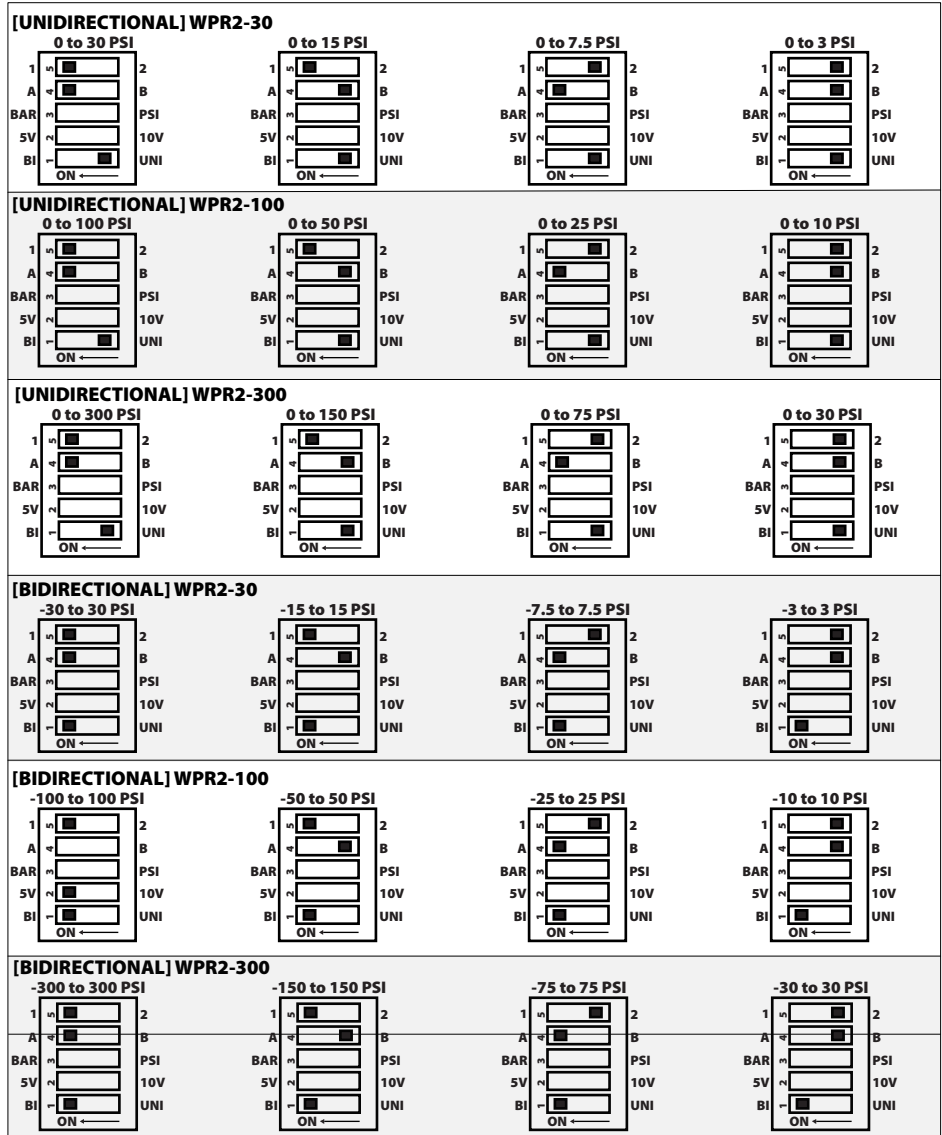
- DIP switch SW7 position 1 set at **BI** side.
- DIP switch SW7 positions 4 and 5 are for Range Selection.

**Note:** In Bidirectional mode, a value of 0 inWC will have an output equal to 50% of the output signal range (12mA, 2.5V, 5V).

**TABLE 2: MAXIMUM PRESSURE**

ACI Part #	Maximum Pressure (PSI)
WPR2-30	30
WPR2-100	100
WPR2-300	300

**FIGURE 5: SWITCH SETTINGS**



## ADDITIONAL LCD FEATURES

### LCD Engineering Units Adjustment

Switch DIP switch SW3 position three to select Pa or inWC. If switched with power on, unit change will not take place until power is cycled.

#### “ERROR”

“ERROR” icon will be on when differential pressure is out of range.

#### “OVR”

“OVR” icon will be on when gage pressure is out of range on either the high or low port.

## TROUBLESHOOTING

### PROBLEM

**“ERROR” icon on Display will be on when differential pressure is out of range. The differential pressure could be lower or higher than the selected range.**

**“ORV” icon on Display will be on when the input pressure is > than Max Line Pressure. Check pressure input with a gauge or other test instrument. The WPR2-300 Series is available for pressures over 100 PSI.**

- Verify the HIGH Sensor Voltage is between 0.5 VDC (0 PSI) and 4.5 VDC (Max Line Pressure). When measuring from the HIGH Sensor terminal block “GND” to “OUT”. If out of range call ACI for Technical support.
- Verify the LOW Sensor Voltage is between 0.5 VDC (0 PSI) and 4.5 VDC (Max Line Pressure). When measuring from the LOW Sensor terminal block “GND” to “OUT”. If out of range call ACI for Technical support.
- Verify in Uni-Directional Mode that the HIGH Sensor Voltage is  $\geq$  the LOW Sensor Voltage. If the voltage is anything different call ACI for Technical support.

#### **Output reading @ 4mA or 0 VDC all the time.**

- Verify proper Supply Voltage at the transducer meets the Product Specifications.
- Verify 5 VDC Reference voltage across “VIN” to “GND” terminals for both the HIGH & LOW Sensor terminal blocks. If voltage is anything different than 5 VDC call ACI for Technical support.

#### **Erroneous Readings.**

- Bleed Air from System.
- Repeat the Auto Zero calibration on page 4.

#### **Output signal reads half with no pressure applied.**

**ie: 5V output on a 0-10V selection.**

- Verify SW7 #1 is set to UNI. Cycle power to confirm the change.

# PRODUCT SPECIFICATIONS

<b>Supply Voltage:</b>	<b>4 to 20 mA Output:</b> 250Ω Load: 18 to 36 VDC   <b>500Ω Load:</b> 20 to 36VDC   <b>0 to 5 / 0 to 10 VDC Output:</b> 16 to 36 VDC, 21.6 to 26.4 VAC, 50/60 Hz
<b>Supply Current:</b>	<b>4-20 mA Output:</b> 24 mA minimum; 0-5 VDC   0-10 VDC Outputs: 6 mA maximum
<b>Output Signals:</b>	<b>2-wire:</b> Linear 4-20 mA DC Current (field selectable)   <b>3-wire:</b> 0-5 VDC; 0-10 VDC (default)
<b>Response Time (0-100% FSO):</b>	8 seconds
<b>Output Update Rate:</b>	1 second
<b>Output Load Resistance:</b>	<b>4 to 20 mA:</b> 500 ohms maximum   <b>0-5 VDC/0-10 VDC:</b> 5K ohms minimum
<b>Warm Up Time:</b>	15 minutes (wait 15 minutes before zeroing)
<b>Operating Temperature:</b>	<b>Transducer:</b> -40-257°F (-40-125°C)   <b>Electronics/Housing/Cables:</b> 32-167°F (0-75°C)
<b>Compensated Temperature Range:</b>	32 to 140°F (0 to 60°C)
<b>Storage Temperature:</b>	-13 to 176°F (-25 to 80°C)
<b>Operating Humidity:</b>	10 to 90% RH non-condensing
<b>Proof Pressure:</b>	<b>A/WPR2-30 Series and A/WPR2-100 Series:</b> 3X FS   <b>A/WPR2-300 Series:</b> 2X FS
<b>Burst Pressure:</b>	1500 psi
<b>Media Types:</b>	Any liquids or gases compatible with Neoprene seal
<b>Process Fitting Material:</b>	304 SS
<b>Process Fitting Size:</b>	1/4"-18 NPT Male; Pressure Snubber included for light oils/water
<b>Transducer Cable Rating   Connector Type:</b>	Type CMP – Plenum Rated (UL Standard 444), NEC Article 800   Packard Connector
<b>Enclosure Rating:</b>	NEMA 4X/IP66
<b>Recommended Torque Specification:</b>	150 in lbs (16.95 Nm)

## WARRANTY

The ACI WPR2 Series are covered by ACI's Five (5) Year Limited Warranty, which is located in the front of ACI's SENSOR & TRANSMITTERS CATALOG or can be found on ACI's website: [www.workaci.com](http://www.workaci.com).

## W.E.E.E. DIRECTIVE

At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre. Do not dispose of with household waste. Do not burn.



