Honeywell

PW Series Conduit Wet Pressure Transmitters

INSTALLATION INSTRUCTIONS

⚠ WARNING

This product can expose you to chemicals including 1,3 Butadiene, which is known to the State of California to cause cancer and reproductive harm. For more information, go to www.P65Warnings.ca.gov

APPLICATION

The PWTB Series wet/wet differential pressure sensors provide reliable, accurate measurement and control of proper applications, including monitoring and controlling pump differential pressure, chiller/boiler differential pressure drop, and CW/HW system differential pressure. The PWTB Series is ideal for measuring pressure across pumps, filters, heat exchangers, compressors, and other non-corrosive wet media applications. The PWTB Series of pressure sensors feature three field selectable pressure ranges, bi/uni-directional modes with configurable output: 4-20 mA, 0-5 Vdc, or 0-10 Vdc output.

IMPORTANT

- *Only qualified trade installers should install this product.*
- *This product is not intended for life-safety applications.*
- *Do not install in hazardous or classified locations.*
- *The installer is responsible for all applicable codes.*
- *De-energize power supply before installation or service.*

Product Application Limitation:
Honeywell products are not designed for life or safety applications. Honeywell products are not intended for critical applications such as nuclear facilities, human implantable devices, or life support. Honeywell is not liable, in whole or in part, for any claims or damages arising from such uses.

IMPORTANT

- *Do NOT exceed the gauge pressure rating of the sensor.*
- *Use ONLY Honeywell gauge pressure sensors provided with your PWTB transmitter to obtain the specified transmitter accuracy.*
- *Follow instructions step by step to ensure proper setup.*

Limites de l'application du produit :
Les produits Honeywell ne sont pas conçus pour des applications de sécurité ou de sauvetage. Les produits Honeywell ne sont pas conçus pour les applications critiques, comme les installations nucléaires, les dispositifs implantables dans le corps humain ou d'assistance vitale. Honeywell n'est pas responsable, en tout ou en partie, des réclamations ou dommages découlant d'une telle utilisation.

IMPORTANT

- *Ne dépassez PAS la pression manométrique nominale du capteur.*
- *Utilisez uniquement des capteurs de pression manométrique Honeywell fournis avec votre émetteur PWTB pour obtenir la précision spécifiée de l'émetteur.*
- *Suivez les instructions détaillées pour assurer une configuration adéquate.*

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DIMENSIONS

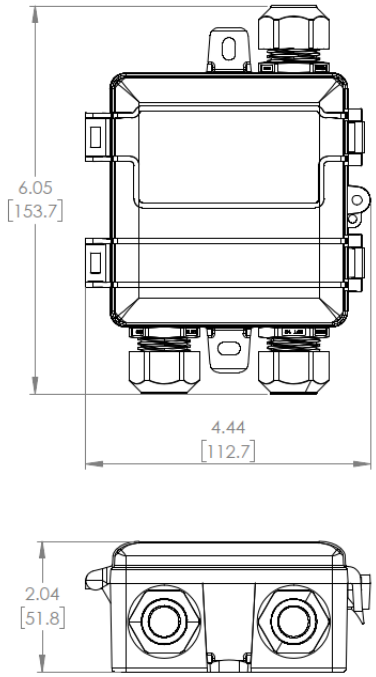


Figure 1. Housing Dimensions

CONNECTION WIRING

Honeywell recommends 22 AWG stranded, and four conductor shielded cable to wire between the PWTB transmitter and pressure sensors.

Terminals are rated for 24-14 AWG, 3.5 lb-in of torque.

INSTALLATION

1. Identify PWC sensors A & B and their respective PSIG rating.

If the expected system gauge pressure exceeds the PSIG rating on the PWTB sensors, DO NOT proceed with the installation.

PWTB50-X = 50 PSIG
PWTB100-X = 100 PSIG
PWTB250-X = 250 PSIG

2. Plumb sensors to media. Sensor A is intended for supply pressure, and sensor B is intended for the return pressure of the system. Plumb sensors to the side or top of the pipe, as plumbing to the bottom, will cause sediment to settle and could clog or affect sensor accuracy. To provide leak-free sealing without excessive torque, it is advisable to use a single wrap of PTFE tape on the sensors threads or non hardening thread sealant. (Make sure thread sealant does not coat the end of the sensor).

No bypass valve manifold is necessary. Use only Honeywell gauge pressure sensor elements provided with your transmitter.

Optional shutoff valves are available
Honeywell recommends closing service valves when flushing the system to prevent contaminants and water hammer damaging to sensing elements.

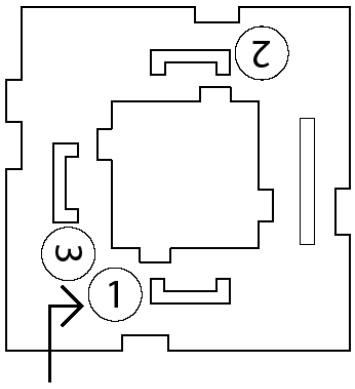
3. Mount the PWTB transmitter and run a conduit (if required) between the transmitter and the sensors.
4. Run the appropriate length cables between the PWTB transmitter and sensors.
   Honeywell recommends 22 AWG stranded, and four conductor shielded cable to wire between the PWTB transmitter and the sensors.
5. Loosen the top screw on each sensor and remove the terminal block for wiring as shown below:

Figure 2. PWTB Pressure Sensor Assembly (no cable)

6. Run the cable through the conduit adapter and connect the wires to the terminal block. Note that the conduit terminal block is numbered and color-coded to match the terminal label colors on the PWTB transmitter.

IMPORTANT

DO NOT connect the shield at the sensor element end. The shielding should only be connected to the ground terminal at the PWTB transmitter end.



PIN	CONNECTION	COLOR
1	PWR	RED
2	GND	GREEN
3	SIGNAL (S1/S2)	WHITE

Figure 3. PWTB Sensor Terminal Wiring

7. Reassemble the conduit adapter and terminal block. Place the rubber cover back on the conduit adapter and plug the adapter onto the sensor. Tighten the assembly screw.

IMPORTANT

DO NOT attempt to plumb or tighten the sensors while wires are attached, as you risk pulling wires from cable attachments.

8. Wire sensors A & B to the PWTB Transmitter terminals labeled A & B respectively. See the table in point 6 if wiring a pre-ordered cable length for color coordination. For strain relief, tighten cable glands.

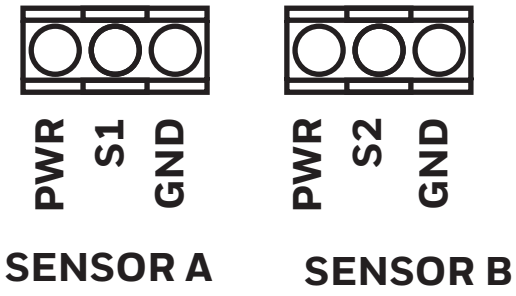


Figure 4. PWTB Transmitter Terminals

IMPORTANT

Cable shielding should be connected to the Shield terminal at the PWTB transmitter and left unconnected at the sensor element end.

9. Connect conduit fittings to the sensors and PWTB transmitter. Use water-tight fittings if required by your installation conditions.

10. Wire PWTB transmitter for voltage or current output as shown (Remote zero wiring is optional):

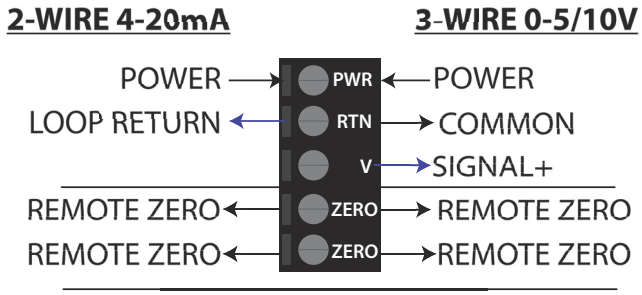
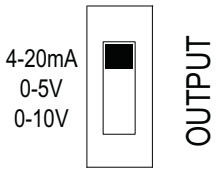


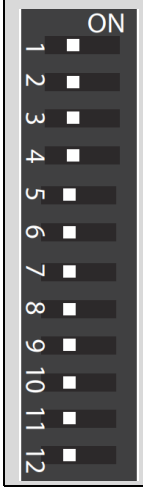
Figure 5. Transmitter Output/Remote Zero Wiring

11. Select 20 mA, 5 V, or 10 V output using the OUTPUT switch based on wiring configuration.



12. Configure output range and sensor PSIG using DIP switches 1-7. DIP 1-3 set the sensor PSIG corresponding to the PWTB ordered. DIP 4-7 are used to set the desired output signal range. Both use the binary code system outlined in the table.

Table 1. PWB Transmitter DIP Switch Configuration



DIP	Function	DOWN	UP
1	SENSOR2	0 (off)	1 (on)
2	SENSOR1	0	1
3	SENSOR0	0	1
4	RANGE3	0	1
5	RANGE2	0	1
6	RANGE1	0	1
7	RANGE0	0	1
8	Units	KPA	PSI
9	UNI/BI	BI	UNI
10	MODE	FAST	SLOW
11	SWAP	B-A	A-B
12	ABS	ABS	+/-

DIP	Binary	Sensor (PSIG)	Sensor (kPa)
1-3	000	Test	Test
	011	50	345
	100	100	689
	110	250	1724
DIP	**Binary**	**Range (PSIG)**	**Range (kPa)**
4-7	0011	0-10	0-69
	0100	0-15	0-103
	0101	0-20	0-138
	0110	0-25	0-172
	0111	0-30	0-207
	1000	0-40	0-276
	1001	0-50	0-345
	1010	0-75	0-517
	1011	0-100	0-689
	1100	0-125	0-862
	1101	0-150	0-1034
	1110	0-250	0-1724

13. Inspect the LCD for readings. The LCD toggles between sensor A, sensor B, and PSID reading.

- A dash mark at the top left of the LCD indicates the reading of sensor A.
- A dash mark at the bottom left of the LCD indicates the reading of sensor B.
- PSID reading is displayed without any mark at the left of the LCD.

14. O/R symbol will flash in the bottom center of the LCD if the differential pressure reading is over range. Select a larger PSID range to avoid clipping of readings if this occurs.

15. Check remaining DIP switch (8-12) configurations for additional setup options:

Display Units: LCD will display readings in PSI or kPa. LCD will indicate PSI or kPa at the top of the screen.

UNI/BI: PWTB transmitter can be set up in Uni or Bi-directional mode.

A	B	DP	Output
100	0	+100	20mA/10V/5V
100	50	+50	16mA/7.5V/3.75V
50	50	0	12mA/5V/2.5V
50	100	-50	8mA/2.5V/1.25V
0	100	-100	4mA/0V/0V

Fig. 6. Bi-Directional Mode Example range set at 100 PSID

Mode: In 'Slow Mode,' the output returns a reading averaged over 64 samples. In 'Fast Mode,' the output returns the most recently calculated reading for PSI.

Swap: If sensor A was plumbed to the return (low) side and sensor B was plumbed to the supply (high) side instead of re-plumbing the sensors, the Port Swap can be utilized without a physical reconfiguration.

ABS: In Absolute Mode, values will always be reported positive.

16. To custom zero the device (optional), hold down the zero button for 5 seconds (until the LCD blinks once). Hold down for 10 seconds (until the LCD blinks twice) to reset/clear the zero value.

CALIBRATION

Honeywell wet pressure sensors are factory calibrated as a set to each PWTB transmitter.

RECYCLING

The product should not be thrown away in the regular trash. Instead, it should be recycled according to the local municipality.

CE

TROUBLESHOOTING

Table 2. Troubleshooting Solutions

Symptom	Solution
No output	Check the wiring. Ensure power supply meets requirements.
Pressure reading error	Verify that control panel software is configured for correct output scaling.
	Verify switch and jumper settings.
The device will not zero	Hold the ZERO button for full 5-seconds until the LCD blinks once.
	Continue holding the ZERO button for 10-15 seconds until the LCD blinks twice to restore to factory settings.

Table 3. PWTB Sensor Models

Model	Max. Sensor Pressure	Cable Type / Length
PWTB50-X	50 PSIG 345 kPa	Installer provided*
PWTB50-PC-9		Plenum - 9 feet
PWTB50-AC-9		Armor - 9 feet
PWTB100-X	100 PSIG 689 kPa	Installer provided*
PWTB100-PC-9		Plenum - 9 feet
PWTB100-AC-9		Armor - 9 feet
PWTB250-X	250 PSIG 1724 kPa	Installer provided*
PWTB250-PC-9		Plenum - 9 feet
PWTB250-AC-9		Armor - 9 feet

SPECIFICATIONS

Table 4. Specification Details

Power supply	Voltage output (0-5V)	12-30 VDC/24 VAC[(1)], 20 mA max.
	Voltage mode (0-10v)	13-30 VDC/24 VAC required for 10V FS output
	Current mode (4-20mA)	15-30VDC(0 ohm)/16-30VDC (250 Ohm) / 18-30VDC (500 Ohm), 20mA max
Outputs	Switch selectable	2-wire 4-20 mA, 3-wire 0-5V/10V
Operating Temperature	Transmitter	-22 to 158 °F (-30 to 70 °C)
Media Compatibility	Type	Water, other 316 SS compatible media (316L diaphragm)
	Temperature	32 to 250 °F (0 to 125 °C)
Zero adjustment	Automatic	Pushbutton, Remote zero Press the button for 5 seconds to re-zero Hold for 10 seconds to restore factory settings
Sensor type	Micro-machined silicon strain gauge	
PWTB Transmitter Accuracy[(2)] Range according to PSID table in PWTB Transmitter DIP Switch Configuration table	**Sensor**	**1% Accurate ranges**
	PWTB50	20/25/30/40/50 PSID 138/172/207/276/345 kPa
	PWTB100	40/50/75/100 PSID 276/345/517/689 kPa
	PWTB250	75/100/125/150/250 PSID 517/689/862/1034/1724 kPa
		2% Accurate ranges
	PWTB50	10/15 PSID 69/103 kPa
	PWTB100	15/20/25/30 PSID 103/138/172/207 kPa
	PWTB250	30/40/50 PSID 207/276/345 kPa
Sensor Performance	Accuracy	< +/-0.25% BFSL
	Stability (1 year)	+/-0.2% FS, typ
	Over-range protection	200 % rated pressure
	Pressure Cycles	> 100 million
	Compensated Range	14 to 158 °F (-10 to 70°C)
	Temperature Compensation %FS/C	Zero, <±0.03 (<100 kPa), <±0.02(>100 kPa) Span, <±0.03 (<100 kPa), <± 0.02(>100 kPa)
	Vibration	10G peak, 20 to 2000 Hz
Enclosure, PWTB	Construction	PC/ABS
	Rating	NEMA 4X
Enclosure, Sensor	Construction	Stainless Steel, 304, 1/4” MNPT, PG9 Conduit Fitting

[1] One side of transformer secondary is connected to signal common. A dedicated transformer is recommended.

[2] Because of lower accuracy, it is not factory recommended to use an output range less than 10% of the total sensor PSIG.

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