

Differential Pressure Test Set User Instructions

Overview

Using Crystal Engineering's Differential Test Set based XP2i-DD and XP2i gauges, it's possible to perform pressure differential measurements. By simply connecting your upstream (+) and downstream (-) pressure lines to the 1/8" FNPT fittings you are ready to go. This test set is capable of displaying live or average differential pressures (average of 10 samples) depending upon which display mode you select.

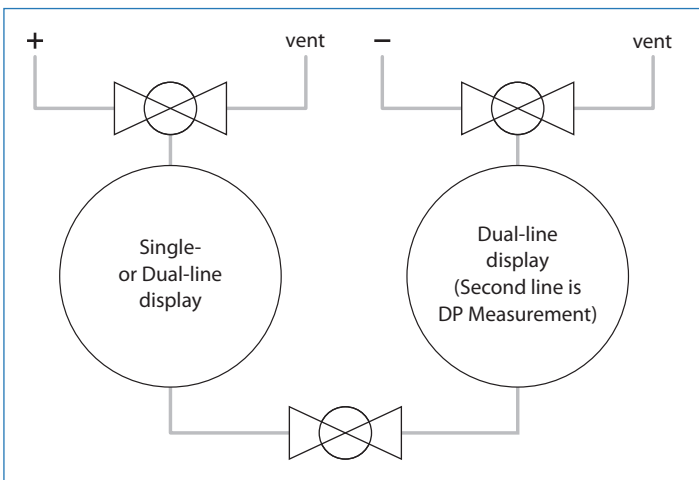


Figure 1: General piping interconnect diagram.

Operation

A typical differential pressure measurement may be done in the following manner.

- 1 Select Units:** Select your required unit of pressure measurement on each gauge by pressing the **units** button on each gauge independently. You may select different units for each gauge but they must be set individually. The differential pressure will be displayed on the lower line of the right (-) dual display gauge and will be in the same units as the static pressure.
- 2 Select Display Options:** Select the appropriate display option on each unit using the **peak** button:
 - a Right hand (-) or differential pressure gauge:** Using the **peak** button, select live pressure display (both **HI** and **LO** icons), or Average pressure over 10 readings (both **HI**, **LO**, and **AVG** icons). Static pressure will be display on the primary line and the differential pressure will be displayed on the secondary or lower line;

- i** If averaging mode is selected, the lower line will display the averaged differential pressure regardless of what display mode the left hand (+) gauge is in.
- ii** When only the **AVG** icon is lit, the second line display is the averaged *non-differential* reading from the gauge and may not be appropriate for your application.

b Left hand (+) or upstream gauge: Using the **peak** button, select live pressure readings (no HI or LO icons), or Average pressure over 10 reading (both **HI** and **LO** icons).

3 Pressure Connections: Connect upstream (+), downstream (-), and their corresponding vent lines to the four 1/8" FNPT connection ports located near the hinge of case. Use pipe thread tape or pipe thread sealant as necessary to ensure a leak free connection.

- a** Always use a wrench on the test set bulkhead 1/8" FNPT fitting, as there is a limit to how much rotational force can be applied to the case.
- b** Due to the robust nature of the Crystal XP2i gauges, full scale pressure may be applied to either gauge at any time without damage.

4 Zero Gauges: Zero both gauges in the vented condition by pressing the **zero** button on each gauge. Figure 2 illustrates the appropriate valve states to ensure venting and isolation between both gauges.

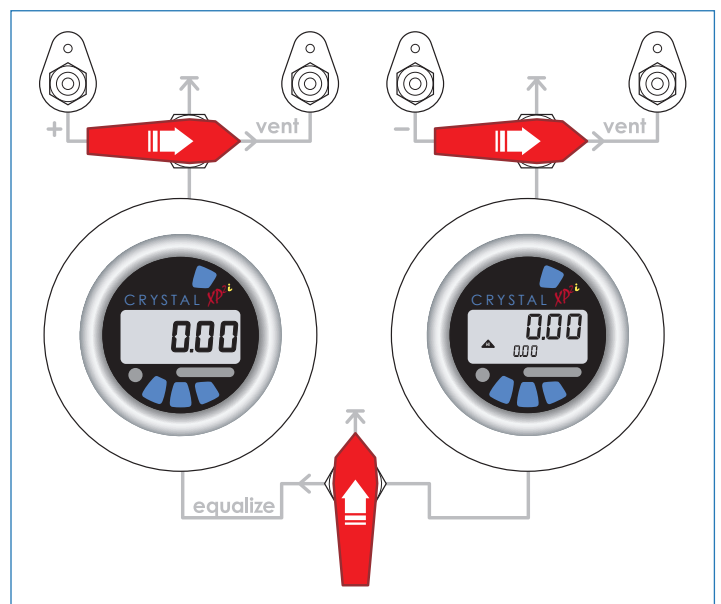


Figure 2: Zero gauge valve states.

5 DP Measurement Mode: Change the valves as shown in figure 3 to allow line pressure and differential pressure measurement.

- a Differential Pressure:** The lower line of the right hand (-) gauge is the differential measurement between both gauges. Place the right hand (-) gauge in averaging mode if further damping is required in the event of erratic or noisy readings.

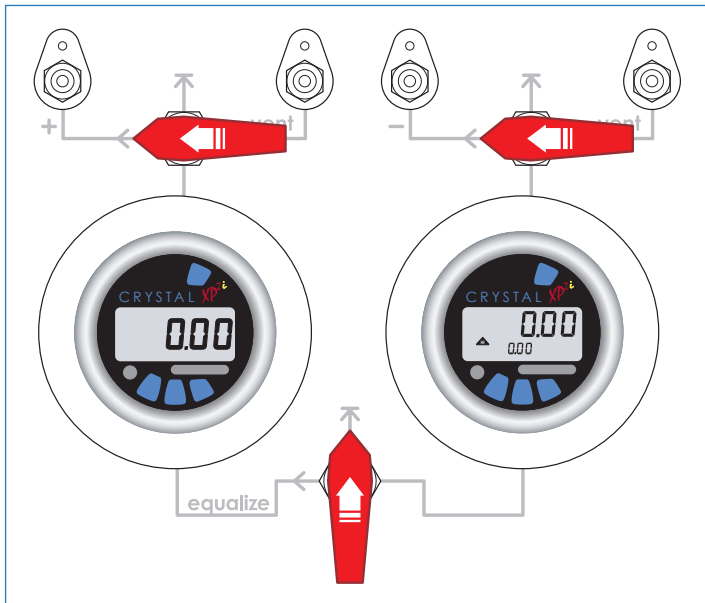


Figure 3: DP measurement mode (pressure gauge isolation).

6 Vent: Vent left-hand (+) gauge as shown in figure 4. Reverse both upper valves to vent the right hand (-) gauge.

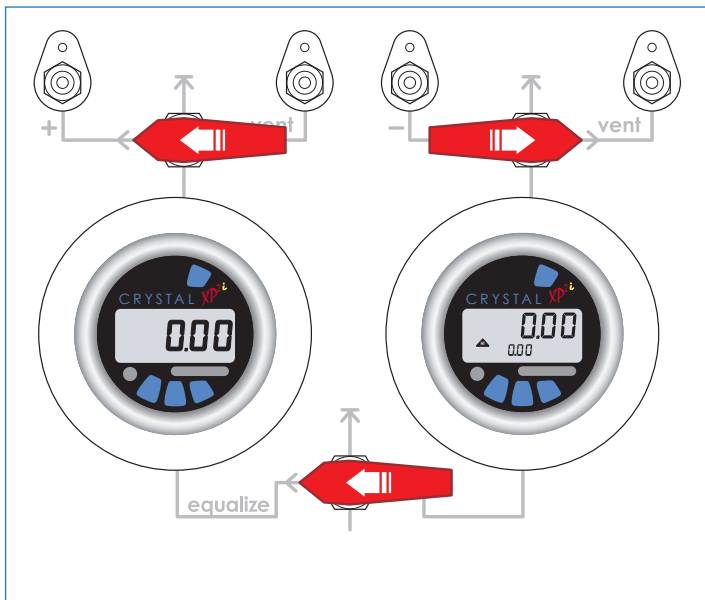


Figure 4: Vent both gauges.

7 Disconnect Connections: Disconnect connections as appropriate.

Note: Further detailed information is available in the XP21-DD (Dual Display or the unit on the right side). This information can be found at crystalengineering.net

Specifications

Pressure

Connections: 1/8" female NPT.

System Pressure Limit: Based on lowest pressure rating of either gauge.

Valving Pressure Limit: 3000 psi maximum.

Accuracy of system using equal pressure range gauges

20% to 100% of Full Scale: $\pm(0.14\%$ of Static Line Reading).

0% to 20% of Full Scale: $\pm(0.028\%$ of Full Scale).

Vacuum for 2000 kPa (300 PSI) and lower pressure gauges:

0 to -99.9 kPa (-14.5 PSIG); $\pm(0.35\%$ of Full Scale),

Where F.S.: -99.9 kPa (-14.5 PSIG).

Batteries

3 each "D" cell. Rotate lid counter-clockwise 90 degrees to remove.

Battery Life

1200 hours typical.

Temperature

Operating and Compensated: -10C to +50C (14F to 122F).

Storage: -40C to +75C (-40F to 167F).

Display Options

Line or Average (over 10 samples).

Display Rate

3 readings/second.

If used in Average mode, 10 sample window is data taken over the last 3.33 seconds.

Display Height:

14.5mm (0.55") Right hand or (-) dual display differential gauge.

16.5mm (0.65") If configured with XP21 gauge (left hand location only).

Media Compatibility:

Liquids and gases compatible with 316 stainless steel.

Enclosure:

Color: Black, watertight, crushproof and dust proof.

IP Rating: IP67.

Weight:

6.1 kg (13 lbs 8 oz)

Size:

37.1 cm x 25.8 cm x 15.2 cm

14.6 in x 10.2 in x 6.0 in

