

Zeroing Out Position Sensitivity in M200-DI Wet / Wet DP

Background: M200-DI Wet / Wet DP Smart Manometers use DP sensors that are protected from process fluids by 316L SS diaphragms on both the high (P1) and low (P2) sides. The spaces between the diaphragms and the DP sensor ends are loaded with a fill fluid. The fill fluid transfers the pressure signal from each diaphragm to the DP sensor.

When Zero Offset Occurs: The fill fluid can apply hydrostatic head pressure to the DP sensor in non-uniform ways depending on the orientation of the handheld during measurement sessions.



1. Horizontal plane (yaw axis): No zero offset

The fill fluid's hydrostatic head pressure is exactly equal on the P1 and P2 sides when lying flat and rotated around the horizontal (yaw) axis.

2. Vertical plane (pitch axis): No zero offset

The fill fluid's hydrostatic head pressure is exactly equal on the P1 and P2 sides when the unit is rotated between straight up and straight down around the vertical (pitch) axis.

3. Roll axis: Zero offset occurs

When the unit is rotated about its roll axis in the horizontal plane or any less-than-vertical plane, the fill fluid in the highest side imparts a greater hydrostatic pressure to its side of the DP sensor. The result is a zero offset in either the + or – direction depending on the roll direction.

Solution: Place unit in orientation it will be used in when making measurements, with no pressure applied to either the P1 or P2 ports, and use the Zero function keys to null out position effect on zero. Measurement stability is very good at any fixed roll position.

Special note for M200-DI0001 and M200-DI0005: These ranges are more sensitive to roll axis position because the zero shift is a greater percentage of full scale range than in higher ranges. Small changes in position about the roll axis will register on the display as pressure changes. Therefore these two ranges will need to be held relatively still while taking measurements or they may need to be placed on a bench or other stationary support prior to making measurements.

Maximum Effect of Roll Axis sensitivity (Clockwise & Counter Clockwise)

M200-DI Range	CW, PSI	CCW, PSI	CW, "H ₂ O	CCW, "H ₂ O
1 PSID	+0.0100 PSI	-0.0100 PSI	+0.30" H ₂ O	-0.30" H ₂ O
5 PSID	+0.010 PSI	-0.010 PSI	+0.29" H ₂ O	-0.29" H ₂ O
15 PSID	+0.010 PSI	-0.010 PSI	+0.30" H ₂ O	-0.30" H ₂ O
30 PSID	+0.010 PSI	-0.010 PSI	+0.30" H ₂ O	-0.30" H ₂ O
100 PSID	+0.01 PSI	-0.01 PSI	+0.3" H ₂ O	-0.3" H ₂ O
300 PSID	+0.01 PSI	-0.01 PSI	+0.3" H ₂ O	-0.3" H ₂ O
500 PSID	+0.01 PSI	-0.01 PSI	+0.3" H ₂ O	-0.3" H ₂ O

