M2 –Series User Manual Supplement

Reference Dwg. No. 9R000045-C M2 Smart Manometer Manual for
M200, M200LS, M200-DI (wet/wet DP) & M201 Rotary Gas Meter Tester

The purpose of this Supplement is to provide corrections, clarifications or additions to the user information contained in the M2 – Series User Manual (controlled drawing number 9R000045-C). These corrections, clarifications or additions relate to the user interface, available sensor ranges and styles or application recommendations only.

Corrections / Changes as of March 31 and May 31, 2009:

1. Page 23; replace the Specifications Table with the following one:
   ~~deleted Absolute Isolated Type 900 mmHg range~~
   deleted Wet / Wet type 50 psid range
   added ±0.05% FS accuracy statement for Wet / Wet 1 PSID range
   added M200LS information throughout
   added GI, AI and DI pressure limit information

Type and Range and Display Resolution: **Differential Non-Isolated Types (M200, M200LS, M201):** 28 inH_2O (1 psid) – XX.YYY 200 inH_2O (7.21 psid) – XXX.YY 2000 inH_2O (72.1 psid) – XXXX.Y **Gauge Isolated Types (M200, M200LS, M201):** 15 psig – XX.YYY 30 psig – XX.YYY 100 psig – XXX.YY (M200LS only) 200 psig – XXX.YY (except M200LS) 300 psig – XXX.YY 500 psig – XXX.YY (M200LS only) 2000 psig – XXXX.Y (except M200LS) **Absolute Isolated Types:** 900 mmHg (17 psia) – XXX.YY (M200LS only) 38 psia (2000 mmHg) – XX.XXY **Differential Wet/Wet Types:** 1 and 5 psid – X.YYYY 15, 30 ~~and 50~~ psid – XX.YYY 100, 300 and 500 psid – XXX.YY
Accuracy: M200, M200-DI, M201 ±0.025% of Full Scale or ±0.05% of Full Scale (±0.1% F.S. for non-isolated 28 inH_2O differential range) (±0.05% F.S. for wet/wet 1 psid differential range) Accuracy: M200LS ±0.01% of Full Scale (±0.02% F.S. for non-isolated 28 inH_2O differential range) Accuracy statements include the combined affects of temperature, linearity, repeatability, hysteresis and resolution for the specified operating temperature range. Warm up time = 5 minutes. Unit should be zeroed at working ambient temperature before use.
Temperature: M200, M200-DI, M201 Storage = -40°C to +60°C (-40°F to +140°F) Operating = -5°C to +50°C (23°F to +122°F) Temperature: M200LS Storage = -40°C to +60°C (-40°F to +140°F) Operating = +15°C to +30°C (+59°F to +86°F)

M2 –Series User Manual Supplement

Reference Dwg. No. 9R000045-C M2 Smart Manometer Manual for M200, M200LS, M200-DI (wet/wet DP) & M201 Rotary Gas Meter Tester

Media Compatibility:

PORTS:

DN: Differential pressure non-isolated sensors for use with clean, dry, non-corrosive gases only.

DI, GI , AI: Differential, Gauge, or Absolute pressure sensors for use with gases and liquids compatible with 316L SS and O-ring material (DI wet/wet differential sensors only)

O-RING Material (for DI sensors only):

Viton (standard)

Buna-N, Neoprene (available option)

Pressure Limits:

GI and AI units: 2x range

DN units: 2x range when pressurized on high side only. 150 PSI (10.5 Kg/cm²) static when applied to both sides of sensor simultaneously.

DI units: 1000 PSI common mode, P1 (HI) only is 3x range, P2 (LO) only is 3x range or 150 PSI, whichever is less.

Connection:

1/8" female NPT, 316L SS. P1 is the high pressure connection and P2 is the low pressure connection. Differential port shown below.

User must use a wrench on the pressure manifold when installing user's 1/8" NPT fitting. Do not tighten the fitting without using a wrench on the pressure manifold. Failure to use a wrench on the manifold will damage the plastic enclosure and void warranty No torque should be applied to the manifold with respect to plastic enclosure.

Battery Type:

4 each AA alkaline batteries.

IMPORTANT!!! ATEX certified models require the use of approved batteries only to maintain the ATEX certification. Refer to Dwg. No. 9R000056 "M2 Intrinsically Safe Control Document" for a list of batteries approved for hazardous atmospheres. A copy of this drawing accompanies each unit shipped.

Remove and / or replace batteries in non-hazardous areas only.

Battery Operation:

>100 hours continuous use, 1 year shelf life, auto power off programmable at Disabled, 10, 20, 30, 60 or 90 minutes

Enclosure:

(6.9" × 3.8" × 2.3") Polycarbonate, Permanently Static Dissipative, ESD Protection

Enclosure with Boot:

(7.2" × 4.2" × 2.5")

M2 –Series User Manual Supplement

Reference Dwg. No. 9R000045-C M2 Smart Manometer Manual for
M200, M200LS, M200-DI (wet/wet DP) & M201 Rotary Gas Meter Tester

2. Page 28
   A. Disregard drawing for DN w/PRT – option not yet available
   ~~B. Disregard drawing for DI w/ FP – option not yet available~~
   ~~C. Bottom of page under Notes, disregard the Note: "FP is a …models."~~

3. Add Appendix 2

Application Information for M200-DI Units

M200-DI (wet/wet) units have liquid filled, sealed sensor assemblies. The fill fluid will apply hydrostatic head pressure to the DP sensor in uniform ways depending on the orientation of the handheld during measurement sessions.

Horizontal plane (yaw axis): No zero offset

Vertical plane (pitch axis): No zero offset

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 the DP sensor. The result is a zero offset in either the + or – direction depending on the roll direction.

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

M200-DI0001 and M200-DI0005 ranges: These ranges are more sensitive to roll axis position because the affect 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 significant pressure changes. Therefore these two ranges will need to be held still while taking measurements or they may need to be placed on a bench or other stationary support prior to making measurements.

4. Add Appendix 3
   M200LS Lab Standard Smart Manometer
   The M200LS provide greater accuracy than our standard M200 for users in controlled or temperate climates. Typical accuracy is ± 0.01% FS over the temperature range of 59º F to 86º F (15º C to 30º C). Accuracy is not certified outside this reduced temperature range.