Addendum to User's Manual No. 9R000045

M201 Rotary Gas Meter Tester For

Differential Pressure "Drop" Tests

of Natural Gas Meters

meriam process technologies
a Scott Fetzer company

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Notes:

1. This Addendum only addresses features unique to model M201. Additional user instructions for those M201 functions common to all M2 Series Smart Manometers can be found in User's Manual No. 9R000045, "M2 – SERIES USER MANUAL: SMART MANOMETER / ROTARTY GAS METER TESTER". User's Manual No. 9R000045 is included with M201 shipments along with Addendum No. 9R124.
2. Information and specifications in this document are subject to change without notice. Check the Meriam web site (www.meriam.com) for latest manual revision.

M201 Rotary (Natural) Gas Meter Tester

Periodic differential pressure tests, or “drop” tests, on rotary natural gas meters are necessary to track meter condition. The tests indicate changes in meter performance over time and reveal when a meter should be removed from service for repair or reconditioning. “Slow” meters, those with higher differential pressure, result in under-billing and therefore cost the natural gas supplier money.

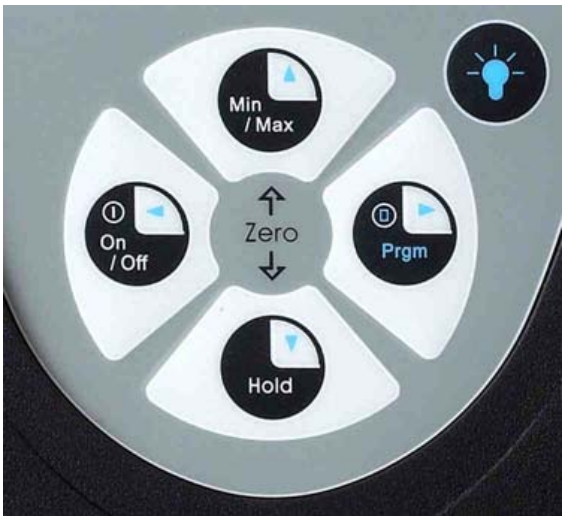
Meriam’s enhanced M201 has new features to improve its general usefulness and make Rotary (Natural) Gas Meter drop tests easier. The new Measure Mode displays differential pressure readings while standing by for a drop test. This allows users to make general DP measurements and provides convenient feedback on zero performance (simultaneously pressing the “Min/ Max” and
“Hold” keys takes a new zero when needed). Measure Mode also lets users know when the M201 is correctly connected to a meter and ready for a test to be run.

When a drop test is started, the enhanced M201 uses an internal stop watch to time the test period. This means the technician no longer needs to time the drop test externally, he only needs start a test (press the “Hold” key from Measure Mode) and then stop it (press the “Hold” key again) after one meter revolution. The M201 results screen shows the test period and average DP once the test is stopped. To view the minimum and maximum DP measured during the test, simply press the Min/Max key. Toggle the Min/Max key again to return to the test time and average DP results display. The enhanced M201 includes a Mode Select program menu for Legacy or Enhanced modes of operation – the users chooses which mode is best for them. See the “M201 Legacy and Enhanced Display Comparison Table” on the last page of this Addendum for more information.

New hardware options protect the M201 from one sided overpressure. Options include a ¼ turn valve and an integral push-to-read cartridge valve in addition to the traditional push-to-read valve manifold. See the Manifold Options section of this Addendum for more details.

User Interface Keys

Refer to the graphic below as reference for instructions in this Addendum.



Mode Select – Enhanced or Legacy

The enhanced M201 (shipping since June 1, 2010), includes a Mode Select option in the program menu for Legacy or Enhanced operation. The user chooses which mode to use. See the "M201 Legacy vs. Enhanced Comparison Table" at the end of this manual addendum for a comparison of features and displays.

To configure the M201 for either Legacy or Enhance mode operation, follow the steps shown on below.

Keystroke	Display
1. Turn unit on using the ON/Off key.	Top line reads " 'Hold' to Test", Bottom line displays live Differential Pressure value
2. Press the Prgm key.	Top line reads "Program Mode," Bottom line reads "Unit Select"
3. Press the ▲ arrow key.	Top line reads "Program Mode", Bottom line reads "Mode Select"
4. Press the ► arrow key.	Top line reads "Mode Select", Bottom line reads current mode, Enhanced or Legacy
5. To retain the display mode, press the Prgm key and proceed to Step 7.	Top line reads "Program Mode", Bottom line reads "mode Select"
6 a. To change the displayed Mode, press the ▲ or ▼ arrow key.	Top line reads "Mode Select", Bottom line displays the new mode option, Legacy or Enhanced
6 b. To retain the displayed mode, press the Prgm key.	Top line reads "Program Mode", Bottom line reads "Mode Select"
7. Press the ◄ arrow key.	Returns to Measure Mode

Time Units Select

The enhanced M201 (shipping since June 1, 2010), includes a Time Unit Select option in the program menu for Enhanced Mode operation. The user chooses either seconds or minutes as the desired time unit for the results display.

To the desired time unit, follow the steps shown on below.

Keystroke	Display
1. Turn unit on using the On/Off key.	Top line reads " 'Hold' to Test", Bottom line displays live Differential Pressure value
2. Press the Prgm. Key.	Top line reads "Program Mode", Bottom line reads "Units Select"
3. Press the ▲ arrow key twice.	Top line reads "Program Mode", Bottom line reads "Time Units"
4. Press the ► arrow key.	Top line reads "Time Units", Bottom line reads current mode, Seconds or Minutes
5. To retain the displayed time unit, press the Prgm key and proceed to Step 7.	Top line reads "Program Mode", Bottom line reads "Mode Select"
6 a. To change the displayed Mode, press the ▲ or ▼ arrow key.	Top line reads "Time Units", Bottom line displays the new unit option, Minutes or Seconds
6 B. To retain the displayed time unit, press the Prgm key.	Top line reads "Program Mode", Bottom line reads "Time Units"
7. Press the ◄ arrow key.	Returns to Measure Mode

Enhanced Mode – Running a Drop Test

The M201 Enhanced mode provides more user feedback at the display then Legacy mode does. Live pressure readings are displayed prior to and during a drop test. Upon test completion, the display shows the test period that was used along with the average differential pressure over the test period.

To run an Enhanced Mode drop test on a rotary natural gas meter, follow the steps below.

Keystroke	Display
1. Turn unit on using t On/Off key.	Top line shows " 'Hold' to Test", Bottom line displays live Differential Pressure (DP) value.
2. Press and Hold key start the test.	Top line shows "Acquiring Data…", Bottom line displays live DP value
3. Allow M201 to acqui test data per user company's procedures.	Top line shows "Acquiring Data…", Bottom line displays live DP value
4. Press and Hold key aga to stop the test.	Top line shows the length of the test in seconds or minutes, Bottom line reads "R" for result and shows the average DP over the test period
5. Press n/Max key for additional test information if desired.	Top line shows Minimum and Maximum DP value over test period, Bottom line reads "R" for result and shows the average DP over the test period
6. To start a new test, pre the Hold key. Repeat Steps 3 & 4.	New test is run
7. Press th ◄ arrow key.	Returns to Measure Mode

Legacy Mode – Running a Drop Test

The M201 Legacy mode operates the same as the original M201 from Meriam did. Legacy mode provides the user with less information than Enhanced mode does. No live pressure readings are displayed either prior to or during the test. Upon test completion, the display shows only the average differential pressure over the test period.

To run a Legacy Mode drop test on a rotary natural gas meter, follow the steps below.

Keystroke	Display
1. Turn unit on using t On/Off key. Unit powers on ready to start a drop test.	Reads “Press Hold to Acquire Data”.
2. Press e Hold key to start the test.	Reads “Acquiring Data…” No values are displayed while pressure values are stored.
3. Press e Hold key again to stop the test.	Reads “R” for result and “XX.XX Units”, the average Differential Pressure (DP) during the test period.
4. Press n/Max key for additional test information if desired.	Top line shows Minimum and Maximum DP value over test period, Bottom line reads “R” for result and “XX.XX Units”, the average DP over the test period.
5. To start a retest, pre the Hold key. Repeat Steps 3 & 4.	Reads “Acquiring Data…”
6. Press th ◄ arrow key.	Returns to Measure Mode

Using the Equalizing Manifold Options

To protect the M201's differential pressure sensor from damage due to accidental over pressure, it is importand to use the M201's equalizing manifold correctly. Three options are available: a Push-To-Read (PTR) valve manifold, an Integral Push-To-Read (IPTR) cartridge valve and a Quarter Turn Valve (QTV) manifold

PTR Manifold
Valve is open and DPVa sensor equalized until the p ush button valve is

IPTR Cartridge Valve
Integral valve is open and DP sensor equalized until the push button valve is depressed

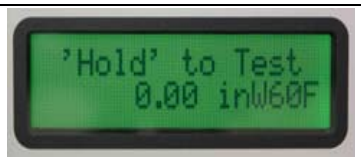
QTV Manifold
¼ Turn Valve is manually opened to equalize DP sensor and closed to make readings

Instructions

1. Install preferred connectors in the 1/8" NPT (female) connections on the M201 or M201 manifold. Use Teflon tape or other suitable thread sealer.
2. PTR and IPTR are normally open and the M201 sensor is equalized. The QTV valve must be manually moved to the equalize position prior to connecting pressure to the M201.
3. Make connections to the gas meter's HI and LO ports. Be certain to observe the P1 (HI) and P2 (LO) on the M201.
4. Turn M201 "On". Display should read zero since HI and LO sides are connected and pressure is equalized. If not, re-zero the M201 buy simultaneously pressing the Min/Max and Hold keys.
5. To make differential pressure measurements with PTR and IPTR options, manually depress and hold the push-to-read valve. To make differential pressure measurements with QTR option, manually move the ¼ turn valve to the closed position.

6. Upon completion of use / test, release the PTR or IPTR valve, or move the QTV valve to the equalize position, to equalize pressure on the M201 sensor. Then disconnect pressure lines.

M201 Legacy and Enhanced Comparison Table

	Legacy Displays	NEW Enhanced Displays
Select Legacy or Enhanced Mode		
Measure Mode	 **No Measure Mode, only Standby…**	 **Standby with Live DP Display**
Test Mode – Acquire Data	 **No DP Display, no timer**	 **Live DP display, internal stop watch**
Test Results Display	 **Average DP Displayed**	 **Test Period & Average DP Displayed**
Test Results "Min/Max" Display	 **Test Min/Max above, Ave. DP below**	 **Test Min/Max above, Ave. DP below**