# Portable Large Meter Tester

## Model PLMT

## TERMINOLOGY

PLMT = Portable Large Meter Tester

Field meter = meter being tested

gpm = gallons per minute

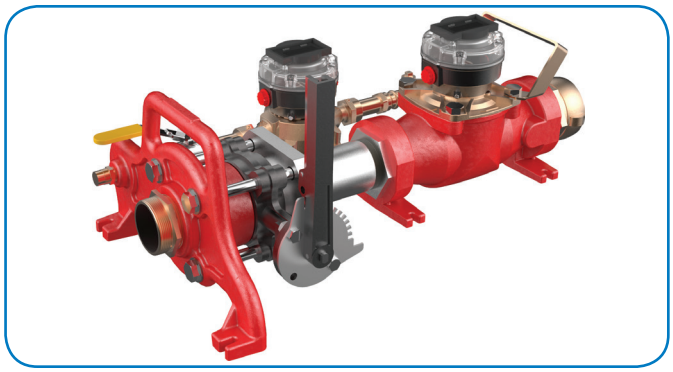
## OPERATION

The Badger Meter® Portable Large Meter Tester is connected to the test plug on the field meter or field tap. Water is run through the PLMT to test flows (0.25…500 gpm). Registration is then compared with the field meter and accuracy computed.

## PROCEDURE

This procedure describes the testing of large meters with maximum continuous flow capacities up to 500 gpm.

1. Close the field meter inlet and outlet valves. Verify that there is no water usage occurring. If provided, open the valve on the meter bypass line.
2. Connect the inlet of the PLMT to the test tee that is downstream of the meter to be tested or to the meter test outlet, if provided. The inlet of the PLMT should be provided with a female fire hose coupling that is to be connected to the male end of the fire hose. The other end of the fire hose is to be connected to the reducer and/or adapter provided with the PLMT to the test tee.
3. Connect the remaining fire hose to the PLMT male outlet connection. Place the outlet end of the fire hose and garden hose (for testers without combining tee) in a drain or other suitable location. Check that the outlet hose is high enough (2 or 3 feet above PLMT) to create sufficient back pressure on the PLMT to keep it filled with water.
4. Check that the control valves on the PLMT are closed. PLMT valves must be water tight, particularly if using the flow combiner or test error will result. Check the PLMT outlets to verify that leaks are not present.
5. Slowly open the field meter inlet valve until the PLMT is fully pressurized.
6. Slowly open the PLMT control valves on both sides and allow sufficient water to pass through the test unit to verify that all air is removed.
7. For low flows (for instance, below 20 gpm), open the control valve downstream of the 5/8 in. meter on the PLMT to the desired flow rate.* When the desired quantity of water has passed through the PLMT, the registration of the field meter is compared with the registration of the 5/8 in. meter on the PLMT to determine meter accuracy.**
8. For high flows (for instance, 20…500 gpm), open the shutoff valve downstream of the turbo side of the PLMT to the desired flow rate. When the desired quantity of water has passed through the PLMT, the registration of the field meter is compared to the registration of the turbo side of the PLMT to determine the meter accuracy.**



9. Close the field meter inlet valve prior to removal of the PLMT. The outlet valve should remain closed.
10. When the PLMT has been removed, replace the test plug and slowly open the field meter inlet and outlet valve to repressurize the meter.

*To determine flow rate, time the dial on the PLMT through one complete revolution or the equivalent value on the ER-9 electronic indicator. (Example: Turbo Meter = 100 gallons) Divide the amount registered by the time to get the flow rate.

Example:
The turbo side of the PLMT was timed through one revolution (100 gallons) at 20 seconds.

The flow rate is as follows:

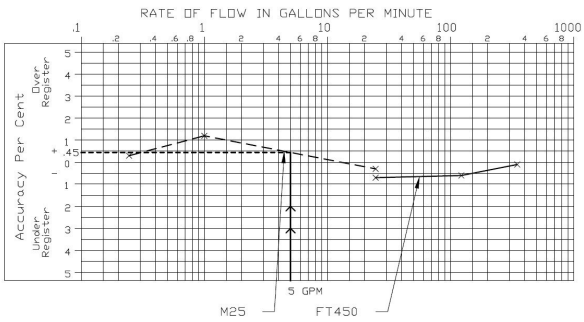
$$\textbf{Flow rate} = \frac{\textbf{100 gallons x 60 sec/min}}{\textbf{20 second test}} = \textbf{300 GPM}$$

** The calculation for accuracy is as follows:

**NOTE:** Must use the same unit of measure or convert to the same unit.

$$\textbf{Meter Accuracy \%} = \frac{\textbf{Field Meter Registration}}{\textbf{PLMT Registration}} \times \textbf{100}$$ **(or x PLMT accuracy at given flow rate)**

PLMT accuracy is taken from the Meter Master Accuracy Chart and the accuracy is used at the test rate run. For example, running test @ 5 gpm, locate where the 5 gpm rate intersects the meter curve.






# Application Data Sheet

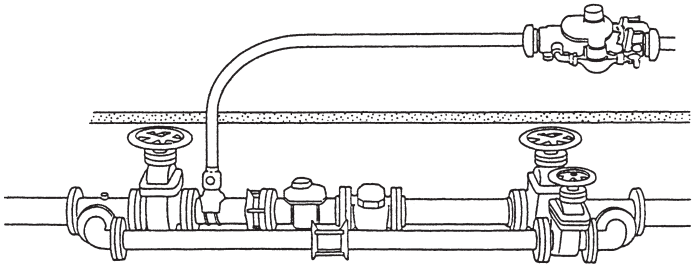
## CARE OF METER TESTER

The PLMT is a precision instrument and should not be subjected to rough handling. Used with proper care, it will provide many years of satisfactory service. The correct operating procedure is described on the laminated instruction sheet attached to the meter.

If the water supply contains sand, silt or pipe scale, flush the test meter with clear water before placing it into storage. After each use, drain all water from the meter, disconnect hoses and cap the ends. Protect the PLMT from excessive heat, cold and dusty conditions when it is in storage.

## SAFETY CONSIDERATIONS

- Read the Application Data Sheet completely before performing a test.
- To prevent severe water hammer, open and close valves slowly.
- Secure the tester for operating pressures above 80 psi.
- Do not operate at pressures above 150 psi.
- Always secure the discharge hose.
- Thrust or water pressure can cause property damage or injury if tester or hose is not controlled.



*Typical field application*

## OPERATION (ER-9 STYLE INDICATORS)

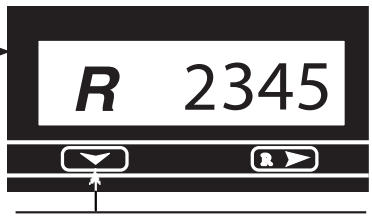
Total Display: Indicates the present count value, which is equal to the number of pulses received (since the last reset), multiplied by the Totalizer Scaler Value programmed.

Reset Key: If the total value is being displayed, pressing this key will cause the value to be reset to 0. The front panel Reset function only works when program mode 7 is preset to enable.

or

When the program input is active this key is used to select a menu item for editing.

Rate Display: Indicates the rate value, which is equal to the input frequency multiplied by the Rate Prescale Value in program mode 4. (If no pulses are received for two (2) seconds, the rate value goes to zero.)




Down Key: Toggles the unit between the total and rate display. When the program mode is active, this key is used to scroll through the menu items. After a menu item has been chosen for editing, the down key is used to set the value for the currently selected (flashing) digit. See the ER-9 User Manual for more detail.

## ER-9 PROGRAMMING NOTES AND FACTORS

1. Gallon and cubic feet totalizers rates are programmed in GPM. Liter rates are LPM.
2. Connect jumper T5 with T1 to program and disconnect jumper. Attach both ends to T5 prior to testing.
3. The Turbo meter pulses-per-unit meter factor can be modified to affect meter calibration. Both the totalizer scale and the rate scale factor must be adjusted accordingly. The meter test tag must record both of these numbers, along with the unit of measure.

**ER-9 Programming for PLMT**

| | | M25 | | | 3 in. TSM See Programming Note 3 | | |
|---|---|---|---|---|---|---|---|
| **Mode** | **Mode Description** | **Gal** | **$FT^3$** | **Liters** | **Gal** | **$FT^3$** | **Liters** |
| 1 | Totalizer Scaler (Scale Factor) | 0.5042 | 0.674 | 1.9084 | 6.2571 | 8.365 | 23.697 |
| 2 | Totalizer Decimal Point | 0.00 | 0.000 | 0.00 | 0.0 | 0.00 | 0.0 |
| 3 | Rate Scale Factor Decimal Point | 0.303 | 0.303 | 1.145 | 37.55 | 37.55 | 142.2 |
| 4 | Rate Scale Factor | 0.303 | 0.303 | 1.145 | 37.55 | 37.55 | 142.2 |
| 5 | Rate Decimal Point (Display) | 0.00 | 0.00 | 0.00 | 0.0 | 0.0 | _ _ _0 |
| 6 | Pulse Output Scale Factor | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 7 | Front Panel Reset Enable | ON | ON | ON | ON | ON | ON |
| 8 | Pulse Output Enable | OFF | OFF | OFF | OFF | OFF | OFF |

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