

PPM pDS METERS

Operation Instructions

User Manual for Models T2/pH
T6/pH



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**MYRON L
COMPANY**
pH/Conductivity Instrumentation
Accuracy • Reliability • Simplicity

DESCRIPTION

This manual describes your Myron L pDS meter, tells you how to use it, and how to keep it working accurately for many years.

Myron L pDS Meters are compact, light-weight, self-contained conductivity/pH meters. They contain a built-in sample cell with a replaceable pH sensor. Models T2/pH and T6/pH convert conductivity values directly to Total Dissolved Solids (TDS), and have dials calibrated in parts per million and in pH units. They will quickly determine the TDS and pH of almost any solution.

Both are 3.4" x 4.5" x 4.0" (85 x 129 x 126mm) and weigh less than one pound (.45 kg). pDS Meters are completely self-contained. The built-in cell is automatically temperature compensated from 50° to 160°F (10° to 71°C). They are powered by a 9 volt transistor battery good for at least 2000 tests, or one year shelf life.

MODEL	PARTS PER MILLION (PPM) RANGES	pH RANGE
T2/pH	0-50, 0-500, 0-5000 ppm TDS	2-12 pH
T6/pH	0-5000 ppm TDS	2-12 pH

ACCURACY (Both Models)

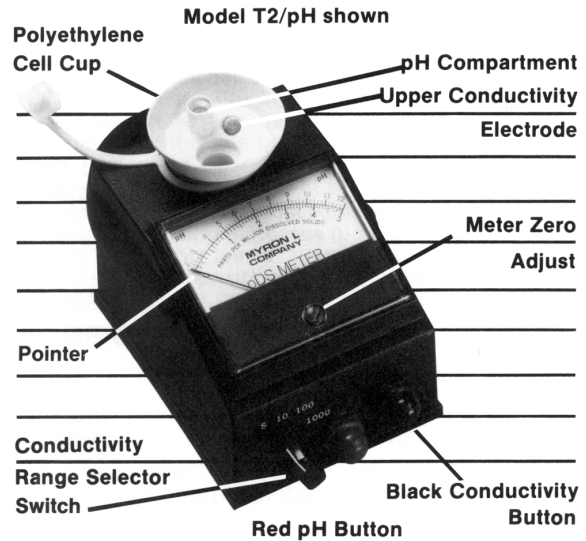
TDS: $\pm 2\%$ of full scale (ppm NaCl standard only); Ground water (442 standard) values are approximate because of varying sample TDS compositions (see ACCESSORIES).

pH: ± 0.2 pH units

REPEATABILITY: (Both Models) $\pm 1\%$

By using an RE-10 Range Extender (see ACCESSORIES), the maximum TDS range of each meter may be increased ten times.

The pictures in this manual show the major operating parts of your Myron L pDS Meter. Handle your pDS Meter and identify these parts to become familiar with it.



USING YOUR METER

TDS MEASUREMENT: Model T2/pH

1. Turn the Range Switch to the desired range. If you don't know which range to use, set it to 1000.
2. Rinse the cell cup three times with the sample you want to test. (For very hot or very cold samples see TEMPERATURE COMPENSATION below.)

NEVER FILL CELL BY DIPPING METER INTO WATER!

3. Fill the cell with another sample to at least 1/4" (6mm) above the upper electrode.
4. Press the black button.
5. Read the dial's black scale value indicated by the pointer. If the pointer is very low on the left or goes off the scale to the right, try the next lower or higher range.
6. Multiply the dial's black scale value by the range setting to determine TDS in parts per million.
7. If the pointer goes off the scale to the right on the x1000 range, try RANGE DOUBLING (see FIELD CALIBRATION) or use an RE-10 range extender (see ACCESSORIES).

TDS MEASUREMENT: Model T6/pH

1. Rinse and fill the cell cup as in steps 2 and 3 above.
2. Press the black button.
3. Read the TDS value in parts per million indicated by the pointer on the dial's black scale.
4. If the pointer goes off the scale to the right, try RANGE DOUBLING (see FIELD CALIBRATION) or use an RE10 range extender (see ACCESSORIES).

NOTE: When finished, RINSE THE CELL CUP with clean water, preferably distilled or deionized.

pH MEASUREMENT

1. Obtain sample to be tested, if necessary, heat or cool it to between 50° and 160°F (10°-71°C).
2. Remove the pH compartment cap and sharply shake out any liquid.
3. Pour or squirt the sample into the built-in cell cup, especially the small pH compartment. Shake out and repeat three times with the sample to be tested. These may be the same rinsings used to condition the cell for the TDS measurement.
4. Press the red button. The pointer immediately indicates the pH of the sample on the red scale. If the pointer drifts, wait approximately 30 seconds and press the button again to obtain a stable reading of pH. If drifting continues, the electrode may be coated with a film. Use a liquid cleaner such as Windex™ or Fantastic™ clean the pH sensor bulb (see pH SENSOR).
5. Rinse both pH and conductivity parts of the cell with clean water. **LEAVE SOME LIQUID IN AND RECAP THE pH COMPARTMENT.**

TEMPERATURE COMPENSATION: For very hot or very cold solutions let the three rinse samples each remain in the cell for several seconds, then immediately fill the cell with the sample you want to test (step 3 above). This allows the automatic temperature compensation feature time to work properly.

CAUTION:

ALWAYS store your pH sensor wet and with the cap on.

ALWAYS rinse the cell cup with pure water immediately after use or cleaning. This will prevent the build-up of deposits and possible contamination of the sample.

DO NOT test solutions which could damage the pH sensor. See MAINTENANCE.

DO NOT use with samples hotter than 160°F (71°C). The readings WILL NOT be accurate.

DO NOT splash solvents such as lacquer thinner, acetone, benzene or chlorinated solvents on the plastic case.

DO NOT fix or modify the meter. That will void your warranty. See SERVICE for details or consult Myron L

DO NOT DIP THE INSTRUMENT INTO WATER. If water does get inside the instrument, see MAINTENANCE for instructions on drying it.

TDS CALIBRATION

TDS STANDARD SOLUTIONS: A Standard Solution has a known conductivity and ppm/TDS. Your meter was calibrated at the factory using Standard Solutions. You can keep your meter accurate by using these same Standard Solutions. 442 Standard Solutions approximate the conductivity characteristics of most natural waters. To pick the right Standard Solution for your meter see ACCESSORIES.

How often you calibrate your meter depends on how much you use it. For once a day use, recalibrate it every three months.

CHECKING TDS CALIBRATION

1. Turn Range Switch to the x1000 range (T2/pH only).
2. Test a sample of appropriate Standard Solution.

CAUTION: Throw away the Standard Solution as you use it. Don't put the used samples back in the bottle.

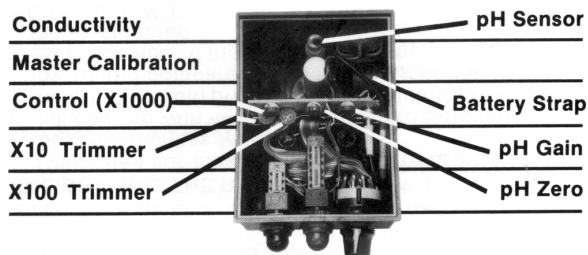
3. If the pDS Meter does not indicate the same value as is on the Standard Solution bottle's label, first clean the cell. For directions on how to do this see CELL CUP inside. Rinse the cell thoroughly and test the Standard Solution again. If the pDS Meter still does not indicate the correct value, recalibrate it as described below.

TO RECALIBRATE TDS

1. Remove the bottom cover using fingernails or a small screwdriver to loosen the front or rear edge. Identify the TDS Calibration Control(s) so you can find them by touch while calibrating (Model T2/pH has three; see photo below).
2. Test another sample of the Standard Solution (be careful to not splash solution inside the meter).
3. Adjust the Master Calibration Control until the meter indicates the value on the Standard Solution label.

NOTE: T2/pH and T6/pH Meters may be calibrated to read either 442 or NaCl parts per million, but not micromhos.

4. The Master Calibration Control on model T2/pH adjusts all ranges. For best accuracy in the lower ranges, get the recommended Standard Solutions for the x100 and x10 ranges. Use the x100 and x10 trimmers to recalibrate those ranges as in steps 2 and 3 above.
5. Turn the Range Switch to "S" and press the black button (T2/pH); or press the green button (T6/pH).
6. Compare the meter reading to the INTERNAL STANDARD value on the meter's bottom label. If they are noticeably different, mark the new value in place of the old one.



NOTE: The feature described below is intended as a quick field calibration check, or for using the range doubling technique. It is not a replacement for calibration with Standard Solution.

INTERNAL STANDARD: An INTERNAL STANDARD value for each meter is on the label on the bottom cover of each meter. Use it between normal calibrations as a field check of your meter's accuracy. To verify your meter's calibration:

1. Turn the Range Switch to "S" and press the black button (T2/pH); or press the green button (T6/pH).
2. If the reading matches the INTERNAL STANDARD value on the bottom label, your meter is in calibration. If not, see TDS CALIBRATION above.

FIELD CALIBRATION/MAINTENANCE

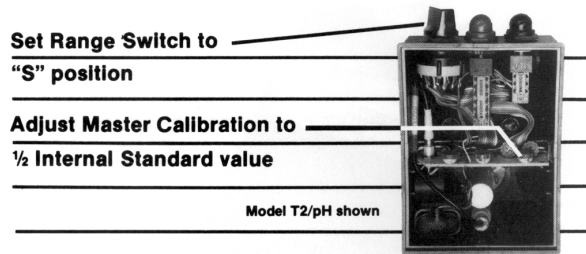
1. Turn the range switch to "S" (T2/pH only).
2. Remove the bottom cover using fingernails or a small screwdriver to loosen the front or rear edge.
3. Press the black button (T2/pH) or green button (T6/pH) and adjust the Master Calibration Control until the meter reading is the same as the INTERNAL STANDARD value.

NOTE: If the meter will not adjust to the INTERNAL STANDARD value the battery should be replaced. See MAINTENANCE below.

4. Replace the bottom cover.

RANGE DOUBLING

1. Using procedures described above, adjust the INTERNAL STANDARD to $\frac{1}{2}$ the value shown on the bottom label.
2. Test sample. Multiply reading by two. For example: Indicated value of 3200 ppm would actually be 6400 ppm (3200×2).



NOTE: After completing tests requiring range doubling, reset the Master Calibration Control to its INTERNAL STANDARD value and replace bottom cover.

pH STANDARD BUFFER SOLUTIONS

All pH sensors "drift" and decrease in strength as they age. pH meters have two Calibration Controls to compensate for those effects. ZERO adjust corrects for "drift" of the pH sensor's response to neutral pH solutions. GAIN adjust amplifies the signal from the pH sensor for accurate readings of other pH values.

Use pH standard buffer solutions to calibrate all pDS meters. The recommended values are 4, 7, and 10. For greatest accuracy, adjust with the buffer closest in pH to the samples to be tested.

pH ZERO ADJUST (Frequency: weekly)

Test by rinsing and refilling the cell with 7 buffer and pressing the red button. The meter should indicate 7 on the red scale. If it is necessary to calibrate Zero, perform the following steps:

1. Remove the bottom cover using fingernails or a small screwdriver to loosen the front or rear edge.
2. Refill cell with 7 buffer (see pH MEASUREMENT for proper procedure).
3. Press the red button and turn the pH Zero control until the needle indicates 7.
4. Recap the pH compartment and replace the bottom cover.

pH GAIN (SLOPE) ADJUST (Frequency: bi-monthly)

The Gain should be calibrated approximately once every eight weeks. The Gain control is used with 4 and 10 buffers.

NOTE: Never adjust the Gain control without first adjusting Zero.

Test by rinsing and refilling the cell with 4 or 10 buffer and pressing the red button. The meter should indicate the buffer value on the red scale. If it is necessary to calibrate the Gain, perform the following steps:

1. Remove the bottom cover.
2. Rinse and fill the pH compartment with 4 buffer and press the red button. Adjust the Gain control until the needle indicates 4.
3. Rinse three times and test with 10 buffer. If adjustment is necessary, adjust to only half way between the initial reading and 10. If, after this, the 4 and 10 buffer readings are not less than one division from 4 and 10, the sensor is deteriorating and should be replaced. The sensor should also be replaced if the Gain control cannot make the pointer reach either 4 or 10.

MAINTENANCE

BATTERY CHECK Turn the Range Switch to "S" and press the black button (T2/pH); or press the green button (T6/pH). If the pointer does not reach the INTERNAL STANDARD value, readjust the "S" (see TDS CALIBRATION). If the pointer will not reach the INTERNAL STANDARD value, the battery should be replaced.

BATTERY REPLACEMENT To replace the battery, detach the battery connector. Pull on the vinyl strap to remove the battery. Replace with fresh zinc carbon or alkaline 9 volt battery. Reinsert the vinyl strap to secure battery.

CELL CUP: Self-conditioning of the built-in electrodes occurs each time the button is pressed with a sample in the cell cup. This ensures consistent results each time. With some samples a small downward swing of the pointer is a result of this conditioning action. This action is powerful and removes normal films of oil and dirt. However, if very dirty samples—particularly scaling types—are allowed to dry in the cell cup, a film will build up. This film reduces accuracy. When there are visible films of oil, dirt, or scale in the cell cup or on the electrodes, scrub them lightly with a small brush and household cleanser. Rinse out the cleanser and the meter is ready for accurate measurements.

pH SENSOR: The unique pH electrode in your pDS meter is a non-refillable combination type which features a porous Teflon* liquid junction (covered by U.S. Patent No. 4128468). It should not be allowed to dry out (see pH MEASUREMENT). If it does, the sensor can sometimes be renewed by soaking in a saturated potassium chloride (KCl) solution for several days.

"Drifting" can be caused by a film on the sensor bulb. Use a liquid cleaner such as Windex™ or Fantastic™ to clean it. The sensor bulb is very thin and delicate. Excessive pressure during cleaning may break it.

Leaving high pH (alkaline) solutions in contact with the pH sensor for long periods of time can damage it. Rinsing such liquids from the pH compartment and moistening it with 4 buffer or tap water will extend its useful life.

Samples containing chlorine, sulphur, or ammonia can "poison" any pH electrode. If it is necessary to measure the pH of any such sample, thoroughly rinse the pH sensor with clean water immediately after taking the measurement. Any sample element which will reduce (add an electron to) silver, such as cyanide, will attack the reference electrode.

Replacement sensors are available only from the Myron L Company or our authorized distributors (see ACCESSORIES).

*™ DuPont Company

WATER INSIDE THE METER

Your Myron L meter is a rugged instrument and will withstand water exposure around its cell, meter movement and switches. However, care should be taken to keep water from leaking in around the bottom cover. It is not sealed (to prevent condensation from forming).

If the water is relatively clean (i.e., tap water or better), and there are only a few drops inside the meter, dry it as described below. Large amounts of water, or corrosive or very dirty solutions will almost certainly damage the meter movement or electronics. Such meters should be returned to the Myron L Company for repair.

To dry your meter:

1. Shake excess water out of the inside of the meter.
2. Dab the exposed surfaces dry with an absorbent cloth or tissue. Avoid pushing any water into the Calibration Controls or the switches.
3. Air dry the meter in a warm area with the bottom cover off. Allow several hours for thorough drying.

If the water entered through a leak in the case or cell, or if the instrument shows erratic readings or other unusual behavior, return it to the Myron L Company for servicing.

ACCESSORIES

STANDARD SOLUTIONS TDS STANDARD SOLUTIONS

Your pDS Meter has been factory calibrated with the appropriate Standard Solution. All Myron L conductivity Standard Solution bottle labels show three values: ppm **442**, ppm **sodium chloride**, and **conductivity** in micromhos.

442: Unless otherwise specified, the calibration used for all DS Meters is the "442" standard. The 442 Standard Solutions consist of the following salt ratios: 40% sodium sulfate, 40% sodium bicarbonate, and 20% sodium chloride. This salt ratio has conductivity characteristics approximating natural waters and was developed by the Myron L Company over two decades ago.

Sodium Chloride: For every ppm 442 Standard Solution there is a ppm sodium chloride (NaCl) solution which will have the same conductivity. The parts per million of the equivalent NaCl solution is on each Standard Solution label. Instruments calibrated to NaCl standards are set using equivalent NaCl values.

Conductivity: All Myron L Company Conductivity Standard Solutions are within 1.0% of Potassium Chloride reference solutions. The concentrations of the reference solutions are calculated from data in the International Critical Tables, Vol. 6.

pH STANDARD BUFFER SOLUTIONS: Ready to use, Myron L Company pH buffer solutions are mold inhibited and accurate to within +0.06 pH units @ 25°C. They are traceable to National Bureau of Standards certified pH references and are color-coded for instant identification.

RECOMMENDED STANDARD SOLUTIONS

MODEL/RANGE SOLUTION NUMBER

T2/pH

TOTAL DISSOLVED SOLIDS:

X 10	442-30
X 100	442-300
X 1000	442-3000
with Re-10	442-30,000

pH ZERO
pH GAIN

7 buffer
4 buffer
10 buffer



T6/pH

TOTAL DISSOLVED SOLIDS:

with RE-10	442-3000
	442-30,000

pH ZERO
pH GAIN

7 buffer
4 buffer
10 buffer

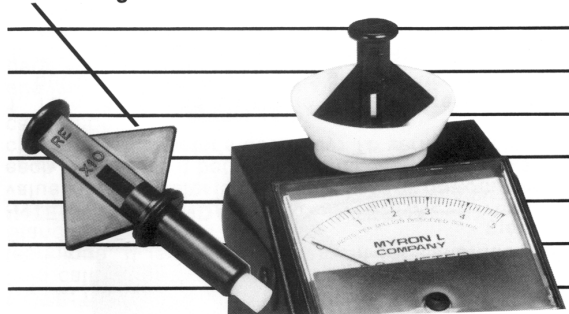
RANGE EXTENDER

The RE-10 Range Extender is a useful accessory for testing high conductivity solutions beyond the normal range of your pDS meter. Inserting the RE-10 into a sample-filled cell cup increases the maximum range ten times. Use the Range Extender whenever the reading is off the scale.

USING THE RE-10

1. Fill the cell cup three times to rinse it, but each time insert the Range Extender to rinse it also.
2. Fill the cell cup with your sample. Push the Range Extender into the cell cup, seating the O-ring seal.
3. Use and read the pDS Meter in the normal manner. Multiply the reading by 10.
4. For best accuracy, repeat the complete test with a fresh sample.
5. When finished, remove the Range Extender. Thoroughly rinse the cell cup and Extender with clean water (preferably distilled or deionized) to eliminate dried salts build-up. This is extremely important when the instrument will be used to test high purity water.

RE-10 Range Extender



CALIBRATING THE RE-10

1. Calibrate your meter (without RE-10) using Standard Solution number 442-3000.
2. Fill cell cup with 442-30,000 Standard Solution.
3. Insert RE-10 and press the button. Multiply the reading by 10 and compare it with the value on the Standard Solution label. If they are not the same, the RE-10 must be recalibrated.

NOTE: DO NOT adjust the Conductivity Calibration Control.

4. Adjust the white insert of the Extender as follows: If the reading is too high—push or tap inward.

If the reading is too low—twist or pull outward with pliers.

NOTE: The Range Extender is factory calibrated to a particular meter. It should be recalibrated if it is to be used with another meter.

PORTA PAK

Carrying Case for use with all Myron L DS and pDS meters, is foam-lined and molded of sturdy ABS plastic.



REPLACEMENT pH SENSORS

Order **Model RPY** for either T2/pH or T6/pH meters. When ordering, be sure to include the model and serial number of your meter to ensure receiving the proper type. Complete installation instructions are provided with each replacement sensor.

ORDERING

To order accessories contact your nearest stocking distributor, or the Myron L Company.

WARRANTY & SERVICE

Myron L pDS meters, excluding the pH sensor, have a two-year warranty. **The pH sensor has a 6 month limited warranty.** If an instrument fails to operate properly, check the batteries, calibrations, and cleanliness of the pH sensor bulb. If it still fails to properly function, return it prepaid to the Myron L Company.

If, in the opinion of the factory, failure was due to materials or workmanship, repair or replacement will be made without charge. A reasonable service charge will be made for diagnosis or repairs due to normal wear, abuse or tampering. This warranty is limited to the repair or replacement of the Myron L pDS meter only. The Myron L Company assumes no other responsibility or liability.

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