

- Under range. A blinking “0.00” indicates that the sample absorbs less light than the zero reference. Check the procedure and make sure you use the same cuvet for reference (zero) and measurement.
- A flashing value of the maximum concentration indicates an over range condition. The concentration of the sample is beyond the programmed range: dilute the sample and re-run the test.



## BATTERY REPLACEMENT

Battery replacement must only take place in a non-hazardous environment.

Simply rotate the battery cover on the back of the meter.

Detach the battery from the terminals and attach a fresh 9V battery while paying attention to the correct polarity. Insert the battery and replace the cover.



## ACCESSORIES

<b>MI512-100</b>	Phosphate low range reagent (100 tests)
<b>MI0001</b>	Glass cuvetts (2 pcs)
<b>MI0002</b>	Caps for cuvetts (2 pcs)
<b>MI0003</b>	Stoppers for cuvetts (2 pcs)
<b>MI0004</b>	Tissue for wiping cuvetts (4 pcs)
<b>MI0005</b>	9V battery (1 pc)

## CERTIFICATION

Milwaukee Instruments conform to the CE European Directives.

**Disposal of Electrical & Electronic Equipment.** Do not treat this product as household waste. Hand it over to the appropriate collection point for the recycling of electrical and electronic equipment.

**Disposal of waste batteries.** This product contains batteries. Do not dispose of them with other household waste. Hand them over to the appropriate collection point for recycling.

Please note: proper product and battery disposal prevents potential negative consequences for human health and the environment. For detailed information, contact your local household waste disposal service or go to [www.milwaukeeinstruments.com](http://www.milwaukeeinstruments.com) (USA & CAN) or [www.milwaukeeinst.com](http://www.milwaukeeinst.com).



RoHS  
compliant



## RECOMMENDATION

Before using this product, make sure it is entirely suitable for your specific application and for the environment in which it is used. Any modification introduced by the user to the supplied equipment may compromise the meter's performance. For your and the meter's safety do not use or store the meter in hazardous environment. To avoid damage or burn, do not perform any measurement in microwave ovens.

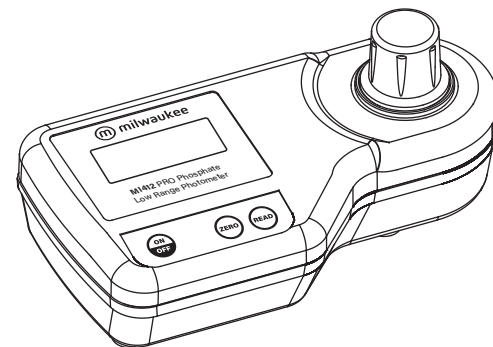
## WARRANTY

These instruments are warranted against defects in materials and manufacturing for a period of 2 years from the date of purchase. This warranty is limited to repair or free of charge replacement if the instrument cannot be repaired. Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered by warranty. If service is required, contact your local Milwaukee Instruments Technical Service. If the repair is not covered by the warranty, you will be notified of the charges incurred. When shipping any meter, make sure it is properly packaged for complete protection.

# USER MANUAL

## MI412

### PRO Phosphate Low Range Photometer



[milwaukeeinstruments.com](http://milwaukeeinstruments.com) (USA & CAN)  
[milwaukeeinst.com](http://milwaukeeinst.com)



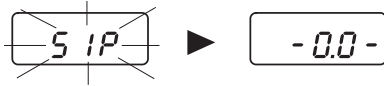
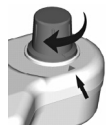
Dear Customer,  
Thank you for choosing a Milwaukee Instruments product. This manual will provide you with the necessary information for the correct use of the instrument. Please read it carefully before using the meter.

## SPECIFICATIONS

Range	0.00 to 2.50 mg/L PO <sub>4</sub>
Resolution	0.01 mg/L
Precision	±0.07 mg/L @ 1.00 mg/L
Light Source	Tungsten lamp
Light Detector	Silicon Photocell and 610 nm narrow band interference filter
Method	Adaptation of ascorbic acid method
Environment	0 to 50 °C (32 to 122 °F) 100% RH max
Battery Type	9 volt (1 pc)
Auto-Shut off	After 10' of non-use
Dimensions	192 x 104 x 52 mm (7.5 x 4.1 x 2")
Weight	380 g

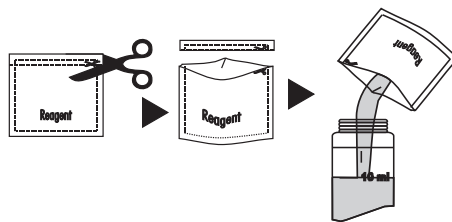
## MEASUREMENT PROCEDURE

1. Turn the meter on by pressing ON/OFF.
2. When the LCD displays "- - -", the meter is ready.
3. Fill the cuvet with 10 mL of sample, up to the mark, and replace the cap.
4. Place the cuvet into the holder and ensure that the notch on the cap is positioned securely into the groove.
5. Press ZERO and "SIP" will blink on the display.
6. After a few seconds the display will show "-0.0-". The meter is now zeroed and ready for measurement.



7. Remove the cuvet. Open it.

8. Add the content of one packet of MI512-0 reagent.



9. Reinsert the cuvet into the holder and ensure that the notch on the cap is positioned securely into the groove.



10. Press and hold READ for 3 seconds and the display will show the countdown prior to the measurement. Alternatively, wait for 3 minutes and just press READ. In both cases "SIP" will blink during measurement.



11. The instrument directly displays concentration in mg/L of phosphate.

## Interferences

- Iron above 50 mg/L
- Silica above 50 mg/L
- Silicate above 10 mg/L
- Copper above 10 mg/L
- Hydrogen sulfide, arsenate, turbid sample and highly buffered samples also interfere.

## GUIDE TO DISPLAY CODES

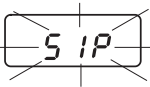
This prompt appears for 1 second each time the instrument is turned on.



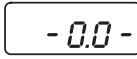
The dashes "- - -" indicates that the meter is in a ready state and zeroing can be performed.



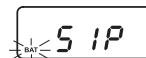
Sampling In Progress. Flashing "SIP" prompt appears each time the meter is performing a measurement.



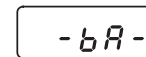
"-0.0-", the meter is in a zeroed state and measurement can be performed.



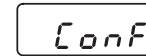
The blinking "BAT" indicates that the battery voltage is getting low and the battery needs to be replaced.



"-bA-", the battery is dead and must be replaced. Once this indication is displayed, the meter will lock up. Change the battery and restart the meter.



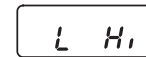
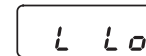
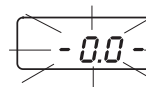
"Conf", the meter has lost its configuration. Contact your dealer or the nearest Milwaukee Customer Service Center.



## ERROR MESSAGES

### On zero reading

- Blinking "-0.0-" indicates that the zeroing procedure failed due to a low signal-to-noise ratio. In this case press ZERO again.
- "no L", the instrument can not adjust the light level. Please check that the sample does not contain any debris.
- "L Lo", there is not enough light to perform a measurement. Please check the preparation of the zero cuvet.
- "L Hi", there is too much light to perform a measurement. Please check the preparation of the zero cuvet.



### On sample reading

- "-SA-", there is too much light for the sample measurement. Please check if the right sample cuvet is inserted.
- "Inv", the sample and the zero cuvet are inverted.
- "ZEro", a zero reading was not taken. Follow the instruction in the measurement procedure for zeroing the meter.

