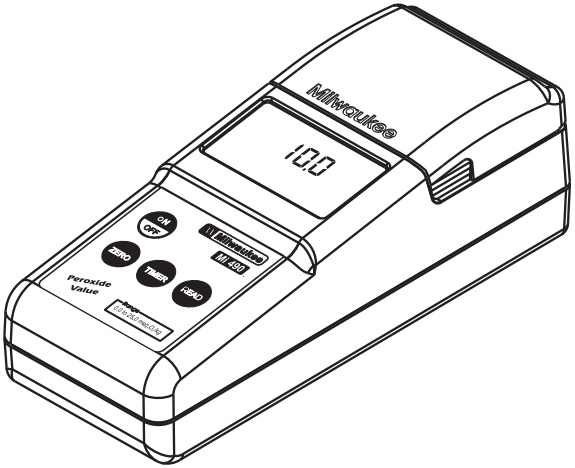
INSTRUCTION MANUAL

Milwaukee Lab Photometer

Mi490
Peroxide value



CE

Milwaukee

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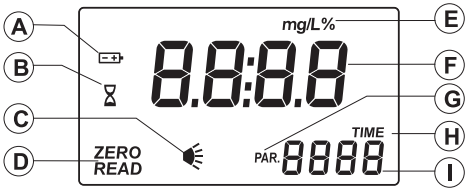

FRONT PANEL

A. LID
B. CUVET HOLDER
C. LIQUID CRYSTAL DISPLAY (LCD)
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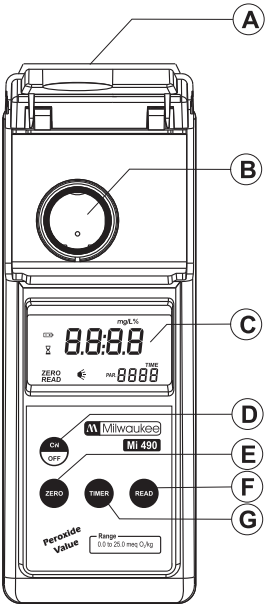


GENERAL DESCRIPTION

Thank you for choosing Milwaukee. This instruction manual will provide you the necessary information for correct use of the meter.

The **Mi490** is an auto-diagnostic portable microprocessor meter. It has an advanced optical system based on a special tungsten lamp and a narrow band interference filter that allows most accurate and repeatable readings. All instruments are factory calibrated.

The auto-diagnostic feature of this meter ensures always optimal measurement conditions to ensure most precise readings. The light level is automatically adjusted each time a zero-measurement is made, and the temperature of the lamp is controlled to avoid overheating.

SIGNIFICANCE OF USE

Peroxides are the primary products of oil oxidation. Their identification gives useful informations about oil conservation and rancidity. **Mi490** allows fast and simple analyses of peroxides in oil in accordance with the EC 2568/91 method.

Oil peroxides content

< 10 meq O_2/kg	excellent conservation
10-15 meq O_2/kg	good conservation
< 10 meq O_2/kg	refined oil
> 20 meq O_2/kg	rancid oil

This meter is supplied with:

- Reagents for 10 tests (Mi490A-0, Mi490B-0)
- Four graduated 1 mL syringes
- Tissue for wiping vials
- Four 1.5V AA batteries
- Instruction Manual
- Instrument Quality Certificate
- Warranty Card

SPECIFICATIONS

Range	0.0 to 25.0 meq O_2/kg
Resolution	0.5 meq O_2/kg
Accuracy	±0.5 meq O_2/kg
Light Source	Tungsten lamp
Light Detector	Silicon Photocell with narrow band interference filter @ 466 nm
Method	adaptation of EC 2568/91 method and following amendments. The reaction between sample and reagent causes a color variation, proportional to the peroxide content expressed in meq O_2/kg.
Environment	0 to 50 °C (32 to 122 °F) ; max 95% RH non-condensing
Battery Type	4 x 1,5 volt AA batteries
Auto-Shut off	After 15' of non-use in *measurement mode*.
Dimensions	225 x 85 x 80 mm (8.7 x 3.3 x 3.1")
Weight	500 g (17,6 oz.).

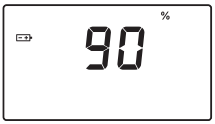
This instrument is in compliance with CE Directives.

Required Reagents

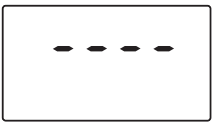
Code	Description	Quantity/test
Mi490A-0	Peroxide Reagent A	1 vial
Mi490B-0	Peroxide Reagent B	1 packet

GUIDE TO DISPLAY CODES

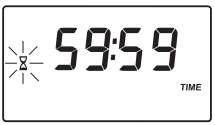
This prompt appears for a few seconds each time the instrument is turned ON.



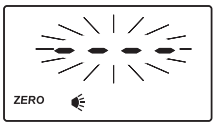
This prompt indicates the battery capacity value.



Indicates that the instrument is in a ready state and waiting for the next command (Timer or Zero).

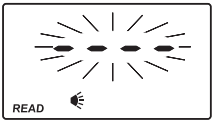


After Timer is pressed, a blinking hourglass icon appears and the display shows a 60 minutes coundown. At the end of the countdown an acoustic signal alerts the user that the timer is finished.

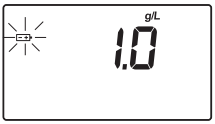


Indicates that the meter is performing a zero measurement. The light intensity is automatically re-adjusted (auto-calibration features) if necessary.

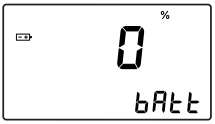
The instrument is zeroed and a measurement can be made.



Indicates that the meter is making a measurement.



Batteries voltage is getting low and the batteries need to be replaced.

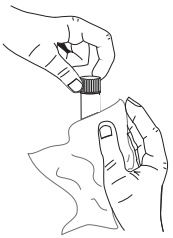


Indicates that the batteries are dead and must be replaced. After this message appears, the instrument is switched off. Change the batteries and restart the meter.

GENERAL TIPS FOR AN ACCURATE MEASUREMENT

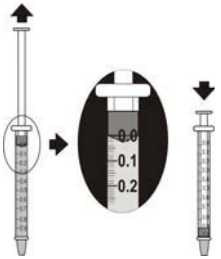
The instructions listed below should be carefully followed during testing to ensure best accuracy.

- The official method EC 2568/91 recommends to work at room temperature, between 15 and 25 °C.
- Whenever the vial is placed into the measurement cell, it must be dry outside, and completely free of fingerprints, oil or dirt. Wipe it thoroughly with **Mi0004** (tissue for wiping cuvets, see chapter ACCESSORIES) or a lint-free cloth prior to insertion.



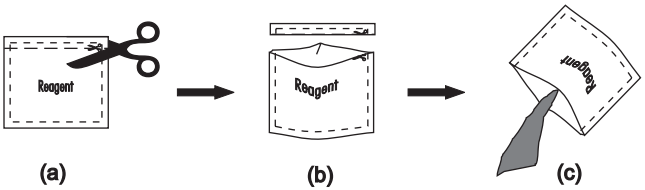
- In order to avoid reagent leaking and to obtain more accurate measurements, it is recommended to close the cuvet very well with the cap.
- In order to measure exactly 1 mL of oil:
  (a) Push the plunger completely into the syringe.
  (b) Insert the syringe in the oil and push the plunger up and down twice to rinse and eliminate air bubbles; then pull the plunger up until the lower edge of the seal is exactly on the 0.0 mL mark.

(c) Take out the syringe and clean the outside of the syringe tip. Then, keeping the syringe in vertical position above the vial, push the plunger completely down into the syringe.



- Proper use of the powder reagent packet:

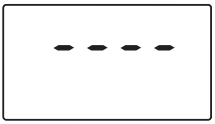
(a) use scissors to open the powder packet;
(b) push the edges of the packet to form a spout;
(c) pour out the content of the packet.



MEASUREMENT PROCEDURE

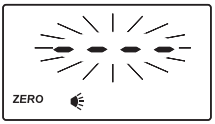
READ THE ENTIRE INSTRUCTIONS BEFORE USING THE KIT

- Remove the cap from a vial of **Mi490A-0** Peroxide reagent.
- Use the graduated syringe to add exactly 1 mL of oil. For a correct use of the syringe, please see "General tips for an accurate measurement".
- Add the sample to the vial and replace the cap.
- Mix by inverting the vial twice.
- Turn on the meter by pressing the **ON/OFF** key. When the LCD displays "---", it is ready.



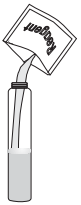
- Place the vial into the instrument.

- Press the **ZERO** key and "----" will blink on the display.

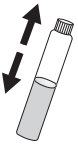


- After a few seconds the display will show "-0.0-". The meter is zeroed and ready for measurement. Remove the vial.

- Remove the cap from the vial and add one packet of **Mi490B-0** Peroxide reagent.



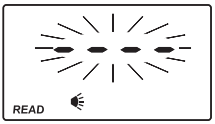
- Replace the cap and press **TIMER** to start the countdown.
- Mix VIGOROUSLY for 1 minute.



- Insert the vial into the instrument and wait for 5 minutes.

Note: 30 seconds before countdown finishes, invert the vial twice.

- When the countdown finishes, the meter makes the reading. If you have not used the **TIMER** key, press **READ** to make the measure. In both cases the display will show "----" during the measurement.
- The meter directly displays the peroxide value in meq O_2/kg on the LCD.



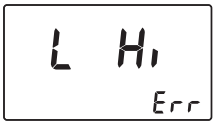
Notes:

- To convert the reading to mmol O_2/kg multiply the reading by 0.5.
- To convert the reading to mg O_2/kg multiply the reading by 8.

ERROR MESSAGES

The meter has lost its configuration. Contact your dealer or the nearest Milwaukee Instruments Customer Service Center.

on zero reading:



"Light high": there is too much light to perform a measurement. Please check the preparation of the zero cuvet.

"Light low": there is not enough light to perform a measurement. Please dilute the sample five times (see "General tips for an accurate measurement", page 8).

"No Light": the instrument cannot adjust the light level. Please check that the sample does not contain any debris.

on sample reading:

"Inverted": the sample and the zero cuvet are inverted.

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 measure again.

BATTERY REPLACEMENT

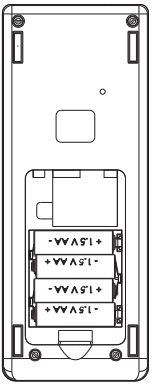
Battery replacement must only take place in a non-hazardous area.

The blinking "⊟+" will appear when the batteries power gets low.

When batteries are completely discharged, "0% bAtt" will appear and after two seconds the instrument is switched off.

Remove the battery cover from the bottom of the instrument and change the old batteries with 4 fresh 1.5V batteries, paying attention to the correct polarity.

Replace the cover.



ACCESSORIES

Reagent sets

Mi590-021 Peroxides reagents (21 tests)

OTHER ACCESSORIES

Mi0006 1.5V AA batteries (4 pcs)

Mi0004 Tissue for wiping cuvets (4 pcs)

The chemicals contained in this kit may be hazardous if improperly handled. Read the relevant Health and Safety Data Sheet before performing this test.
For your Safety don't use or store the instrument in hazardous environments. To avoid damages or burns, do not perform any measurement in microwave ovens.

WARRANTY

This instrument is warranted against defects in materials and manufacturing for a period of 2 years from the date of purchase.
If during this period the repair or replacement of parts is required, where the damage is not due to negligence or erroneous operation by the user, please return the intrument to either distributor or our office and the repair will be effected free of charge.
Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered by the warranty.

Milwaukee/Martini instruments reserves the right to make improvements in design, construction and appearance of its products without advance notice.

THANK YOU FOR CHOOSING

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