Instruction Manual

Handheld Refractometer 402 ATC

- to check freeze point of fluids

Refractometer 402 ATC is intended for measuring frost protection of antifreeze fluids, windshield washer fluids and battery electrolyte.

With the percent concentration shown you can find out the freezing temperature for both ethylene glycol (left-side scale, used as antifreeze mostly in Europe) and propylene glycol (right-hand scale, used as antifreeze outside Europe).

It can be also used to measure electrolyte concentration in car batteries following the middle scale that shows the specific density of the battery electrolyte. The scale text also suggests what to do next with the battery.

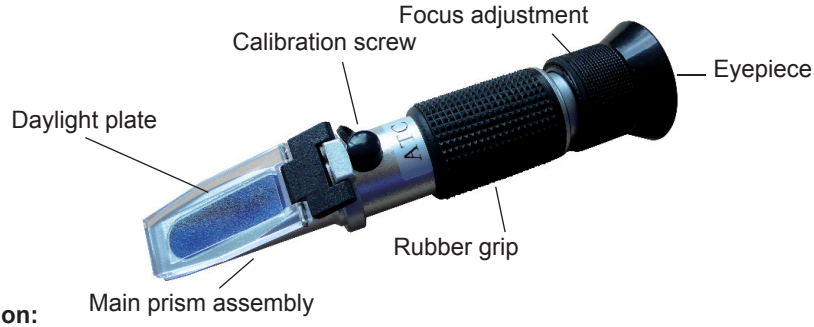
GOOD

FAIR

RECHARGE

Model	Measurement range:	Accuracy:
402 ATC	ethylene glycol -50 až 0 °C	ethylene glycol 10 °C
	propylene glycol -50 až 0 °C	propylene glycol 5 °C
	battery fluid 1,10-1,40 sg	battery fluid 0,01 sg

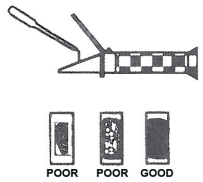
Refractometer parts



Operation:

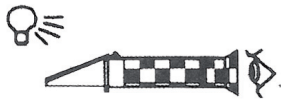
Step 1:

Open the daylight plate and place 2-3 drops of distilled water on the main prism. Close the daylight plate so the water spreads across the entire surface of the prism without bubbles or dry spots. Allow the sample to temperature adjust on the prism for approx. 30 sec. before going to Step 2. (This allows the sample to adjust to the ambient temperature of the refractometer.)

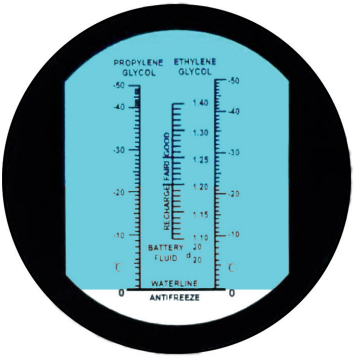


Step 2:

Hold the refractometer in the direction of a natural light source and look into the eyepiece. You will see a circular field with graduations down the center. You may have to focus the eyepiece to clearly see the graduations.



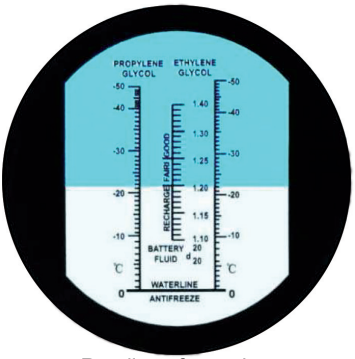
The upper portion of the field should be blue, while the lower portion should be white.
This can be seen when looking into the instrument.



Calibration to zero

Step 3:
Looking into the eyepiece, turn the calibration screw until the boundary between the upper blue field and the lower white field meet exactly at ZERO on the scale, as in the picture. That is the end of the calibration process. Make sure the ambient temperature is correct for the solution (20 °C). When working temperature of the room or environment (not the sample) changes by more than 5 °F, we recommend recalibrating to maintain accuracy. If the instrument is equipped with Automatic Temperature Compensation (ATC), the ambient working temperature must be 20 °C for each calibration. Once such an instrument is calibrated, shifts in ambient temperature within the acceptable range (10-30 °C) should not affect accuracy.

Step 4:
Now place a few drops of the sample to be tested on the main prism, close the daylight plate and check reading. Take the reading where the boundary line of blue and white cross the graduate scale.



Reading of sample

Warning - Maintenance

1. Accurate measurement depends on careful calibration. The prism and sample must be of the same temperature for accurate results.
2. Do not expose the instrument to damp working conditions and do not immerse it into water. If the instrument becomes foggy, water has entered the body. Call a qualified service technician or contact your dealer.
3. Do not attempt to measure abrasive or corrosive fluids with this instrument, they can damage the prism's coating.
4. Clean the instrument after each measurement using a soft damp cloth. Failure to clean the prism on regular basis will lead to inaccurate results and damage to the prism's coating.
5. This is an optical instrument requiring careful handling and storage. Failure to do so can result in damage to the optical components and its basic structure. With care, this instrument will provide years of reliable service.

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