

OPERATING INSTRUCTION SHEET HAND REFRACTOMETER

This optical refractometer is designed for checking the concentration of antifreeze and battery acid but also Adblue.

- Designed for checking the concentration of Adblue.
- Urea additive in the exhaust flow which reduces NOx-emissions.

⚠ WARNING! To prevent equipment failure or damage resulting in personal injury:



- Read and follow all warnings in this instruction sheet before operating this unit. If the operator cannot read English, operating instructions and safety precautions must be read and discussed in the operator's native language.



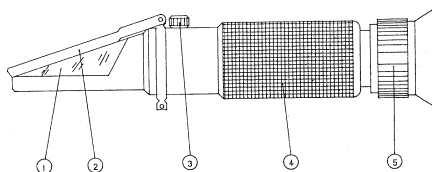
- Always wear eye protection and protective clothing when working with refrigerants and sulphuric acid. Contact with refrigerants and sulphuric acid may cause personal injury.



- Do not drink antifreeze (propylene or ethylene glycol base) or solution (sulphuric acid base). If swallowed, give two glasses of water and induce vomiting. Call a physician.

SPECIFICATIONS

Style:	Battery/Coolants
Model:	Art.no: 822001
Range:	- 60 °F ~ 32 °F / 1.15 ~ 1.30 sg
Resolution:	10 °F; 0.01 sg
Adblue:	30%~35%
Ethylene Glycol:	-50°C-0°C
Propylene Glycol:	-50°C-0°C
Cleaning Fluids:	-40°C-0°C
Battery Fluids:	1.100-1.400sg
Resolution Factor:	0.5% 5°C,5°C,5°C,0.01sg
Size:	27 x 40 x 160 mm
Weight:	176 g



1. Prism
2. Cover plate
3. Correction screw
4. Mirror tube (holds the reticle scale)
5. Eyepiece (focusing ring of diopter)

Accessories

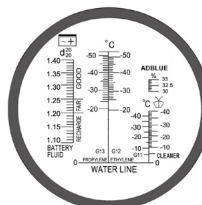
Eyeshade	Screw driver	Leather cover
Glass rod	Soft cloth	

Application

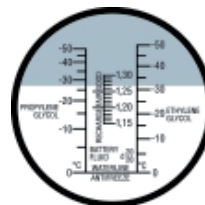
The Sonic Hand Refractometer is a portable, precision optical instrument used for measuring the freeze point of engine coolant and the operation state of battery charging liquid. It is used on transportation vehicles, such as cars, tractors, tanks, ships, etc., which use propylene or ethylene glycol for coolant and sulphuric acid for charging liquid.

When a liquid (such as coolant or charging liquid) is placed on the prism, the light passing through it is bent. The more concentrated the liquid, the more the light will bend. The refractometer contains a reticle, or scale, that is enlarged through the eyepiece to measure this bent light.

The values of the scale have been established to measure the coolant or charging liquid.



The reticle without any liquid on the prism.



The reticle with liquid on the prism. The reading is taken at the point the shadow line crosses the scale.

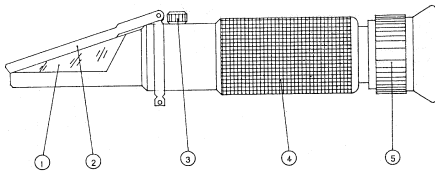
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Operating Instructions

Use the following instructions to operate the Sonic Hand Refractometer.

IMPORTANT: Read and understand all Operating Instructions and Helpful Hints before operating the Refractometer.



1. Aim the front end (prism [1] and cover plate [2] end) of the refractometer toward a bright light; then adjust the focusing ring of the diopter (5) until the reticle (scale within the mirror tube) can be seen clearly.
2. To set the Hand Refractometer to a null or zero point -
 - (a) Open the cover plate.
 - (b) Place one or two drops of pure distilled water on the surface of the prism.
 - (c) Close the cover plate and press it lightly.
 - (d) Through the eyepiece, observe where the shadow line falls.
 - (e) If necessary, adjust the correction screw (3) with the screw driver provided to make the shadow line coincide with the water line.



The Hand Refractometer should now have a null point, and you are ready to begin measuring.

3. Open the cover plate, and wipe the water off the surfaces of the prism and cover plate with the soft cloth that is provided.
4. Then place one or two drops of the liquid needed to be measured on the prism surface.

⚠ WARNING: To prevent personal injury, use glass rod provided when measuring battery liquid.

Close the cover plate and press it lightly. The reticle reading on the shadowline is the freeze point of the liquid, or an indication of the operation state of the battery liquid.

5. After measurements are taken, wipe the liquid completely from the prism surface with the soft cloth and let dry.

⚠ CAUTION: To prevent damage to the refractometer, do NOT use water to wash the instrument.

6. Replace the refractometer in its case, and store it in a dry, clean area.

Helpful Hints and Maintenance

- The distilled water and the liquid to be measured should be at the same temperature.
- Null point should be adjusted once every 30 minutes.
- Clean prism completely to prevent residual impurities, which could cause error during measuring.
- The refractometer is a precision optical instrument; handle with care. Do NOT touch the optical surfaces.
- Avoid strong shock during transportation.