

Hand Refractometer

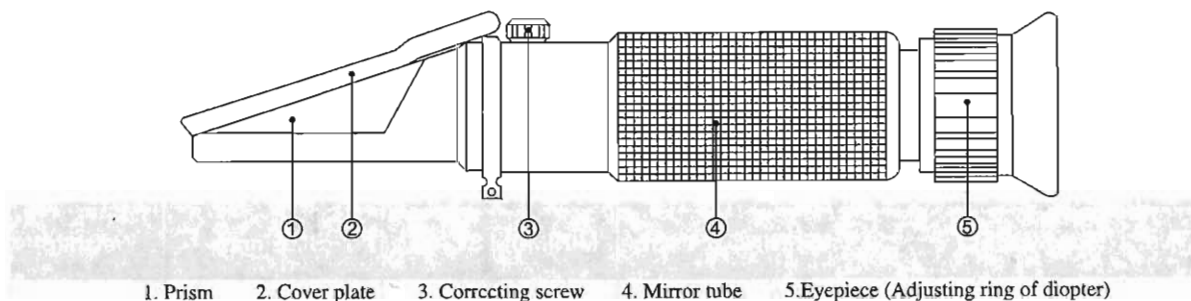
Instructions Operating

Series _____

No.	MODEL	MEASURING RANGE	MINIMUM SCALE	SIZE(mm)	Weight(g)
1	REF401/411/401bp	E32~-60°F P32~-50°F B1.15~1.30kg/L	-10°F -10°F 0.01kg/L	26/30x40x160	180
2	REF401K/411K	E32~-60°F(0~59%) P32~-60°F(0~63%) B1.15~1.30kg/L	-5°F -5°F 0.01kg/L	26/30x40x160	180
3	REF401A/411A	E32~-84°F P32~-60°F B1.100~1.400kg/L	-5°F -5°F 0.01kg/L	26/30x40x160	180
4	REF402/412/402bp	E/P 0~-50°C B1.15~1.30kg/L	-5°F 0.01kg/L	26/30x40x160	180
5	REF420A/412A	E0~-60°C P0~-50°C B1.100~1.400kg/L	-5°C -5°C 0.01kg/L	26/30x40x160	180
6	REF402K/412K	E0~-50°C(0~58.4%) P0~-50°C(0~62.4%) B1.15~1.30kg/L	-5°C -5°C 0.01kg/L	26/30x40x160	180
7	REF403A/413A	E/P 0~-50°C C 0~-50°C B1.10~1.40kg/L	-5°C -5°C 0.01kg/L	26/30x40x160	180
8	REF404/414/404bp	E/P 0~-50°C C 0~-40°C B1.100~1.400kg/L	-10°C -5°C 0.01kg/L	26/30x40x160	180
9	REF405A/415	E/P 0~-50°C E/P32~-60°F B1.10~1.40kg/L	-5°C -10°C 0.01kg/L	26/30x40x160	180
10	REF408/418	E/P/C 0~-50°C E/P/C32~-60°F B1.15~1.30kg/L	-5°C -10°C 0.01kg/L	26/30x40x160	180

Note: 1. Each of the models in Series catalog with footnote "bp" has a prism base made of black engineering plastics.
2. "Weight" listed here refers to the weight of plain type refractometer.

Name of components



USE

Portable Refractometer model REF 401~408 are a precision optical instrument especially for measuring the ice point of engine coolant and the operation state of battery charging liquid. It suitable for transportation vehicles, such as car, tractor, tank, ship etc, which use ethylene glycol as coolant, sulphuric acid as charging liquid. It is characterized by small volume, light weight and easy to operate, therefore it can be used from all sides.

METHOD OF OPERATION

1. Aim the front end of the refractometer to the direction of bright, and adjust the adjusting ring of diopter 5 until the reticle can be seen clearly.

2. Adjustment of null

Open the cover plate 2, drop one or two drops of pure distilled water on the surface of the prism. Close the cover plate and press it lightly, then adjust the correct screw 3 to make the light/dark boundary coincide with the water line.

3. Open the cover plate 2 and wipe the water off the surfaces of the prism and cover plate by emery cloth, then drop one or two drops of the liquid needed to test on the prism surface, close the cover plate and press it lightly. The corresponding dial reading on the light/dark boundary is the ice point of the liquid, or the indication of the operation state of battery liquid.

4. After measuring, wipe the liquid off the prism surface by emery cloth. After drying, please keep appropriately in store.

ATTENTIONS AND MAINTENANCE

1. Adjusting the null liquid and specimen should be under the same temperature, if the temperature varied greatly, the null point should be adjusted once per 30 minutes.

2. The prism must be cleaned completely. Because any residual impurity on it could cause error during measuring.

3. Because the battery liquid contains sulphuric acid, it must be dipped in by glass rod instead of your hand to avoid hurt of you.

4. After usage, don't use water to wash the instrument, so as to avoid water entering into pipe of the instrument.

5. As it is a kind of precision optical instrument, you should handle it gently and take good care of it. Don't touch and scratch the optical surfaces. It should be kept in the environment of dry, clean and non-corrosive air, so as to prevent the surface of it turning mouldy and foggy, please avoid strong shock during transportation.

6. If the consumers use the instrument in accordance with the mentioned usage, it guarantees that the instrument can't break down. The optical performance can't change.

Temperature Compensation

REF411-418 Model has a built-in automatic temperature compensation system. Compensation temperature range 10°C to 30°C

Accessories

1. Cleaning cloth	1
2. Suction tube	1
3. Screw driver	1