

# PORTABLE REFRACTOMETER OPERATING INSTRUCTIONS

## SERIES

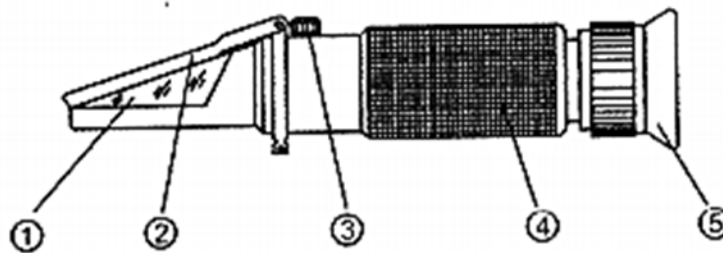
STYLE	MODEL (ATC)	MEASURING RANGE	RESOLUTION	SIZE Ø×L	WEIGHT
Battery/ Coolants/ Cleaner	FG401/411	1.15-1.30sg 32°F - - 60°F	0.01sg 10°F	Ø29×148mm	175g
	FG402/412	1.15-1.30sg 0°C - - 50°C	0.01sg 5°C	Ø29×148mm	175g
	FG403/413	1.15-1.30sg 0°C - - 50°C 0°C - - 40°C	0.01sg 5°C 5°C	Ø29×148mm	175g
	FG404/414	1.10-1.40kg/l 0°C - - 50°C 0°C - - 40°C	0.01kg/l 5°C 10°C	Ø29×148mm	175g

Ordinary: If the condition temperature isn't 20°C, it need to adjust the zero for the measuring accuracy.

ATC(Automatic Temperature Compensation): The ATC device is a built-in type. Its compensation temperature range: 10°C~30°C

## NAME OF COMPONENTS

1.Prism 2.Cover plate 3.Correct screw 4.Mirror tube 5.Eyepiece(Adjusting ring of diopter)



## APPLICATION

Portable Refractometer model FG401/411(402/412,403/413,404/414)are a precision optical instrument especially for measuring the ice point of engine coolant and cleaner, and the operation state of battery charging liquid. It suits to 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.

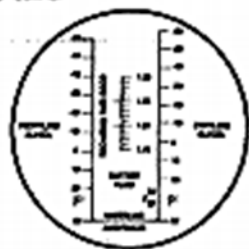
## METHOD OF OPERATION

1. Aim the front end of the refractometer to the direction of bright light, 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 clean the water on the prism and cover plate by soft cotton flannel, 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 measurement, clean away the adherent on the surface of prism and cover plate by moist gauze. After drying, it should be stored perfectly.

## 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. After usage, don't use water to wash the instrument, so as to avoid water entering into the pipe of the instrument.
4. As it is a kind of precision optical instrument, you should hand 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-corrosiveness air, so as to prevent the surface of it turning mouldy and foggy. Please avoid strong shock during transportation.
5. If the consumers use the instrument in accordance with the mentioned method of usage, it guarantee that instrument can't break down, the optical performance can't change.
6. Take particular care when testing the battery liquid. Because it contains sulphuric acid, it must be dipped in by plastic pipette, don't let it come into contact with the eyes and skin-this could be harmful.

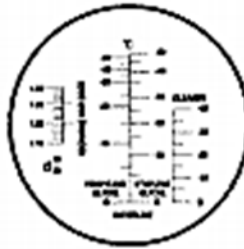
## DIALS



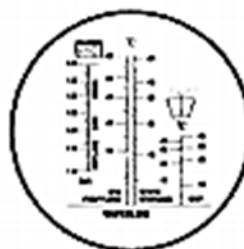
FG401/FG411



FG402/FG412



FG403/FG413



FG404/FG414

## ACCESSORY:

1. Plastic pipette 2
2. Screw driver 1
3. Cotton flannel 1