



# REFRACTOMETER

## 10645

**Version 1:** January 2013  
First release

**Version 2:** November 2023  
Template change

Read this manual in full before using this product and retain it for future use. Always use the latest version of the manual. Please visit [drapertools.com/manuals](http://drapertools.com/manuals) for the latest version.

### 1. Intended Use

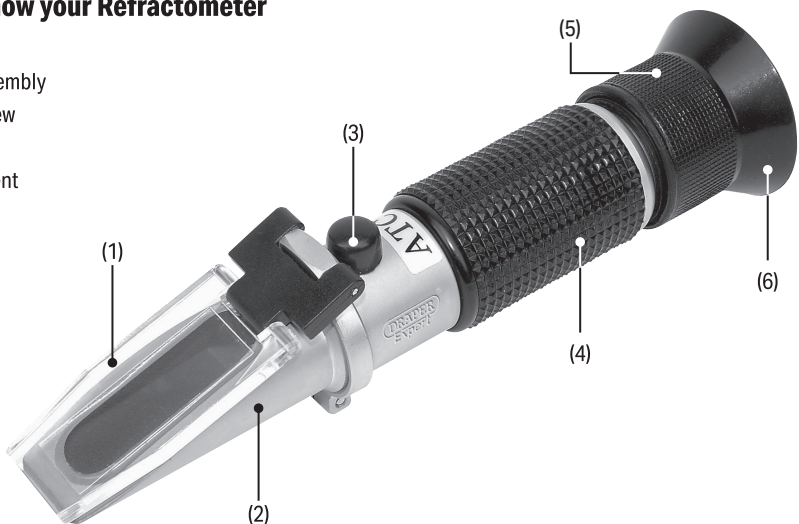
For accurately measuring the strength of battery fluid, antifreeze and screen wash. Any other application beyond the conditions established for use will be considered misuse. Draper Tools accepts no responsibility for improper use of this product.

### 2. Specification

Stock No.	10645
Part No.	RFR
Measuring range of screen wash	0 – -40°C
Measuring range of anti-freeze	0 – -50°C
Fineness of anti-freeze	+/- 2.5°C
Measuring range of battery fluid specific gravity	1.10 – 1.40
Fineness of battery fluid specific gravity	+/- 0.1

### 3. Getting to know your Refractometer

- (1) Cover plate
- (2) Main prism assembly
- (3) Calibration screw
- (4) Rubber grip
- (5) Focus adjustment
- (6) Eyepiece



## 4. Maintenance

**WARNING!** – When testing battery fluid do not allow the fluid to come in contact with eyes or skin. Wear appropriate PPE as specified in the relevant Safety Data Sheet.

This is an optical instrument, it requires 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.

Do not expose the instrument to damp working conditions and do not immerse the instrument in water. If the instrument becomes foggy, water has entered the body. Call a qualified service technician or contact your dealer.

Clean the instrument between each measurement using a soft, damp cloth. Failure to clean the prism on a regular basis will lead to inaccurate results and damage to the prism's coating.

Do not measure abrasive chemicals with this instrument. They can damage the prism's coating.

Accurate measurement depends on careful calibration. The prism and test fluid sample must be at the same temperature for accurate results (20°C recommended).

## 5. Calibration

This refractometer is a precision optical measuring device. Before first use it must be calibrated. This device is fitted with Automatic Temperature Compensation (ATC) and must be initially calibrated at 20°C (68°F) ambient temperature for both the calibration fluid and the refractometer.

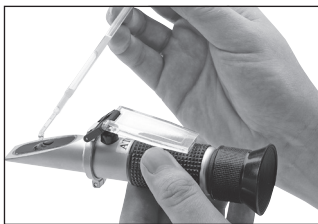


Fig. 1

Open cover plate and place 2-3 drops of calibration fluid (distilled water) on the main prism (Fig. 1). Close the cover plate so the water spreads across the entire surface of the prism without air bubbles or dry spots. Allow the sample to temperature adjust on the prism for approximately 30 seconds before proceeding further. (This allows the sample to adjust to the ambient temperature of the refractometer).

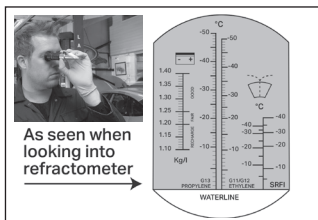


Fig. 2

Hold cover plate in the direction of a light source and look into the eyepiece. You will see a circular field with graduations down the centre (you may need to focus the eyepiece to clearly see the graduations). The upper measurement field should be blue, while the lower up to the waterline should be white (Fig. 2).

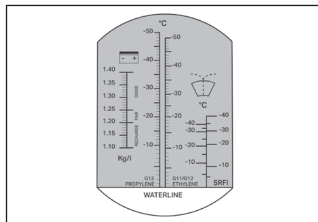


Fig. 3

Remove the rubber cap above the calibration screw and look into the eyepiece slowly turn the Calibration screw until the boundary between the upper blue field and the lower white field meet exactly on the waterline, shown in Fig.3. That is the end of the calibration process.

Once calibrated, shifts in ambient temperature within the acceptable range between 10°C-30°C should not affect accuracy. Recalibration can be conducted as required by the user.

## 6. Operation and Use

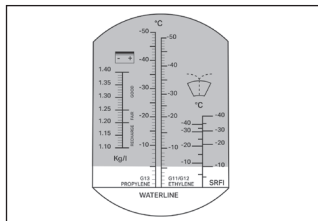


Fig. 4

Ensuring the prism and cover plate are clean and dry, place a few drops of the sample to be tested onto the main prism, close the cover plate and check reading. Take the reading where the boundary line of blue and white cross the graduated scale. The scale will provide a direct reading of the concentration on the relevant scale to the fluid being measured. After use, clean and dry the prism face and cover plate. Always store in carry case when not in use and do not drop or immerse in fluid as this will irrevocably damage the refractometer.

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