EXTECH®

USER MANUAL

RF153 Brix Meter
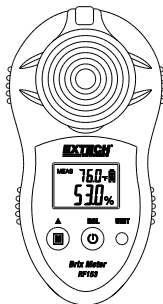
User Manual Translations available
at www.extech.com

$C \in$ RoHS COMPLIANT REACH (SVHC) IP65

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Table Contents

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1. Introduction

Thank you for selecting the Extech RF153 Brix Meter. We ship this meter fully tested. With proper use, it will provide years of reliable service.

1-1 Features

- Wide measurement range (Brix 0~53%)
- Sugar content (Brix%) display
- Refractive Index (RI) measurement
- High resolution (Brix 0.1%)
- Auto Temperature Compensation ATC
- Dual LCD display
- Low power consumption
- IP65 Splash/Dust-proof
- Automatic measurement function
- Memory mode automatically stores up to 10 readings
- Sapphire coating is abrasion and corrosion-resistant

1-2 Applications

- Sugar, food and beverage production inspection (fruit juices, soft drinks).
- Measure sugar concentration in cane, fruits, vegetables, etc.
- Measure sugar content of fruit and plants to determine maturity (helpful in seed selection, and fertilization).
- For use in canning factories, breweries, beverage plants, etc. for quality control inspections to determine the degree of sugar (Brix).
- For use in restaurants for sweetness control.
- Control the concentration of industrial fluids (cutting coolants, hydraulic fluids, and antifreeze) to prevent corrosion.

2. Safety ⚠

Read the following safety information carefully before attempting to operate or service the meter. Only qualified personnel should perform repairs.

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2-1 Safety Symbols

$C\!\!\in$ CE Certification.

RoHS Restricts the use of six substances within electrical and electronic equipment (EEE).

REACH (SVHC) This device does not use materials or substances identified by REACH to be potentially harmful or hazardous.

IP (Int'l Protection Classification) Conforms to the IP65 waterproof specification.

![battery disposal symbol] You, as the end user, are legally bound (**EU Battery ordinance**) to return all used batteries, **disposal in the household garbage is prohibited!** You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle.

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2-2 Warning ⚠

To avoid injury:

- Please read the manual carefully to ensure safe and correct use of this device.
- Do not disassemble or modify the meter.
- Do not attempt to repair the meter. Only qualified personnel may do so.
- This is high precision device, do not apply excessive force or pressure to the LCD or prism. Avoid shock and vibration.
- Do not use this meter near magnets or magnetic fields.
- Do not use the meter near an open flame or in flammable environments.
- Do not use this meter where the ambient temperature exceeds the recommended range of 10°C (50ºF) to 40°C (104ºF) or in areas where the Relative Humidity exceeds 80%.

- If the temperature of the liquid that you wish to measure is extreme, allow it to settle to a workable temperature before use.
- Do not use metal tools when sampling. Metals can damage the prism surface.
- The prisms are coated for protection; do not use acetone to clean the prism, as this will harm the coating.
- After use, please follow the user manual instructions for cleaning the prism. Close the prism cover when storing.
- If the meter is to be stored for a long period, remove the battery and close the prism cover.
- Never use organic solvents for cleaning.

3. Specifications

Model	Extech RF153
Sensor Element	Photodiode Array Detector
Measurements	Brix % Temperature (ºC/ºF) Refractive index (RI)
Ranges	
Brix % *Water* *4~60ºC* *(39~140ºF)*	0.0~53.0% (10~40ºC [50~104ºF] Automatic Temperature Compensation)
RI *Water* *4~60ºC* *(39~140ºF)*	1.3301~1.4374
Temperature	4.0~60.0ºC (39.0~140.0ºF)
Accuracy *(Water* *73.4ºF/23ºC)*	Brix ±0.2% Temperature ±1ºC(ºF) RI ±0.0003
Resolution	Brix: 0.1% Temperature: 0.1ºC(ºF) RI: 0.0001
Operating conditions	10~40ºC (50~104ºF) < 80% RH

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|	
Storage conditions	0～50ºC (32～122ºF) < 80% RH
Response time	3 seconds
IP rating	IP65 splash/dust-proof
Data Hold	Freezes displayed reading
Low battery indication	Four levels
Data storage	10 storage locations
Zero Function	Zeros the display
Auto Power Off	2 minutes (approximately)
Power supply	2 x 'AAA' batteries
Dimensions	113 x 60 x 38 mm (4.4 x 2.4 x 1.5")
Weight	120g (4.23 oz.) without battery
Accessories	Wrist strap, pouch, 2xAAA batteries, and user manual

4. Product Descriptions

4-1 Meter Description
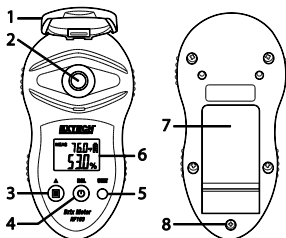
1. Prism Cover
2. Prism
3. Measure (short press) / Zero (long press) / Scroll up button (short presses in Memory mode only)
4. Power ON/OFF (long press) / RCL (short press to select Memory mode)
5. Unit button (short press for RI/BRIX; long press for temperature units)
6. LCD display
7. Battery cover
8. Battery compartment secure screw

4-2 LCD Description
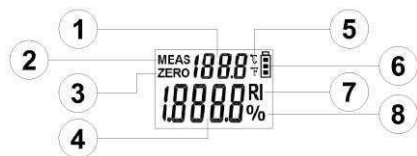
1. Temperature reading
2. Measurement mode
3. Zero function
4. Brix% or RI reading
5. Temperature units
6. Battery status
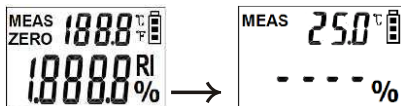7. Refractive index mode
8. Brix% mode

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5. Operation

5-1 Main Functions

Power ON∕OFF

Long press 🔘 to turn the meter on. All display symbols will appear for 2 seconds. After power-on, the meter will show the ambient temperature along with dashes in the main reading area. Long press 🔘 to turn the meter off.

Long press 🔘

| MEAS | |
| ZERO | |

```
MEAS  1888º℃
ZERO      ℉
      1.8888RI
          %
```

→

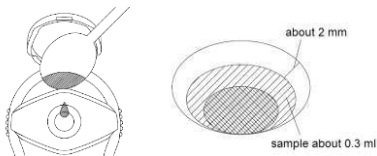```
MEAS   25.0º℃
      - - - -%
```

## Select Measurement Units

Short press **UNIT** to select Brix unit (%) or RI (refractive index). Long press **UNIT** to select the temperature units ($^{\circ}$C/$^{\circ}$F).

## Adding a sample to the prism

1. Use a dust-free cloth to wipe (gently) the prism surface.
2. Use a non-metallic spoon or dropper to place the sample on the prism (0.3 ml, approximately), to begin measuring. As shown below.



## Replacing a sample

1. Incline 45 degrees to allow the measured sample to spill out along the

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grooves. As shown below.

2. Use water to flush the prism surface.
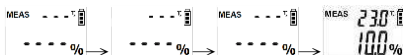3. Use a dust-free cloth to wipe the prism surface.



**Auto Measurements**

After placing the measurement liquid on the prism, close the prism cover to start measuring. The measurement result will display on the LCD and save to memory automatically (see Section 5-2). If **ERR** is shown, an error has occurred, refer to Section 5-3-2.

## Manual Measurements

After placing the measurement liquid, press **M** to start measuring. The measurement result will display on the LCD and save to memory automatically (see Section 5-2). If **ERR** is displayed, an error has occurred, please refer to Section 5-3-2.
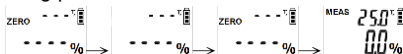
Press **M**

| MEAS ----°C | ----°C | MEAS ----°C | MEAS 23.0°C |
|-------------|--------|-------------|-------------|
| · · · · % → | · · · · % → | · · · · % → | 10.0 % |

## Zero Calibration

Placed distilled or tap water on the prism, long press **M** to access the zero function.

Long press **M**

| ZERO ----°C | ----°C | ZERO ----°C | MEAS 25.0°C |
|-------------|--------|-------------|-------------|
| · · · · % → | · · · · % → | · · · · % → | 0.0 % |

- Perform a zero calibration before each use.
- Temperature of distilled/tap water should equal ambient temperature.

## 5-2 Memory/Measurement modes

### Mode selection
Short press **RCL** to switch between the Measurement mode and the Memory mode.

### Memory Mode
When you access the Memory datalogger mode, "dat #" flashes before showing the stored readings.

Short press **RCL** → $dAt\ 1$ → 23.0℃ 🔋 / 100.0%

Use the ▲ button to scroll through the stored readings.

### Measurement Mode
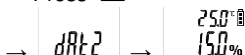When you select the Measurement mode, dashes will display on the LCD screen.

Short press **RCL** → MEAS 25.0℃ 🔋 / - - - -%

## View Stored Readings

In Memory mode, short press ▲ to step through up to 10 logged readings in sequence.

| dAt 1 | → | 23.0℃ 🔋 / 10.0% |

→ Press ▲

| → | dAt2 | → | 25.0℃ 🔋 / 15.0% |

If a memory location is empty, the LCD will display dashes for Temperature and Brix.

## Clear Stored Readings

To clear all stored readings: In Memory mode, long press **M** until "CLr DATA" flashes once and then returns to "dat 1".

Long press **M**

| → | CLr 🔋 / dAtA | → | dAt 1 | → | ---℃ 🔋 / ----% |

## 5-3 LCD icons and alerts

### 5-3-1 Hi/Lo Alerts

The Hi or Lo Alert will appear under these conditions:

- When ambient or sample temperature is >40°C (104°F) or <10°C (50°F). The temperature units will also flash. The Brix reading will still display but the accuracy will not be optimum; use for reference only.
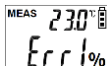
  MEAS 45.0°🔋  →  MEAS 45.0°🔋  →  MEAS 45.0°🔋
  15.0%          15.0%           15.0%

- When the Brix or RI reading is out of range. (Brix >53% or <0%)

  MEAS 23.0°
  - Lo - %

Note: When the Brix of the sample reads low, perform a zero calibration (see Section 5-1).

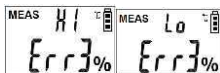## 5-3-2 Error Messages

MEAS  23.0℃
Err 1%

**Error 1**: Prism Cover Error

During a measurement, the prism cover was opened/closed, or the ambient light was too strong. Close cover and try again.

MEAS  23.0℃
Err 2%

**Error 2: No Water Error**

There is no water or there is an insufficient amount of sample on the prism surface to perform a measurement.

MEAS  HI ℃   MEAS  Lo ℃
Err 3%        Err 3%

**Error 3: Temperature Over Range**

When the sample temperature (measured on the prism surface) is out of range, the accuracy will not be optimum (< 4℃ [39.2℉] or > 60℃ [140℉]).

Note that measurement data is not automatically stored when an error message is showing. Contact Extech if an error is persistent and does not clear.

# 6. Maintenance

## Cleaning the prism
Clean the prism surface immediately after each measurement.
1. Use a cotton swab dipped in quality alcohol (over 99%) and wipe in concentric circles; avoid using acetone.
2. Use a dust-free cloth to wipe the surface after using the alcohol.
3. Store in a dry and shaded area.

## Cleaning the housing
Clean with soap and water using a damp sponge or soft cloth.

## Maintenance Notes
Do not use organic solvents to clean the meter. Remove the batteries when storing the meter. Close the prism cover when not in use.
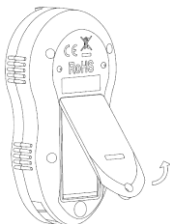
## Battery Replacement

Two 'AAA' batteries power the meter. When the 🔋 symbol flashes, replace the batteries.

1. Turn the meter off
2. Open the rear battery cover as shown in the diagrams below
3. Replace the batteries observing correct polarity
4. Close the battery cover
5. Fasten the compartment before use
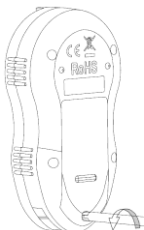


**Step One**          **Step Two**

**CAUTION**: Close the cover tightly in order to prevent liquid ingress

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## *Customer Support*

**Customer Support Telephone**:

U.S. (866) 477-3687

International +1 (603) 324-7800

**Calibration, Repair, and Returns email**:
repair@extech.com

**Technical Support**:
https://support.flir.com

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