Waterproof Digital Refractometer

300058, 300059,
300060, 300062,
300063, 300064
& 300065

Instruction Manual

SPER
SCIENTIFIC

Environmental Measurement Instruments

Waterproof Digital Refractometer

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INTRODUCTION

Housed in a protective rubberized IP65 Waterproof case to safeguard the electronics from wet environments and makes for easy clean ups Model 300058 features a scratchproof sapphire lens.Measure samples as small as 1 ml, in the field with laboratory accuracy. Sample temperature is initially displayed on the large LCD followed by the measurement results. The sophisticated microprocessor provides automatic calibration, automatic temperature compensation and automatic shutoff.

Powered by a rechargeable, long-life, Li (Lithium Ion) battery providing 50,000 tests on a single charge.Simple one-button calibration using distilled water ensures accurate readings.

MATERIALS SUPPLIED

- Refractometer
- One lithium-Ion battery
- DC Power Adapter
- Distilled Water
- Transfer pipet
- Instruction Manual
- Carrying Case

FEATURES

- Displays sample temperature followed by measurement result
- IP65 Waterproof, rugged exterior
- Rechargeable battery
- Low battery indicator
- DC power adapter
- Automatic shutoff

POWER SUPPLY

The meter is powered by one rechargeable lithium-ion battery. An icon in the upper-right corner of the LCD indicates the level of battery power available:

 75%-100% power

 40%-75% power

 15%-40% power

 Less than 15% power. (This icon will flash)

The DC adapter included plugs into the port on the left side of the meter. This both provides an alternate power supply and recharges the battery.

Automatic Shutoff

The power will automatically shut off if the meter is not used for 3 minutes.

FRONT PANEL DESCRIPTION

1. POWER - Power on/off
2. READ - Read measurements /select scale
3. CAL - Calibrate meter
4. LENS COVER

LCD DISPLAY

1. S 1 - Current scale number
2. BATTERY ICON - Battery power level
3. DISPLAY - Displays temperature and readings

CALIBRATION

Use distilled water (refractive index 1.3330 to 1.3340) to calibrate the meter.

1. With the meter turned off, place a few drops of distilled water on the lens.
2. Close the lid to cover the lens.
3. Press **POWER** to turn the meter on.
4. The temperature of the distilled water appears on the LCD.
5. Press and hold **CAL** for 2 seconds to enter Calibration Mode. “CAL” will be displayed to indicate that calibration is occurring.
6. When calibration is finished the meter returns to Measurement Mode and “ - - - ” is displayed on the LCD.

Note…
For best results, calibrate the meter at 20°C. Measurements can be taken at other temperatures, but the calibration should be done at 20°C.

MEASUREMENT PROCEDURES

After calibration you can remove the distilled water from the lens and begin measurement.

Note…
Use a clean, lint-free cloth or tissue to remove solutions from the lens.

1. With the meter turned off, place a few drops of the solution being measured on the lens.
2. Press **POWER** to turn the meter on.
3. The temperature of the solution appears on the LCD.
4. Close the lid to cover the lens.
5. Press **Read** to view the measurement on the LCD.
6. To change scales, press and hold **Read** for 2 seconds until the scale number changes. Repeat to cycle through the available scales. (see page 10)
7. Press **Read** if desired to repeat the measurement.

MEASUREMENT ERRORS

Certain conditions can cause an error code to appear on the LCD:

Error Code & Cause

HHH	The measurement is above the upper limit
LLL	The measurement is below the lower limit

SCALE INFORMATION

Scale Indicator & Name - 300058

S1	Brix
S2	Refractive Index
S3	Dextran
S4	Fructose
S5	Glucose
S6	Lactose
S7	Maltose

Scale Indicator & Name - 300059

S1	Brix
S2	Refractive Index

Scale Indicator & Name - 300060

S1	Brix
S2	Refractive Index

Scale Indicator & Name - 300062

S1 Salinity %
S2 Salinity ‰
S3 Specific Gravity
S4 Refractive Index

Scale Indicator & Name - 300063

S1 Cleaner
S2 Ethylene Glycol
S3 Propylene Glycol
S4 Battery

Scale Indicator & Name - 300064

S1 Urine Specific Gravity
S2 Serum Protein
S3 Refractive Index

Scale Indicator & Name - 300065

S1 ADBLUE
S2 Refractive Index

SPECIFICATIONS

Unit of Measure	Range	Accuracy
Temperature	0.0 °C to 40.0 °C	±0.8 °C
ATC Range	0.0 °C to 40.0 °C	±0.8 °C
Sample Capacity	0.3 mL to 1 mL	
Measurement Time	0.5 to 1.0 seconds	
Waterproof Rating	IP65	

Sugars - 300058

Unit of Measure	Range	Resolution	Accuracy
Brix	0.0 to 95%	0.1%	±0.2%
Refractive Index (nD)	1.3330 to 1.5320	0.0001	±0.003 nD
Dextran	0.0 to 10.6%	0.1%	±0.2%
Fructose	0.0 to 68.9%	0.1%	±0.2%
Glucose	0.0 to 59.9%	0.1%	±0.2%
Lactose	0.0 to 16.5%	0.1%	±0.2%
Maltose	0.0 to 15.6%	0.1%	±0.2%
Temperature	0.0 to 40°C	0.1°C	±0.8°C

Brix 0 to 60% - 300059

Unit of Measure	Range	Resolution	Accuracy
Brix	0 to 60%	0.1%	±0.2%
Refractive Index (nD)	1.3330 to 1.4420	0.0001	±0.003 nD

Brix 0 to 95% - 300060

Unit of Measure	Range	Resolution	Accuracy
Brix	0 to 95%	0.1%	±0.2%
Refractive Index (nD)	1.3330 to 1.532 0	0.0001	±0.003 nD

Salinity - 300062

Unit of Measure	Range	Resolution	Accuracy
Salinity	0 to 28%	0.1%	±0.2%
	0 to 280‰	1‰	±2‰
Specific Gravity	1.000 to 1.217	0.001	±0.002
Refractive Index (nD)	1.3330 to 1.3900	0.0001 nD	±0.003 nD

Automotive - 300063

Unit of Measure	Range	Resolution	Accuracy
*Windshield Washer Fluid	32 to -40°F	0.1°F	±0.2°F
Ethylene Glycol	32 to -50°F	0.1°F	±0.2°F
Propylene Glycol	32 to -50°F	0.1°F	±0.2°F
Battery	1.000 to 1.500 sg	0.001	±0.005 sg

Note...

*Windshield Washer Fluid is an aqueous cleaner used in a vehicle's automated spray system. It is not glass cleaner that is applied by hand and wiped with a towel. Windshield Washer Fluid is a mixture that may contain any or all of the following: detergent, methanol, propylene glycol, and silicone polymers. The output of the refractometer is the freezing point of the windshield washer fluid.

Clinical - 300064

Unit of Measure	Range	Resolution	Accuracy
Urine Specific Gravity	1.000 to 1.050	0.001	±0.002
Serum Protein g/dL	0 to 12	0.1	±0.2
Refractive Index (nD)	1.3330 to 1.3900	0.0001	±0.003 nD

Diesel Exhaust Fluid - 300065

Unit of Measure	Range	Resolution	Accuracy
ADBLUE (Diesel Exhaust Fluid)	0 to 40%	0.1%	±0.2%
Refractive Index (nD)	1.3330 to 1.4098	0.0001	±0.003 nD

WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for a period of **one (1) year** from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover probes, batteries, battery leakage, or damage resulting from accident, tampering, misuse, or abuse of the product. Opening the meter to expose its electronics will void the warranty.

To obtain warranty service, ship the unit postage prepaid to:

SPER SCIENTIFIC LTD.
8281 E. Evans Rd., Suite 103
Scottsdale, AZ 85260

The defective unit must be accompanied by a description of the problem and your return address. Register your product online at www.sperwarranty.com within 10 days of purchase.

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