



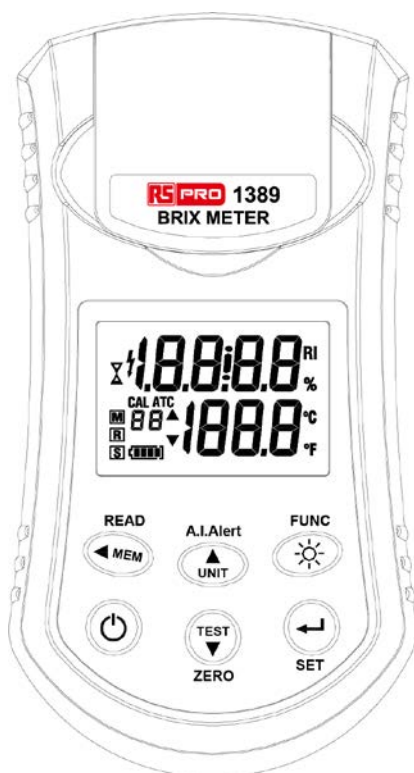
Instruction Manual

RS-1389

210-7487

BRUX METER

EN



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1. INFORMATION

- The meter is a portable optical meter that uses the measurement of refractive index to determine the % Brix of sugar in aqueous solutions.
- The measurement technique and temperature compensation use methodology recommended by ICUMSA (International Commission of Uniform Method of Sugar Analysis).
- The meter is a waterproof brix meter with a rating of IP65 and has a memory of 99 data points that can later be read by the meter.
- Prior to working with the meter all operators should read this manual carefully, which will help you to operate and maintain the meter, as well as to avoid damage caused by unsuitable operation and maintenance.

✘ **Protected by:**

Taiwan: D195768

China: ZL 2018 30275110.8

U.S.A.: US D861,523



2. FEATURES

- Wide measuring range (Brix 0 ~ 53%)
- Refractive index measurement (RI)
- Temperature measurement (°C/°F)
- Ambient temperature compensation (ATC)
- Brix or RI high/low limit value alarm function
- Zero calibration with distilled or deionized water
- Friendly operation and easy to use
- Wide and dual display LCD and backlight function
- Reliable water resistant (IP65)
- Data memory and read function (99 sets)
- Auto power off after 2 minutes of non-use

APPLICATIONS

- Food industry: Beverages, fruits and sweets
- Industry: Monitoring of lubricants in machines and quality control
- Agriculture: Determination of the degree of ripeness of fruit for quality control in harvesting

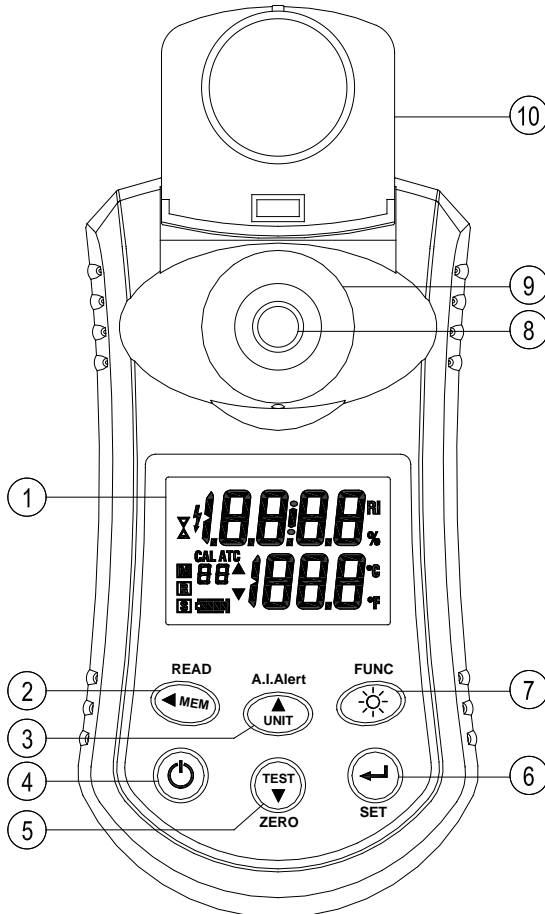


3. SPECIFICATIONS

- Sensor:** Photodiode arrays
- Measuring Function:** Brix (%)
Temperature (°C/°F)
Refractive index (RI)
- Brix Range:** 0.0 ~ 53.0%
(10 ~ 40°C/50 ~ 104°F Automatic temperature compensation)
- RI Range:** 1.3329 ~ 1.4265
- Temperature Range:** 4 ~ 60°C (39.2~140°F)
- Accuracy (Water at 23°C /73.4°F):** Brix: ±0.2%
Temperature: ±1°C/°F
RI: ±0.0003
- Resolution:** Brix: 0.1%
Temperature: 0.1°C/°F
RI: 0.0001
- Data memory Capacity:** 99 sets.
(Direct reading from LCD display)
- Operation Temperature Range:** 10~40°C (50 ~ 104°F),
Less than 85%RH
- Store Temperature Range:** 0~50°C (32 ~ 122°F),
Less than 85%RH
- Response Time:** 3 seconds
- International Protection Class:** IP65 water resistant
- Battery:** AAA batteries x 4
- Size:** 148mm x 78mm x 50mm
- Weight:** Approx. 250g
- Accessories:** Instruction manual, Battery, One sample vial,
Two transfer plastic pipettes.

4. NAME OF PARTS AND POSITIONS

4-1 Description of Parts & Control keys



1. LCD Display: Dual display LCD is used for reporting the measurement Brix (%), Refractive index (RI), Temperature values and has several other marks to provide function guidance.



2. ◀ MEM READ key:

◀ **key:** In the setting mode, press ◀ key to move flicking cursor to desired position.

MEM key: After measurement, press “MEM” key to store the measured Brix (%), Refractive index (RI), Temperature (°C or °F) values and the memorized time (RTC) to memory.

READ key: Press and hold down the “SET” key then press “READ” key to enter the memory data reading mode.

Press “READ” key again to exit this mode.



3. ▲ UNIT A.I.Alert key:

▲ **key:** In the setting mode, press ▲ key to change the desired parameter or increase the displayed setting value.

In the read mode, press ▲ key to increase the memorized address number.

UNIT key: Press “UNIT” key to change the Brix % to RI unit or RI to Brix % unit.

A.I.Alert key: Press and hold down the “SET” key then press “A.I.Alert” key to enter or exit Brix % or Refractive index (RI) the high/low limit value alarm function.

4.  **key:** Press  key to turn on or off the meter

5. TEST ▼ ZERO key:

TEST key: Press “TEST” key to perform the single-shot measurements.



▼ **key:** In the setting mode, press ▼ key to change the desired parameter or decrease the displayed setting value.

In the read mode, press ▼ key to decrease the memorized address number.



ZERO key: Press and hold down the “**SET**” key then press “**ZERO**” key to perform the zero-calibration function.

6. **SET key:**

 **key:** In the setting mode, press  key to confirm the setting item or stored the setting values.



SET key: Press and hold down the “**SET**” key then press “**READ**” key to enter the memory data reading mode.

Press and hold down the “**SET**” key then press “**A.I.Alert**” key to enter or exit Brix % and Refractive index (RI) the high/low limit value alarm function.

Press and hold down the “**SET**” key then press “**ZERO**” key to perform the zero-calibration function.

Press and hold down the “**SET**” key then press “**FUNC**” key to enter the setting mode.

7 **FUNC key:**

 **key:** Press  key to turn the LCD backlight function on or off.

FUNC key: Press and hold down the “**SET**” key then press “**FUNC**” key to enter the setting mode.

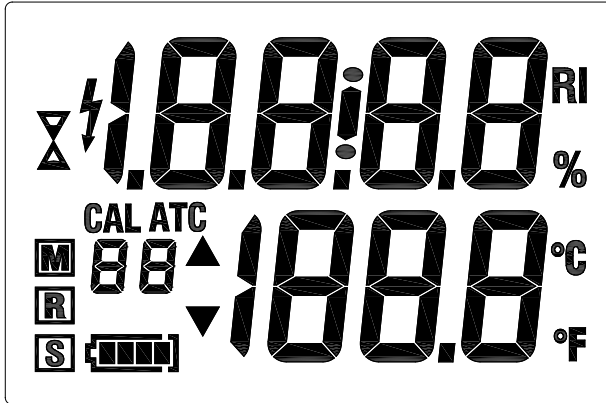
Press “**FUNC**” key again to exit setting mode.


8. Prism

9. Sample plate

10. Cover

4-2 Description of Display



 : Measurement in progress indication.

 : Brix % and RI high/low limit value alarm function indication.

RI: Refractive index reading indication.

%: Brix % reading indication.

CAL: Zero calibration indication.

ATC: Automatic temperature compensation indication.

M 00: Manual memory address number indication.

R: Read mode indication.

R 00: Recall manual memory address number indication.

▲: Alarm high limit indication.

▼: Alarm low limit indication.

°C, °F: Temperature units.

S: Setting mode indication.

: Battery capacity indication.




5. OPERATING INSTRUCTIONS

5-1 Precautions

- Handle the meter carefully. Do not drop or shake the meter.
- The meter is used to measure sugar solutions. Do not expose the meter or prism to solvents that will damage it. This includes most organic solvents and extremely hot or cold solutions.
- Never submerge the meter and do not spray water on the meter except the sample plate located over the prism.
- Sample matter may scratch the prism. Absorb sample with a soft tissue and rinse sample plate and prism with distilled water or deionized water between samples and wipe dry.
- Use plastic pipettes to transfer the solutions. Do not use metallic tools such as spoons, tweezers or needles as these will scratch the prism.
- If a film develops on the prism will repel test samples and affect the measured recording. If this occurs, clean with a mild detergent.

5-2 Zero Point Calibration



Zero-point Calibration should be performed daily, before sample testing begins, between a long series of measurements or when you suspect that the reading may be inaccurate.

1. Press  key to turn on the meter.
2. Press “**UNIT**” key to select Brix % reading the “%” symbol is displayed.
3. Open the sample plate cover. Wipe and clean the prism surface.



4. Using plastic pipettes, drip a few drops of distilled or deionized water on the prism, make sure that water covers the prism surface completely.
5. Close the sample plate cover.
6. Press and hold down the “**SET**” key then press “**ZERO**” key to enter the zero-calibration mode, the “**ZERO CAL**” symbol is displayed. When the “0.0 %” reading is displayed means the meter is calibrated.
7. Gently absorb the sample water with a soft tissue. Take care not to scratch the prism surface. Wipe the surface completely. The meter is ready for sample measurement.

5-3 Measurement on Sample







1. Press  key to turn on the meter.
2. Open the sample plate cover. Wipe and clean the prism surface.
3. Using plastic pipettes, drip a few drops of sample on the prism, make sure that sample covers the prism surface completely. If the temperature of the sample differs significantly from the temperature of the meter, wait approximately 1 minute to allow thermal equilibration.
4. Close the sample plate cover.
5. Press “**TEST**” key, the measurement in progress symbol “” blinking three times then the measured value is displayed in units of % Brix.
6. Press “**UNIT**” key to cycle displayed the measured % Brix or RI (refractive index) values.

If the temperature exceeds the 10~40°C/50~104°F range, the “**ATC**” symbol blinks and automatic temperature compensation is disabled.










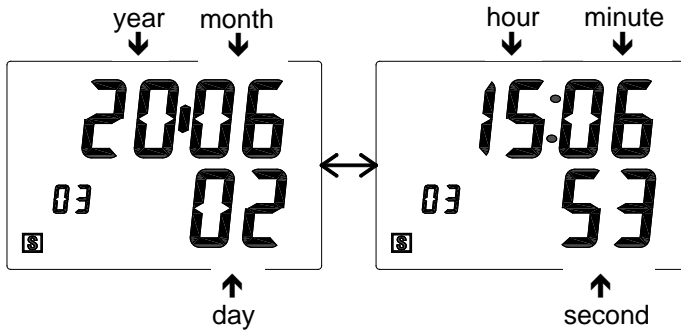
7. Press “**MEM**” key to store the measured values and the RTC to memory. Only one measurement can store at one time.
8. Remove sample from the sample plate by absorbing with a soft tissue.
9. Using plastic pipettes, rinse prism and sample plate with distilled or deionized water then wiper dry.
The meter is ready for the next sample.

5-4 Changing Temperature Unit °C ↔ °F

1. Press  key to turn on the meter.
2. Press and hold down the “**SET**” key then press “**FUNC**” key to enter the setting mode, the “ 0 Unit” symbol is displayed.
3. Press  key to enter the temperature unit setting mode.
4. Press  or  key to select the desired temperature unit °C or °F.
5. Press  key to store the setting and exit setting mode.

5-5 Setting Real-Time

1. Press  key to turn on the meter.
2. Press and hold down the “**SET**” key then press “**FUNC**” key to enter the setting mode, the “ 0 Unit” symbol is displayed.
3. Press  key two times to select the RTC setting mode, the “ 03 rtc” symbol is displayed then press  key to enter the RTC setting mode.
4. Press  or  key to select the desired “year | month | day ” or “hour:minute:second” setting mode.



5. Press \leftarrow key to confirm the selection.
6. Press \leftarrow key to move the blinking cursor to the desired position then press \blacktriangle or \blacktriangledown key to set the element to real-time. Repeat this step to all element.
7. Press \leftarrow key to store the setting and exit this mode.

5-6 Data Memory and Read Mode

5-6-1 To Memorize the Reading





1. After each measurement, Press “**MEM**” key to store the measured reading and the RTC to memory. At this moment, LCD will show the “**M**” symbol and the memory address number. Total memory size is 99 sets.
2. When the memory is full, the “**Full**” symbol is display one time.

5-6-2 To Recall and Read Memorized Reading


1. Press and hold down the “**SET**” key then press “**READ**” key to enter the memory data reading mode, the “**R**” symbol and the memory address number is displayed. If no data stored in the memory the “**R null**” symbol is display one time.
2. Press \blacktriangle or \blacktriangledown key to select the desired memory address number data for display.

3. Press “**FUNC**” key to cycle display the Brix %, RI reading and the memorized RTC.
4. Press “**READ**” key again to exit this mode.

5-6-3 To Clear the Memorized Data







1. Press  key to turn off the meter.
2. Press and hold down the “**MEM**” key then press  key to turn on the meter, LCD will show “ **CLr ñEñ**” symbol one time, it indicated that the memorized data is erased, the “ **00**” symbol is displayed.

5-7 LCD Backlight Function

In the measurement mode, except in the setting mode and memory data read mode, press  key to turn the LCD backlight function on or off.

5-8 Alarm Function Operation

5-8-1 To Set the Alarm Limit Values

1. Press  key to turn on the meter.
2. Press and hold down the “**SET**” key then press “**FUNC**” key to enter the setting mode, the “ **01 unit**” symbol is displayed.
3. Press  key one time to select the alarm limit values setting mode, the “ **02 ALñ**” symbol is displayed then press  key to enter this mode.
4. Press  key to select desired Brix % “**br 11 %**” or Refractive index “**rEFA RI**” limit value setting mode.

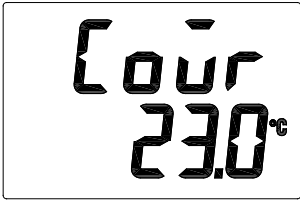
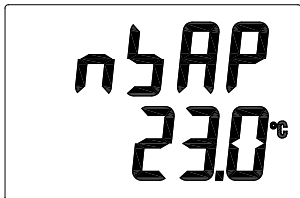


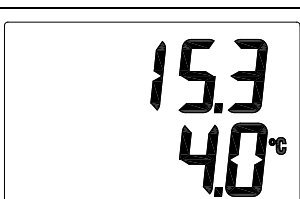


5. Press **↵** key to confirm the selection and to enter the high limit value setting mode, the “**Ⓢ ▲**” symbol and the previous high limit setting value are displayed.
6. Press **◀** key to move the blinking cursor to the desired position then press **▲** or **▼** key to set desired values, repeat this step to all digits.
7. Press **↵** key to store the setting value and to enter the low limit value setting mode, the “**Ⓢ ▼**” symbol and the previous low limit setting value are displayed.
8. Press **◀** key to move the blinking cursor to the desired position then press **▲** or **▼** key to set desired values, repeat this step to all digits.
9. Press **↵** key to store the setting value and exit this mode.

5-8-2 To Turn on and Turn Off Alarm Function

1. In the measurement mode, press and hold down the “**SET**” key then press “**A.I.Alert**” key to turn on or turn off the alarm function.
2. When the measured value is upper to the alarm high limit setting value the beep will sound 12 seconds and the “**▲**” symbol is blinking displayed.
3. When the measured value is below to the alarm low limit setting value the beep will sound 12 seconds and the “**▼**” symbol is blinking displayed.

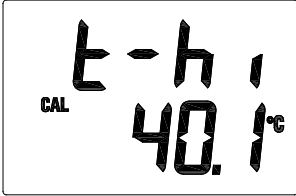
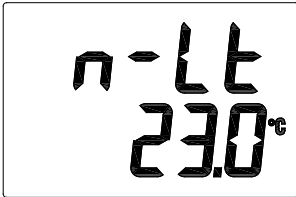
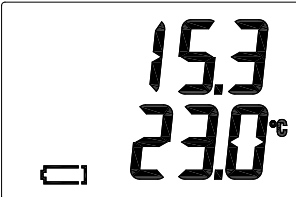
6. EXPLANATION OF ERROR MESSAGES

Error Code	LCD Display	Description
Cover		Sample plate cover not closed.
No sample		No sample exists on the prism surface.
HHH		Sample exceeds maximum measurement range
LLL		Sample is reading lower than the 0% standard used for meter zero calibration.
Temperature reading are blinking		Temperature measurement out of sampling range (<4.0°C)




Error Code	LCD Display	Description
Temperature reading are blinking		Temperature measurement out of sampling range (>60.0°C)
ATC segment blinking		Outside temperature compensation range (10°C to 40°C)
CAL segment ON		Wrong calibration used to zero the meter. Use deionized or distilled water.
CAL segment ON		Wrong calibration used to zero the meter. Use deionized or distilled water.
CAL segment ON Temperature reading are blinking		Temperature exceeds ATC low limit (10°C) during calibration.

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Error Code	LCD Display	Description
CAL segment ON Temperature reading are blinking		Temperature exceeds ATC low limit (40°C) during calibration.
no Light		LED light is not detected. Contact local seller.
Battery segment blinking		<5% of battery life is remaining.



7. BATTERY CHECK-UP & REPLACEMENT

1. When operating the meter on batteries, periodically check this indicated to determine the remaining battery capacity. The number of black segments decreases as the batteries are used up. When the “” symbol blink display, correct measurement is no longer possible. Replace the batteries with a fresh set.
2. Take care not to reverse the (+) and (-) polarity when inserting the batteries. Always replace all four batteries together. Do not mix old and new batteries or batteries of different type.
3. **Prevention of battery fluid leakage:**
 - ① When the battery power is low, replace the new battery to avoid possibility of further battery fluid leakage.
 - ② In long-term, when the instrument is not in use, to avoid the battery liquid leak damage, please remove battery out of the instrument.

8. MAINTENANCE

1. After use, wipe off a sample adhering to the prism surface and adjacent area use tissue paper wetted with water and remove moisture completely with dry tissue paper. Cleaning should be carried out before and immediately after each use of the meter to maximize its life and optimize measurement results.
2. Never touch the measuring prism with hard tools made from plastic, wood, rubber, metal, glass etc. Hard objects can quickly damage the relatively soft prism glass, resulting in measurement errors.

9. BRUX TO REFRACTIVE INDEX (n_D) CONVERSION TABLE

Table of Refractive Indexes and Brix %

%	n_D^{20}	%	n_D^{20}	%	n_D^{20}	%	n_D^{20}	%	n_D^{20}
0	1.33299	20	1.36384	40	1.39986	60	1.44193	80	1.49071
1	1.33442	21	1.36551	41	1.40181	61	1.44420	81	1.49333
2	1.33586	22	1.36720	42	1.40378	62	1.44650	82	1.49597
3	1.33732	23	1.36889	43	1.40576	63	1.44881	83	1.49862
4	1.33879	24	1.37060	44	1.40776	64	1.45113	84	1.50129
5	1.34026	25	1.37233	45	1.40978	65	1.45348	85	1.50398
6	1.34175	26	1.37406	46	1.41181	66	1.45584	86	1.5067
7	1.34325	27	1.37582	47	1.41385	67	1.45822	87	1.5094
8	1.34477	28	1.37758	48	1.41592	68	1.46061	88	1.5122
9	1.34629	29	1.37936	49	1.41799	69	1.46303	89	1.5149
10	1.34782	30	1.38115	50	1.42009	70	1.46546	90	1.5177
11	1.34937	31	1.38296	51	1.42220	71	1.46790	91	1.5205
12	1.35093	32	1.38478	52	1.42432	72	1.47037	92	1.5234
13	1.35250	33	1.38661	53	1.42647	73	1.47285	93	1.5262
14	1.35408	34	1.38846	54	1.42863	74	1.47535	94	1.5291
15	1.35568	35	1.39032	55	1.43080	75	1.47787	95	1.5320
16	1.35729	36	1.39220	56	1.43299	76	1.48040		
17	1.35891	37	1.39409	57	1.43520	77	1.48295		
18	1.36054	38	1.39600	58	1.43743	78	1.48552		
19	1.36218	39	1.39792	59	1.43967	79	1.48811		

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