

temperature compensation ensures accurate measurement results for water-based solutions in relation to the temperature of the sample.

The refractometer is temperature-compensated for water-based, sugary solutions. Temperature differences in a range of 5 °C–40 °C (41 °F–104 °F) can be compensated. However, the temperature of the sample has only a minor influence on the accuracy of the measurement. The volume of the sample compared to the mass of the refractometer is so small that in most cases the sample is almost immediately at the temperature of the refractometer and assumes the ambient temperature, and is therefore in equilibrium with the temperature range of the measuring instrument. The temperature coefficient of the majority of water-based solutions is generally very close to the coefficient of the cane sugar/water solution. However, the temperature coefficient of oils, hydrocarbons and other, non-water-based solutions is generally greater. In order to achieve as accurate a result as possible, non-water based samples should be measured at an ambient temperature as close to 20 °C (68 °F) as possible.

8. Calibration/zero point calibration

The refractometer's zero position must be inspected prior to initial use and periodically thereafter. A zero point calibration should be performed at least once daily and prior to any measurement where the highest possible accuracy is required, or when moving to a different environment with a different ambient temperature. For the majority of models all you need for calibration/zero point calibration is distilled and deionised water. Ideally, the ambient and calibration liquid temperature should be exactly 20.0 °C (68.0 °F) during calibration.

Calibration liquid with 60% Brix is required for a variety of models.

You should be aware of the adjustment condition when using a measuring instrument.

1. Inspect the prism to ensure that the surface is clean and dry.
2. Apply a few drops of the calibration liquid onto the prism window.
3. Press the „→ 0 ←“ button; the measuring instrument begins the zero point calibration process.
4. The measuring instrument is performing the calibration process when "Scan zero" and a loading bar appear in the display.
5. When the calibration process is complete "Scan Result" and "Pass" is shown in the display in case the calibration was successful. When it was not successful the display shows "Fail". The calibration result will be saved and will be the new zero point after the device is powered off and on again.

9. Measuring*

1. Inspect the prism window [4] to ensure it is clean and dry.
2. Apply a few drops of the liquid being examined onto the prism window.
3. Press the „Meas“ button; the instrument begins to measure and the results are shown in the display for 90 seconds.
4. Press the "Meas" button to re-check the previous measurements.

10. Battery change

When the batteries are fully charged the "████" symbol appears at the top right of the display in green colour.

If the batteries are too weak or almost drained the "█" symbol appears at the top right in red colour. The batteries should then be replaced. Open the battery cover on the rear and replace the batteries. Always replace both batteries!

11. Switching the temperature

The measuring instrument works in Celsius or Fahrenheit. For changing over just press the „→ 0 ←“ button for 2 seconds.

12. Switching the measuring scale

1. Hold "Meas" for 2 seconds, the scale will change to the next measurement type.

2. Repeat Step 1 until desired the scale is shown on the screen.

13. Troubleshooting

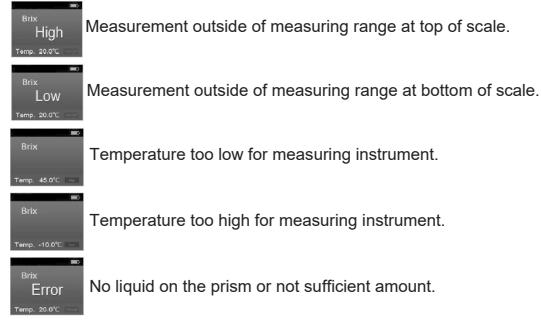
If you suspect that the measuring instrument is not working correctly or displays incorrect results, perform a zero point calibration. Then perform a measurement using water to check the zero point. If this does not lead to any improvement, please perform a factory reset by pressing "On/Off" and "Meas" simultaneously and confirming with „→ 0 ←“.

If the measured data still appear untrustworthy, please replace the batteries and perform the above calibration once again.

If the measuring instrument jams or no longer reacts, separate the measuring instrument from the power supply by removing the batteries and replacing them. If no data appears in the display when it is switched on, examine the position and polarity of the batteries. If the instrument still does not work, please examine the battery charge status and/or replace the batteries. If the batteries are good and the measuring instrument still does not display, please call your dealer's technical customer service.

13.1 Error messages

Calibration was not successful. Make sure you are using the correct calibration solution and there is sufficient amount and perform the calibration again while having an environmental temperature that matches 20.0 °C (68.0 °F) as accurate as possible.



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14. Cleaning and maintenance

Clean the refractometer using a soft, lint-free cloth moistened with water, or if necessary alcohol. Do not use any aggressive or abrasive cleaning agents.

Never touch the measuring prism [2] 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.

The refractometer is maintenance-free.

Cleaning should be carried out immediately before and after each use of the refractometer to maximise its life and optimise measurement results.

15. Storage

Store the refractometer in a dry, non-corrosive environment, preferably between 10 °C and 30 °C.

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16. Service

After reading this operating manual, if you have any questions about setting up or using the refractometer, or if any unexpected problem occurs, please contact your dealer. The device housing may only be opened by trained service technicians authorised by KERN.

17. Disposal

The packaging consists of environmentally friendly materials which can be disposed of via local recycling facilities.

The device and storage box should be disposed of by the operator in accordance with applicable national or regional regulations at the place of use.

18. Additional information

The product may differ slightly from the illustrations.

The exposing the refractometer to direct sunlight!

Never bring the refractometer into contact with solvents.

19. Brix to refractive index (nD) conversion table

Data from „ICUMSA“ International Commission for Uniform Methods of Sugar Analysis, at 20 °C and 589 nm wavelength.

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Brix	nD	Brix	nD	Brix	nD
0	1.3320	30	1.2912	60	1.4419
1	1.3344	31	1.2830	61	1.4442
2	1.3359	32	1.2848	62	1.4465
3	1.3373	33	1.2866	63	1.4488
4	1.3388	34	1.2885	64	1.4511
5	1.3403	35	1.2903	65	1.4535
6	1.3418	36	1.2922	66	1.4558
7	1.3433	37	1.2941	67	1.4582
8	1.3448	38	1.2960	68	1.4605
9	1.3463	39	1.2979	69	1.4628
10	1.3478	40	1.2999	70	1.4655
11	1.3493	41	1.4018	71	1.4679
12	1.3509	42	1.4038	72	1.4704
13	1.3524	43	1.4058	73	1.4729
14	1.3541	44	1.4078	74	1.4754
15	1.3557	45	1.4098	75	1.4779
16	1.3572	46	1.4118	76	1.4804
17	1.3589	47	1.4137	77	1.4828
18	1.3605	48	1.4159	78	1.4855
19	1.3622	49	1.4180	79	1.4881
20	1.3638	50	1.4201	80	1.4907
21	1.3655	51	1.4222	81	1.4933
22	1.3672	52	1.4243	82	1.4960
23	1.3689	53	1.4265	83	1.4986
24	1.3706	54	1.4286	84	1.5013
25	1.3723	55	1.4307	85	1.5040
26	1.3740	56	1.4329		
27	1.3758	57	1.4351		
28	1.3776	58	1.4374		
29	1.3794	59	1.4397		

* Further information on Measuring

It is important to take care of the lighting conditions in the user environment when calibrating the device and subsequent measuring a sample.

The measuring prism of the refractometer does not have any coverage and therefore a measurement in addition to the light of the internal light source is also influenced by ambient light. To bright lighting (e.g., by a lamp directly above the device) may trigger an error message already during the calibration. Ordinary (diffuse) light is not a problem.

The lighting conditions (or the location of the device) may not be changed after the calibration or between different measurements, otherwise the refractometer performs each of the processes on a different basis and the results would not be comparable.

We recommend that both for the calibrations and for measurements, after the sample was placed on the measuring prism, to create an improvised opaque cover over the prism (incl. sample).