

Brix Refractometer

Models RF18



Introduction

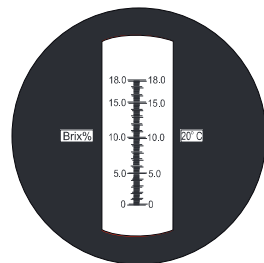
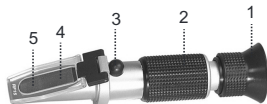
Congratulations on your purchase of the Extech RF18 Brix Refractometer. Precision optical instruments should be handled gently; avoid touching the optical surface. Careful use of these instruments will provide years of reliable service.

Specifications

| | |
|------------|-------------------------------------|
| Range | 0 to 18% Brix |
| Resolution | 0.1% |
| Dimensions | 1.2 x 1.6 x 6.7" (30 x 40 x 170mm); |
| Weight | 3.2 oz. (91g) |

Description

1. Eyepiece
2. Cover plate
3. Adjustment screw
4. Mirror tube
5. Prism



Operation

This instrument measures the refractive index of a sample. The measurement is displayed in % Brix.

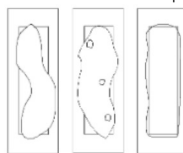
1. Zero Adjustment

Cover the prism with a few drops of distilled water from the included vial (several drops will suffice). Close the cover plate and rotate the adjustment screw until the light/dark boundary (shadowline) lines up with the zero line. After the zero adjustment, clean the prism with a soft cloth.

2. Sample Preparation and Reading

To take a sample reading, simply place a few drops of a sample liquid on the measurement prism at the end of the instrument. Close the prism cover plate so that the liquid spreads across the entire surface of the prism without air bubbles or dry spots (see diagram). Allow the sample to remain on the prism for approximately 30 seconds.

While holding the instrument under a light source, look through the eyepiece. The sucrose concentration is determined by the intersection of the boundary of the light and dark fields (known as the shadowline) on the printed scale. If the scale appears out of focus, the eyepiece may be adjusted by rotating the knurled portion of the eyepiece. The instrument also features an eye-guard to prevent stray light from entering the eyepiece and causing reflections.



It may be necessary to adjust the position of the light source to maximize the contrast of the shadowline. Under normal conditions, optimal contrast is obtained by holding the instrument underneath and perpendicular to a light source.

Once a reading has been taken, wipe dry with a clean cloth (do not wash or rinse) and place the instrument in the supplied plastic case. Store the instrument in a safe, dry environment.

Note: The Distilled water temperature, used for zero adjustment, and the sample liquid temperature should be the same. If the temperature of the samples fluctuates, zero the refractometer every 30 minutes (RF10 only).

3. Temperature Compensation

Temperature is one of the single most important factors influencing accurate refractometer readings and is one of the largest sources of measurement error. Temperature compensation relieves the user of the responsibility to measure temperature and apply a correction factor when taking readings.

The RF18 Refractometer has been designed for use with a 20°C standard temperature. Therefore, if the temperature of the measurement deviates from 20°C, the reading must be manually compensated in accordance with the Temperature Compensation Table below.

Example: A reading of 20% at 28°C is compensated thusly: 20% + 0.62%=20.62%.

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Temperature Compensation Table (Referenced To 20°C)

| % | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 |
|----|---|------|------|------|------|------|------|------|------|------|------|------|------|------|
| °C | Subtract the following from the measurement | | | | | | | | | | | | | |
| 10 | 0.58 | 0.59 | 0.61 | 0.64 | 0.67 | 0.69 | 0.71 | 0.72 | 0.74 | 0.74 | 0.75 | 0.76 | 0.77 | 0.77 |
| 11 | 0.51 | 0.54 | 0.55 | 0.58 | 0.61 | 0.63 | 0.65 | 0.65 | 0.67 | 0.67 | 0.67 | 0.68 | 0.68 | 0.69 |
| 12 | 0.47 | 0.49 | 0.50 | 0.52 | 0.55 | 0.57 | 0.58 | 0.58 | 0.60 | 0.60 | 0.60 | 0.61 | 0.61 | 0.61 |
| 13 | 0.42 | 0.44 | 0.44 | 0.45 | 0.49 | 0.50 | 0.51 | 0.51 | 0.53 | 0.53 | 0.53 | 0.53 | 0.53 | 0.53 |
| 14 | 0.37 | 0.38 | 0.39 | 0.40 | 0.42 | 0.43 | 0.44 | 0.44 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.46 |
| 15 | 0.31 | 0.32 | 0.33 | 0.34 | 0.35 | 0.36 | 0.37 | 0.37 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 |
| 16 | 0.25 | 0.26 | 0.27 | 0.28 | 0.28 | 0.29 | 0.30 | 0.30 | 0.30 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 |
| 17 | 0.19 | 0.20 | 0.20 | 0.21 | 0.21 | 0.22 | 0.22 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| 18 | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 19 | 0.06 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| | Add the following to the measurement | | | | | | | | | | | | | |
| 21 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 22 | 0.14 | 0.14 | 0.14 | 0.14 | 0.15 | 0.15 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 |
| 23 | 0.21 | 0.21 | 0.22 | 0.22 | 0.23 | 0.23 | 0.23 | 0.23 | 0.24 | 0.24 | 0.24 | 0.24 | 0.23 | 0.22 |
| 24 | 0.28 | 0.29 | 0.29 | 0.30 | 0.30 | 0.31 | 0.31 | 0.31 | 0.31 | 0.32 | 0.32 | 0.31 | 0.31 | 0.31 |
| 25 | 0.35 | 0.36 | 0.37 | 0.38 | 0.38 | 0.39 | 0.39 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.39 | 0.39 |
| 26 | 0.43 | 0.44 | 0.44 | 0.46 | 0.46 | 0.47 | 0.47 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.47 | 0.47 |
| 27 | 0.51 | 0.52 | 0.53 | 0.54 | 0.55 | 0.55 | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 | 0.55 | 0.55 |
| 28 | 0.59 | 0.60 | 0.61 | 0.62 | 0.63 | 0.64 | 0.64 | 0.65 | 0.65 | 0.64 | 0.64 | 0.64 | 0.64 | 0.63 |
| 29 | 0.67 | 0.68 | 0.69 | 0.70 | 0.71 | 0.72 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.72 | 0.72 | 0.71 |
| 30 | 0.75 | 0.77 | 0.78 | 0.79 | 0.80 | 0.81 | 0.81 | 0.81 | 0.82 | 0.81 | 0.81 | 0.81 | 0.80 | 0.79 |

Source: International Commission for Uniform Methods of Sugar Analysis (1966)

International Brix% Scale

Brix to Refractive Index (nD) Conversion Table

| % | nD | % | nD | % | nD | % | nD | % | nD | % | nD | % | nD | % | nD |
|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|---|----|---|----|
| 0 | 1.333 | 15 | 1.3557 | 30 | 1.3811 | 45 | 1.4097 | 60 | 1.4419 | 75 | 1.4778 | | | | |
| 1 | 1.3344 | 16 | 1.3573 | 31 | 1.3829 | 46 | 1.4118 | 61 | 1.4442 | 76 | 1.4804 | | | | |
| 2 | 1.3359 | 17 | 1.3589 | 32 | 1.3847 | 47 | 1.4138 | 62 | 1.4464 | 77 | 1.4829 | | | | |
| 3 | 1.3373 | 18 | 1.3605 | 33 | 1.3866 | 48 | 1.4159 | 63 | 1.4488 | 78 | 1.4855 | | | | |
| 4 | 1.3388 | 19 | 1.3622 | 34 | 1.3884 | 49 | 1.418 | 64 | 1.4511 | 79 | 1.4881 | | | | |
| 5 | 1.3403 | 20 | 1.3638 | 35 | 1.3903 | 50 | 1.42 | 65 | 1.4534 | 80 | 1.4907 | | | | |
| 6 | 1.3418 | 21 | 1.3655 | 36 | 1.3922 | 51 | 1.4222 | 66 | 1.4558 | 81 | 1.4933 | | | | |
| 7 | 1.3433 | 22 | 1.3672 | 37 | 1.3941 | 52 | 1.4243 | 67 | 1.4582 | 82 | 1.496 | | | | |
| 8 | 1.3448 | 23 | 1.3689 | 38 | 1.396 | 53 | 1.4264 | 68 | 1.4606 | 83 | 1.4987 | | | | |
| 9 | 1.3463 | 24 | 1.3706 | 39 | 1.3979 | 54 | 1.4286 | 69 | 1.463 | 84 | 1.5014 | | | | |
| 10 | 1.3478 | 25 | 1.3723 | 40 | 1.3998 | 55 | 1.4308 | 70 | 1.4654 | 85 | 1.5041 | | | | |
| 11 | 1.3494 | 26 | 1.374 | 41 | 1.4018 | 56 | 1.4329 | 71 | 1.4678 | 86 | 1.5068 | | | | |
| 12 | 1.3509 | 27 | 1.3758 | 42 | 1.4037 | 57 | 1.4352 | 72 | 1.4703 | 87 | 1.5096 | | | | |
| 13 | 1.3525 | 28 | 1.3776 | 43 | 1.4057 | 58 | 1.4374 | 73 | 1.4728 | 88 | 1.5123 | | | | |
| 14 | 1.3541 | 29 | 1.3793 | 44 | 1.4077 | 59 | 1.4396 | 74 | 1.4753 | 89 | 1.5151 | | | | |

Source: International Sugar Analysis Committee

Warranty

FLIR Systems, Inc. warrants this Extech Instruments brand device to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies to sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department for authorization. Visit the website www.extech.com for contact information. A Return Authorization (RA) number must be issued before any product is returned. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. FLIR Systems, Inc. specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. FLIR's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.