

ABBE REFRACTOMETERS



1T



3T



2T



DR-A1



4T



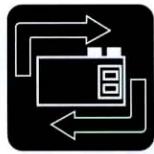
DR-M2, DR-M4



DR-M2/1550, DR-M4/1550

EXPLANATION OF ICONS

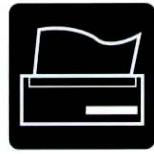
Icons for functions, specifications and scales have been added to this catalog.



- *Connectable with circulating constant temperature bath
- *Thermostatable par circulation
- *Cirkulierendes konstant temperiertes Wasserbad angeschlossen
- *Collegabile a bagno termostatico a circolazione
- *Conexión para baño termostático de circulación
- *可連結恒溫循環水槽



- *Calibration with water
- *Calibration 1 point* sur eau distillée
- *Kalibrierung mit Wasser
- *Calibrazione con acqua
- *Calibración con agua
- *用水歸零



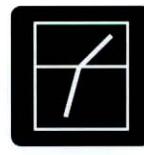
- *Connectable with printer
- *Sortie imprimante
- *Verbindung mit Personalcomputer
- *Collegabile a stampante esterna
- *Conexión para impresora
- *可與印表機連結



- *AC outlet(AC100 to 240V)
- *Alimentation secteur(CA 100 à 240 V)
- *AC Ausgang (AC 100 bis 240V)
- *Uscita AC(AC 100 240V)
- *Conexión a 240V CA
- *AC插座(AC 100至240V)



- *Digital display
- *Affichage numérique
- *Digital Anzeige
- *Display digitale
- *Pantalla digital
- *數字顯示



- *Refractive index scale
- *Indice de réfraction
- *Skala fuer Refraktive Index
- *Indice di rifrazione
- *Escala de índice de refracción
- *折射率刻度

CAT.NO.1310

DIGITAL ABBE
REFRACTOMETER

DR-A1



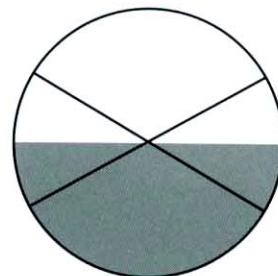
By very simple operation that needs only to set the boundary line of refraction at the cross hairs, this refractometer directly indicates a measured value(in refractive index or Brix, selective) in digits together with temperature on the display. This refractometer enables anybody to carry out measurement easily without reading of analog graduation.
※ Dispersive value cannot be measured by this refractometer.

SPECIFICATIONS

Measurement range	:Refractive index(nD) 1.3000 to 1.7100 Brix(%) 0.0 to 95.0%
Minimum indication	(Automatic temperature compensation is executed from 5 to 50°C for Brix only)
Measurement accuracy	:Refractive index(nD) 0.0001, Brix(%) 0.1%
	:Refractive index(nD) ± 0.0002 Brix(%) $\pm 0.1\%$
Measurement temperature range	: 5 to 50°C (at unit of 0.1°C)
Indications	:Refractive index(nD) or Brix(%) and temperature(°C)
Power supply	:With AC adapter (100 to 240V (50/60Hz) AC input)
Power consumption	:10VA
Dimensions and Weight	:Main Unit 13×29×31cm, 6.0kg

ACCESSORIES

Test piece (Refractive index standard).....	1pc
Monobromonaphthalene(4ml)	1pc
Allen wrench.....	1pc
Lighting adapter.....	1pc
Tube band.....	10pcs
Instruction manual.....	1pc



Refraction view



Display

CAT.NO.1210/CAT.NO.1240

ABBE REFRACTOMETER 1T/4T

1T (ATAGO'S STANDARD MODEL)



The 1T is an Abbe refractometer of standard type, measures refractive indices of liquids and solids quickly and accurately. It is designed to give refractive indices of D line without using a sodium lamp.

SPECIFICATIONS

Refractive index range.....	nd 1.3000 to 1.7000
R.I. minimum scale.....	nd 0.001
Brix range.....	0 to 95%
Brix minimum scale.....	0.5%
Accuracy of R.I. & Brix.....	±0.0002, ±0.1%
Dispersion (nF-nC)	with conversion table
Applicable temperature	0 to 50°C
Digital thermometer.....	Built-in thermistor in the prism ±0.2°C
Input	100 to 120, 220 to 240 V a.c.
Size and weight.....	Refractometer 23×18×23cm, 3.4kg Thermometer 8×10×11cm, 0.8kg

ACCESSORIES

Test piece (Refractive index standard)	1pc
Monobromonaphthalene(4 ml)	1pc
Thermometer (Digital type)	1pc
Screwdriver for scale adjustment	1pc
Lamp cord	1pc
Illuminator lamp (8V 0.15A)	5pcs
Instruction manual	1pc



With Digital Thermometer !

4T(HIGH REFRACTIVE INDEX MODEL)



R&D on new materials for modern technologies is being actively conducted in every industry. Many of these materials (especially polymer film and related materials) are of high refractive index - often too high for measurement with existing Abbe refractometers. But these are now covered with the nd 1.4700 to 1.8700 range of the Type 4T.

SPECIFICATIONS

Refractive index range.....	nd 1.4700 to 1.8700
R.I. minimum scale.....	nd 0.001
Accuracy of R.I.	±0.0002
Applicable temperature	0 to 50°C
Digital thermometer.....	Built-in thermistor in the prism ±0.2°C
Input.....	100 to 120, 220 to 240 V a.c.
Size and weight.....	Refractometer 23×18×23cm, 3.4kg Thermometer 8×10×11cm, 0.8kg

ACCESSORIES

Test piece (Refractive index standard)	1pc
Monobromonaphthalene(4ml).....	1pc
Methylene iodide containing sulfur solution(4 ml).....	1pc
Thermometer(Digital type).....	1pc
Screwdriver for scale adjustment.....	1pc
Lamp cord.....	1pc
Illuminator lamp (8V 0.15A)	5pcs
Instruction manual	1pc

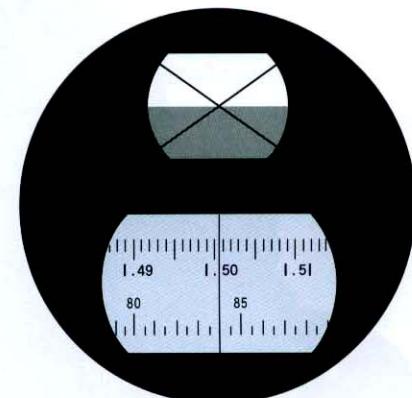


Photo:1T

Abbe Refractometer for low refractive index measurement

In addition to our standard Abbe Refractometer type 1T, we can supply the following Abbe model.

● Abbe Refractometer 1T•LO (for low refractive index measurement) Cat.No.1217

Measurement range :Refractive index(nd) 1.1500 to 1.4800

Measurement temperature range:0 to 50°C

Note : You are requested to convert measured refractive indices to "real refractive indices"(with referring to conversion table),since the above Abbe refractometer has the same scale as our standard Abbe refractometer type 1T.

For further details, please make inquiries to our export department.

CAT.NO.1230

ABBE PRECISION REFRACTOMETER

3T



The Type 3T has been developed to give improved measuring accuracy and ease of use.

This has been achieved by making fundamental improvements to the optical system, utilising a larger scale, incorporating a high intensity lamp and using a double control knob to give quick and finer control.

This latest model is the result of 44 years research and experience together with the comments of users of the Abbe Refractometers.

FEATURES

1. **Digital thermometer for more accurate measurements.**
 - (a) A digital thermometer has an accuracy of $\pm 0.2^\circ\text{C}$ divisions.
 - (b) Thermistor is inserted in the main prism.
2. **Lighting**
 - (a) Built-in four position light intensity switch.
 - (b) High intensity tungsten lamp.
 - (c) Capable of measuring semi-opaque samples.
 - (d) Independent scale illumination of constant intensity.
3. **High accuracy obtained using a large scale.**
 - (a) The scale is four times larger than those used in conventional instruments of ATAGO.
 - (b) The minimum scale division of 0.0002 enables measurements of refractive index of 0.0001 to be made. Similarly, using the Brix scale which has divisions of 0.1%, enables readings of 0.05% to be obtained.
4. **Double control knob for easier operation.**
 - (a) Fine control knob for fine adjustment gives greater accuracy and enables the operator to bring the boundary line into the center cross more quickly.
 - (b) This facility gives quicker operation and better reproducibility of measurements.
5. **Able to measure solid and liquid samples.**
 - (a) The high intensity lighting is suitable for the measurement of both solid and liquid samples.
6. **Safe electrical system.**
 - (a) The transformer and electrical wiring are housed within the main body. This avoids any possibility of damage due to sample spillage.
 - (b) The power supply cable is fixed to the main body of the instrument.
7. **Built-in air dryer and moisture removal device.**
 - (a) A large cartridge drying chamber containing silicagel is incorporated to prevent moisture condensing on the inside of the instrument.
 - (b) Means are provided for using compressed air to remove internal moisture droplets.

SPECIFICATIONS

Refractive index range.....	nD 1.3000 to 1.7100
R.I. minimum scale.....	nD 0.002
Brix range.....	0 to 95%
Brix minimum scale.....	0.1%
Accuracy of R.I.& Brix.....	$\pm 0.0001, \pm 0.05\%$
Dispersion (nF-nc)	with conversion table
Applicable temperature	0 to 50°C
Digital thermometer.....	Built-in thermistor in the prism $\pm 0.2^\circ\text{C}$
Input	100 to 120, 220 to 240 V a.c.
Size and weight.....	Refractometer 12X31X34cm, 9kg Thermometer 8X10X11cm, 0.8kg

ACCESSORIES

Test piece (Refractive index standard)	1pc
Monobromonaphthalene(4 ml)	1pc
Thermometer (Digital type)	1pc
L-Wrench(for regulating scale).....	1pc
Illuminator lamp (6V 1.2A).....	3pcs
(8V 0.15A).....	3pcs
Instruction manual	1pc
Air purger.....	1pc



With Digital
Thermometer !

CAT. NO.1220

ABBE REFRACTOMETER (HIGH TEMPERATURE MODEL)

2T



The field of application of the abbe refractometer is further extended to enable measurement to be made with high molecular compounds by this new model, Type 2T, which is designed for use with samples at high temperature.

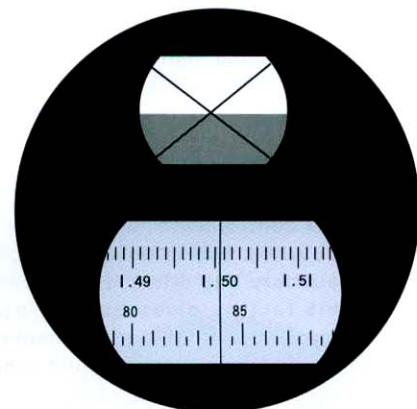


SPECIFICATIONS

Refractive index range.....	nD 1.3000 to 1.7000
R.I. minimum scale.....	nD 0.001
Brix range.....	0 to 95%
Brix minimum scale.....	0.5%
Accuracy of R.I.& Brix.....	±0.0002, ±0.1%
Dispersion (nF-nC)	with conversion table
Applicable temperature.....	0 to 120°C
Digital thermometer.....	Built-in thermistor in the prism 0 to 100°C (±0.2°C) 100 to 120°C(±0.5°C)
Input.....	100 to 120, 220 to 240 V a.c.
Size and weight.....	Refractometer 21×20×25cm, 5.8kg Thermometer 8×10×11cm, 0.8kg

ACCESSORIES

Test piece (Refractive index standard).....	1pc
Monobromonaphthalene(4ml)	1pc
Thermometer(Digital type).....	1pc
Screwdriver for scale adjustment	1pc
Illuminator lamp(8V 0.15A)	5pcs
Instruction manual.....	1pc



With Digital Thermometer !

Abbe Refractometers for low refractive index and high refractive index measurements

In addition to our standard Abbe Refractometer type 2T, we can supply the following Abbe models.

- **Abbe Refractometer 2T•LO** (for high temperature and low refractive index measurements) Cat.No.1227
Measurement range :Refractive index(nD) 1.1500 to 1.4800
Measurement temperature range:0 to 120°C
- **Abbe Refractometer 2T•HI** (for high temperature and high refractive index measurements) Cat.No.1228
Measurement range :Refractive index(nD) 1.4700 to 1.8700
Measurement temperature range:0 to 120°C

Another option

*We can supply Abbe refractometer with measurement range of "nD 1.7000 to 2.0800" and with measurement temperature range of "0 to 50°C" or "0 to 120°C".

Note: You are requested to convert measured refractive indices to "real refractive indices"(with referring to conversion tables), since the above Abbe refractometers have the same scales as our standard Abbe refractometer type 2T.

For further details, please make inquiries to our export department.

CAT. NO.1410, 1414

MULTI-WAVELENGTH ABBE REFRACTOMETER

DR-M2

DR-M4



Refractive index or Abbe number (vd or ve) can be measured at different wavelengths ranging from 450 to 1,100nm (For measurement at wavelengths ranging from 681 to 1,100nm, the optional Near Infrared Ray Viewer (RE-9115) is required.) The DR-M2/DR-M4 display measurement result of refractive index or Abbe number digitally on the LCD.

Measurement can be achieved by matching the boundary line with the intersection point of the cross hairs.

These refractometers are connectable with digital printer DP-21 (A) (optional).

Measurement range:

DR-M2

Wavelength 450nm :Refractive index 1.3277 to 1.7379

Wavelength 589nm :Refractive index 1.3000 to 1.7100

Wavelength 680nm :Refractive index 1.2912 to 1.7011

Wavelength 1,100nm:Refractive index 1.2746 to 1.6843

DR-M4

Wavelength 450nm :Refractive index 1.5164 to 1.9164

Wavelength 589nm :Refractive index 1.4700 to 1.8700

Wavelength 680nm :Refractive index 1.4558 to 1.8557

Wavelength 1,100nm:Refractive index 1.4304 to 1.8303

Minimum indication :0.0001 in refractive index

0.1 in Abbe number

Measurement accuracy : ± 0.0002 in refractive index (with the attached test piece at 589nm)

Wavelength range :From 450 to 1,100nm
(with interference filters)
(For measurement at wavelengths ranging from 681 to 1,100nm, the Near Infrared Ray Viewer (optional) is required.)

Measurement temperature range:5 to 50°C

Output terminal :For printer, DP-21(A) (optional),
Conforming to Centronics standard

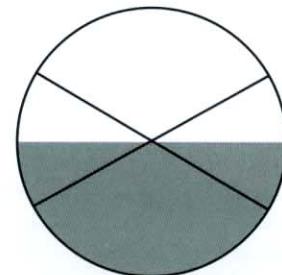
Power supply :AC100 to 240V (50/60Hz)

Size and weight :Refractometer 13×29×31cm,6.0kg
Light source unit 15×33×11cm,3.0kg

Optional accessory :Near Infrared Ray Viewer (Part No.RE-9115)

ACCESSORIES

Allen wrench.....	1pc
Test piece (Refractive index point).....	1pc
Monobromonaphthalene,4ml.....	1pc
Methylene iodide containing sulfer solution,4ml (for DR-M4 only).....	1pc
Lighting glass.....	1pc
Interference filter, 589 nm and 546 nm.....	1each
Tube band.....	10pcs
Spare bulb.....	1pc
Instruction manual.....	1pc



Refraction view



Display



CAT. NO.1412, 1415

MULTI-WAVELENGTH ABBE
REFRACTOMETER

DR-M2/1550
DR-M4/1550



Refractive index or Abbe number(vd or ve) can be measured at different wavelengths ranging from 450 to 1,550 nm.
These refractometers digitally display measurement result of refractive index or Abbe number on the LCD.
Measurement can be achieved by matching the boundary line with the intersection point of the cross hairs.
They are connectable with digital printer DP-21(A)(optional).

Measurement range:

DR-M2/1550

Wavelength 450nm: Refractive index 1.3278 to 1.7379
Wavelength 589nm: Refractive index 1.3000 to 1.7100
Wavelength 680nm: Refractive index 1.2913 to 1.7011
Wavelength 1,100nm: Refractive index 1.2746 to 1.6843
Wavelength 1,550nm: Refractive index 1.2594 to 1.6690

DR-M4/1550

Wavelength 450nm : Refractive index 1.5164 to 1.9164
Wavelength 589nm : Refractive index 1.4700 to 1.8700
Wavelength 680nm : Refractive index 1.4558 to 1.8557
Wavelength 1,100nm : Refractive index 1.4304 to 1.8303
Wavelength 1,550nm : Refractive index 1.4215 to 1.8214

Minimum indication : 0.0001 in refractive index
0.1 in Abbe number

Measurement accuracy: ± 0.0002 in refractive index
(with the attached test piece at 589nm)

Wavelength range : From 450 to 1,550nm
(with interference filters)

Measurement temperature range: 5 to 50°C

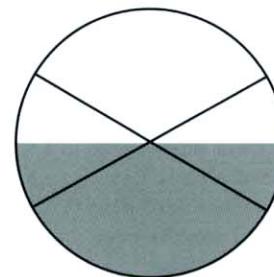
Output terminal : For digital printer, DP-21(A),
Conforming to Centronics standard

Power supply : AC 100 to 240V(50/60Hz)

Size and weight : Refractometer 13X29X31cm, 6kg
Power supply 15X33X11cm, 3kg

ACCESSORIES

Near Infrared Ray Viewer.....	1pc
Mounting adapter and set screw.....	1each
Monochromatic light source devise.....	1set
Allen wrench.....	1pc
Test piece.....	1pc
Monobromonaphthalene,4ml.....	1pc
Methylene iodide containing sulfer solution,4ml(for DR-M4/1550 only).....	1pc
Interference filter, 589nm.....	1pc
Tube band.....	10pcs
Instruction manual.....	1pc



Refraction view



Display



Specifications and appearance are subject to change without notice.



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