MEASURING QUALITY. SINCE 1796

KRÜSS
A.KRÜSS OPTRONIC
GERMANY

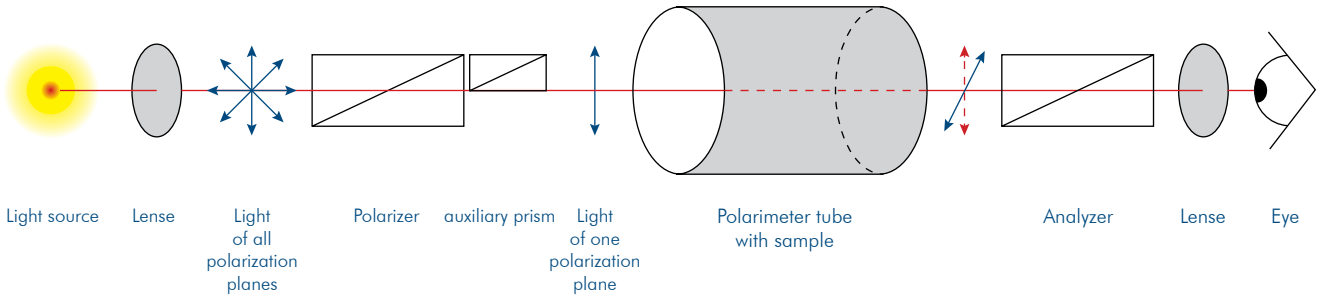
POLARIMETERS

FAST AND RELIABLE ANALYSIS OF OPTICALLY ACTIVE SUBSTANCES

MADE IN GERMANY

www.kruess.com

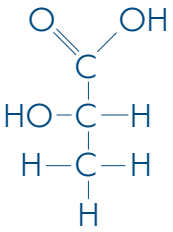
What is POLARIMETRY?



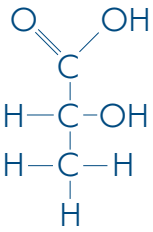
If we regard light as an electromagnetic wave propagating through space, it is possible to illustrate the phenomenon of "polarized light".
The oscillation and the direction of propagation of the wave define a very specific plane. If you would look towards the beam you would see this wave as a line which is inclined at a certain angle in space.
Regular light includes waves that are inclined in any direction of the space while polarized light is inclined only at a defined angle.
This polarization can only be achieved by a very close meshed grating – a polarization filter. This one filters out all waves from the regular light that do not have the same inclination as the filter's grating. Is the light now directed to a second grating which is exactly 90° to the first grating, no light will fall on the detector or the human eye located behind it. If you place an optically active substance between the two filters, light will again pass through the second filter.
Optically active substances change the inclination of the lightwave. Depending on the design of the device, the second filter is rotated (manually or automatically) until no light will fall on the detector. This technical setup explains the terms "optical rotation", "rotation angle" as well as the terms "clockwise" and "anticlockwise".
The two later terms describe the behavior of the wave mentioned above during the passage through an optically active substance. Depending on the molecular structure of the substance, the direction of the inclination of the wave is towards the right or towards the left.
In order to be able to measure this change, the second filter has to be rotated anticlockwise or clockwise.
Typical substances are sugar, lactic acid, tartaric acid but also many other biologically active substances.

Optically active are chiral substances whose molecules can take up different spatial arrangements that can not be aligned with by a rotation. Hence, this is a form of configuration isomerism. The different molecules of the substance are called enantiomers.

The following two enantiomers of lactic acid are an example of such a molecule:



S- (+) lactic acid



R- (-) lactic acid

The chiral center of the lactic acid is the middle carbon atom. Since the two enantiomers have different rotation angles, the polarimetry will provide information about the molecular structure.
In addition to the properties of the substance, the following factors also have an influence on the strength of the optical activity: the temperature, the wavelength of the light, the concentration of the substance and possibly also the solvent.
The following applies as well: The longer the path of the light through an optically active substance, the larger the angle of rotation.

A.KRÜSS Optronic Polarimeters

Precision Instruments „made in Germany“

For over 200 years A.KRÜSS Optronic has been famous worldwide for innovative optic-electronic measuring instruments of the highest precision.
As the oldest company in this field, our target is to develop instruments which set new standards.
With our products we aim to simplify testing and inspection tasks in laboratories or production facilities.
For this reason all instruments are user-friendly and can be operated intuitively.

P8000-Serie | Automatic High-Speed Polarimeters

The fastest polarimeters in the world!

The digital polarimeters of the P8000 series feature an innovative measuring principle to measure optically active liquids.
Our patented measuring technology works much faster than in conventional polarimeters, as it reduces measuring time to just one second, regardless of the rotation angle of the sample.
In addition, it permits continuous measurement, for example for kinetic investigations or in HPLC use.
All adjustments on the device are made via an easy to use touchscreen. An easy to understand help display can be called up at any time.
With minimum effort, the user can carry out a simple menu-driven calibration using test quartz.
The T-models of the P8000 series are equipped with thermostat interfaces and the delivery includes an external PT31 thermostat.
The connection of a temperature-controlled gauge head permits extremely accurate measurement.
The devices are intended for use in FDA-regulated sectors due to their GLP compliance, integrated user management and full network support, for simple connection to the laboratory environment and an LIMS.

All internal data (measurement values, parameters and methods) are organised in an SQL database.
This can be accessed externally using SQL queries through a fixed interface (e.g. LIMS).
With KrüssLab software, the device can be controlled by PC remote mode, using the same intuitive layout as the touchscreen on the polarimeter.
The PC stores measurement results as a local copy in the database, so your data is retained after the polarimeter is switched off.
Various data filters allow you to send data in Excel or HTML to your printer or export it in PDF format.

Range of applications

Pharmaceutical industry

- Monitoring chemical processes
- Purity control and determination of concentrations
- Characterisation of new synthetic substances
- The analysis of pharmaceuticals complies with Pharmacopoeia, DAB and other national and international standards.

Chemical industry

- Purity control and determination of concentrations
- Analysis of optically-active components (qualitative and quantitative)
- Determination of changes in the configuration
- Monitoring chemical processes

Sugar industry

- Quality control of original and end product
- Determination of fructose and glucose
- Sugar concentrations in refined beet and cane sugar, molasses and beet pulp

Food industry

- Determination of concentration
- Purity control
- Quality control

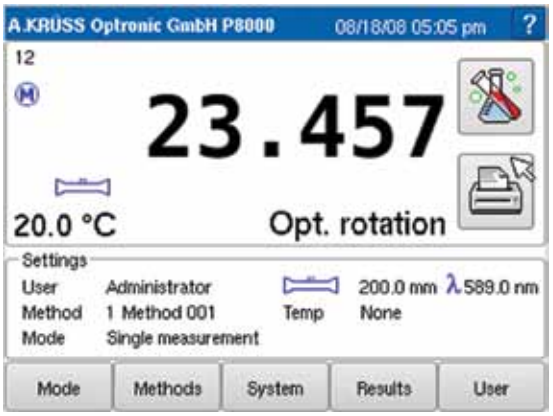
Special features

- Extreme time savings – about 1 sec. measurement duration
- Bright touchscreen display with intuitive operation
- Extreme precision and resolution across the entire measurement range (regardless of rotation angle)
- High resolution LED with 100,000 hour service life
- Interval or continuous measurement possible
- 100 different methods and user tables (individual tables) can be set
- Calibratable temperature sensor
- High light intensity: Measurement and continuous sample readings possible to an optical density of 3.0
- Tough powder-coated metal housing
- Very quiet operation
- Data display of all important settings and measurements
- User management functionality (password-protected) can be activated
- Integral SQL database for data storage
- USB interface for data export and firmware updates and for connecting keyboard or barcode scanner
- RS-232 interface for serial printer
- Ethernet interface for direct connection to a PC (with possibility of remote maintenance via internet)
- PDF-export
- Direct printing possible on a PostScript-enabled network printer
- Full cGMP/GLP capability: password protection, data backup, automatic printout or data output in CSV-format
- Meets the relevant international standards such as Pharmacopoeia, OIML, ASTM
- NIST-compliant calibration certificate
- IQ/OQ/PQ-commissioning possible
- Extremely low maintenance and long life
- 3 year warranty with registration

Main measuring display

This is where the measurement is carried out and the results as well as the important parameters are displayed.

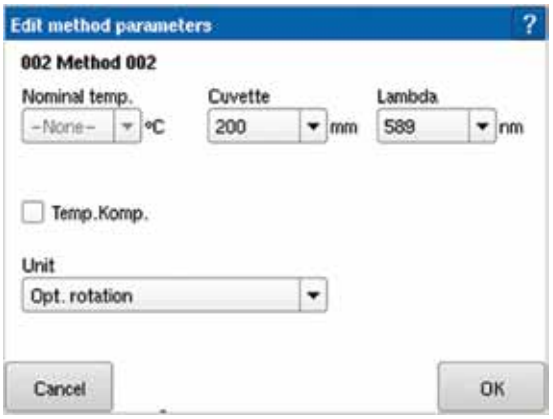
- Reading [°, °Z, g/ml]: Optical rotation, international sugar scale, concentration
- Tube temperature
- Sample number
- Tube length
- Wavelength
- Thermostat temperature
- Status information



Parameter selection

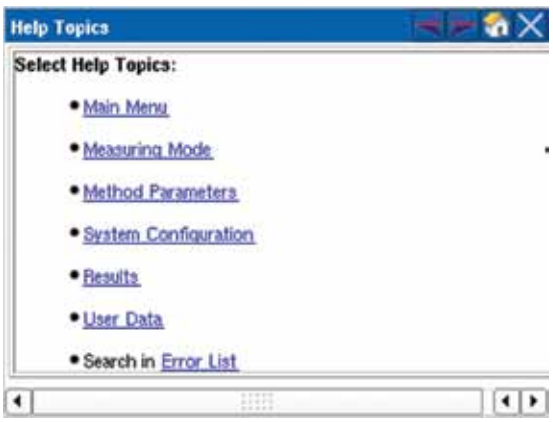
This menu is used to adjust the measuring parameters.

- Sample designation
- Comment
- Tube length
- Wavelength
- Measuring unit [°, °Z, g/ml]
- Specific rotation
- Temperature compensation



Individual user administration and help key

- Your settings are protected by an individual password.
- All screens have a help key which calls up explanations of the symbols shown on the screen.
- There is also extensive online help with every unit.



Specifications

	P8000	P8000-T	P8100	P8100-T
Measuring method	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined
Measuring range	±90° ±259 °Z 0–99.9 g/ml	±90° ±259 °Z 0–99.9 g/ml	±90° ±259 °Z 0–99.9 g/ml	±90° ±259 °Z 0–99.9 g/ml
Measuring units	Angle [°, °Z] conc. [g/100 ml] user defined	Angle [°, °Z] conc. [g/100 ml] user defined	Angle [°, °Z] conc. [g/100 ml] user defined	Angle [°, °Z] conc. [g/100 ml] user defined
Resolution	0.001° 0.01 °Z 0.1 g/ml	0.001° 0.01 °Z 0.1 g/ml	0.001° 0.01 °Z 0.1 g/ml	0.001° 0.01 °Z 0.1 g/ml
Accuracy	±0.003° ±0.01 °Z ±0.5 g/100 ml	±0.003° ±0.01 °Z ±0.5 g/100 ml	±0.002° ±0.01 °Z ±0.5 g/100 ml	±0.002° ±0.01 °Z ±0.5 g/100 ml
Reproducibility	0.002°	0.002°	0.002°	0.002°
Measuring time ±90°	1 s	1 s	1 s	1 s
Light source	1 LED with filter	1 LED with filter	1 LED with filter	1 LED with filter
Wavelength	589 nm others optional	589 nm others optional	589 nm others optional	589 nm others optional
Wavelength selection	One fixed wavelength	One fixed wavelength	One fixed wavelength	One fixed wavelength
Connection for temperature sensor	Special tube with PT100 temperature sensor required	Special tube with PT100 temperature sensor required	Special tube with PT100 temperature sensor required	Special tube with PT100 temperature sensor required
Temperature measurement	0–99.9 °C	0–99.9 °C	0–99.9 °C	0–99.9 °C
Temperature resolution	0.1 °C	0.1 °C	0.1 °C	0.1 °C
Temperature accuracy	±0.2 °C	±0.2 °C	±0.2 °C	±0.2 °C
Temperature reading point	Tube	Tube	Tube	Tube
Temperature control	–	PT31 Peltier thermostat (water) with fast closure system	–	PT31 Peltier thermostat (water) with fast closure system
Range of temperature control	–	15–40.0 °C	–	15–40.0 °C
Accuracy of temperature control	–	±0.2 °C	–	±0.2 °C
Max. length of tube	220 mm	220 mm	220 mm	220 mm
Sensitivity	min 0.1 % (OD3)	min 0.1 % (OD3)	min 0.1 % (OD3)	min 0.1 % (OD3)
Calibration	Automatic (menu-driven)	Automatic (menu-driven)	Automatic (menu-driven)	Automatic (menu-driven)
Display	LCD TFT 5.7 " 640x480 pixel color display (VGA)	LCD TFT 5.7 " 640x480 pixel color display (VGA)	LCD TFT 5.7 " 640x480 pixel color display (VGA)	LCD TFT 5.7 " 640x480 pixel color display (VGA)
Operation	Touchscreen	Touchscreen	Touchscreen	Touchscreen
Measured data storage	999 measurements	999 measurements	999 measurements	999 measurements
Interfaces	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)
Operating voltage	90–250 V 50/60 Hz	90–250 V 50/60 Hz	90–250 V 50/60 Hz	90–250 V 50/60 Hz
Dimensions in cm	64.5 x 20.0 x 36.0	64.5 x 20.0 x 36.0	64.5 x 20.0 x 36.0	64.5 x 20.0 x 36.0
Weight	28 kg	28 kg	28 kg	28 kg

P8000-PT | Automatic polarimeters with Peltier temperature control

Direct temp. control of the sample tube

Based on the reliable P8000 series, A. KRÜSS Optronic has developed a polarimeter with electronic temperature control using a special tube.
Peltier elements and a glass tube with unbreakable metal sleeve are just some of its special features.
The good insulation and positioning of the Peltier elements gives verifiable homogeneous sample temperature, making it possible to omit the water bath thermostat otherwise required for precise measurements. The advantages are obvious:
There is no thermostat to be readjusted and maintained. The set-point temperature is entered directly on the touch-screen of the polarimeter and the device can automatically detect whether the tube has been connected. Of course, it is possible to use standard tubes without temperature control if the accuracy of a temperature-controlled sample is not required.
In case the sample has been warmed up before, the time to bring it up to the right temperature can be considerably reduced thus utilizing the short measuring time of the P8000-Series – approx. one second . The P8000 series is the fastest polarimeter in the world!

Special features

As for the P8000, plus temperature-controlled Peltier sample tube.

Applications

As for the P8000

Specifications

	P8000-PT	P8100-PT
Measuring method	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined
Measuring range	±90° ±259 °Z 0–99.9 g/ml	±90° ±259 °Z 0–99.9 g/ml
Measuring units	Angle [°, °Z], conc. [g/100 ml], user defined	Angle [°, °Z], conc. [g/100 ml], user defined
Resolution	0.001° 0.01 °Z 0.1 g/ml	0.001° 0.01 °Z 0.1 g/ml
Accuracy	±0.003° ±0.01 °Z ±0.5 g/100 ml	±0.002° ±0.01 °Z ±0.5 g/100 ml
Reproducibility	0.002°	0.002°
Measuring time ±90°	1 s	1 s
Light source	1 LED with filter	1 LED with filter
Wavelength	589 nm, others optional	589 nm, others optional
Wavelength selection	One fixed wavelength	One fixed wavelength
Max. length of tube	220 mm	220 mm
Sensitivity	min 0.1 % (OD3)	min 0.1 % (OD3)
Calibration	Automatic (menu-driven)	Automatic (menu-driven)

Display	LCD TFT 5.7 " 640x480 pixel color display (VGA)	LCD TFT 5.7 " 640x480 pixel color display (VGA)
Operation	Touchscreen	Touchscreen
Measured data storage	999 measurements	999 measurements
Interfaces	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)
Operating voltage	90–250 V 50/60 Hz	90–250 V 50/60 Hz
Dimensions in cm	64.5 x 20.0 x 36.0	64.5 x 20.0 x 36.0
Weight	28 kg	28 kg
Peltier temperature control	Special tube PRG-100-EPT required	Special tube PRG-100-EPT required
Temperature measurement	0–99.9 °C	0–99.9 °C
Temperature resolution	0.1 °C	0.1 °C
Temperature accuracy	±0.2 °C	±0.2 °C
Temperature reading point	Tube	Tube
Range of temperature control	15–40.0 °C	15–40.0 °C
Accuracy of temperature control	±0.2 °C	±0.2 °C

P8000-DT Series | Autom. Polarimeters with Rinsing and Drying Module

Applications

As for the P8000-T
Main application areas: Flavourings industry and ingredient analysis of high-value substances.

Semiautomatic sampling

The P8000-DT features a temperature-controlled micro-cuvette that can be used in flow-through operation. This is particularly useful for aggressive or expensive samples and substances, as are often used in the pharmaceutical and flavouring industries.
The built-in rinsing and drying unit permits semi-automatic sampling, and subsequent cleaning using a hose pump and the integrated drying unit.
This eliminates the need to remove the sample tube and clean it outside the polarimeter, for major savings of valuable sample substances as well as time.
Cleaning is also possible through displacement by the new sample.

Special features

As for the P8000-T, plus

- Rinsing and drying module for aggressive substances and small sample volumes
- Parts that come into contact with samples are chemical-resistant (PTFE, PFA, viton, glass)
- Adjustable measurement and cleaning parameters
- Also available with autosampler

Specifications

	P8000-DT	P8100-DT
Measuring method	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined	Optical rotation, int. sugar scale, concentration, spec. rotation, user-defined
Measuring range	±90° ±259 °Z 0–99.9 g/ml	±90° ±259 °Z 0–99.9 g/ml
Measuring units	Angle [°, °Z] conc. [g/100 ml] user defined	Angle [°, °Z] conc. [g/100 ml] user defined
Resolution	0.001° 0.01 °Z 0.1 g/ml	0.001° 0.01 °Z 0.1 g/ml
Accuracy	±0.003° ±0.01 °Z ±0.5 g/100 ml	±0.002° ±0.01 °Z ±0.5 g/100 ml
Reproducibility	0.002°	0.002°
Measuring time ±90°	1 s	1 s
Light source	1 LED with filter	1 LED with filter
Wavelength	589 nm others optional	589 nm others optional
Wavelength selection	1 fixed wavelength	1 fixed wavelength
Connection for temperature sensor	Special tube with PT100 temperature sensor required	Special tube with PT100 temperature sensor required
Temperature measurement	0–99.9 °C	0–99.9 °C
Temperature resolution	0.1 °C	0.1 °C
Temperature accuracy	±0.2 °C	±0.2 °C

	P8000-DT	P8100-DT
Temperature reading point	Tube	Tube
Temperature control	PT31 Peltier thermostat (water) with fast closure system	PT31 Peltier thermostat (water) with fast closure system
Range of temp. control	15–40.0 °C	15–40.0 °C
Accuracy of temperature control	±0.2 °C	±0.2 °C
Max. length of tube	220 mm	220 mm
Sensitivity	min 0.1 % (OD3)	min 0.1 % (OD3)
Calibration	Automatic (menu-driven)	Automatic (menu-driven)
Display	LCD TFT 5.7 " 640x480 pixel color display (VGA)	LCD TFT 5.7 " 640x480 pixel color display (VGA)
Operation	Touchscreen	Touchscreen
Measured data storage	999 Measurements	999 Measurements
Interfaces	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)
Operating voltage	90–250 V 50/60 Hz	90–250 V 50/60 Hz
Sample-feeding	Hose pump	Hose pump
Cleansing	Rinsing and drying module	Rinsing and drying module
Dimensions in cm	64.5 x 20.0 x 36.0	64.5 x 20.0 x 36.0
Weight	28 kg	28 kg

Fast, precise sugar values

This low-cost alternative to the P8000 was developed especially for the sugar industry.
The PS8000 is a precise and very fast polarimeter, with the same operating and measurement functions as the P8000.
The high light intensity permits measurement and continuous sample readings up to an optical density of 3.0 (dark samples).
The measuring values are displayed in the international sugar scale.
Display for different initial weights is possible:
In addition to the standard unit of 26 g/100 ml, initial weights of 13 g/100 ml and 6.5 g/100 ml can also be selected.

Special features

As for the P8000

Applications

As for the P8000
Main application area: Sugar industry

Specifications

	PS8000	PS8000-T
Measuring method	Int. sugar scale	Int. sugar scale
Measuring range	±259 °Z	±259 °Z
Measuring units	Angle (°Z)	Angle (°Z)
Resolution	0.01 °Z	0.01 °Z
Accuracy	±0.01 °Z	±0.01 °Z
Reproducibility	0.02 °Z	0.02 °Z
Measuring time ±90°	1 s	1 s
Light source	1 LED with filter	1 LED with filter
Wavelength	589 nm others optional	589 nm others optional
Wavelength selection	1 fixed wavelength	1 fixed wavelength
Connection for temperature sensor	Special tube with PT100 temperature sensor required	Special tube with PT100 temperature sensor required
Temperature measurement	0–99.9 °C	0–99.9 °C
Temperature resolution	0.1 °C	0.1 °C
Temperature accuracy	±0.2 °C	±0.2 °C
Temperature reading point	Tube	Tube

	PS8000	PS8000-T
Temperature control	–	PT31 Peltier thermo-stat (water) with fast closure system
Range of temp. control	–	15–40.0 °C
Accuracy of temperature control	–	±0.2 °C
Max. length of tube	220 mm	220 mm
Sensitivity	min 0.1 % (OD3)	min 0.1 % (OD3)
Calibration	Automatic (menu-driven)	Automatic (menu-driven)
Display	LCD TFT 5.7 “ 640x480 pixel color display (VGA)	LCD TFT 5.7 “ 640x480 pixel color display (VGA)
Operation	Touchscreen	Touchscreen
Measured data storage	999 Measurements	999 Measurements
Interfaces	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)	RS-232 (printer) USB (data export, firmware updates) Ethernet (LIMS, remote monitoring)
Operating voltage	90–250 V 50/60 Hz	90–250 V 50/60 Hz
Dimensions in cm	64.5 x 20.0 x 36.0	64.5 x 20.0 x 36.0
Weight	28 kg	28 kg

P3000 Series | Automatic Polarimeters

For fast standard measurements

The P3000 economical polarimeter is a simplified version of the P8000 and uses the same patented fast measurement technique. It measures samples in just 1 second, regardless of the rotation angle, saving much time over measurement with conventional polarimeters.
The P3000 is operated fully automatically with an intuitive touchscreen. Measured values can be displayed as optical rotation angles or in the ICUMSA international sugar scale, and can be printed out with the printer interface.
The P3000 offers unbeatable value for money for all applications where measurement accuracy to 2 decimal points is sufficient.

Specifications

Measuring method	Optical rotation, int. sugar scale
Measuring range	±90° ±259 °Z
Measuring units	Angle [°, °Z]
Resolution	0.01° 0.01 °Z
Accuracy	±0.01° ±0.01 °Z
Reproducibility	0.01°
Measuring time ±90°	1 s
Light source	1 LED with filter
Wavelength	589 nm
Wavelength selection	1 fixed wavelength
Temperature measurement	0–99.9 °C
Temperature resolution	0.1 °C
Temperature accuracy	±0.2 °C
Temperature reading point	Tube
Max. length of tube	220 mm
Sensitivity	min 0.1 % (OD3)
Calibration	Automatic (menu-driven)
Display	LCD 3.5“ color display
Operation	Touchscreen
Interfaces	RS-232
Operating voltage	100–250 V, 50/60 Hz
Dimensions in cm	64.5 x 20.0 x 36.0
Weight	28 kg

Range of applications

Pharmaceutical industry
- Hospitals and pharmacies
- Monitoring chemical processes
- Purity control and determination of concentrations
- The analysis of pharmaceuticals complies with Pharmacopoeia, DAB and other national and international standards.

Chemical industry
- Purity control and determination of concentrations
- Analysis of optically active components (qualitative and quantitative)
- Determination of changes in the configuration
- Monitoring chemical processes

Sugar industry
- Quality control of original and end product
- Determination of fructose and glucose

Food industry
- Determination of concentration
- Purity control
- Quality control

P1000-LED | Manual Lab Polarimeter

Classic traditional instrument

The P1000-LED polarimeter is a simple and robust device for basic applications in the lab and for training. It operates according to the half-shade principle and the reading takes place via an eye-piece and two noniuses.The P1000-LED features a high-quality metal stand and a sample chamber for tubes of up to 220 mm length. The LED diodes last about 500 times longer than conventional sodium lamps, making this a highly economical alternative. It is equipped with a swivel-mounted cover, polarizer and analyzer and the delivery includes accessories.

New: *Energy-saving, long-life LED illumination*

Specifications

Measuring range	2 semi-circles (0-180°)
Glass tubes	100 and 200 mm
Scale division	1°
Reading precision	0.05° (with nonius)
Light source	LED
Dimensions in cm	14.0 x 33.0 x 50.0
Weight	4.3 kg

Scope of delivery

- Polarimeter tubes 100 and 200 mm with bubble trap

Accessories

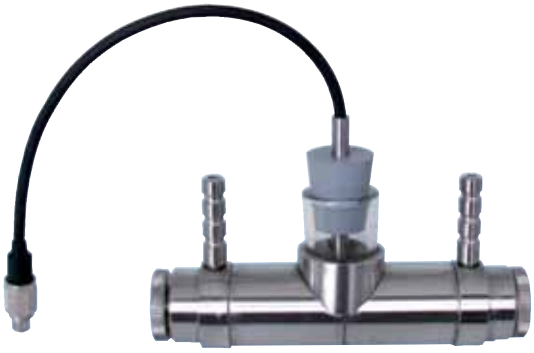
- Replacement sodium lamp for older models
- Glass cover plate

Polarimeter Accessories

Polarimeter tubes made of glass

PRG-100-ETT and PRG-200-ETT: Glass and metal polarimeter tubes

Temperature-controlled glass/metal tubes with funnel and temperature sensor.
The PRG-100/200-ETT is a highly robust, multi-purpose polarimeter tube. The glass interior makes it acid-proof, which is very important in the pharmaceutical industry. The outside metal housing makes it unbreakable. Verifiable homogeneous sample temperature along the entire length is afforded by the outward-facing inlets. The PT-100 temperature sensor is positioned directly in the sample, and can be Teflon-coated on request. The tube can be opened at both ends for cleaning.



Article No	Length in mm	Volume in ml (approx.)
PRG-100-ETT	100	6.00
PRG-200-ETT	200	12.00

The temperature sensor is also available with acid-resistant Teflon coating!

Micro glass tube for small sample volumes without temperature control

Article No	Length in mm	Volume in ml (approx.)
PRG-50-M	50	0.55
PRG-100-M	100	1.10

Glass tube with bubble trap for single measurements without temperature control

Article No	Length in mm	Volume in ml (approx.)
PRG-100	100	8.00
PRG-200	200	15.00

Glass tube with funnel without temperature control

Article No	Length in mm	Volume in ml (approx.)
PRG-50-E	50	3.00
PRG-100-E	100	6.00
PRG-200-E	200	12.00

Custom-made product: If this selection of polarimeter tubes and quartz plates does not meet your requirements, please do not hesitate to contact us!

PRG-100-EPT:
Electronic Peltier temperature control for the P8000-PT
Glass tube with integrated Peltier temperature control
The PRG-100-EPT is a multi-purpose polarimeter tube with autonomous temperature control.
The built-in Peltier elements provide automatic temperature control without a water connection.
This enables simple and highly precise temperature monitoring between 10 °C and 40 °C.
The glass interior makes it acid-proof, which is very important in the pharmaceutical industry.
The outside metal housing makes it unbreakable.
Verifiable homogeneous sample temperature along the entire length is afforded by the good insulation and positioning of the Peltier elements.
The PRG-100-EPT is designed especially for the P8000-PT polarimeter, and works only with that model.

Article No	Length in mm	Volume in ml (approx.)
PRG-100-EPT	100	8.00

Polarimeter tubes made of stainless steel

Stainless steel micro flow-through tube with hose connectors without temperature control

Article No	Length in mm	Volume in ml (approx.)
PRM-10-SDM	10	1.50

Stainless steel flow-through tube with funnel and overflow pipe without temperature control

Article No	Length in mm	Volume in ml (approx.)
PRM-100-D	100	12.00
PRM-200-D	200	17.00

Stainless steel flow-through tube with funnel, overflow pipe and temperature control

Article No	Length in mm	Volume in ml (approx.)
PRM-100-DT	100	12.00
PRM-200-DT	200	17.00

Stainless steel flow-through tube with hose connectors without temperature control

Article No	Length in mm	Volume in ml (approx.)
PRM-50-SD	50	10.00
PRM-100-SD	100	12.00
PRM-200-SD	200	17.00

Stainless steel flow-through tube with hose connectors and temperature control

Article No	Length in mm	Volume in ml (approx.)
PRM-100-SDT	100	12.00
PRM-200-SDT	200	17.00

Stainless steel flow-through tube with hose connectors, temperature sensor and temperature control

Article No	Length in mm	Volume in ml (approx.)
PRM-100-SDTT	100	12.00
PRM-200-SDTT	200	17.00

Quartz Control Plates

Economy quartz control plates with manufacturer´s certification traceable to official PTB certificate	
PQE+17	+17° (+/- 1°), +50 °Z (+/- 1 °Z)
PQE+34	+34° (+/- 1°), +99 °Z (+/- 1 °Z)
PQE -17	–17° (+/- 1°), –50 °Z (+/- 1 °Z)
PQE -34	–34° (+/- 1°), –99 °Z (+/- 1 °Z)

Premium quartz control plates with manufacturer´s certification traceable to official PTB certificate (individual PTB certificate available upon request)	
PQP+8	+8° (+/- 1°), +25 °Z (+/- 1 °Z)
PQP+17	+17° (+/- 1°), +50 °Z (+/- 1 °Z)
PQP+26	+26° (+/- 1°), +75 °Z (+/- 1 °Z)
PQP+33	+33° (+/- 1°), +95 °Z (+/- 1 °Z)
PQP+34	+34° (+/- 1°), +99 °Z (+/- 1 °Z)
PQP-10	–10° (+/- 1°), –30 °Z (+/- 1 °Z)

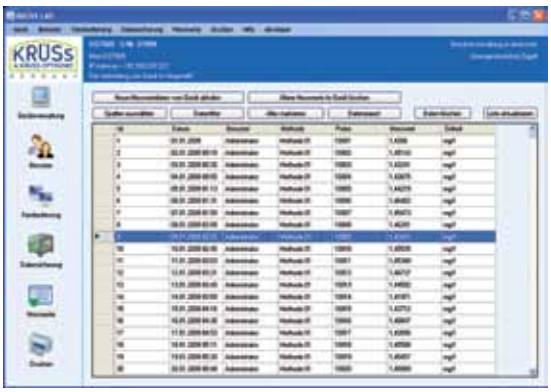
Sodium Lamps

P1000-300
Replacement sodium lamp for older models

Glass Cover Plate

P1000-150
Glass cover plate for polarimeter tube, package of 2 pieces

KrüssLab Software



The custom LIMS for your KRÜSS instruments.
For convenient remote control of refractometer, polarimeter and densimeter.

- Simple installation with Windows Explorer
- Device management, remote control and measurement administration
- Uses the same intuitive layout as the touchscreen on your Krüss instrument, for direct PC control
- The PC stores measurement results as a local copy in the database
- Central control of an unlimited number of KRÜSS instruments

Printer

CBM910
24 characters regular paper printer for:
- Digital refractometers from the DR6000 series
- Digital Abbe refractometer AR2008
- Digital polarimeters from the P8000 series
- Density meters DS7000 series

Automated sample injector - Autosampler

AS80
The refractometer, fitted with a flow-through cuvette, and the density meter can be completed by means of an automated sample injector system.
This consists of a rotor sampler, a peristaltic pump and a constriction-tube valve as toggle switch. The sampler uses a plate with 89 positions for sample tubes in polystyrene with dimensions ∅ 16 x 100 mm. These can accept sample volumes of 8 ml. Peristaltic pump and valve are integrated into the sampler and are controlled via this by the measuring device. The heads of the two assemblies are situated on the right-hand side of the unit.
The sample is transported into the measurement system by means of the peristaltic pump. If the measured value is stable and is recorded, the valve toggles from Sample to Standby and the system is rinsed. This minimises spreading and measurement errors. To take the following measurement the rotor is moved to the next sampling position and the valve set back to sample mode.

Peltier Thermostat

PT31
The electronic water bath thermostat with Peltier element is a versatile and powerful device used to control the temperature of refractormeters, polarimeters etc.
It is extremely robust, compact and easy to operate.
With its small footprint it takes little space in the lab.

Resolution	0.1 °C
Heating output	30 W
Cooling efficiency	15 W
Power supply	115–230 V
Pump pressure	2000 Pa
Pump capacity	20 l/h
Temperature	8–40 °C (continuously adjustable)
Temperature accuracy	±0.2 °C
Bath volume	about 100 ml
Dimensions in cm	8.0 x 21.0 x 14.0
Weight	1.5 kg

Water bath cleaner

PT35
- Prevents mould and algae growth
- Protects pipes

EN

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