

DR6000 | Digital Refractometer Series

The new series of A.KRÜSS Optronic Digital Refractometers are fitted with integrated Peltier thermostats for outstanding temperature control. Measurements are made with high accuracy and are not affected by colour or cloudiness.

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. 21 CFR Part 11 software is also available for the device.

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).

A self-explanatory touch screen with clear menu navigation and data output and USB/RS-232 interfaces fulfil all demands.

The instrument covers a large range of applications in the foodstuffs, sugar, beverage, chemistry, textiles, paper, metalworking and petrochemical industries.



Fields of application:

Determination of mixing ratios, quality and quantity inspection in the following industries:

- Pulp and paper industries
- Chemical industry
- Beverage industry
- Food industry
- Sugar and sweetener industry
- Textiles industry
- Metalworking industry
- Petrochemical industry
- Wastewater management

Features at a glance

- Large measurement range with high resolution
- User-friendly touch screen operation in 6 languages
- Data export (e.g. in Excel format) to a USB flash drive
- Various programmable measurement units
- Password protected user management (optional)
- User friendly RS-232, USB and Ethernet interfaces for direct connection to a PC
- Data display of all important settings and measurements
- 32-bit processor
- Integrated high-accuracy Peltier thermostat for temperature control without water. Rapid sample cool-down (T Series)
- SQL database
- High quality ceramic PT100 sensor
- NIST compliant calibration certificate
- Full GLP suitability

Specifications

Standard

	Range 1.3200-1.5800nD 0-95% Brix	Range 1.3200-1.7000nD 0-95% Brix	Accuracy 0.0001nD 0.1% Brix	Resolution 0.0001nD 0.1% Brix	Built-in Peltier thermostat	Flow- through cell
DR6000 *	X		X	X		
DR6000-F *	X		X	X		X
DR6000-T	X		X	X	X	
DR6000-FT	X		X	X	X	X
DR6100 *		X	X	X		
DR6100-F *		X	X	X		X
DR6100-T		X	X	X	X	
DR6100-FT		X	X	X	X	X

High accuracy

	Range 1.32000-1.58000nD 0-95% Brix	Range 1.32000-1.70000nD 0-95% Brix	Accuracy 0.00002nD 0.02% Brix	Resolution 0.00002nD 0.01% Brix	built-in Peltier thermostat	Flow- through cell
DR6200 *	X		X	X		
DR6200-F *	X		X	X		X
DR6200-T	X		X	X	X	
DR6200-FT	X		X	X	X	X
DR6300 *		X	X	X		
DR6300-F *		X	X	X		X
DR6300-T		X	X	X	X	
DR6300-FT		X	X	X	X	X

* All models without internal temperature control can be connected with our external Peltier thermostat PT31

Common Specifications	
Measurement modes	Single, Interval
Scales	Preset standard scales: Refractive Index [nD], %Brix (saccharose, inverted sugar, glucose, fructose). Temperature corrected [nD], temperature corrected [%Brix]. User defined scales can be initialized.
Calibration	1-point-calibration with any substance possible
Measurement time	~4 sec
Prism	Sapphire
Illumination	LED 590nm (est. life: >100.000 hours)
Housing	Cast aluminium, powder-coated
Analysis basin	Stainless steel
Display	LCD 5.7" 320x240 Pixel, TFT
Operation	Touch-screen
Interface	RS232, USB, Ethernet
Protection class	IP65 for analysis basin
Working voltage	90V...260V~, 50/60Hz, 60W

Common Specifications	
Temperature measurement	5-90°C
Temperature resolution	0.1°C
Temperature measurement accuracy	0.05°C
Temperature compensation	ICUMSA User defined 3-Point
Temperature sensor	PT100 sensor
Sample temperature	10-80°C
Ambient temperature	15-35°C

Only T-Models	
Temp. control range	10°C - 80°C (optional)
Temp. accuracy	0.1°C
Temp. stability	0.05°C

KRÜSS LabGuide

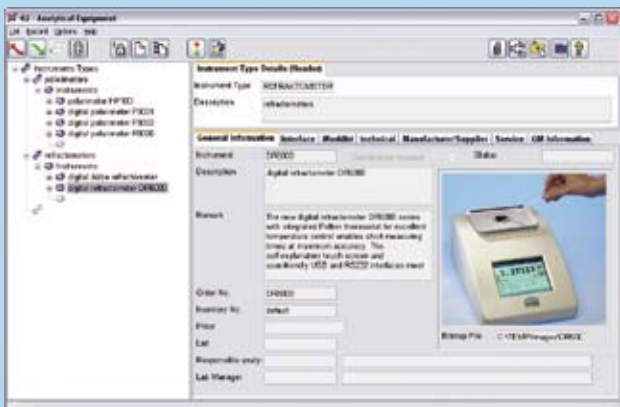
The program KRÜSS-LabGuide makes it easy for the laboratory technician to carry out measuring processes and find related documentations and values. It replaces the current manual records in the form of electronic journals. All requirements in handling electronic records and electronic signatures (ER/ES) are met by the KRÜSS-LabGuide according to 21 CFR Part 11. The development of the KRÜSS-LabGuide represents a collaborative effort between A. KRÜSS Optronic GmbH and iCD.GmbH on the basis of Laboratory Information/Management-Systems (LIMS) LABS/Q. Established 1796, A.KRÜSS Optronic in Hamburg, Germany has been developing and producing high precision optical measuring instruments for more than two centuries, now featuring state-of-the-art electronics.

iCD GmbH specializes in the development of software and related consultations for laboratories in the processing industry, government agencies and for energy and water supply enterprises.

KRÜSS-LabGuide software is delivered with the new generation of equipment for digital polarimeters and refractometers. It is our aim to fulfill the particular requirements for documentation and data security serving the pharmaceutical industry. Aside from a multi-lingual user guide, the system also includes a standardized interface for data exchange with other systems. A certified interface for SAP-QM is available as optional equipment.

User Management

The program includes a user management feature. Each user is assigned to a group through which he will be assigned access rights. Selection of the language version may be made during the registration process. All actions are recorded in an audit trail according to the requirements specified in 21 CFR Part 11.



Measuring Device Management

The supported laboratory devices are connected with each other via ethernet interface. The units will be automatically registered with KRÜSS-LabGuide and are available to the User for measuring- and test purposes.

Management of Measuring Methods

On the basis of prepared measuring methods for polarimeters and refractometers the User may set up and manage his own measuring methods with product-specific marginal values.

Evaluation and Reporting

Aside from the statistical print-outs of the recorded test data, the User has available to him various pre-established reports to print out results and test data. Individual reports may be obtained via external reporting tools with the use of a standardized data bank interface.



Scalability

LabGuide is a data bank based program. It may be used at an individual work station together with a test device, as well as in a network as an intranet application with several test devices and a central data bank.

Interfaces

Aside from the standardized XML-Interface used to exchange measuring data between LabGuide and other systems, the system offers data exchange with SAP-QM over a certified interface, as an optional feature.

The screenshot shows a 'Submission Report' with the KRUSS logo and the date 'Date: 20.07.2017 14:54'. The report includes a table with columns for 'Submission', 'Sample', 'Batch', 'SampleName', 'SampleCode', 'Acetylsalicylic acid', and 'Salicylic acid'.

Submission	Sample	Batch	SampleName	SampleCode	Acetylsalicylic acid Regulation of Acetylsalicylic acid % base	Salicylic acid Regulation of Acetylsalicylic acid % base
21000-01	241	01100000010-200	Acetylsalicylic acid	241	21.7	2.10
21000-02	241	01100000010-200	Acetylsalicylic acid	241	21.7	2.10
21000-03	241	01100000010-200	Acetylsalicylic acid	241	21.7	2.10
Avg					22.5	0.458
Max					22.7	1.00
Min					22.4	1.00
Std					0.8	2.09
Std+1Sigma					23.3	4.12
Std-1Sigma					21.9	0.794

Expandability:

LabGuide may be expanded through a variety of modules, beginning with the connection to other units such as analysis scales, via the management of test devices all the way to a complete, high performance Laboratory Information/Management System (LIMS).