SCHMIDT HAENSCH

Product Overview
Sugar Analysis

2025
2026

Purity Analyzer
our unique combination of
Polarimeter and Refractometer

United since 1864

SCHMIDT + HAENSCH and the sugar industry

SCHMIDT + HAENSCH, a pioneer in optical measurement technology, has supported the sugar industry for over 160 years. Founded in 1864, we have continuously set new standards in sugar analysis. Early on, we introduced some of the first optical instruments that enabled customers to accurately determine sugar content and purity. This significantly improved product quality and revolutionized production processes. Over the decades, we have developed numerous innovations in international cooperation with our partners in the sugar industry, helping to advance technical solutions even further. From the first manual polarimeters to the current state-of-the-art digital optical measuring systems, our extensive expertise makes us a reliable partner. We deliver durable, high-performance solutions that not only optimize production but also support a sustainable and profitable future for the sugar industry.

ICUMSA®

Methods *	Polarimeter, Refractometer, Spectrophotometer
ICUMSA® GS1-1	Polartronic® V, Saccharomat® V
ICUMSA® GS1-2	Polartronic® V, Saccharomat® V
ICUMSA® GS1-7	ATR P, Coloromat 100
ICUMSA® GS1-15	Coloromat 100
ICUMSA® GS1-16	Coloromat 100
ICUMSA® GS1-17	ATR P, Coloromat 100
ICUMSA® GS2-1	Polartronic® V, Saccharomat® V
ICUMSA® GS2-9	ATR P, Coloromat 100
ICUMSA® GS2-10	ATR P, Coloromat 100
ICUMSA® GS2-11	Saccharoflex
ICUMSA® GS2-13	Saccharoflex
ICUMSA® GS2-18	ATR P, Coloromat 100
ICUMSA® GS2-25	Coloromat 100
ICUMSA® GS2-29	Coloromat 100
ICUMSA® GS2-31	Coloromat 100
ICUMSA® GS2-33	Coloromat 100
ICUMSA® GS2-35	Coloromat 100
ICUMSA® GS2-36	Coloromat 100
ICUMSA® GS3-1	Polartronic® V
ICUMSA® GS4-1	Polartronic® V, Saccharomat® V
ICUMSA® GS4-13	ATR P
ICUMSA® GS4-18	Coloromat 100
ICUMSA® GS5-1	ATR P, Polartronic® V, Purity Analyzer, Saccharomat® V
ICUMSA® GS5-2	ATR P, Polartronic® V, Purity Analyzer, Saccharomat® V
ICUMSA® GS6-3	Polartronic® V, Saccharomat® V
ICUMSA® GS7-3	ATR P
ICUMSA® GS7-7	Polartronic® V
ICUMSA® GS7-15	Coloromat 100
ICUMSA® GS7-21	ATR P, Coloromat 100
ICUMSA® GS7-31	ATR P, Polartronic® V, Purity Analyzer, Saccharomat® V
ICUMSA® GS7-33	Coloromat 100
ICUMSA® GS7-36	ATR P, Coloromat 100
ICUMSA® GS8-2	Polartronic® V, Saccharomat® V
ICUMSA® GS8-12	Coloromat 100
ICUMSA® GS8-19	Coloromat 100
ICUMSA® GS8-23	Coloromat 100
ICUMSA® GS8-25	Coloromat 100
ICUMSA® GS9-8	Coloromat 100
ICUMSA® GS9-10	Coloromat 100
ICUMSA® SPS-1	Polartronic® V, Saccharomat® V
ICUMSA® SPS-3	ATR P

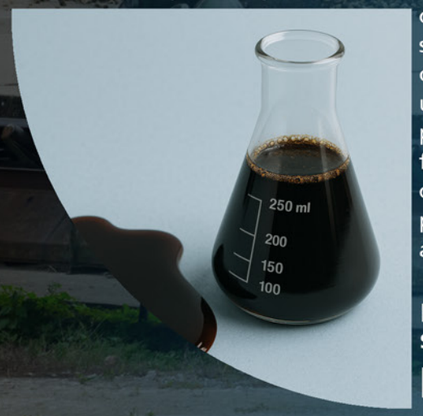
* According to ICUMSA 2024 method numbering

Saccharomat®

The unique quartz-wedge polarimeter

Already patented in 1863 this unique measurement principle has been developed by SCHMIDT + HAENSCH solely for sucrose measurement and and is still exclusively implemented in the Saccharomat®. The ORD (Optical Rotatory Dispersion) of sucrose can be compensated by the closely matching ORD of quartz wedges. This technique ensures that even minor changes in wavelength are directly corrected, without affecting the accuracy of the results. While classical circle polarimeter/ saccharimeter use an angular encoder, the quartz-wedge polarimeter (Saccharomat®) operates with a linear encoding system which eliminates the additional mechanical transmission errors. Thousands of installations worldwide, even in the roughest environments, have proven the advantages of the Saccharomat®. Its sustainability and longevity are the result of the nearly maintenance-free operating concept of this instrument.

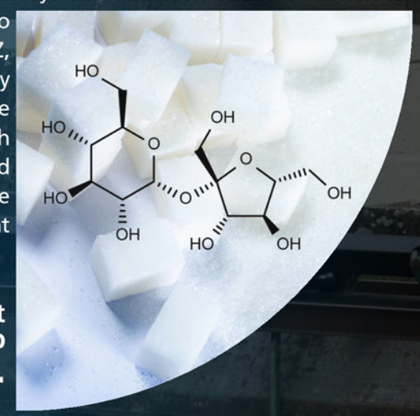
Sample preparation in sugar laboratories has traditionally involved clarification steps using hazardous chemicals. A safer and more efficient alternative is Near Infra Red (NIR) polarimetry, which avoids the use of such chemicals altogether. Measuring at 882 nm instead of 589 nm is an official ICUMSA® method, developed through close collaboration between SCHMIDT + HAENSCH and several leading institutions, including Australian Sugar Institute, Sugar Institute in Braunschweig, PTB (German Standardization Institute) and SMRI (Sugar Milling Research Institute in Durban). The aim of this study was to improve sample preparation by eliminating the clarification step – offering significant benefits in terms of cost reduction, faster analysis, and reduced environmental and health risks. The ability to analyze even dark samples without clarification significantly increases sample throughput in sugar analysis. To take full advantage of NIR polarimetry, we recommend using a dual-wavelength (VIS & NIR) polarimeter, such as the Saccharomat® from SCHMIDT + HAENSCH, in combination with the AutoFilt sample preparation unit and celite as a filter aid.



Fast, reliable and chemical free sugar analysis of dark samples

NIR Polarimetry

Our Purity Analyzer is an inherent part in the analysis of the sucrose content. It is applied in sugar cane and sugar beet reception laboratories as well as for quality control in sugar factories for fair payment. Thanks to its open, modular design, our system allows for the direct and flexible integration of various components. The Purity Analyzer is the combination of the refactometer (ATR Series) to the Saccharomat® (quartz-wedge polarimeter) or the Polartronic (circular polarimeter/saccharimeter). Both instruments are controlled by one user interface, which displays the calculated purity value (in %) of the sugar solution on the polarimeter, based on the SCHMITZ table. Even directly connected, our modular system still allows each instrument to be used independently. It also supports direct measurements in °Z, °Pol, and refractometric dry substance (RDS, Brix), in accordance with ICUMSA® methods. With unmatched precision, speed, and performance, our instruments set the standard for reliable measurement results.



The core instrument of your sugar lab

Purity Analyzer

The Heart of your Sugar Laboratory

for Accurate Purity Determination

Purity Analyzer

The SCHMIDT + HAENSCH Purity Analyzer is an inherent part in the analysis of the sucrose content. It is applied at payment laboratories of the cane and beet sugar receptions and other operation laboratories. The modular set-up of our instrument allows the direct, flexible coupling of our polarimeters and refractometers. The Purity Analyzer is the combination of the measuring unit of our refractometer ATR P to the Saccharomat® (quartz-wedge compensated polarimeter) or the Polartronic® (circular polarimeter/Saccharimeter).

The display of the polarimeter shows the calculated purity value (in %) of the sugar solution according to SCHMITZ table calculation method as both instruments are sharing the same control unit. Even when directly connected, the system's flexibility allows each instrument to be used independently for direct measurements in °Z, °Pol, and Brix (RDS), in accordance with ICUMSA® methods. SCHMIDT + HAENSCH instruments achieve uncompromisingly precise, fast and highly reliable measurement values.

Saccharomat® V

Sugar Polarimeter

Our fully automatic quartz wedge compensated sugar polarimeter provides continuous measurement with unrivaled accuracy and without the need for recalibration.

- **High-Precision Sugar Analysis**
  specifically designed for precise and reliable sugar concentration measurements, adhering to ICUMSA® standards.
- **Temperature Compensation**
  equipped with automatic temperature compensation, ensuring accurate results regardless of environmental conditions.
- **For many different applications**
  like D-glucose, invert sugar, saccharose, isomalt, starch and a lot more.
- **Flexible Sample Handling**
  compatible with a wide range of sample tubes, supporting diverse application needs.
- **Connectivity**
  offers advanced connectivity options, including integration with SCHMIDT + HAENSCH's Aquisys3 software for seamless data management.
- **More than a simple Saccharimeter**

ATR P

Refractometer

Our robust refractometer is designed for continuous measurement in the sugar laboratory and can be operated in either a horizontal or vertical alignment.

- **Dual-Scale Measurements**
  measures both, refractive index and Brix (RDS) with high precision, making it suitable for a wide range of applications.
- **Optional Thermostating**
  by connecting an external thermostat to ensure temperature-sensitive measurements.
- **Durable and Compact Design**
  features a compact, stainless steel construction with self-rinsing vertical flow-through sample compartment, which can also be used horizontally for highly concentrated liquids like molasses.
- **Workflow Efficiency**
  quick measurement times and easy sample handling improve productivity in routine analysis.

Meet Aquisys3.
our truly intuitive user interface with state of the art connectivity.

Your Sugar Analysis Workflow

for Better Product Quality

Example Workflow

From raw material intake to finished crystal sugar – SCHMIDT + HAENSCH devices ensure the highest quality and precision for sugar analysis. Our simplified example workflow demonstrates the full ICUMSA® compliance of our instruments, starting with the fully automated pressure filtration system, AutoFilt Z. Sugar solutions from beet or cane can be filtered without any environmentally harmful clarification chemicals in no time. In addition or as an alternative, the automatic dosing system AutoDosage is used to preparate samples according to ICUMSA® gravimetric dilution. Turbidity free sample preparation is crucial for the reliable measurement of also very dark samples. The state-of-the-art ATR P refractometer measures the sucrose concentration in Brix (RDS). When combined with the polarimetric sucrose value (measured in °Z), our unique Purity Analyzer automatically calculates the sucrose purity – providing a fast, precise, and fully integrated solution.

YOUR OPTIMIZED WORKFLOW -- YOUR OPTIMIZED WORKFLOW -- YOUR OPTIMIZED WORKFLOW

Thanks to the ability to use a polarimeter tube in our Coloromat 100 spectrophotometer, ICUMSA®-compliant liquid sucrose color measurement is now possible. This feature provides a major advantage by allowing a seamless transition between purity analysis and color determination. For automatic, ICUMSA®-compliant color classification of finished crystal sugar, we offer the Saccharoflex 2020 reflection colorimeter. With innovative measurement technology, reliable processes, and tailored solutions, SCHMIDT + HAENSCH supports you in optimizing your workflow – helping you achieve the highest product standards with efficiency, precision, and sustainability. Full traceability of results, combined with reduced manual effort, ensures highly transparent and reliable laboratory analysis. Staying competitive in the sugar industry means embracing innovation – advanced optical measurement technology can be a key step toward long-term success.

YOUR OPTIMIZED WORKFLOW -- YOUR OPTIMIZED WORKFLOW -- YOUR OPTIMIZED WORKFLOW

Filtration

Remove turbidity from your samples – completely chemical-free

Dosage

Automate your workflow – precise dosing and dilution of up to 4 liquids with just one button

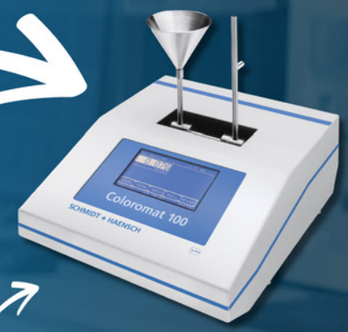
Polarimetric Measurement

From °Z to purity – precision polarimetry for accurate sugar analysis

Purity Analysis

Refractometric Measurement

Robust refractometer for Brix (RDS) and purity monitoring – built for the demands of daily sugar analysis



Color Measurement of Liquid Sugar

Precise color and turbidity analysis – fully compliant with ICUMSA® standards for liquid sugar quality control

Color Measurement of Crystal Sugar

Reliable final color inspection of crystal sugar – ICUMSA®-compliant reflection measurement for quality assurance

The Ideal Companions to Your Purity Analyzer

from Sample Preparation to Color Analysis

Sample Preparation

Automatic Pressure Filtration Unit **AutoFilt Z**

SCHMIDT + HAENSCH's fully automatic pressure filtration unit AutoFilt Z is designed for filtering sugar samples from sugar beet or cane during processing, preparing them for subsequent analysis with a polarimeter. It can be used for various sample types, such as factory juice, fist expressed juice or other runoffs. When combined with a polarimeter that operates at an NIR wavelength of 882 nm, there is no need to decolorize even highly colored samples.

- Chemical-free and environmentally-friendly preparation
- Cost-reducing due to short filtration times below one minute
- Sensor controlled operation ensuring a constant filtrate volume
- Automated discarding of pre- and post-filtrate for turbidity-free samples
- Contamination-free filtration due to direct sample input

Universal Dosage System **AutoDosage**

The SCHMIDT + HAENSCH AutoDosage system is a valuable asset for streamlining laboratory workflows. It ensures perfectly reproducible and precise preparation and dilution of samples, standard solutions, and other routine laboratory tasks — helping to maintain the highest standards of laboratory practice and delivering reliable results. Even for methods such as Carrez clarification, this universal dosing system operates efficiently and consistently, saving valuable time and taking your laboratory automation to the next level.

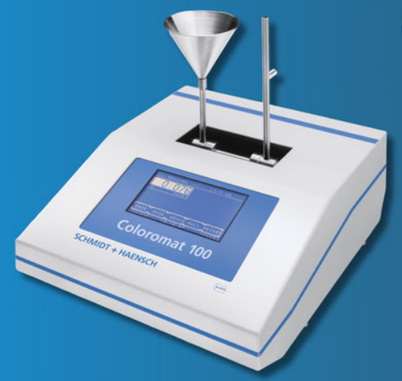
- Automatic, fast, and reliable
- Dosing of up to four different liquids
- Gravimetric or volumetric dosage
- 70 user programs storable
- Timesaving, error-free sample preparation

Color Analysis

Coloromat 100 Single Beam Spectrophotometer

The SCHMIDT + HAENSCH Coloromat 100 features a continuous measuring mode with a freely configurable sampling rate, allowing real-time monitoring of color changes in liquids. The ability to use our standard polarimeter tubes in this single-beam spectrophotometer ensures a smooth and efficient workflow. Additionally, the device supports ICUMSA®-compliant turbidity measurements thanks to its precise optical path. The IU value is automatically calculated based on the corresponding sucrose concentration (Brix, RDS).

- Measurement of transmission/extinction and turbidity
- Color determination of liquid samples
- Up to nine fixed wavelengths
- Polarimeter tubes up to 100 mm
- Integrated ICUMSA® methods
- Standard wavelengths 420, 560 and 720 nm



Saccharoflex 2020 Reflectance Colorimeter

The SCHMIDT + HAENSCH Saccharoflex 2020 electronic reflectance colorimeter is the only instrument for automatic color grading of crystal sugar that fully complies with ICUMSA® recommendations and EU regulations. It measures the reflectance factors at 495 nm and 620 nm, calculating the ratio to determine a precise color type number. Additionally, it determines the color appearance based on the Braunschweig sugar classification. The use of highly integrated circuits, minimal heat generation, and a detachable lighting unit ensure that the Saccharoflex 2020 is both reliable and easy to maintain.

- ICUMSA® compliant measurement
- Determination of ICUMSA® crystal color and degree of whiteness of crystal sugar
- Easy calibration by ceramic or Brunswick Color Standards
- Robust instrument designed for permanent use

Your Factory Automatization

directly In-line or as a Bypass On-line System

In-line Brix Control

iPR B⁴

Basic Inline Process Refractometer

Standard Process Control

Entry-level process refractometer with wide measuring range and great price/performance ratio for real-time quality control and monitoring of sugar concentrations in liquids and other various applications in sugar manufacturing and sugar processing industries.

Measuring range	1.32000 - 1.51000 RI / 0 - 85 Brix
Accuracy	± 0.00011 RI / ± 0.08 Brix
Temperature range	- 10 to + 90 °C

iPR FR²

Full-Range Inline Process Refractometer

Pan-Crystallization Monitoring

Our flagship process refractometer is an allrounder, designed to provide high resolution in two distinct measuring ranges. The integrated water cooling circuit allows for very high process temperatures. It is also suitable to measure dry substance content in order to calculate the supersaturation of the mother liquid to achieve best crystallization results.

Measuring range 1	1.3200 - 1.5300 RI / 0 - 100 Brix
Measuring range 2	1.4200 - 1.6000 RI / 50 - 100 Brix
Accuracy	± 0.00007 RI / ± 0.05 Brix
Temperature range	- 10 to + 150 °C (with water cooling)

iPR HR²

High-Res Inline Process Refractometer

Condensate Monitoring

The world's most precise process refractometer is the best choice for any application where inline measurements need to be as precise as laboratory analysis. It is designed for monitoring very low concentrations, making it ideal for monitoring potential sucrose carryover in condensate tanks, which is a critical safety issue.

Measuring range	1.3200 - 1.3720 RI / 0 - 25 Brix
Accuracy	± 0.00003 RI / ± 0.02 Brix
Temperature range	- 10 to + 150 °C (with water cooling)

On-line Monitoring

On-line Purity Analyzer

The SCHMIDT + HAENSCH automatic Purity Analyzer is the first system worldwide capable of on-line measurements of also supersatureted sugar juices. Samples are automatically taken from various selection points e.g. pipes or pans. The sugar juices are automatically prepared for online polarimetric and refractometric sucrose analysis and thus determine the purity of the juices.

- Automatic on-line analysis of factory juices
- Fully automated analysis in ten minutes
- Automatic rinse cycles
- No product loss
- Reducing manual analytical work

Ash Color Turbidity Analyzer

The modular, computer-aided automated laboratory system includes the determination of ash, liquid sugar color (IU) and turbidity analysis with the integrated Spectro photometer, based on ICUMSA® analytical methods. An automatic dosing system prepares the sugar samples in order to achive the proper sucrose concentration. The vacuum filtration using 0.45 µm cellulose acetate filters indicates also filtrabilty.

- Automated quality control of liquid sugar color
- Max. one minute preparation time
- Analysis cycle takes ten minutes, including automatic cleaning of the complete system
- Reducing lab routine considerably by factor of 5
- In accordance with the official ICUMSA® GS1-13, GS2-17 ash - conductivity method, using an automatically prepared solution at 28 or 50 Brix (RDS)

On-line Titration

A fast and accurate analysis of the liming process is an important step in the juice purification process. The on-line process analysis enables continuous analysis of pH, alkalinity and total lime of the pre- and mainliming. Herewith considerable reduction of the lime consumption can be achieved. Compared to manual analysis the pH control becomes traceable and consistent.

- Continuous analysis of pH, alkalinity, and lime consumption
- Process optimization
- Saving of coke and lime
- Higher efficiency human resources
- Immediate data transfer to control room

SCHMIDT HAENSCH

SCHMIDT + HAENSCH has developed from a rich history of engineering and scientific research. The family-run company was founded by Franz Schmidt and Herrmann Haensch in 1864 and has been part of innovative German technology from the beginning.

Franz Schmidt

Herrmann Haensch

1864 SCHMIDT + HAENSCH founded by Franz Schmidt and Herrmann Haensch in Berlin

1879 Manufacturing microscopes for Rudolph Virchow

1895 Manufacturing of Abbe refractometer with Pulfrich-principle

1921 Manufacturing color mixing apparatus according to Helmholtz-König

1986 First fully-automatic table refractometer with measuring range up to 1.72000 and a resolution of 10-5 Brix

2005 Introduction of patented multi-wavelength refractometer

2022 Development of the SpectroPol - multi-wavelength scanning polarimeter

2024 SCHMIDT + HAENSCH celebrates 160 year anniversary

1864 Developing quartz wedge polarimeter in cooperation with Karl Ventzke

1881 Manufacturing interferometer for Michelson-Morley experiment

1905 Manufacturing circle polarimeter for Swiss Nobel Price winner Alfred Werner

1963 Developing and manufacturing of worlds first fully automatic sugar polarimeter with digital display and printer

1992 Developing first refractometers for process control

2018 Launch of the VariFamily - refractometer, polarimeter and density meter

2023 Introduction of the iCS - the world's smallest process refractometer

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