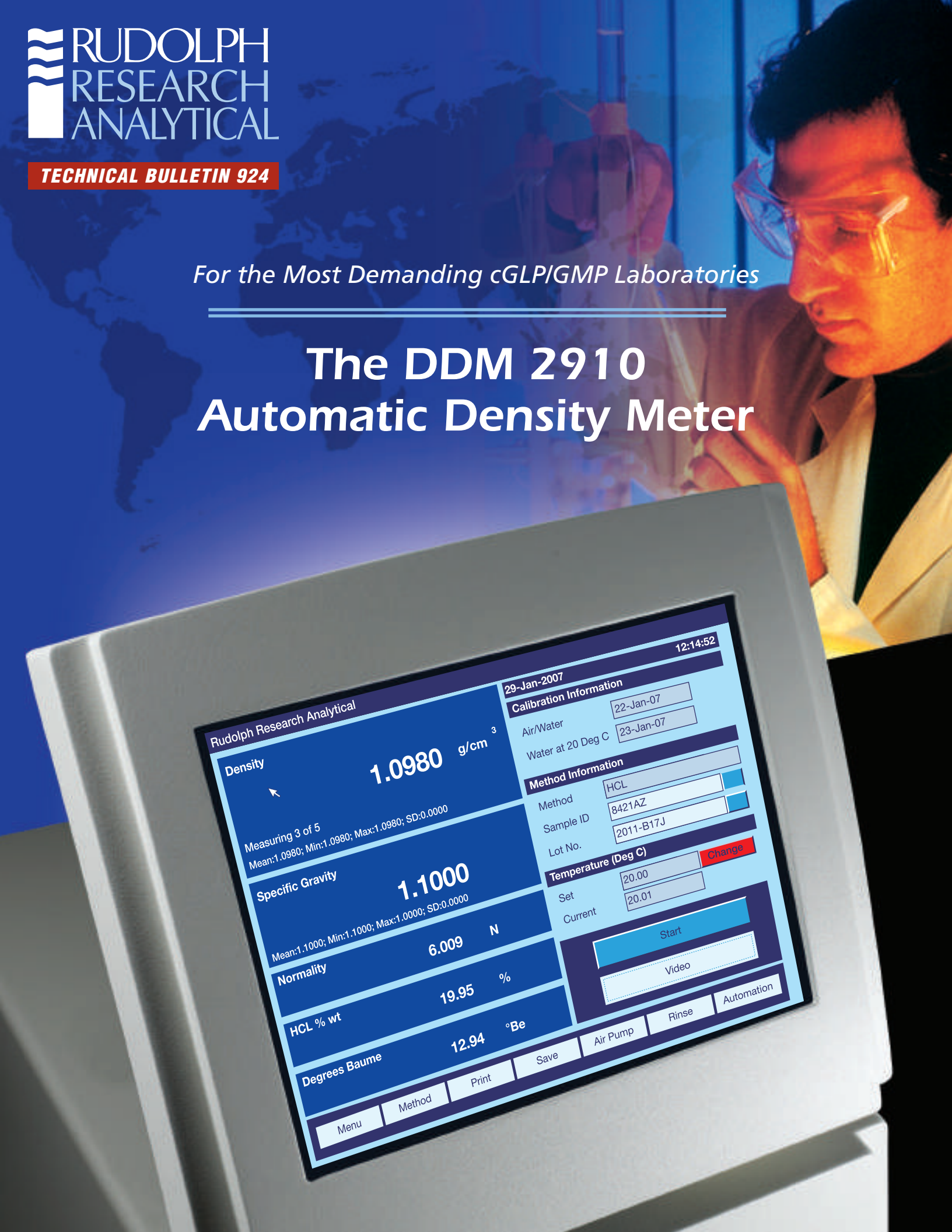
RUDOLPH RESEARCH ANALYTICAL

TECHNICAL BULLETIN 924

For the Most Demanding cGLP/GMP Laboratories

The DDM 2910 Automatic Density Meter



Densitometry

Applications

The DDM 2910 Density Meter, with high precision Peltier temperature control of sample, has the features to meet the needs of today's industries.

PETROLEUM

- Measure API Values in accordance with ASTM D1250, ASTM D4052, ASTM D5002 and DIN 51757
- QC incoming raw materials
- Research new products and additives
- Withstands harsh and heavy use environments
- Calibrate using petroleum standards

CHEMICAL

- Measure in units of Kg/m³, g/cm³, g/ml, pounds/gallon, specific gravity, Baumé and more
- Determine concentrations in: %, molarity, normality, mole fraction, ppm, and more
- Check batch consistency and ensure proper blending ratios
- Wetted materials compatible with the most aggressive chemicals

PHARMACEUTICAL

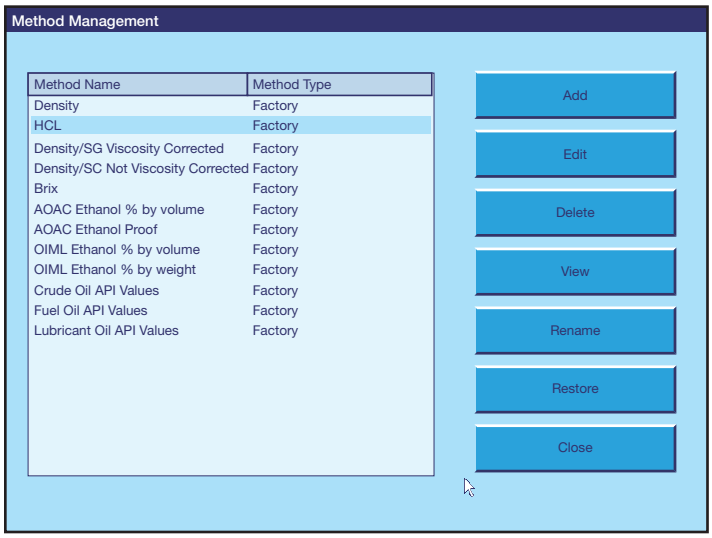
- Capable of 2,3,4 or more multiple measurements with standard deviation, min and max reading for true cGLP/GMP compliance
- Complete IQ/OQ/PQ documentation
- Checking of raw materials and product release
- 21CFR11 Compliance; Electronic Signature and Secure Data Storage
- Compliant with USP 29<841>, JP, BP and EP

BEVERAGE

- Measure both alcoholic and non-alcoholic beverages with easy bubble detection using VideoView™
- Direct and accurate means of °Brix determination, °Plato, Extract, % Solids
- Use apparent density function for proper filling volume monitoring

Flexible Method Management

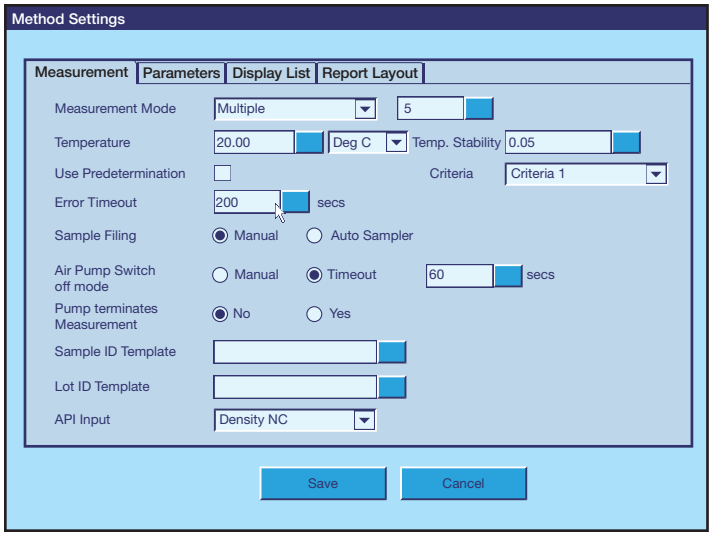
Factory installed measurement methods allow for immediate selection of the correct method to match the most common applications.



For unique measurement applications, create a sample method using an unlimited number of Concentration Tables, Formulas, and Polynomials to match the measurement methods used in your laboratory. A few customized sample methods shown below:

- Concentration D_2O – Heavy Water
- Baumé of Hydrochloric Acid
- Normality of Sulfuric Acid
- Molecular Weight of Polymer
- Drug to Propellant Ratio
- Lead Content
- ppm Gold in Acid
- % Toluene in Heptane
- Fat in Lubricant
- Mole Fraction of Methanol
- % HNO_3
- Monomer Solutions
- Potassium Permanganate
- Hydrogen Peroxide
- Molar Solutions of EDTA
- SG of Urine
- Sweeteners
- Sodium Hydroxide

Setting up your custom method is as simple as filling out a few screens like the one below.



Rudolph Research Analytical 55 Newburgh Road, Hackettstown, NJ 07840 USA ▪ Phone: 973-584-1558 ▪ Fax: 973-584-5440 ▪ E-mail: info@rudolphresearch.com ▪ Internet: www.rudolphresearch.com

Full cGMP/GLP Compliance

Versatile Communication Capability

The DDM 2910's standard communication package includes:

- Ethernet Port for Network Cable Connection
- 3 USB ports
- 2 RS 232 ports

Allowing the capability to:

- Connect directly to Rudolph's service department for remote testing and diagnostics via Internet connection.
- Connect to any Windows® based printer via USB or direct to the server via Windows® Print Library
- Save measurement data direct to your Network/Server

cGMP/GLP Printing

Sample measurement reports are edited quickly and easily. Just import templates from Word® or Excel® to the DDM 2910 Density Meter and print your company's customized "C of A" directly.

Print your customized Certificate of Analysis including your company logo directly from the DDM 2910 touch screen

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Hackettstown, NJ 07840 USA

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Date: 26-Jan-2007

This sample was measured on DDM 2910 serial number 20212, manufactured by Rudolph Research Analytical, Hackettstown, NJ, USA.

Lot ID 2019

Temperature: 20.0 Deg C

No	Sample ID	Density	Sp. Gravity	Normality	HCL % wt	° Baume	Time
1	8421	1.0980	1.1000	6.009	19.95	12.94	14:20:50 PM
1	8421	1.0980	1.1000	6.009	19.95	12.94	14:21:40 PM
1	8421	1.0980	1.1000	6.009	19.95	12.94	14:22:30 PM
1	8421	1.0980	1.1000	6.009	19.95	12.94	14:23:20 PM
1	8421	1.0980	1.1000	6.009	19.95	12.94	14:24:10 PM

Counts	:	5
Average	:	1.0980
SD	:	0.0000
Maximum	:	1.0980
Minimum	:	1.0980

Capable of making multiple measurements on a single sample and reporting complete statistical data and all measurement results

NIST Traceable Calibration Standards

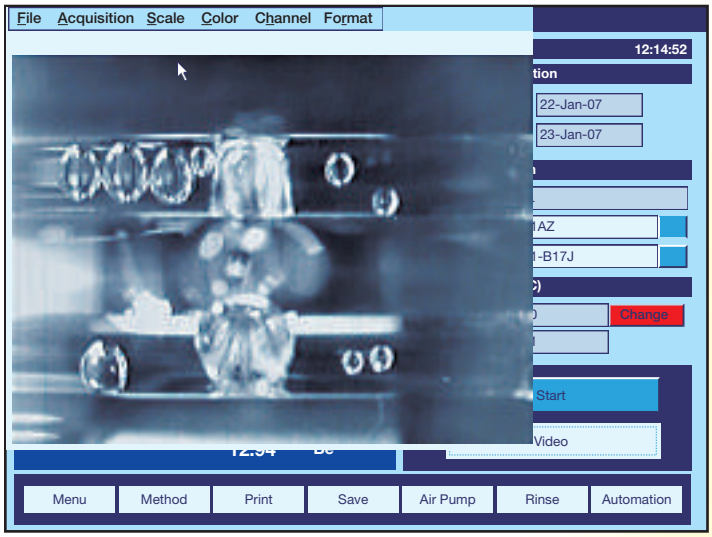
Rudolph knows how important it is to calibrate with NIST Traceable Standards and therefore, we include two NIST standards in the accessories provided with your density meter. The DDM 2910 standard accessories include:

- Quick Start Guide
- Desiccant
- Filling Nozzles
- NIST Standards
- IQOQPQ Documentation
- Luer Syringes
- Connecting Fittings & Tubing
- Manual

The Simplicity of Touch Screen Measure

VideoView™ Bubble Detection

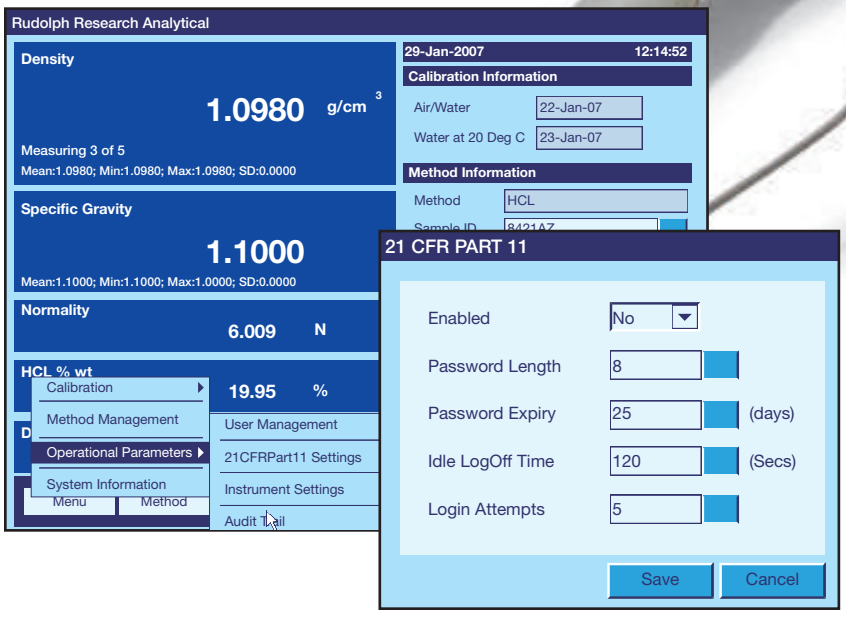
No more straining to see small difficult-to-detect air bubbles in your sample with live on-screen video viewing. On-screen bubble detection is made possible utilizing Rudolph's exclusive VideoView™ (patent pending) with 10X magnification.



Full 21CFR Part 11 Instrument Level Compliance

The DDM 2910's 21CFR Part 11 software module is easily enabled through the user friendly touch screen. This module gives you full compliance with:

- Electronic signature
- Access levels
- Internal write protected storage
- Unique passwords
- Write protected documents sent directly to server



Oscillating U-Tube with V Correction and Reference O

(patent pending)

The DDM 2910's oscillating U-tube with fu correction and reference oscillator (patent long term calibration stability and meas temperatures with a single calib

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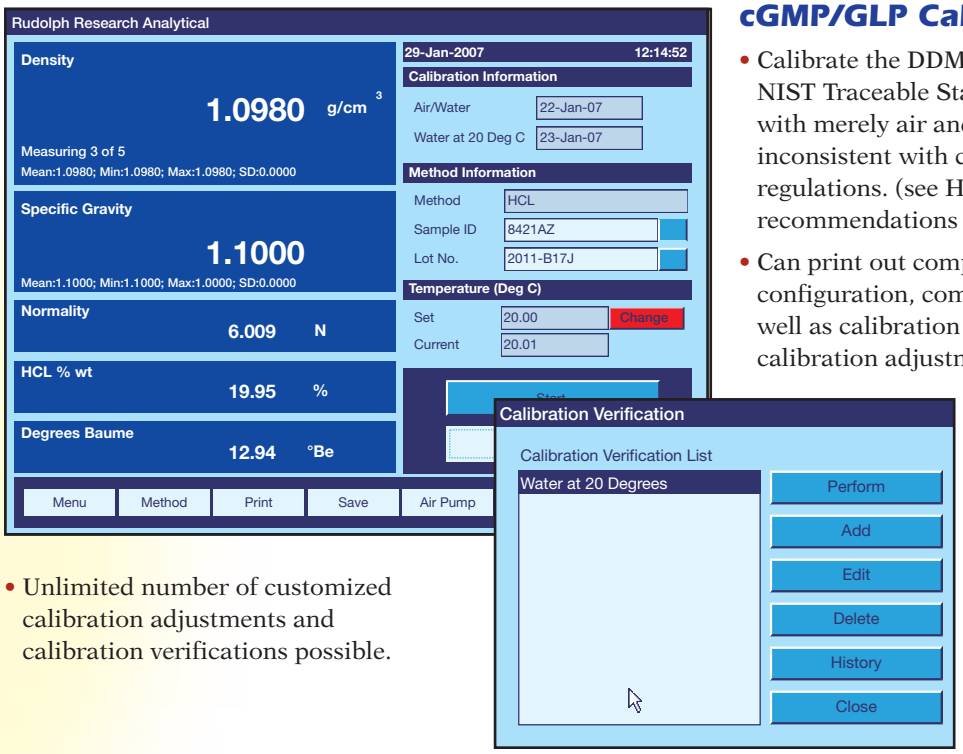
ement with the Flexibility of Windows®

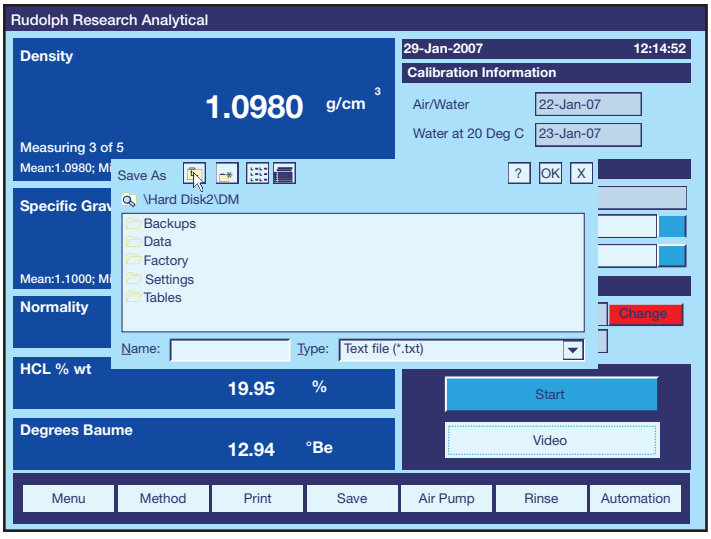


cGMP/GLP Calibration

- Calibrate the DDM 2910 with 2, 3, or more NIST Traceable Standards – calibrating with merely air and water appears inconsistent with cGMP/GLP compliance regulations. (see H&D Fitzgerald's recommendations at www.density.co.uk)
- Can print out complete method configuration, communication settings, as well as calibration verification and calibration adjustment data/history.
- Unlimited number of customized calibration adjustments and calibration verifications possible.
- Measured values can be shown continuously as temperature stability is being reached or, at the discretion of the user, measured values will only be displayed once the final answer is reached and completely stable.

Computer Windows Based Flexibility

- 2 gigabytes of internal memory allow almost unlimited capacity for saving measurement data. The DDM 2910 is network ready and data may also be saved directly to your server or to any directory desired.
- Internet access is possible directly from the DDM 2910's touch screen. This feature allows real time contact with Rudolph Research Analytical's Service and Technical Support Team who can access your instrument remotely to assist in Window navigation, method setup and trouble shooting.



- Windows based navigation architecture is so intuitive that most operators will never read the manual. But should you wish to reference the manual, it is stored right on the DDM 2910's internal memory.
- Copy methods, transfer concentration tables, download data, etc., via a USB port on front of unit.
- Three USB ports allow for quick and easy connection to a mouse, keyboard, printer, bar code scanner, or memory stick.

iscosity Oscillator

ll range viscosity pending) allows surement at all ration.

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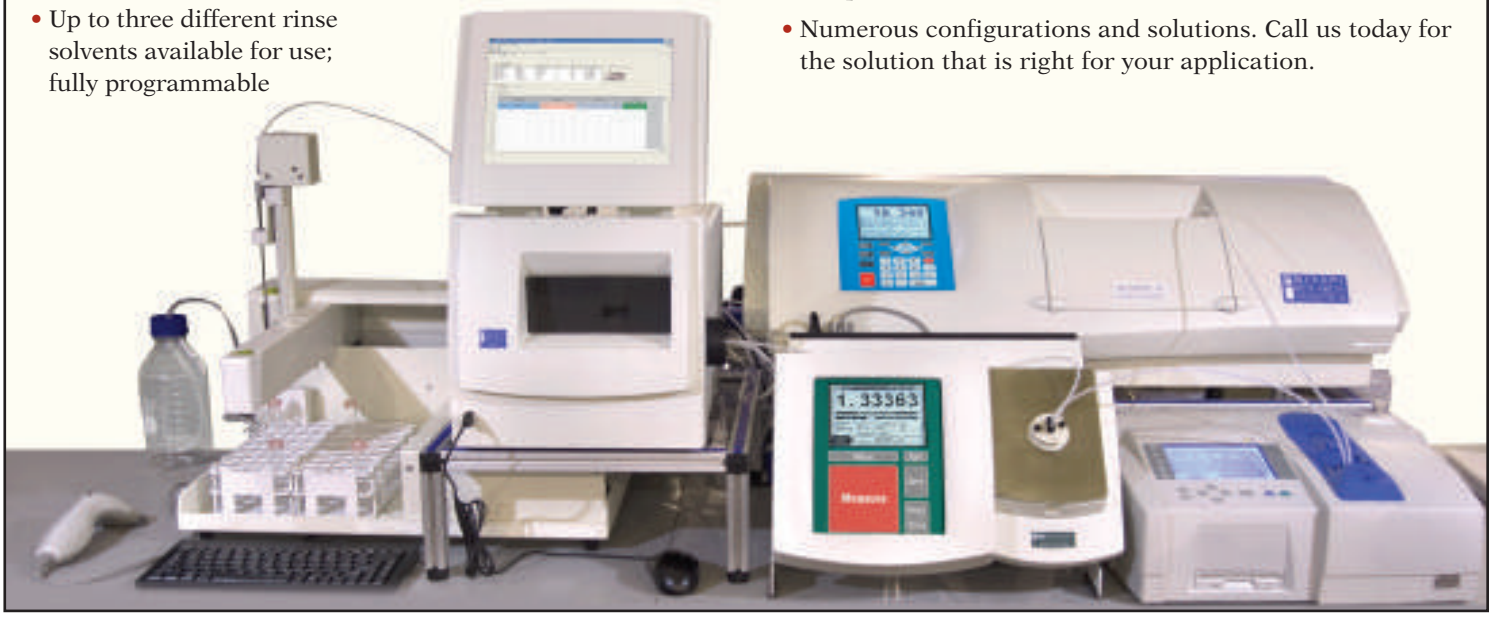
Automation Flexibility

- Rudolph's AutoSampler can be loaded with up to 240 samples
- Combine density and specific gravity measurements with a polarimeter, refractometer, and colorimeter for simultaneous measurements of:
  – Density/Specific Gravity
  – Refractive Index
  – Color
  – Optical Rotation/Specific Rotation
- Up to three different rinse solvents available for use; fully programmable
- Two sample loading modes; pressurized and suction; for optimizing sample transfer and measurement
- Customer's unique sample bottles may be used to eliminate the need to transfer samples into special sized test tubes.
- Emergency samples measured at any time without stopping the AutoSampler or moving sample vials.
- Numerous configurations and solutions. Call us today for the solution that is right for your application.



Specifications of the DDM 2910

Measurement Ranges:	**Density:** 0 to 3 g/cm³ **Temperature:** 0 °C to 90 °C (controlled via Peltier) **Pressure:** 0 to 10 bars
Measurement Modes:	Continuous, Single, Multiple
Measurement Technique:	Mechanical Oscillator Method
Accuracy:	**Density:** 0.0001 g/cm³ **Temperature:** 0.05°C
Repeatability:	**Density:** 0.00005 g/cm³ **Temperature:** 0.02 °C
Resolution:	**Density:** 0.00001 g/cm³ **Temperature:** 0.01 °C
Minimum Sample Volume:	1 ml, approximately
Wetted Materials:	Borosilicate glass, Teflon (PTFE, ECTFE)
Display:	10.4 inch diagonal, 800-600 pixels, color, Flat Panel Monitor with Resistant Touch Screen Interface, 200 nits brightness, gasketted for spill protection
Communication Interface:	Touch Screen User Interface 3 – USB Ports 2 – RS232 Ports Ethernet Port for Network Connection Keyboard, Bar Code Scanner, Mouse, Network Capabilities
Video & Magnification:	Video assisted view of cell, capable of approximately 10X magnification
Internal Memory:	2 GB Non-removable Compact Flash
Shipping Dimensions:	36 in. (L) x 19 in. (W) x 18 in. (H) 91.44 cm (L) x 48.26 cm (W) x 45.72 cm (H)
Shipping Weight:	70 lbs. (31.75 kg)
Power Supply:	85 to 260 VAC; 48 to 62 Hz
Power Consumption:	150 – 200 Watts

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