RUDOLPH RESEARCH ANALYTICAL

TECHNICAL BULLETIN 937 -R2

AutoFlex® R837

Flexible Automation Solution

RUDOLPH LIFETIME CELL WARRANTY

ISO 17025 ACCREDITATION

20 YEAR Service Guarantee

ISO 9001 CERTIFIED

nqa. ISO 9001 QUALITY MANAGEMENT

ANAB ACCREDITED

nqa. ISO 9001 QUALITY MANAGEMENT

UKAS MANAGEMENT SYSTEMS 015

NVLAP® CALIBRATION
NVLAP LAB CODE: 200898-0
Accreditation to ISO/IEC 17025
www.rudolphresearch.com/resources/quality

ilac-MRA

Rudolph Research Analytical serving its customers with Integrity Quality, and Innovation for over 50 years.

See website for how above accreditations and warranty certifications apply

Flexible Automation Solution

Automate your Density, Specific Gravity, Optical Rotation, Specific Rotation, Refractive Index, Brix, Urea, Color (Reflectance and Transmittance), pH measurements and more.

- **Self-validated system** - makes it so easy to run daily system validation. This can be done as often as you'd like without any interruption to your routine.

- **Flexible Sample vials** - Saves time, money and no decanting. Simply use the same vial you're accustomed to, 4 Dram, 1 oz. , 1/2 oz. , 16x100mm, 13x100mm, 13x7mm, 5mL, and more.

- **Heated Racks** - For your heated applications we have 2 configurations available 40/10 (40 heated and 10 non-heated) and 20/30 (20 heated and 30 non-heated). We know that it is necessary to have non-heated availability for some control samples and the AutoFlex® R837 is the only auto sampler in the world that can fulfill that need. We make it very easy to use. It's merely transparent to the user. The system has the intelligence to not use the heated tubes and interface when loading a non-heated sample and also to heat up the tubes and heated interface prior to loading a heated sample.

- **Flexible Method Selection** – With the variety of samples that are cycled in today's laboratories we realized how important it is to have a system that can handle your samples painlessly. One of our goals at Rudolph Research Analytical is to keep things simple for the user. Each sample may require different sample load mode and/or parameters, measurement parameters, measurement criteria, temperature, cleaning parameters with solvent type, amount of solvent and drying time.

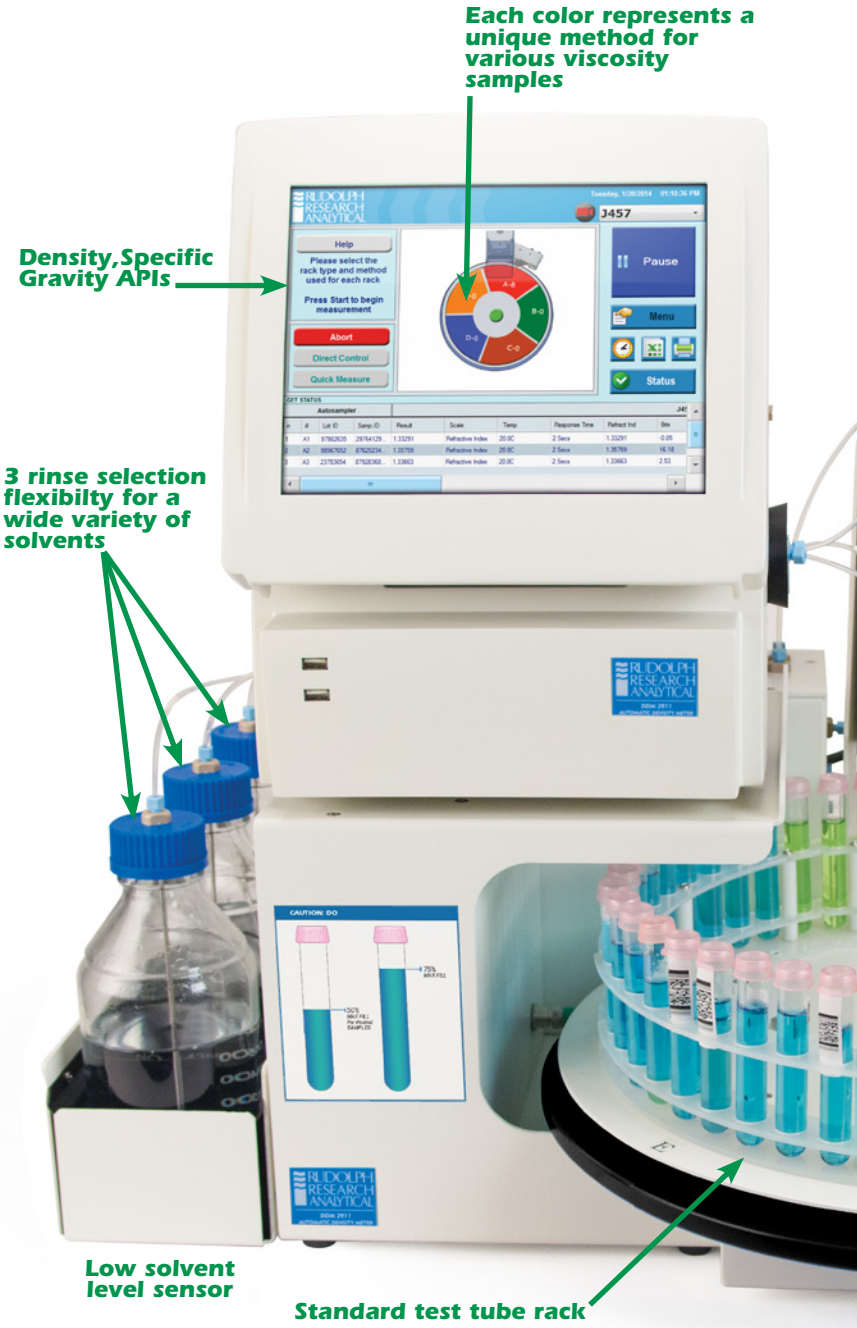
- **Most advanced safety features** – The needle does not protrude in the absence of a sample vial. Turns on the heated racks in the morning and off at the end of the day.

- **Robust** – Built with advanced cutting-edge technology. Military grade cables and circuits to ensure top quality and redundancy. The AutoFlex® R837 is built to handle the harshest laboratory environments. Its metal frame and covers can handle any accidental chemical spills.

- **Urgent sample** – Allows the user to run an urgent sample without interrupting the active run.

- **Unattended Operation** – The R837 has the intelligence to alert the operator to a low solvent condition or high waste jar condition.

- **Unmatched Features** – Push the start button and watch the vial spin to read your barcode (QR, PDF417, or 2D labels) for the sample ID. Low and highly viscous samples load flawlessly. The R837 measures Density, SG, OR, SR, RI, Brix, CIE L*a*b*, Gardner, ABS, %T, Cobalt, pH, then transfers the results automatically to LIMS, SAP or any proprietary data management system. The R837 can reclaim the sample if enabled, then thoroughly clean and dry with zero cross contamination.



Flexible Automation Solution

- **Import List of Sample IDs** – A whole list of sample IDs can be saved and exported to the instrument to automatically populate the sample sequence without the need of sample labels.
- **Safety** – Complies with all safety regulations (US and International)
- **Low sample volume consumption** – The AutoFlex® R837 uses less than 12mL for a 5 analytical instruments system (Density Meter, Refractometer, Polarimeter, Colorimeter, pH meter).
- **Fast Throughput** – 1.5 to 8 minutes per cycle (load, measure & clean).

Automated Data Collection

Automated sampling manages electronic data recording, sample IDs, and reduces operator errors. Test tubes and bottles can be automatically identified by the system with a built in bar code and label reader.

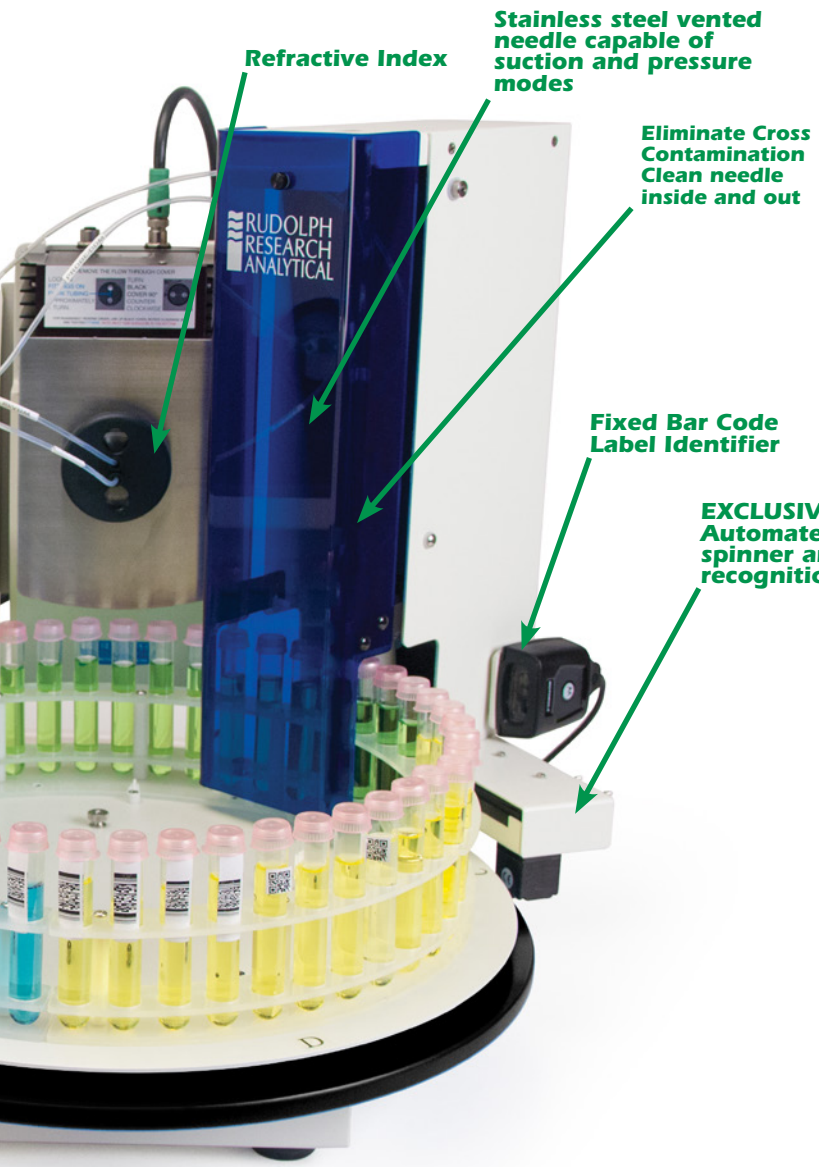
- Use any format of bar codes: PDF 417, 2D Matrix, UPC, or any bar code your lab chooses.
- The bar code is recorded as the Sample ID, measurements are taken, and data is available for export to a USB, Network Server, LIMS or any data storage system.
- Labeling sample vials is also simplified as each bar code can be placed at any rotation on the sample vial or bottle because the sample vials are spun as they pass the bar code reader.

QR CODE 2D MATRIX

PDF 417

Rudolph Research

UPC



AutoFlex R837

The Standard for high throughput in the Flavor and Fragrance Industry

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

Laboratory Automation

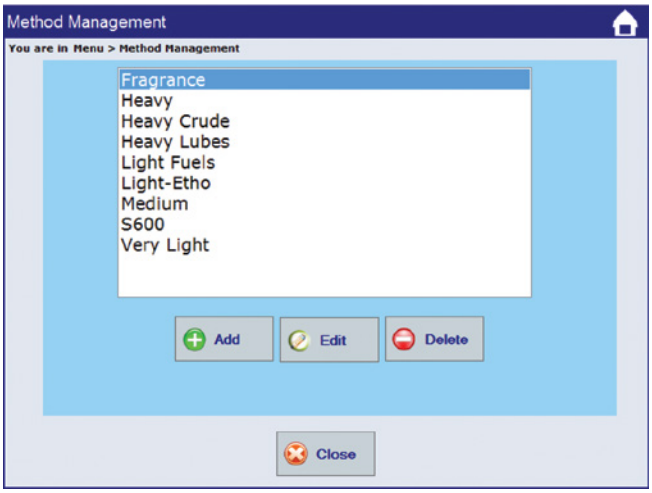
The Autoflex® R837 is engineered to work better and built to last

The Rudolph R837 Automatic Sampling System is rugged and specifically designed to stand up in harsh laboratory and industrial applications.

- Superior material construction: Stainless Steel Needle, PTFE, Teflon, and PEEK liquid flow path materials.
- Robust needle with a sufficient torque to pierce any septum.
- Never miss piercing a sample vial with precision-engineered probe arm and sample racks which virtually eliminate misalignment errors.
- Safety guard protects hands and automated needle detects no-sample condition.
- Modular design reduces combined footprint.

Application Flexibility

The AutoFlex® R837 can be configured with various instruments and measurement methods to automate a wide range of sample viscosities. It is perfect for high throughput laboratories looking to increase productivity. The R837 is excellent when used in combination with Rudolph Research laboratory instruments in the Petroleum, Chemical, Flavor, Fragrance, Pharmaceutical, and Toxicology industries.

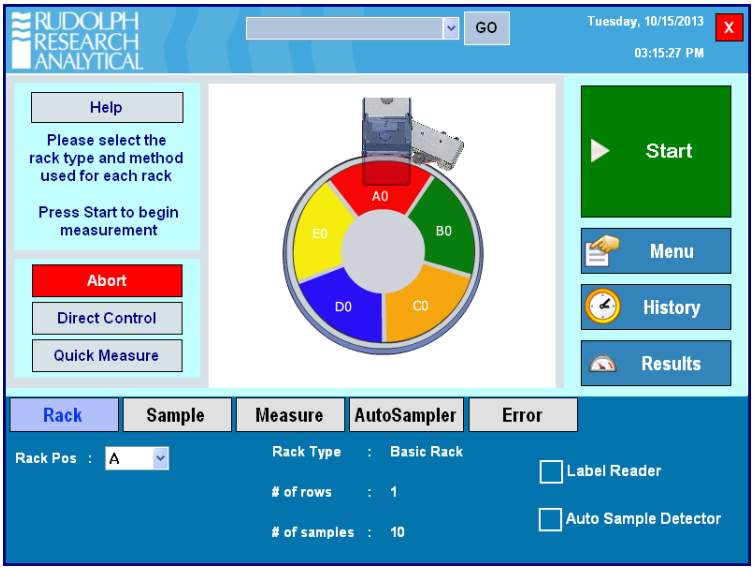


Eliminate sample cross contamination with complete needle cleaning - a Rudolph exclusive feature

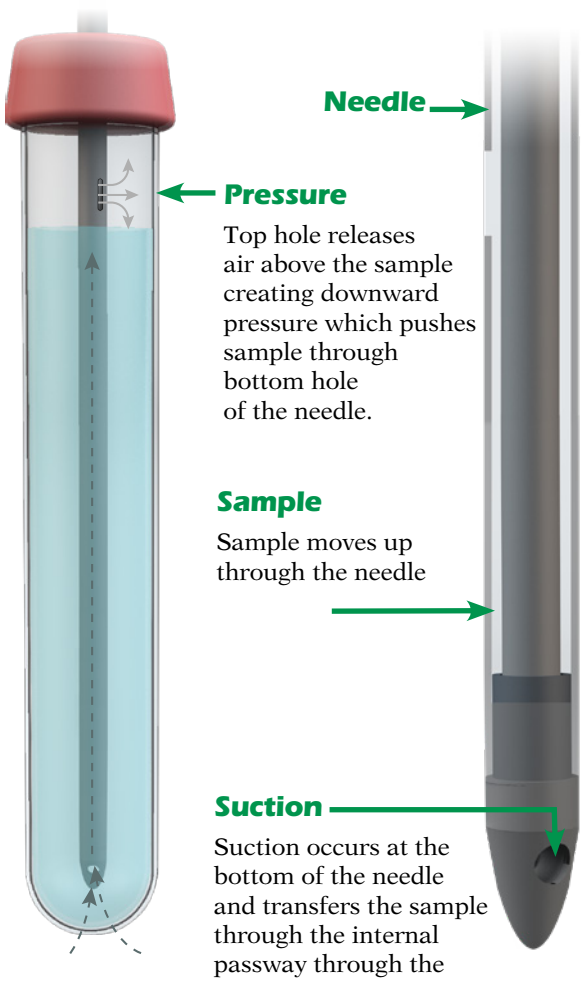
- Self-cleaning needle eliminates cross contamination by washing both inside and outside areas of the needle between each sample. Most commercially available automation systems only flush the inside of the sample needle but neglect cleaning the outside of the needle thereby carrying over small amounts of the prior sample into new samples.
- The R837 rinses the entire system with your choice of 3 solvents between each sample.
- Low solvent level sensing: the 3 solvent bottles have a non-contact low level sensor which will prompt the user with a low solvent level message.
- Sample return feature: allows 95% of the original sample to be returned to the sample vial.
- Solvent selection flexibility: by using highly solvent resistant materials for all sample pathways, a wide variety of solvents may be used including: water, acetone, isopropanol, toluene, hexane, and heptane.

Flexibility Unmatched with Windows Embedded

The user interface allows the operator to interrupt a measurment routine with an urgent sample. If you need to quickly find and measure a sample in the rack, the auto-find feature will search and measure it for you.



Rudolph's exclusive Pressure and Suction Mode:



Reporting

SYNERGY®

CERTIFICATE OF ANALYSIS

This sample was measured on Autosampler,Needle Box Serial Number : 1047
and Valve Box Serial Number : 00000

Density Meter Serial Number : DDM4085

Refractometer Serial Number : 1780

Polarimeter Serial Number : 35262

pH-Meter Serial Number : 1780001024219

Colorimeter Serial Number : 104034

Printed Date and Time : Wednesday,09/02/2020 12:48:44 PM

	Autosampler						Density Meter		
	N	DateTime	Pos	Sample ID	Lot ID	AS Method	Density	Specific Gravity	Temp
1	1	09/02/2020 11:41:58 AM	A1	Scope		Synergy	1.000696g/cm^3	1.003664	25.000

		Refractometer				Polarimeter	
	Density Meter Method	Refract Ind	Brix	Sample Temp	Refractometer Method	OR	Sample Temp
1	Emerald	1.35048	11.71	19.99 C	Automated 20C	0.00	24.4 C

	Polarimeter	pH-Meter			Colorimeter			
	Polarimeter Method	pH value	Temperature	pH-Meter Method	L*	a*	b*	Gardner
1	TEST	6.561	25.0	TEST	96.471	-19.408	2.808	0.200

Operator Name : _____

Reviewer Name : _____

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Flexible Automation Solution

Automate your Density, Specific Gravity, Refractive Index, Color, and pH measurements.

- Push the Start button and measure Density, Specific Gravity, Refractive Index, Optical Rotation, Specific Rotation, Color, and pH. All results are exported automatically to your LIMS with a sample ID number.
- Flexible Sample Vials: Test Tubes, Boston Rounds, 1 OZ, ½ OZ, virtually any size bottle.
- Flexible rack configurations: Heated and unheated on the same carousel.
- Flexible Method Selection: Suction Mode, Pressure Mode, Combination Mode (for unmatched power) 3 variable rinse selections and endless drying time options.

Smart Sample Loading Technology

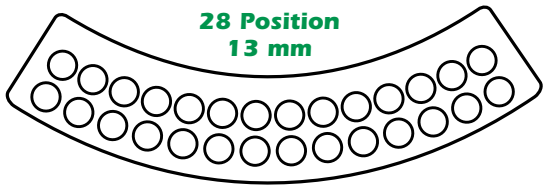
- SMART TECHNOLOGY™ automatically adjusts pump speed ranging from thin to high viscosity samples up to 36,000 mPa-s (cP).
- A heated rack option handles heavy crudes and waxes.
- Standard Methods: Define measurement configuration, sample load configuration (Vacuum or Gas Displacement) solvent choices, and drying time.
- No loss of accuracy or reproducibility over manually loaded samples.

Flexible Rack Configurations For Your Application

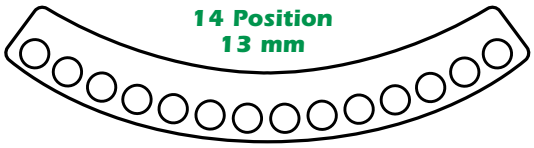
Rudolph Research can provide a sample rack configured to the bottles used in your laboratory so there is no decanting.

A sample of the many custom rack configurations available only from Rudolph
Mix or match up to 5 heated or unheated racks on one Carousel

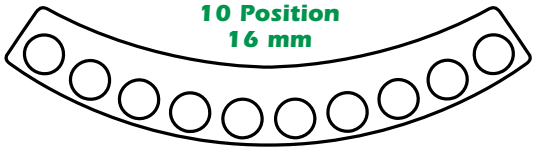
Small diameter 28 Positions per rack with up to 5 racks. 13mm Test Tube (Dual Rows) Up to 140 samples per carousel.



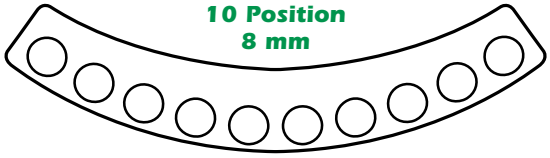
Small diameter 14 Positions per rack with up to 5 racks. 13mm Test Tube (Single Row) Up to 70 samples per carousel.



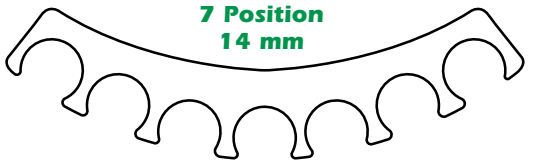
Standard Test Tube Rack, 10 Positions per rack, 16mm Test Tube (Single Row) Up to 50 samples per carousel.



Short Test Tube Rack, 10 Positions per rack, 8mm Test Tube (Single Row) Up to 50 samples per carousel.



Boston Round bottle with caps Rack, 6 or 7 Positions per rack, (1/2 oz or 1 oz)(14 mm or 28mm) 30-35 samples per carousel.



Heated Rack Configurations For Your Application

Pre-Heat your samples from 30°C to 90°C with heated sample positions.

2 Heated Configurations

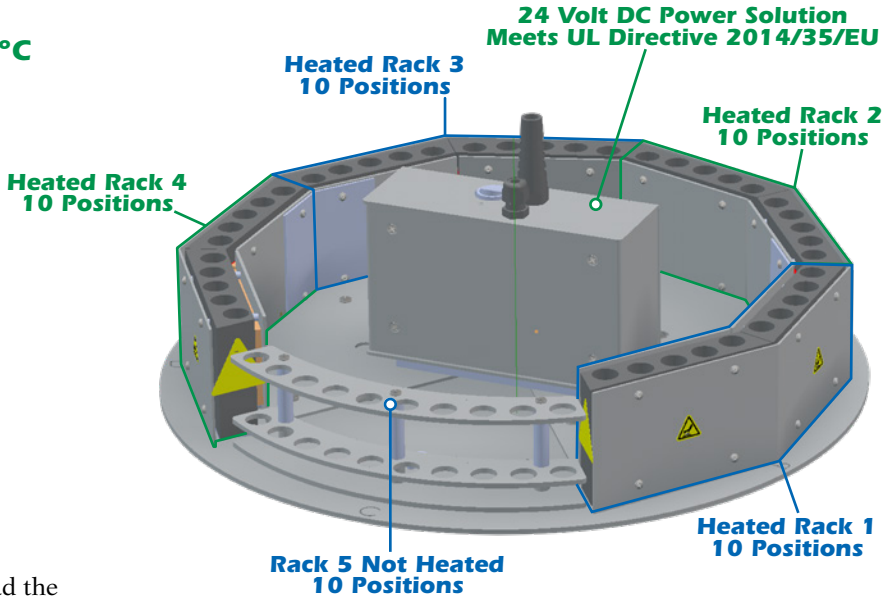
- 20 Heated and 30 non-heated sample positions, for a total of 50 positions.
- 40 Heated and 10 non-heated sample positions, providing independent temperature control for 20 samples that can be set at one temperature and the other 20 at a different temperature and 10 non-heated, for a total of 50 positions.

Safety

- The automation software has safety measures and intelligence to avoid operator errors.

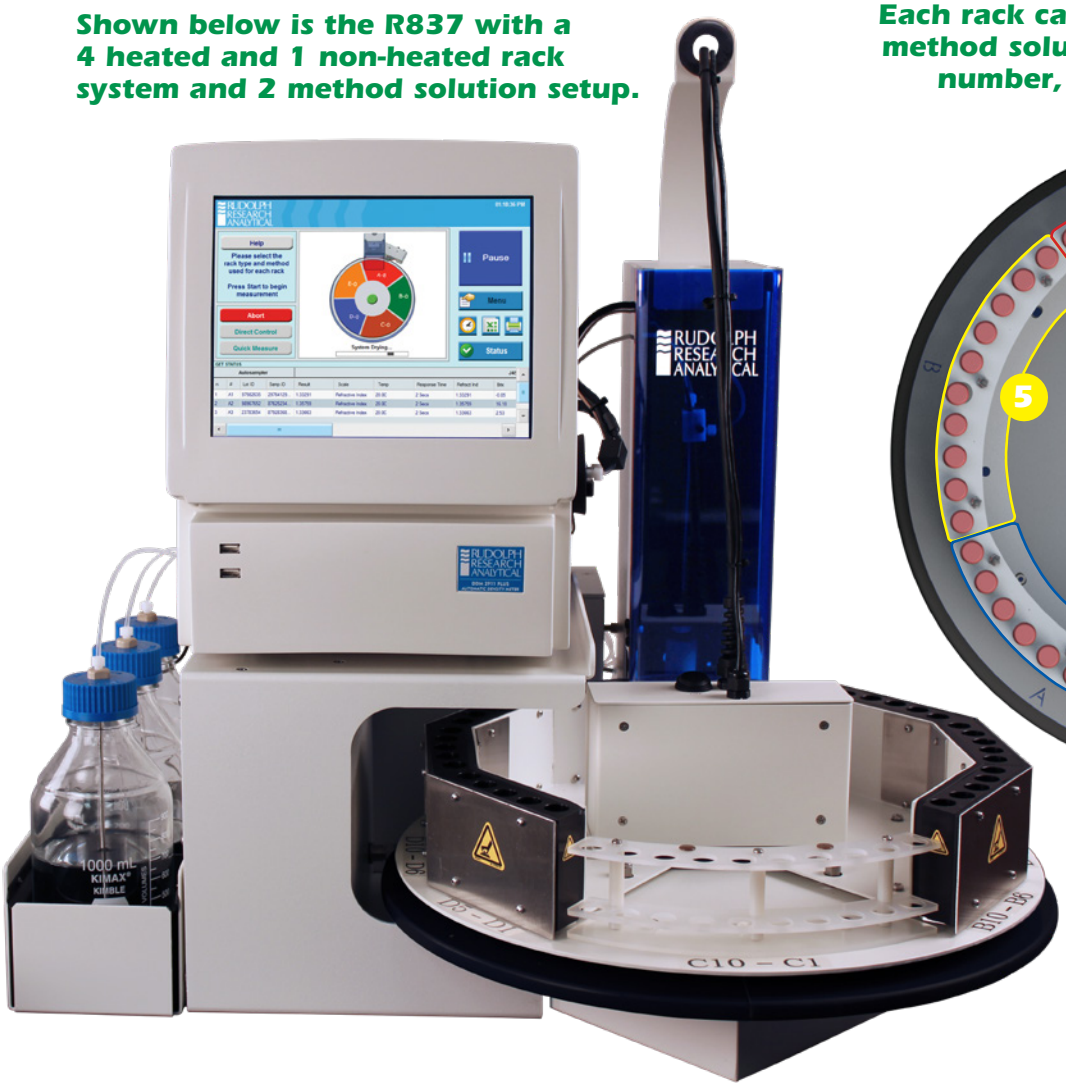
Heated Tubing

- Keeps the sample in a liquid state to load and unload the sample without clogging. Controlled by the measurement methods making it transparent, operator friendly, reliable, and safe. Only turns on when it is required in the method.



Complies with ASTM D4052 and D5002

Shown below is the R837 with a 4 heated and 1 non-heated rack system and 2 method solution setup.



Each rack can have its own measurement method solution: pressure, suction, rinse number, rinse time, and dry time.

Features and Specifications

Standard Features:

- 3 rinses available
- Inside and Outside Needle Wash
- Low Solvent Level Detection
- Suction Mode
- Pressure Gas Displacement Mode
- Flexible Method Selection
- LIMS Compatible
- 5 Test Tube Racks Handling 50 Samples
- Rack Specific Method Selection
- SAP Compatible
- Variable Drying and Rinse Times

Optional Features:

- Racks (customized to your bottles)
- Heated Racks
- Built in Bar Code / Label Reader with Vial Spinner
- Handheld Bar Code / Label Reader
- Automated Empty Vial Recognition
- Extra Racks
- Sample Return Feature: Allows 95% of sample to be returned to sample vial
- Custom Programming

Specifications:

Sample Visciosity:
Samples up to 36,000 mPa-s (cP)

Sample Volume Requirements:
3.5ml typical, optional to 1.5ml or 1.5mL to 10mL config. dependent

Rack Sample Capacity:
50 - 16 x 100mm test tubes. 70 - 13 x 100 mm, or optionally dozens of sample vial configurations and capacities.

Cleaning Cycle:
1:45 minutes nominal – time varies by application

Full Measurement and Cleaning Cycle:
2:30 minutes nominal - time varies by application

Software Interface:
Compatible with Rudolph Research instruments running Windows Embedded OS

Power Requirements:
100-240 volts - 50-60 Hz – 10 amps

Operating Dimensions: **L:** 24" **W:** 24" **H:** 20.5"
L: 61 cm **W:** 61 cm **H:** 52cm

Weight: 42 lbs / 19 kg

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