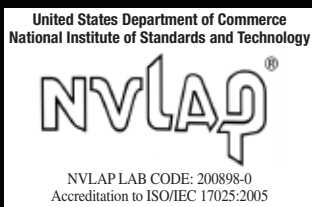


*For Pharmaceutical Applications
Two Great Solutions*

The Autopol[®] V and Autopol[®] V PLUS



**The brand of polarimeter used
in more labs than any other.***

TECHNICAL BULLETIN 928

*Emmes Survey

Two excellent polarimeter choices to satisfy the most stringent pharmaceutical requirements

Autopol® V

Autopol® V PLUS

With Hastelloy™ acid resistance and three rotation NIST calibration standard



The Industry Standard Polarimeter

The Autopol® V has the validation tools and features to satisfy today's global pharmaceutical companies, including: instrument level 21CFR Part 11 compliance, NIST traceable calibration standards and a global list of installations. Rudolph Research has thousands of satisfied customers who praise the Autopol® V's quality, accuracy and reproducibility.

Autopol® V Standard Features And Accessories

- TempTrol™ – Electronic cooling & heating from 15°-35°C
- Six Standard Wavelengths: 365nm, 405nm, 436nm, 546nm, 589nm and 633nm
- 21CFR11 Compliance: Electronic Signature and secure local electronic data storage
- Domestic 3-year warranty and 20-year support guarantee
- International warranty varies by country
- Standard Accessories: TempTrol™ NIST Traceable Quartz Standard (single rotation), TempTrol™ 100mm Polarimeter Cell, TempTrol™ Temperature Validation Cell, Built-In Sample Measurement Probe

Standard Accessories



TempTrol™ Hastelloy™ Measurement Cell*
*Option on the Autopol® V, standard on the Autopol® V Plus

One or three NIST Traceable Certificates**

TempTrol™ NIST Traceable Quartz Calibration Standard
**Single rotation on the Autopol® V, three rotations on the Autopol® V Plus

The Autopol® V and V Plus Use Rudolph's Exclusive TempTrol™ Electronic Temperature Control System

The USP <781> requires optical rotation measurements at $25^{\circ}\text{C} \pm .5^{\circ}\text{C}$ (unless another temperature is specified). The European Pharmacopoeia requires optical rotation measurements made at $20^{\circ} \pm .5^{\circ}\text{C}$ (unless another temperature is specified).

Whatever your temperature control needs are, the Autopol® V and the Autopol® V Plus' exclusive TempTrol™ System (Patent No. 6,717,665) makes your measurement in a few minutes without a waterbath or any type of water circulation.

The TempTrol™ System allows push-button temperature control of your 100mm cell, 200mm cell or Quartz Plate. Set the temperature, push "measure" and walk away. The Autopol® will heat or cool to a predefined temperature and then provide you with the result all in one easy step.

Patented TempTrol™ Technology Eliminates the Need for a Water Bath. Here is How the TempTrol™ System Works:



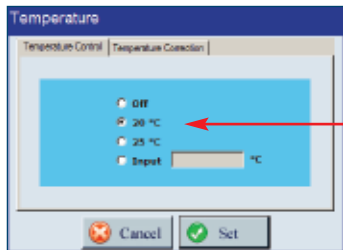
TempTrol™ active surface with Silco Steel™ coating



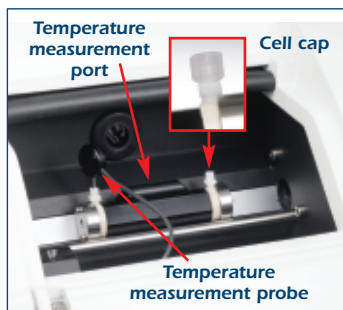
TempTrol™ Hastelloy™ passive surface

TempTrol™ heating and cooling transfer surface

TempTrol™ cell with mating heating & cooling transfer surface manufactured with acid resistance materials: Hastelloy™ and Peek™.



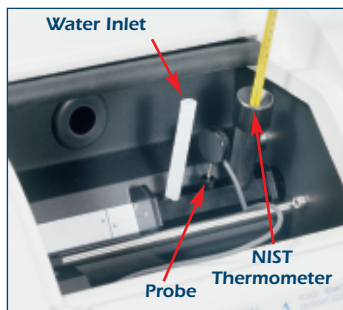
Temperature is selected via touch screen. Temperature selection of 20°C shown left.



Temperature measurement port
Cell cap
Temperature measurement probe

Place the TempTrol™ cell in your TempTrol™ equipped Autopol® sample chamber to measure to within $\pm 0.2^{\circ}\text{C}$ of the USP, EP, JP or BP specified temperature (normally 20°C or $25^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$).

For improved temperature performance or when working with acids (HCl) use the measurement port in the body of the cell. This also allows the inlet and outlet ports to be capped to avoid evaporation, fumes and spillage.



Water Inlet
Probe
NIST Thermometer

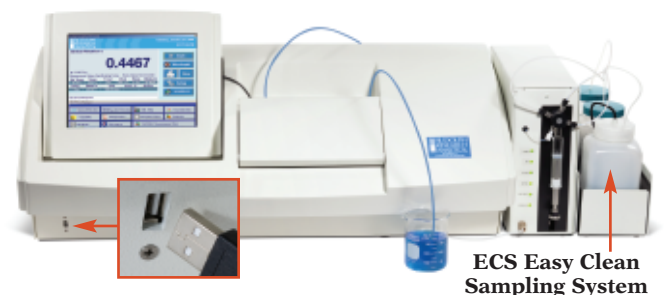
Rudolph provides a temperature validation cell with every TempTrol™ system. The temperature validation cell along with an optional NIST traceable thermometer is designed to validate the temperature control performance of the polarimeter and cell to $\pm 0.2^{\circ}\text{C}$.

THE AUTOPOL® V PLUS ADVANTAGE

- 6m HCl acid resistance: Silco Steel coating on the chamber temperature transfer surface and a Hastelloy measurement cell with NIST certificate certifying optical path length.
- To meet the FDA's latest position on measurement bracketing, the Autopol® V Plus comes with a NIST traceable quartz plate with three rotations: $+0.998^{\circ}$ Arc, $+10.998^{\circ}$ Arc, -10.000° Arc. Each rotation has a NIST certificate.

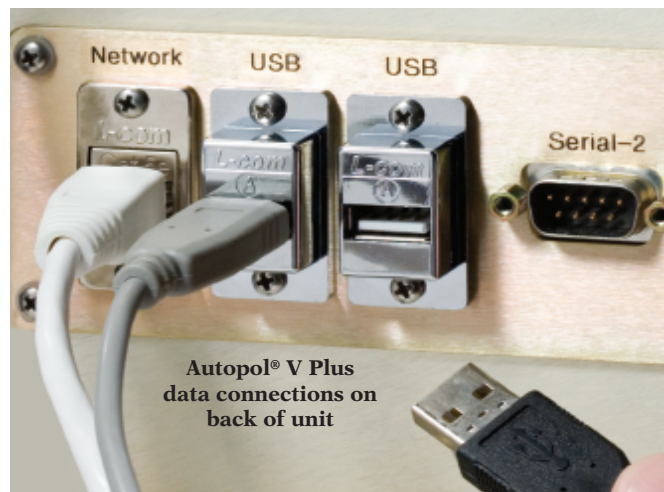


- Windows based navigation architecture is so intuitive that most operators will never read the manual. But should you wish to reference the manual, it is stored right on the Autopol® V Plus' internal memory.
- Available with automated sampling



ECS Easy Clean Sampling System

- Three USB ports allow quick and easy connection to a mouse, keyboard, printer, bar code scanner, or memory stick. One USB port is located on the front of the unit (shown above) and two USB ports are located on the back of the unit (shown below).



Autopol® V Plus data connections on back of unit

- Ethernet Port for Network Cable Connection
- Internet access allowing connection to Rudolph's service department for remote testing and diagnostics
- 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

Specifications

Features	Autopol® V	Autopol® V PLUS
Measuring Mode:	Optical Rotation, Specific Rotation, Concentration & User-defined Scales	Optical Rotation, Specific Rotation, Concentration & User-defined Scales
Measuring Scale:	Degrees Arc, % Concentration	Degrees Arc, % Concentration
Measuring Range:	±89.9° Arc Optical Rotation, ±999.99° Arc Specific Rotation and 0-99.9% Concentration	±89.9° Arc Optical Rotation, ±999.99° Arc Specific Rotation and 0-99.9% Concentration
Selectable Resolution:	0.01°, 0.001°, 0.0001° Arc Optical Rotation 0.001% Concentration 0.001° Specific Rotation	0.01°, 0.001°, 0.0001° Arc Optical Rotation 0.001% Concentration 0.001° Specific Rotation
Reproducibility:	0.002° Arc	0.002° Arc
Standard Model Accuracy:	0.002° up to 1°, 0.2% up to 5°, 0.01° above 5°	0.002° up to 1°, 0.2% up to 5°, 0.01° above 5°
AP Model Accuracy and Resolution:	(546nm and 589nm): ±0.002° Arc over ±89.9° Arc. Accuracy for other wavelengths is the same as the standard model. Selectable Resolution 0.01°, 0.001°, 0.0001° Arc Optical Rotation	Autopol V Plus Single: ±0.002° Arc over ±89.9° Arc. Autopol V Plus Six Wavelength (546nm and 589nm): ±0.002° over ±89.9° Arc. Selectable Resolution 0.01°, 0.001°, 0.0001° Arc Optical Rotation
Prism:	Glan Thompson calcite quartz	Glan Thompson calcite quartz
Optical Wavelengths:	365nm, 405nm, 436nm, 546nm, 589nm, 633nm (other wavelengths available)	365nm, 405nm, 436nm, 546nm, 589nm, 633nm (other wavelengths available)
Wavelength Selection:	Automatic by push-button	Automatic by push-button
TempTrol™ Range:	Automatic Electronic Heating & Cooling 15°-35°C	Automatic Electronic Heating & Cooling 15°-35°C
TempTrol™ Accuracy:	±0.2°C	±0.2°C
Temp. Probe Range:	10°-40°C	10°-40°C
Temp. Probe Accuracy:	±0.1°C	±0.1°C
Acid Resistance:	Hastelloy™ measurement cell and Silco Steel™ sample chamber (optional)	Hastelloy™ measurement cell and Silco Steel™ sample chamber (standard)
Measurement Time:	4°/sec. slew rate and 5 sec. nominal settling time	4°/sec. slew rate and 5 sec. nominal settling time
Light Source:	Tungsten-halogen 6V, 20W, avg. 2,000 hour life	Tungsten-halogen 6V, 20W, avg. 2,000 hour life
Sample Chamber:	Accepts sample tubes up to 200mm	Accepts sample tubes up to 200mm
Data Storage/Internal Memory:	Multimedia Card and/or Secure Digital Card	2 GB Non-removable Compact Flash
Communication Interface:	Two RS232 serial ports, one parallel printer port and one auxiliary port	Touch Screen, 3 – USB Ports, 2 – RS232 Ports, Ethernet Port for Network Connection, Keyboard, Bar Code Scanner, Mouse, Network Capabilities
Calibration:	Automatic calibration by push-button	Automatic calibration by push-button
Display:	7.5cm x 10cm graphics LCD, 320 x 240 dots cold fluorescent back lit	10.4 inch diagonal, 800-600 pixels, color, Flat Panel Monitor with Resistant Touch Screen Interface, 200 nits brightness, gasketed for spill protection
User Interface:	Touchscreen	Touchscreen
Automatic Sensitivity Control:	Measures samples with transmittance as low as 0.01% (up to O.D. 4.0)	Measures samples with transmittance as low as 0.01% (up to O.D. 4.0)
Input Power:	100-240VAC, 50/60 Hz	85 – 260 VAC; 48 – 62 Hz, 150 – 200 Watts consumption
Operating Dimensions:	35"W x 10.5"H x 17"D 890mm W x 267mm H x 432mm D	32"W x 11.5"H x 18"D 813mm W x 292mm H x 457mm D
Shipping Dimensions:	43"W x 26"H x 23"D 1,025mm W x 625mm H x 625mm D	43"W x 28"H x 23"D 1,411mm W x 919mm H x 722mm D
Operating Weight:	85 lbs. (39kg)	90 lbs. (41kg)
Shipping Weight:	115 lbs. (52kg)	140 lbs. (64kg)