

*For Pharmaceutical Applications  
Two Great Solutions*

# The Autopol<sup>®</sup> V and Autopol<sup>®</sup> V PLUS



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

 **RUDOLPH  
RESEARCH  
ANALYTICAL**

**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



Two TempTrol™ Validation Cells

One or three NIST Traceable Certificates\*\*

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

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. 2778542)** 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.

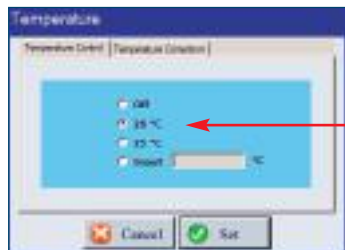
## Patented TempTrol™ Technology Eliminates the Need for a Water Bath. Here is How the TempTrol System Works:



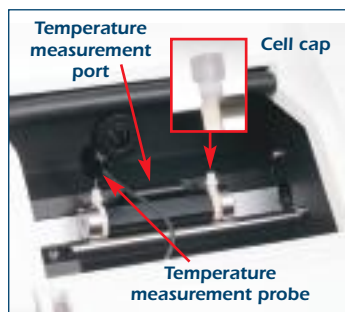
TempTrol heating and cooling transfer surface



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

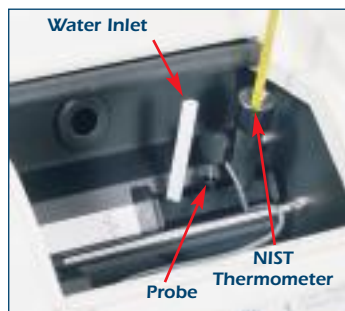


Temperature is selected via touch screen. Temperature selection of  $20^{\circ}\text{C}$  shown left.



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  $20^{\circ}\text{C}$  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.



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

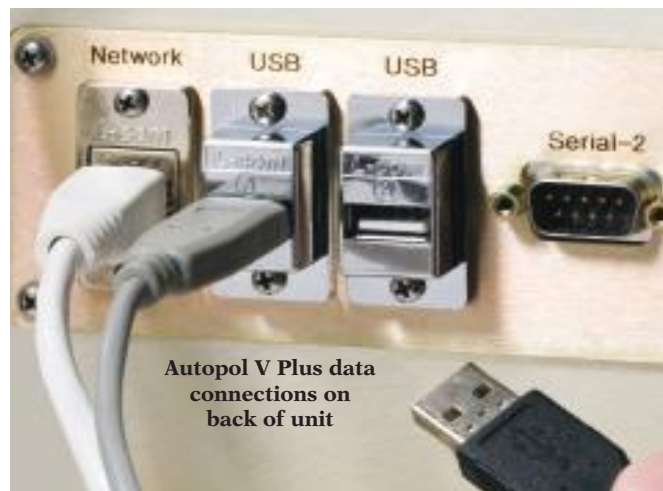
- **6m HCl acid resistance:** Silco Steel coating on the chamber temperature transfer surface and a Hastelloy measurement cell with NIST certificate certifying optical path length.
- To meet the FDA's latest position on measurement bracketing, the Autopol V Plus comes with a NIST traceable quartz plate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



- 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).



- 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   |
|---------------------------------------|---|---|
| <b>Measuring Mode:</b>                | Optical Rotation, Specific Rotation, Concentration & User-defined Scales            | Optical Rotation, Specific Rotation, Concentration & User-defined Scales  |
| <b>Measuring Scale:</b>               | Degrees Arc, % Concentration  | Degrees Arc, % Concentration  |
| <b>Measuring Range:</b>               | ±89° Arc Optical Rotation, ±999.99° Arc Specific Rotation and 0-99.9% Concentration | ±89° Arc Optical Rotation, ±999.99° Arc Specific Rotation and 0-99.9% Concentration   |
| <b>Resolution:</b>                    | 0.001° Arc Optical Rotation<br>0.001% Concentration<br>0.001° Specific Rotation     | 0.001° Arc Optical Rotation<br>0.001% Concentration<br>0.001° Specific Rotation   |
| <b>Reproducibility:</b>               | 0.002° Arc  | 0.002° Arc  |
| <b>Accuracy:</b>                      | 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°  |
| <b>Prism:</b>                         | Glan Thompson calcite quartz  | Glan Thompson calcite quartz  |
| <b>Optical Wavelengths:</b>           | 365nm, 405nm, 436nm, 546nm, 589nm, 633nm (other wavelengths available)              | 365nm, 405nm, 436nm, 546nm, 589nm, 633nm (other wavelengths available)  |
| <b>Wavelength Selection:</b>          | Automatic by push-button  | Automatic by push-button  |
| <b>TempTrol™ Range:</b>               | Automatic Electronic Heating & Cooling 15°-35°C                                     | Automatic Electronic Heating & Cooling 15°-35°C   |
| <b>TempTrol™ Accuracy:</b>            | ±0.2°C  | ±0.2°C  |
| <b>Temp. Probe Range:</b>             | 10°-40°C  | 10°-40°C  |
| <b>Temp. Probe Accuracy:</b>          | ±0.1°C  | ±0.1°C  |
| <b>Acid Resistance:</b>               | Hastelloy™ measurement cell and Silco Steel™ sample chamber (optional)              | Hastelloy™ measurement cell and Silco Steel™ sample chamber (standard)  |
| <b>Measurement Time:</b>              | 4°/sec. slew rate and 5 sec. nominal settling time                                  | 4°/sec. slew rate and 5 sec. nominal settling time  |
| <b>Light Source:</b>                  | Tungsten-halogen 6V, 20W, avg. 2,000 hour life                                      | Tungsten-halogen 6V, 20W, avg. 2,000 hour life  |
| <b>Sample Chamber:</b>                | Accepts sample tubes up to 200mm  | Accepts sample tubes up to 200mm  |
| <b>Data Storage/Internal Memory:</b>  | Multimedia Card and/or Secure Digital Card  | 2 GB Non-removable Compact Flash  |
| <b>Communication Interface:</b>       | 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             |
| <b>Calibration:</b>                   | Automatic calibration by push-button  | Automatic calibration by push-button  |
| <b>Display:</b>                       | 7.5cm x 10cm graphics LCD,<br>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 |
| <b>User Interface:</b>                | Touchscreen   | Touchscreen   |
| <b>Automatic Sensitivity Control:</b> | 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)  |
| <b>Input Power:</b>                   | 100-240VAC, 50/60 Hz  | 85 – 260 VAC; 48 – 62 Hz,<br>150 – 200 Watts consumption  |
| <b>Operating Dimensions:</b>          | 35"W x 10.5"H x 17"D<br>890mm W x 267mm H x 432mm D                                 | 32"W x 11.5"H x 18"D<br>813mm W x 292mm H x 457mm D   |
| <b>Shipping Dimensions:</b>           | 41"W x 25"H x 25"D<br>1025mm W x 625mm H x 625mm D                                  | 43"W x 28"H x 22"D<br>1,411mm W x 919mm H x 722mm D   |
| <b>Operating Weight:</b>              | 85 lbs. (39kg)  | 90 lbs. (41kg)  |
| <b>Shipping Weight:</b>               | 105 lbs. (47kg)   | 140 lbs. (64kg)   |