



# Automated Multi-Range Viscometer

## ADVANTAGES:

- **Quick, easy operation in three simple steps**
- **Performs two tests at two temperatures... simultaneously!**
- **Truly continuous operation with unique autosampler**
- **Results in five minutes**
- **0.5–5000 mm<sup>2</sup>/s range**
- **Stand alone operation**
- **Multi-instrument networking & enhanced PC-based operation with HLIS**



## HVM 472

Herzog's HVM 472 Automated Multi-Range Viscometer measures transparent and opaque liquids in as little as five minutes with a unique dual-bath design that **enables two simultaneous tests at two different temperatures**. Plus, a revolutionary autosampler offers truly continuous operation: spent sample cups automatically unload, allowing you to **add new samples at any time**... even mid-test! The HVM 472 meets or exceeds precision requirements of ASTM D 445. Results can be exported to a printer or LIMS. Add the powerful Herzog Laboratory Information System (HLIS®) **Windows-based software** for enhanced operation and data management.

## APPLICATIONS:

# Viscosity

LIQUID PETROLEUM PRODUCTS  
WATER-CONTAINING EMULSIONS  
USED OILS  
WAXY SAMPLES  
ASPHALT  
BASE STOCKS  
ADDITIVES  
FORMULATED OILS  
LIGHT/HEAVY OILS  
MARINE FUELS  
CRUDE OILS  
HYDRAULIC OIL

## METHODS:

Precision of  
**ASTM D 445**  
**IP 71 Section 1**  
**ISO 3104**  
**EN ISO 3104**

# HERZOG HVM 472

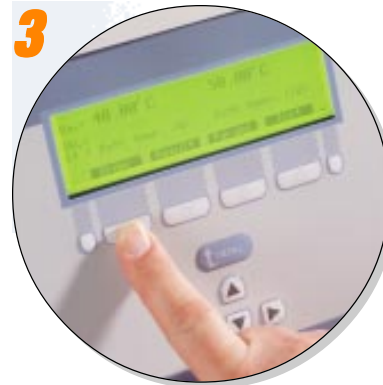
## Begin a test in 3 easy steps!



**1** Simply place a prepared sample in the easy access sample feeder



**2** At the analyzer's auto prompt, key in the sample ID



**3** Identify the sample as a priority test, or add it to the list of already loaded samples

### QUICK, POWERFUL TESTING

- Quick, easy operation in three simple steps; two tests, two temperatures simultaneously
- Variable temperature selection from 20°C to 150°C with superior microprocessor control
- Results ready in five minutes; high throughput testing of up to 12 measurements per hour
- Two multi-range capillaries, 100-fold each
- Complete testing range meets requirements of entire petroleum industry (0.5–5000 mm<sup>2</sup>/s)
- Measures transparent, opaque liquids with powerful precision
- Optional sample preheating station with individual temperature settings for testing waxy and heavy materials
- Results immediately display on local digital readout and can be output automatically or on-demand to an optional printer or computer system
- Fast temperature equilibration

### SMART, STREAMLINED AUTOMATION

- Designed for unattended operation
- Two 26-position autosamplers (one per bath)
- Used sample cups automatically unload to easily accessible tray
- New samples may be added mid-test
- System automatically prompts user for sample name/ID when new samples are loaded

### EFFORTLESS CLEANING PROCESS

- Automatic tube cleaning system accommodates two solvent types; four solvent option available
- Compatible with aggressive solvents, such as acetone
- No external vacuum pump or pressurized solvent tank required

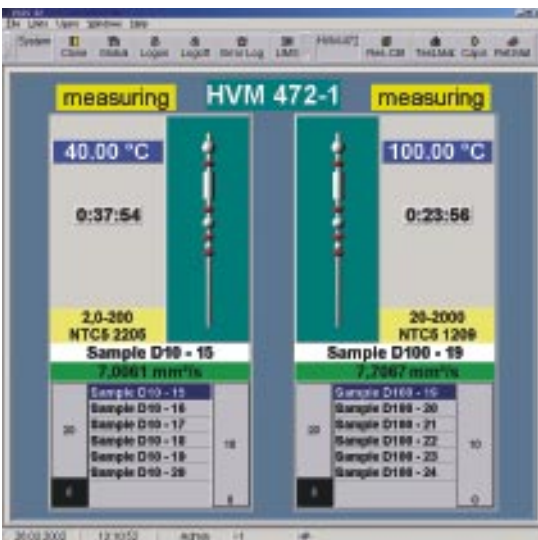
### SAFE, DEPENDABLE PERFORMANCE

- Built in over-temperature and low liquid level power cutoffs
- Dual panes insulate bath media and contain heat
- CE approved for safe, reliable operation
- Expert sales and service from PAC's worldwide network of factory trained authorized representatives

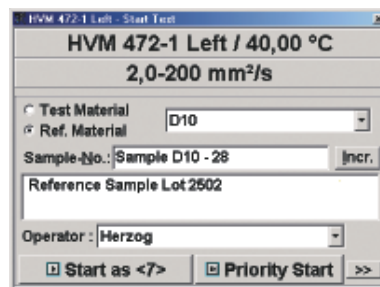


### OPTIONAL PC CONTROL & MULTI-INSTRUMENT NETWORKING WITH HLIS®

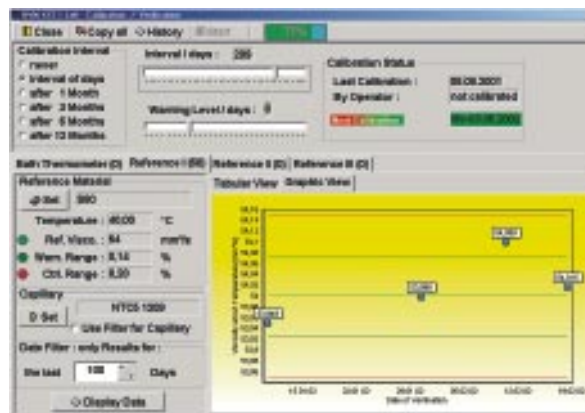
- Dual control options: 1) local programming using keypad commands, or 2) remote control from PC with Windows-based HLIS networking software
- Results database with powerful data handling features
- Advanced LIMS communication & calibration capabilities
- VI, SUS, Dynamic Viscosity, M-value calculations
- Automatic correction (gravity and energy)
- Operates up to 16 HVM 472 instruments



From the Summary screen, simply right click to open a menu of all programming and overview options.



The Start Test screen automatically opens any time a new sample is placed into the feeder. Key in a sample number (test material, operator and sample description can also be entered here), then add the sample to the list or press "Priority Start" to specify priority testing for the sample.



From the Calibration & Certification Screen, easily set calibration intervals and warnings. Calibrate bath temperature and, using reference materials, verify instrument calibration.

*Two tests, two temperatures... simultaneously!*

# HVM 472 Automated Multi-Range Viscometer

## Simultaneous multi-temperature testing, automated sampling

### SPECIFICATIONS

<b>Ordering Information</b>	<p><b>HVM 472 Automated Viscosity Analyzer</b> enables stand-alone, simultaneous testing of two samples at two different temperatures with integrated autosamplers for continuous operation. Includes integrated keypad control, display, two baths, bath liquid, timing system, dual-solvent cleaning systems, two autosamplers.</p> <ul style="list-style-type: none"> <li>– Optional <b>Cleaning System Upgrade</b> increases number of solvents to a maximum of four solvent types</li> <li>– Optional <b>Waxy/Heavy Materials Testing Upgrade</b> adds sample preheating (40 to 130° C) and slop tube heating (100° C); one required for each measuring position; specify left and/or right capillaries</li> </ul>
<b>Standard Test Methods</b>	Precision of ASTM D 445, IP 71 Section 1, ISO 3104, EN ISO 3104
<b>Performance</b>	<p>Viscosity Range 0.5–5000 mm<sup>2</sup>/s at 40°C; 0.5–2000 mm<sup>2</sup>/s at 100°C. (Dual 100 fold capillaries: 0.5–50 mm<sup>2</sup>/s to 50–5000 mm<sup>2</sup>/s)</p> <p>Bath Temperature Range 20 to 150°C (68 to 302°F), user programmable</p> <p>Bath Temperature Stability ≤ 100°C: better than ±0.01°C (±0.02°F). &gt;100°C: better than ±0.03°C (±0.05°F)</p> <p>Bath Temperature Control Proportional heat control, high velocity bath media circulation</p>
<b>Sample Induction</b>	Via integrated 26-position autosamplers (one sampler per bath), which automatically draw sample directly from 18 ml cup. Programming window automatically opens when samples are placed, allowing user to key in sample ID and start testing.
<b>Detection</b>	Two multi-range tubes (see Viscosity Range, above). Thermal (TNC) meniscus detection/timing
<b>Documentation</b>	Numeric display; output to printer by parallel Centronics™ interface; output to LIMS or HLIS® via RS 232 serial standard port
<b>Auto Cleaning</b>	Dual solvent system with programmable cycle parameters; low solvent usage (no external vacuum pump required). Built-in automatic detection of cleaning solvent availability. Kalrez™ seals compatible with various solvents, including acetone. 4-solvent cleaning available as an option.
<b>Diagnostics &amp; Calibration</b>	Real time status display and control for all mechanical and electrical systems locally or with optional PC network
<b>Utility Requirements</b>	230/115/100 VAC, 50–60 Hz configurable/selectable
<b>Dimensions &amp; Weight</b>	49 cm W x 75 cm D x 127 cm H; 90 kg (99 kg with bath liquid). 19.3" W x 29.6" D x 50" H; 199 lbs (219 lbs with bath liquid)

### ACCESSORIES

<b>HLIS for Windows®</b>	<b>Herzog Laboratory Information System.</b> Windows-based software. Operates up to 16 HVM 472's with material-based individual measurement programs. Calculates VI and other derived data. Storage and database management. Customized output data format for transfer to an external LIMS.
<b>Ticket Printer</b>	For stand alone use or with option PC; 40 columns endless paper
<b>Cooling Accessories</b>	<p><b>External Circulation Cooler:</b> obtains bath temperatures from 20° to 40°C</p> <p><b>Cooling Control System:</b> recommended if external cooler is used; prevents bath cooling when a temperature above 40°C is selected; one required for each measuring position</p>
<b>Slop Accessories</b>	<p><b>Sensor:</b> detects a full slop container and prevents overflow</p> <p><b>Container:</b> for waste solvent (according to safety regulations)</p>
<b>Sample Beakers</b>	<p>Plastic disposable beaker (100°C max)</p> <p>Glass disposable beaker (150°C max)</p>
<b>Multi-Range Capillary</b>	100 fold range. 12 gradings: 0.5–50; 1–100; up to 50–5000 mm <sup>2</sup> /s
<b>PC and Printer</b>	Contact your PAC representative for details

### FOR ADDITIONAL INFORMATION:

AMERICAS:

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Due to continuing product development, specifications subject to change at any time without notice.  
All Herzog products are  compliant.

YOUR LOCAL REPRESENTATIVE: