Automated Multi-Range Capillary Viscometer

HVM 472

PAC
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herzog
by PAC

The Advanced Solution for Unattended, Continuous Viscosity Testing

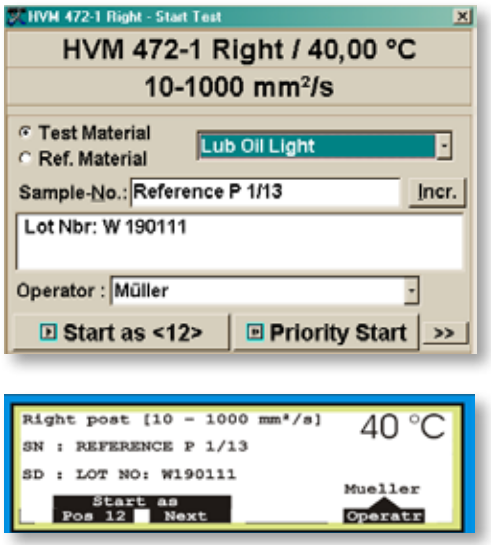
- Precise and accurate analysis results
- Easy and safe operation with advanced system automation
- Flexible and modular design for fast adaptation to both current & future analysis needs
- In compliance with ASTM D445, IP 71 Section 1, ISO 3104 and EN ISO 3104

HVM 472 - Viscometer

AUTOMATED MULTI-RANGE CAPILLARY VISCOMETER

The Herzog Multi-Range Viscometer (HVM 472) determines kinematic viscosity of transparent and opaque liquids. The easy to operate HVM 472 includes 2 multi-range capillaries with 100 fold measuring range, requires only 18 ml, and delivers precise results. A revolutionary auto sampler offers truly continuous operation, spent sample vials automatically discharge, allowing new samples to be added at any time, even mid-test! For rapid analysis within viscosity range of 0.5 to 600mm2/s, the HVM 472 offers the smart alternative to run samples using 20-fold range Fast Run ("FR") capillaries.

1. Insert sample beaker into feeder



2. Enter sample number in software and indicate it either priority sample or added as next in line at the end of the sample order list

3. After the analysis is run, the used sample is collected in the discharger tray.

ADVANCED SYSTEM AUTOMATION AND DESIGN FOR HIGH LEVEL OF STABILITY, SAFETY AND EASE OF USE

Smart bath design
- Capillary tubes are visible from 360° direction
- Effective circulation system ensures bathes temperature uniformity
- Double cover glass wall to avoid direct contact with hot surface

Reduced VOC emissions
Allows connection to ventilation system

High quality and robust configuration
- Automated cleaning station, using 2 differents solvents (up to 4 as option
- Seal & valve system made of robust and corrosion resistant material
- No direct contact from operators

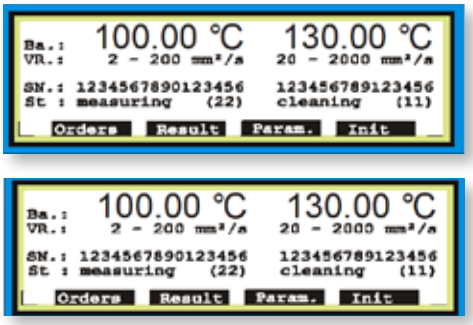
Maximized sample throughput
- Two integrated sample changers for 7-8 hours unattended operation
- Capability to run 2x26 samples at two differents temperatures
- Compatible with very viscous products, (option of individual sample preheating up to 120°C)

USER-FRIENDLY SYSTEM CONTROL AND ANALYSIS SOFTWARE

The HVM 472 software includes a range of features for user-friendly control and optimzed system operation:

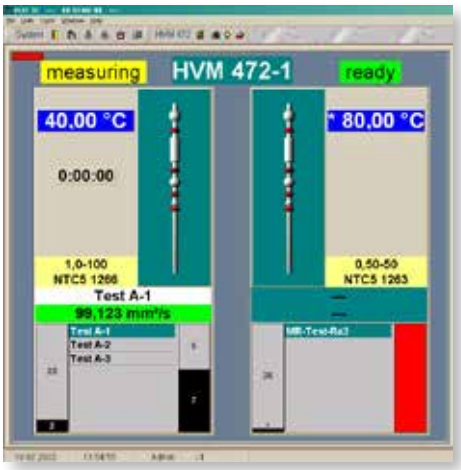
DIRECT ACCESS TO CRITICAL INFORMATION

- **Continuous monitoring of test progress for both baths**:
  Bath T°C, sample ID, measuring range of installed capillary, unit status and order no. in the sampler changer tray
- **Comprehensive results display:**
  Upto 400 results (local memory), sample ID, flow times (+ deviation to previous flow time) Status also availble through PC software and print output



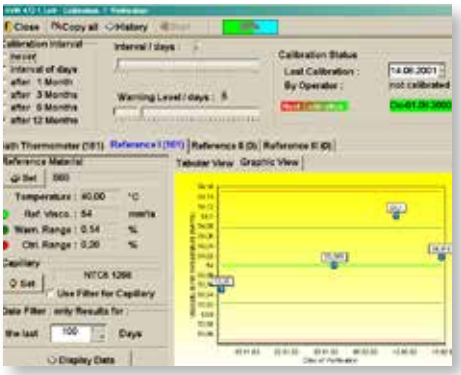
RANGE OF ANALYSIS OPTIONS

- Common result database for several instruments
- Individual measuring program for each sample
- Automatic gravity and energy correction
- Automatic viscocity index calculation
- SUS-, dynamic viscosity- and M- value calculations
- Statistical flow times analysis (outlier detection)
- Repeatability and reproducibility calculation



TOTAL QUALITY ASSURANCE

- **Factory calibration at both 40°C (104°F) and 100°C (212°F):**
  - Ready for immediate determination of VI
  - Up to 10 temeprature points available per bath
- **Easy Calibration Procedure within 3 steps:**
  - Measure bath real temperature with a Certified Reference Thermometer
  - Enter the temperature reading into the instrument calibration table
  - The system automatically calculates the correction offset history information

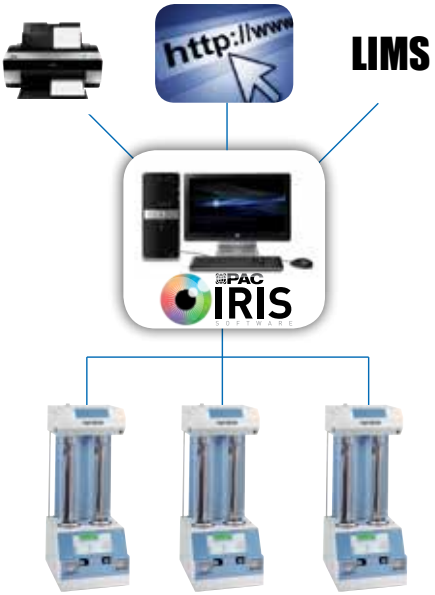


MULTIPLE UNITS NETWORK OPERATION

Users can choose to have the HVM 472 operate as a stand-alone unit or benefit from using it in a PC-controlled network with PAC IRIS Software. This advanced lab instrument data integration software is designed specifically for PAC instruments to gather and analyze test data and communicate results so customers can make informed decisions.

PAC IRIS offers:

- Improved laboratory efficiency
- Simplified knowledge sharing and decision making
- Designed to promote Good Laboratory Practices



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HERZOG BY PAC

Herzog, originally established in 1937, is a long-established comprehensive line of laboratory instruments for testing distillation, flash point, vapor pressure, bitumen testing, cold flow properties, viscosity and other physical properties of materials.

SPECIFICATIONS

GENERAL INFORMATION	
Ordering Information	HVM472 Automated Multi-Range Capillary Viscometer. Stand-Alone configuration with two bathes, integrated auto samplers and automatic dual solvents cleaning system for continuous operation.
Standard Test Methods	ASTM D445, IP 71 Section 1, ISO 3104, EN ISO 3104
OPERATION	
Performance Viscosity range Bath temperature control	0.5 - 5000mm2/s (Dual 100-fold atlantic capillaries) 20–150°C (68 to 302°F), user programmable ≤100°C: better than ± 0.01°C (±0.02°F) >100°C: better than ±0.03°C (±0.05°F) Proportional heat control resolution 0.001°C, high velocity bath media circulation
Sample induction	Via integrated 26 position auto samplers (one sampler per bath), which automatically draw sample directly from 18ml / 4 ml vial. Programming window automatically opens when samples are placed, allowing user to key in sample ID and start testing.
Detection	Two multi-range tubes (see viscosity range above) Thermal NTC meniscus detection/timing
Documentation	Numeric display; output to printer by parallel Centronics interface; output to LIMS or HLIS vial serial standard port
Auto Cleaning	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
Diagnostics & Calibrations	Real time status display and control for all mechanical and electrical systems locally or with optional network
Utility requirements	230/115/100 VAC, 50–60 Hz configurable/selectable
Dimensions & Weight	49 cm W x 75 cm D x 127 cm H; 90 kg (99 kg with bath liquid) 19.3 in W x 29.6 in D x 50 in H; 199 lbs (219 lbs with bath liquid)
ACCESSORIES	
PAC IRIS Software features for HVM 472	• Run Control • Quality Control • Test Start • Results • Diagnostics • Results Evaluation • Calibration • Method Definition • Instrument Parameters • Reports
Ticket Printer	For stand-alone use or with option PC; 40 columns endless paper
Cooling Accessories	External circulation cooler: obtains bath temperatures from 20° to 40°C Cooling control system: recommended if external cooler is used; prevents bath cooling when a temperature above 40°C is selected; one required for each measuring position
Slop Accessories	Sensor: detects a full slop container and prevents overflow Container: for waste solvent (according to safety regulations)
Sample Beakers	Standard or 4ml: - Plastic disposable beaker (100°C max) - Glass disposable beaker (150°C max)
Adapter and Filling Support	Adapter for low volume option; Filling support for single vial filling; Tray 20 positions for low volume vial with filling support Tray 20 positions for standard beaker with filling support for FR capillary
Multi-Range Capillary	Standard: 100 fold range; 12 gradings Fast Run: 20 fold range; 10 gradings: 0.5–10; 1–20 up to 30–600 mm2/s
PC and Printer	Contact your PAC representative for details

Continuing research and development may result in specifications or appearance changes at any time

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