Automatic Viscometer and Autosampler

HVU 490 AND MP 491

Herzog’s HVU 490/MP 491 Automatic Viscosity Analysis System automates Kinematic viscosity testing while meeting or exceeding requirements of ASTM D 445. To ensure quick, accurate results, it incorporates superior microprocessor temperature control, near-infrared or thermal timing systems that exceed precision requirements of standard methods, and an automatic tube cleaning system. It performs up to 8 tests simultaneously, boasting cycle times as fast as 11 minutes in optional Fast Run configuration, or in 20–30 minutes using standard operation parameters.

As your testing needs expand, easily add additional HVU 490 Analyzers to the system. One MP 491 Autosampler accommodates up to four units. To further simplify analysis, Herzog’s Laboratory Information System (HLIS) monitors and controls the autosampler and viscometers.

**ADVANTAGES:**

- Results in minutes
- Ultra-precise NIR or NTC thermal meniscus detection
- Displays all test conditions and results
- Wide bath temperature range, exceptional bath temperature stability
- Centralized control of network operation and data management using HLIS
- Buy one testing station now... add additional viscometers as your testing needs grow

**APPLICATIONS:**

- LIQUID PETROLEUM PRODUCTS
- WATER-CONTAINING EMULSIONS
- USED OILS
- POLYMERS
- ASPHALTS
Viscosity, liquid’s “internal friction” or resistance to flow, depends greatly upon sample temperature. Standardized test methods require precision temperature control as sample travels under gravity through a glass capillary tube. Often, viscosity determinations are performed at multiple temperature points, enabling “viscosity index” calculations—the key to most completely understanding a product’s flow properties. Herzog’s HVU 490 Automatic Viscometer incorporates superior microprocessor temperature control, standard calibrated capillary tubes, and infrared or thermal timing systems to exceed the precision requirements of standard methods and the performance capabilities of other viscosity analyzers. All test steps and calculations are performed quickly and automatically, enhancing stability, repeatability and efficiency.

An illuminated bath permits convenient viewing of tests in process. Standard Ubbelohde tubes are outfitted with NIR or thermal meniscus detectors for exceptional accuracy on a wide variety of samples.

8 sample magazines hold 12 samples each. Any of the samples can be automatically delivered to any of up to 4 baths (8 capillaries) at any time for testing at different temperatures. For continuous, unattended operation, replace magazines as frequently as necessary during testing. Re-usable brass or disposable plastic sample containers are available.
The Herzog Laboratory Information System (HLIS) combines power of Windows-based navigation with HVU Series Automatic Analyzers’ robust electronics and mechanical design. A few mouse clicks are all that’s required to control and monitor up to 4 units from a central computer.

**CALIBRATION**
System calibration is quickly and easily performed with keystrokes, rather than electro mechanical adjustments.

**OVERVIEW**
At a glance, view status of all instruments on the network. Operating status, sample ID, bath temperature and efflux time are all displayed. Color codes make it easy for a single operator to manage many tests in process.

**MEASUREMENT**
From the Summary screen, simply click on the unit number to open its Measurement window. Here, sample number and ID are entered. A program is selected from a pulldown menu, and the start button begins the test cycle.

**DIAGNOSTICS**
Actual measurement values including bath temperature, valve condition, infrared and thermal sensors, and timers are observable at a glance. Plus, interactive, context sensitive help screens are available throughout the program.

**QUICK, ULTRA-PRECISE ANALYSIS**
- Initiates tests with only a few clicks and keystrokes
- Ubbelohde capillary tubes protect sample from external ambient conditions until 2 determinations are made within user-set repeatability limits
- Dynamic/static sample tempering quickly achieves equilibrium sample temperature
- Highly precise near-infrared (NIR) 2-point meniscus detection unaffected by surface tension effects, sample conductivity, or water content
- Programmable, multi-solvent cleaning cycles clean, rinse and dry tubes according to user preferences
- Results immediately display on local digital readout and can be output automatically or on-demand to an optional printer or computer system

**SOPHISTICATED SAMPLING OPTIONS**
- MP 491 autosamplers (2- or 4-bath capacity) enable continuous, uninterrupted operation
- Holds up to 96 samples—all samples available to all baths at all times; magazines may be replaced as frequently as necessary during testing
- Integral sample pre-heating system speeds temperature equilibration
- Autosampler housing includes storage space for solvent and waste reservoirs, capillary tubes, and other supplies

**PC-DRIVEN CONVENIENCE WITH HLIS**
- Controls and monitors up to 4 units from a single computer, enabling quick view of operation status and measurement values
- Built-in calibration, self-test, & system diagnostics
- Sophisticated Windows-based database management organizes test parameters and results for easy retrieval

**RUGGED, RELIABLE OPERATION**
- Withstands aggressive solvents & extensive operation
- Quick tube changes in under two minutes minimize routine maintenance downtime
- Expert sales and service from PAC’s worldwide network of factory trained authorized representatives
- Quality construction and reliable operation backed by a limited parts and service warranty
- Intensive customer training at your site or ours
# HVU 490 Viscometer & MP 491 Autosampler

## Fast Viscosity Analysis, High Sample Throughput

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Ordering Information</th>
<th><strong>HVU 490 Automatic Viscosity Analyzer</strong> includes integrated keypad control, display, temperature bath, 2 capillary tubes, timing and cleaning systems. Requires MP 491 Autosampler for sample induction (for stand-alone operation, see Herzog’s HVU 481, or ask your sales representative about modifying the viscometer and using modified capillary tubes for the HVU 490). MP 491-000-02 Autosampler: 2 bath capacity (48 samples) or MP 491-000-04 Autosampler: 4 bath capacity (96 samples)</th>
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<tbody>
<tr>
<td>Standard Test Methods</td>
<td>ASTM D 445 and D 446, P 71, DIN 51 562, ISO 3014, ISO 3015</td>
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<tr>
<td>Performance</td>
<td><strong>Temperature Range</strong></td>
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<tr>
<td>Bath Temperature Stability</td>
<td>User-programmable 20–150°C (68–302°F)</td>
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<tr>
<td>Sample Temperature Control</td>
<td>±0.005°C (±0.01°F)</td>
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<tr>
<td><strong>Viscometer Tubes</strong></td>
<td>Proportional heat control, high velocity bath media circulation, sleeved capillary tubes, pressurized sample agitation</td>
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<td><strong>Meniscus Timing</strong></td>
<td>ASTM D 446 Ubbelohde-style with quick-change connections</td>
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<td><strong>Sample Induction</strong></td>
<td>Micro-Ubbelohde tubes for “Fast Run” analysis available as optional accessories (see below)</td>
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<td><strong>Documention</strong></td>
<td>Near-Infrared (NIR): high precision technique for clean, black, water containing, or conductive samples</td>
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<td><strong>Auto Cleaning</strong></td>
<td>Thermal (NTC): for high carbon or stable emulsion (dark) samples</td>
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<td><strong>Diagnostics &amp; Calibration</strong></td>
<td>Via MP 491 Autosampler (required) — automatically draws sample directly from cup; no external vacuum pumps required</td>
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<td><strong>Utility Requirements</strong></td>
<td>Local 2-line LCD; parallel output port standard; RS-232 serial output port standard; compatible with HLIS for Windows</td>
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<td><strong>Optional Accessories</strong></td>
<td>Dual solvent system with programmable cycle parameters; low solvent usage (40 ml minimum); gravity intake and discharge (no external vacuum pump required); built-in automatic detection of cleaning solvent availability; Kalrez™ seals compatible with various solvents, including acetone; no viton seals</td>
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### OPTIONAL ACCESSORIES

| **HLIS for Windows®** | Herzog Laboratory Information System. Operates up to 4 HVU 490s and/or Herzog automatic viscosity analyzers with central measurement program and test results storage and database management. All data collected/stored by HLIS automatically transmits by RS 232 to external LIMS. User may customize output format using preferred field delimiters. System PC can function as workstation on LAN and move/share data via file transfer or Dynamic Data Exchange (DDE) with other Windows applications. |
| **Fast Run Equipment** | Significantly reduces analysis time. Items sold separately: |
| **PC and/or Printer** | - Micro-Ubbelohde tubes reduce sample size to 12 ml of sample needed, reduce measuring cycle time down to 15 minutes per sample, and increase viscosity measuring range. Contact your PAC representative for details. |

### FOR ADDITIONAL INFORMATION:

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All Herzog products are ESR compliant.

*Your Local Representative:*