SRV
WIDE VISCOSITY RANGE INLINE PROCESS VISCOMETER

- Repeatable measurements in both newtonian and non-newtonian, single- and multi-phase fluids
- Hermetically sealed, all 316L stainless steel wetted parts
- Built in fluid temperature measurement

Specifications

Fluid Measurements

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity Range</td>
<td>3 to 10,000 cP</td>
</tr>
<tr>
<td>Viscosity Accuracy</td>
<td>5% of reading (standard)</td>
</tr>
<tr>
<td>Reproducibility</td>
<td>Better than 1% of reading</td>
</tr>
<tr>
<td>Temperature</td>
<td>Pt1000 (DIN EN 60751 class B)</td>
</tr>
<tr>
<td>Calibrated to NIST traceable</td>
<td>viscosity standards.</td>
</tr>
</tbody>
</table>

Operational Environment

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Fluid Temperature</td>
<td>-40 up to 200 °C</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>-40 up to 150 °C</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>up to 5,000 psi</td>
</tr>
</tbody>
</table>

Mechanical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material (Wetted parts)</td>
<td>316L Stainless Steel</td>
</tr>
<tr>
<td>Diameter x Length</td>
<td>35 x 140 mm</td>
</tr>
<tr>
<td>Process Connection</td>
<td>3/4” NPT</td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>IP68</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>M12 (8-pin, A-coded)</td>
</tr>
</tbody>
</table>

Electronics & Communication

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog output</td>
<td>4-20 mA (3 channel) (Viscosity, Density, Temp.)</td>
</tr>
<tr>
<td>Digital output</td>
<td>Modbus RTU (RS-485)</td>
</tr>
<tr>
<td></td>
<td>Ethernet</td>
</tr>
<tr>
<td></td>
<td>USB</td>
</tr>
<tr>
<td>Wireless output</td>
<td>Bluetooth LE 4.0</td>
</tr>
<tr>
<td>Display</td>
<td>Multi-line LCD (max. 55°C)</td>
</tr>
<tr>
<td>Operational temp.</td>
<td>max. 55 °C</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V DC</td>
</tr>
<tr>
<td>SME-TR(D)</td>
<td>IP65/66</td>
</tr>
<tr>
<td>SME-DRM</td>
<td>IP40/50</td>
</tr>
<tr>
<td>Software</td>
<td>Data acquisition and service control panel</td>
</tr>
<tr>
<td></td>
<td>iOS and Android app</td>
</tr>
</tbody>
</table>

SRV-DS-1706

Protected by US and International patents granted and pending
rheonics • Switzerland • USA • www.rheonics.com • info@rheonics.com +41 52 511 32 00 +1 713 364 5427
Operating principle

The rheonics SRV measures viscosity by means of a torsional resonator, one end of which is immersed in the fluid under test. The more viscous the fluid, the higher the mechanical damping of the resonator. By measuring the damping, the product of viscosity x density may be calculated by rheonics’ proprietary algorithms. The resonator is both excited and sensed by means of an electromagnetic transducer mounted in the sensor’s body. Thanks to rheonics’ patented symmetric resonator design, the transducer is isolated from the fluid in a hermetically sealed capsule, while maintaining excellent mechanical isolation from the sensor’s mounting. Damping is measured by the rheonics patented sensing and evaluation electronics. Based on rheonics’ proven gated phase-locked loop technology, the electronics unit offers stable and repeatable, high-accuracy readings over the full range of specified temperatures and fluid properties.

Application

Painting and coating
- Optimize solvents and lacquer use in the process
- Control the coating process regardless of temperature
- Eliminates the need for costly destructive testing
- Ensure uniform film thickness and adhesion
- Eliminate manual sampling and laboratory time
- Reduce wastage & ensure quality of end product
- Small form factor for direct installation in printing presses and painting nozzles

Polymers and Slurries
- Monitor the viscosity change through the complete polymerization process
- End-point detection and real-time monitoring
- Avoid blockage through instantaneous and early detection of viscosity build-up
- Check incoming raw material quality and ensure outgoing product quality
- Ensure process control and stability
- Scale from pilot plants to production rapidly without further application engineering

Other applications:
- Pump efficiency optimization and pipeline leak monitoring
- HFO/MDO viscosity monitoring in fuel conditioning units on-board ships
- SAGD heavy oil viscosity control for transport through heating and slurry formation
- Viscosity monitoring and control in multiple food manufacturing processes for making dough, chocolate, cream, cheese, jams, mayonnaise, etc
- Ink viscosity monitoring and control for printing
- Lubricants viscosity monitoring and control
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WIDE VISCOSITY RANGE INLINE PROCESS VISCOMETER

Mechanical & Electrical

**Cable Gland**
- Standard
- Ex Rated

**Sensor Cable**
- Up to 30m

**M12 connector**
- (IP67 | IP68 | IP69)

**Mechanical**
- 316L stainless steel (standard)
- Available with custom coatings
- Long insertion adapters for installation in larger pipes and tanks

**Process connection**
- 3/4" NPT (standard)
- Adapters available for Flange and Tri-clamp
- Sanitary fittings optional

**Electronics** (select between)
- SME-TRD
  - Explosion-proof IP66 enclosures
  - Onsite and remote installation of electronics head
  - Available with and without rugged display for field use
- SME-TR
  - DIN rail mount
  - Extra-small form factor for easy installation
  - Ethernet connection
  - External adapters for wifi
- SME-DRM
  - External adapters for wifi

**Mounting**

**Pipe**
- Any configuration possible
  - Flanged
  - NPT thread
  - Tri-clamp

**Tank**
- Any configuration possible including long insertion adapters
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WIDE VISCOSITY RANGE INLINE PROCESS VISCOMETER

Electronics installation

Dimensions

Industrial high-contrast LCD
Bluetooth LE 4.0
Status LED

Display connector
USB
Ethernet
Power 24V DC
Modbus RTU
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

1/2" NPT (standard)

145.0 [5.71"]
110.0 [4.33”]
17.5 [0.69”]
17.5 [0.69”]
114.0 [4.49”]
70.0 [2.76”]
59.0 [2.32”]
129.0 [5.08”]
126.0 [4.96”]
50.0 [1.97”]
59.0 [1.97”]
109.0 [4.29”]
255x87
415x87
491x87
449x73
550x172
256x651
28x310
229x49
147x597
147x514
147x420
350x268
526x16
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SRV dimensions

Front View

Top View

Perspective View

Software

rheonics Application

PC Data Acquisition & Analysis

Connect using:
- 📲 Bluetooth
- 🌐 Cloud
- 🔛 Real-time data
- 🕒 Process view
- 🔔 Alerts
- 🔍 Configure
- 🌐 Android
- 🌐 IOS

Connect over:
- 🌐 USB
- 🌐 Ethernet
- 🌐 Bluetooth
- 🌐 Cloud
- 🔍 Configure sensor
- 🔔 Check calibration
- 🔍 Firmware upgrade

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Ordering

Ordering code example

<table>
<thead>
<tr>
<th>SRV</th>
<th>V1</th>
<th>STD</th>
<th>E1</th>
<th>C1,C2</th>
<th>T1</th>
<th>P1</th>
<th>X1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity range</td>
<td>Calibration</td>
<td>Electronics</td>
<td>Communication</td>
<td>Temperature</td>
<td>Pressure</td>
<td>Process Connection</td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>3-3000 cP</td>
<td>Standard calibrated range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>3 - 50,000 cP</td>
<td>Extended calibrated range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V3</td>
<td>0.5 - 3000 cP</td>
<td>Extended lower calibrated range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V4</td>
<td>custom</td>
<td>Customer specified calibrated range within 0.5 - 50,000 cP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calibration (select all)

STD | Standard calibration
EXT | Extended calibration with multiple fluids for wider range and higher accuracy
CUS | Customer specific calibrations - specify viscosity range, accuracy required and operational conditions

Electronics (select one)

E1 | SME-TRD | Explosion proof transmitter housing with display
E2 | SME-TR | Explosion proof transmitter housing with solid cover
E3 | SME-DRM | DIN-rail mount housing

Communication (select all)

C1 | 4-20 mA | 3 channels of 4-20 mA analog signal
C2 | Modbus RTU (RS-485) | Modbus RTU over RS-485
C3 | USB | USB 2.0 compliant service and data acquisition port
C4 | Ethernet | Ethernet TCP/IP with RJ45 connector
C5 | Bluetooth LE 4.0 | Bluetooth module for short range communication, only available with display module

Temperature (select one)

T1 | 125 °C | Sensor rated for operation in process fluids up to 125 °C (250 °F)
T2 | 150 °C | Sensor rated for operation in process fluids up to 150 °C (300 °F)
T3 | 200 °C | Sensor rated for operation in process fluids up to 200 °C (400 °F)
T4 | > 200 °C | Sensor rated for operation in process fluids above 200 °C (400 °F)

Pressure (select one)

P1 | 15 bar (200 psi) | Sensor rated for process fluids pressure up to 15 bar (200 psi)
P2 | 70 bar (1000 psi) | Sensor rated for process fluids pressure up to 70 bar (1000 psi)
P3 | 200 bar (3000 psi) | Sensor rated for process fluids pressure up to 200 bar (3000 psi)
P4 | 350 bar (5000 psi) | Sensor rated for process fluids pressure up to 350 bar (5000 psi)

Process Connection (select one)

X1 | 3/4" NPT | Standard
X2 | Flange | Flange adapter, specify DN/PN
X3 | Tr-clamp | TC adapter, specify size
X4 | Sanitary | DIN 11851 Hygienic union, specify size
X5 | Custom | Specify connector dimensions

Accessories

Sensor cable | 5m, 10m, 30m | 8 core cable for connecting sensor to transmitter (PUR or PEEK sheaths)
Cable gland | 1/2" NPT | 1/2"NPT Standard and explosion-proof cable glands
Transmitter mounting bracket | | Mounting bracket for SME-TR and SME-TRD transmitter housings

Contact Information

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