SRV
LINE 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>Parameter</th>
<th>Specification</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></td>
<td>1% &amp; higher accuracy available</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>Calibration</td>
<td>Calibrated to NIST traceable viscosity standards.</td>
</tr>
</tbody>
</table>

Operational Environment

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</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>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material (Wetted parts)</td>
<td>316L Stainless Steel</td>
</tr>
<tr>
<td>Diameter x Length</td>
<td>Ø35 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>Parameter</th>
<th>Specification</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</td>
</tr>
<tr>
<td></td>
<td>(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></td>
<td>IP65/66</td>
</tr>
<tr>
<td></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>

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
SRV-DS-1706
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
Mechanical & Electrical

Electronics (select between)

- **SME-TRD**
  - Transmitter housing (IP66)
  - 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**

**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

**Mounting**

- **Pipe**
  - Flanged
  - NPT thread
  - Tri-clamp
- Any configuration possible including long insertion adapters
- **Tank**
  - Any configuration possible including long insertion adapters
SRV
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 (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Modbus RTU
Sensor cable
Display connector
USB
Ethernet

Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable

Display connector
USB
Ethernet

Power 24V DC
Modbus RTU (RS-485)
Viscosity(ch1)
Density(ch2)
Temperature(ch3)
GND
Sensor cable
SRV
WIDE VISCOSITY RANGE INLINE PROCESS VISCOMETER

SRV dimensions

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
### Ordering code example

<table>
<thead>
<tr>
<th>Order code</th>
<th>Name</th>
<th>Short description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>3-3000 cP</td>
<td>Standard calibrated range</td>
</tr>
<tr>
<td>V2</td>
<td>3 - 50,000 cP</td>
<td>Extended calibrated range</td>
</tr>
<tr>
<td>V3</td>
<td>0.5 - 3000 cP</td>
<td>Extended lower calibrated range</td>
</tr>
<tr>
<td>V4</td>
<td>custom</td>
<td>Customer specified calibrated range within 0.5 - 50,000 cP</td>
</tr>
<tr>
<td>STD</td>
<td>Standard calibration</td>
<td></td>
</tr>
<tr>
<td>EXT</td>
<td>Extended calibration with multiple fluids for wider range and higher accuracy</td>
<td></td>
</tr>
<tr>
<td>CUS</td>
<td>Customer specific calibrations - specify viscosity range, accuracy required and operational conditions</td>
<td></td>
</tr>
<tr>
<td>SME-TRD</td>
<td>Transmitter housing with display</td>
<td></td>
</tr>
<tr>
<td>SME-TR</td>
<td>Transmitter housing with solid cover</td>
<td></td>
</tr>
<tr>
<td>SME-DRM</td>
<td>DIN-rail mount housing</td>
<td></td>
</tr>
<tr>
<td>3 channels of 4-20 mA analog signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modbus RTU over RS-485</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB 2.0 compliant service and data acquisition port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethernet TCP/IP with RJ45 connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bluetooth LE 4.0 Bluetooth module for short range communication, only available with display module</td>
<td></td>
<td></td>
</tr>
<tr>
<td>125 °C Sensor rated for operation in process fluids up to 125 °C (250 °F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 °C Sensor rated for operation in process fluids up to 150 °C (300 °F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 °C Sensor rated for operation in process fluids up to 200 °C (400 °F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 200 °C Sensor rated for operation in process fluids above 200 °C (400 °F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 bar (200 psi) Sensor rated for process fluids pressure up to 15 bar (200 psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 bar (1000 psi) Sensor rated for process fluids pressure up to 70 bar (1000 psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 bar (3000 psi) Sensor rated for process fluids pressure up to 200 bar (3000 psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>350 bar (5000 psi) Sensor rated for process fluids pressure up to 350 bar (5000 psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4” NPT Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flange adapter, specify DN/PN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC adapter, specify size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN 11851 Hygienic union, specify size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specify connector dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 core cable for connecting sensor to transmitter (PUR or PEEK sheaths)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2” NPT Standard and Ex cable glands</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Contact Information

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