Specifications

Fluid Measurements

- Viscosity Range: 1 to 3,000 cP
- Viscosity Accuracy: 5% of reading (standard), 1% & higher accuracy available
- Density Range: 0.4 to 4.0 g/cc
- Density Accuracy: 0.01 g/cc, 0.001 g/cc & higher accuracy available
- Reproducibility: Better than 1% of reading
- Temperature: Pt1000 (DIN EN 60751 class B)
  - Calibrated to NIST traceable viscosity and density standards.

Operational Environment

- Process Fluid Temperature: -40 up to 200 °C
- Ambient Temperature: -40 up to 150 °C
- Pressure Range: up to 5,000 psi

Mechanical

- Material (Wetted parts): 316L Stainless Steel
- Diameter x Length: Ø35 x 140 mm
- Process Connection: 3/4" NPT
  - Flange & sanitary connections available
- Ingress Protection: IP68
- Electrical Connection: M12 (8-pin, A-coded)

Electronics & Communication

- Analog output: 4-20 mA (3 channel) (Viscosity, Density, Temp.)
- Digital output: Modbus RTU (RS-485), Ethernet, USB
- Wireless output: Bluetooth LE 4.0

Display (SME-TRD) Multi-line LCD (max. 55°C)
- Operational temp.: max. 55 °C
- Power supply: 24 V DC
- SME-TR(D)
- SME-DRM
- Software: Data acquisition and service control panel
  - iOS and Android app

Simultaneous density and viscosity monitoring in diverse processes
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
The rheonics SRD measures viscosity and density by means of a torsional resonator, the finned end of which is immersed in the fluid under test. The more viscous the fluid, the higher the mechanical damping of the resonator, and the denser the fluid, the lower its resonant frequency. From the damping and resonant frequency, the density and viscosity may be calculated by means of rheonics' proprietary algorithms. Thanks to rheonics' symmetric resonator design (US patent number 9267872), the transducer is isolated from the fluid in a hermetically sealed capsule, while maintaining excellent mechanical isolation from the sensor's mounting. Damping and resonant frequency are measured by the rheonics sensing and evaluation electronics (US patent number 8291750). 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**

**Metering and Interface detection**
- Highly accurate and reliable density measurement
- Interface detection to recognize product change

**Blending and Batching**
- Real-time molar ratio control in chemical reactions through continuous concentration measurement

**Biofuels and Petroleum**
- In Biofuel production monitor density to distinguish between raw materials and separated products
- In refinery distillation column, differentiate fractions based on density and viscosity - between gasoline, diesel, lubricant and marine fuel
- Continuous measurement - eliminate manual sampling and laboratory time
- Inspect quality of end product at refinery, gas station, in aeroplane and on ship
- Small form factor for direct installation in flow lines

**Beverages and Dairy**
- Concentration monitoring in soft drink blending
- Continuous sugar concentration read-out in fermentation
- Measure wort density in beer brewing
- Density monitoring across the dairy production process

**Other applications:**
- Continuous electrolyte density check in battery
- Adapt process to variable raw material quality (eg. due to stratification in tanks) by monitoring density and viscosity of the raw material in real-time
- Measure concentration of lime slurry (calcium hydroxide)
- Ink and coating density and viscosity monitoring for equipment control and QA
- Lubricant density and viscosity monitoring
- Fuel consumption (density) and quality (density, viscosity) monitoring
SRD
INLINE PROCESS DENSITY METER AND 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
- 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
- 45.7mm
- Ø35mm

Mounting

Pipe — any configuration possible
- Flanged
- NPT thread
- Tri-clamp

Tank — any configuration possible including long insertion adapters

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SRD-DS-1706
SRD
INLINE PROCESS DENSITY METER AND VISCOMETER

Electronics installation

Industrial high-contrast LCD
Bluetooth LE 4.0
Status LED

Dimensions
SRD
INLINE PROCESS DENSITY METER AND VISCOMETER

SRD dimensions

Front View

Perspective View

Top View

Software

rheonics Application

Connect using:
- Bluetooth
- Cloud
- Real-time data
- Process view
- Alerts
- Configure
- Android
- IOS

PC Data Acquisition & Analysis

Connect over:
- USB
- Ethernet
- Bluetooth
- Cloud
- Configure sensor
- Check calibration
- Firmware upgrade
## Ordering

**Ordering code example**

<table>
<thead>
<tr>
<th>Code</th>
<th>V1</th>
<th>V. Calibration</th>
<th>D1</th>
<th>D. Calibration</th>
<th>E1</th>
<th>E1/E2</th>
<th>T1</th>
<th>P1</th>
<th>X1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Viscosity range (select all)
- V1: 1 - 3000 cP
- V2: custom

### Viscosity Calibration (select all)
- STD: Standard calibration
- CUS: Customer specified calibration - specify viscosity range, accuracy required and operational conditions

### Density range (select all)
- D1: 0.4 - 1.5 g/cc
- D2: custom

### Density Calibration (select all)
- DCAL1: 0.01 g/cc
- DCAL2: 0.001 g/cc or better

### Electronics (select one)
- E1: SME-TRD
- E2: SME-TR
- E3: SME-DRM

### Communication (select all)
- C1: 4-20 mA
- C2: Modbus RTU (RS-485)
- C3: USB
- C4: Ethernet
- C5: Bluetooth LE 4.0

### Temperature (select one)
- T1: 125 °C
- T2: 150 °C
- T3: 200 °C
- T4: > 200 °C

### Pressure (select one)
- P1: 15 bar (200 psi)
- P2: 70 bar (1000 psi)
- P3: 200 bar (3000 psi)
- P4: 350 bar (5000 psi)

### Process Connection (select one)
- X1: 3/4" NPT
- X2: Flange
- X3: Tri-clamp

### Accessories
- Sensor cable: 5m, 10m, 30m
- Cable gland: 1/2" NPT
- Transmitter mounting bracket: Mounting bracket for SME-TR and SME-TRD transmitter housings

## Contact Information

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SRD-DS-1706

†subject to change without notice