

REAL TIME. ON-LINE. IN-LINE.

Description

SenGenuity's ViSmart® VS-2610 Viscosity Sensor provides continuous, real-time, in-process viscosity and temperature measurement for fluids with operating temperatures of -15°C (5°F) to +105°C (221°F). It is well suited for oils, lubricants, fuels, and hydraulic fluids that are found in applications such as power gensets, wind turbines, marine engines, and on & off road vehicles. The ViSmart® sensor is solid state with no moving parts and is based on the integration of electronics, packaging, and Bulk Acoustic Wave (BAW) technology. Used in conjunction with the VisConnect® Converter modules, the VS-2610 Sensors can provide viscosity and temperature measurements in a variety of output interfaces including CANopen, RS232, RS485, and 4–20mA.

Features

- Continuous real-time, in-process relative viscosity measurement
- Kinematic viscosity range 0-500 cSt¹
- Continuous real-time, in-process temperature measurement
- -15°C to +105°C (5°F to +221°F) fluid operating temperature
- Highly immune to shock and vibration
- Industrial grade reliability
- EC IP 67 Ingress Protection
- 1/2" male NPT threads for installation into engine blocks, oil sumps, tanks or Tee fittings
- M12 x 1, 8 pin male connector for quick connection / disconnection to sensor cable

Applications

- Oil & Lubricants (mineral & synthetic based)
- ISO Viscosity Grade Oils (2 to 460)
- Hydraulic fluids
- Viscosity monitoring of marine fuel oils
- Other industrial fluids
- Indication of contamination in fuels
- Condition Based Maintenance (CBM)
- Predictive Maintenance (PdM)
- Alternative or supplement technology to calendar/time based maintenance activities

Performance Specifications

Parameter	VS-2610
Physical	
Viscosity Range (AV) ²	0 to 400
Kinematic Viscosity Range (cSt) ^{1,3}	0 to 500
Viscosity Repeatability % of Reading	±10%
Sensor Head Pressure [Gauge Pressure] PSIG (bar)	60 (4.14 bar)
Burst Pressure Rating [Gauge Pressure] PSIG (bar)	90 (6.00 bar)
Measurement Rate (Reading/Second)	1 / second
Interface	Proprietary SPI
Electrical Data	
Power Supply Voltage (Vdc)	5 to 10
Power Supply Current (mA)	<35
Power Consumption (mW)	<175 @ 5V
Approvals	
EMC Immunity/Emission	EN 55000, EN 61000-4-2, EN 61000-4-3, EN 61000-4-6
Environmental	
Fluid Operating Temperature (°C)	-15 to 105
Ambient Operating Temperature (°C)	-15 to 105
Storage Temperature (°C)	-40 to 80
Mechanical	
ViSmart® Sensor (inches)	Ø1.00 x L 4.23
ViSmart® Sensor (mm)	Ø25.40 x L 107.42
Sensor Connector	M12 x 1 Circular Connector
Weight (approximate) (oz) (g)	5 (153 g)
Ingress Protection Rating of ViSmart® Sensor ⁴	IP67
Connector Type	M12x1, 8 pin male
Recommended max Torque for NPT thread engagement (N-m)	40
Vibration ⁵	±20g (5-2000 Hz)
Shock ⁶	100g (6 ms)

Notes:

- cSt value based on use of calibration fluid with typical density value of 0.89 g/cm³. Actual cSt range greater for lower density fluids. Correlation functions between acoustic viscosity and dynamic/kinematic viscosity should be constructed in consultation with SenGenuity. Attempts at using the above mentioned formulae in isolation will most likely result in poor results.
- All viscosity measurements are shear rate and material dependent. Variations in material properties and homogeneity could result in varied interpretations of acoustic viscosity by the sensor.
- The general relationship between acoustic viscosity and kinematic viscosity is: Acoustic viscosity (AV) = kinematic viscosity x density² (cSt x (g/cm³)²).
- When mated with IP67/IP68 rated connector and cordset
- Per Mil-Std-810C, Figure 514.2-2
- Per Mil-Std-202G, Method 213B
- For further information regarding the ViSmart® Viscosity Sensor Starter Kits please visit http://www.sengenuity.com/tech_ref/ViSmart_Viscosity_Starter_Kit.pdf.

Wetted Material:

When completely immersed, the following materials are exposed to fluid media:

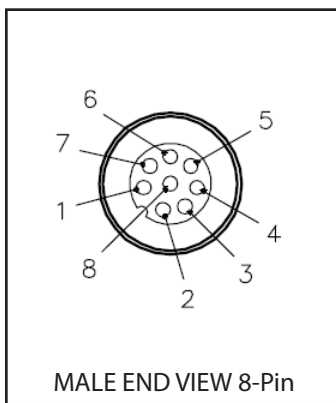
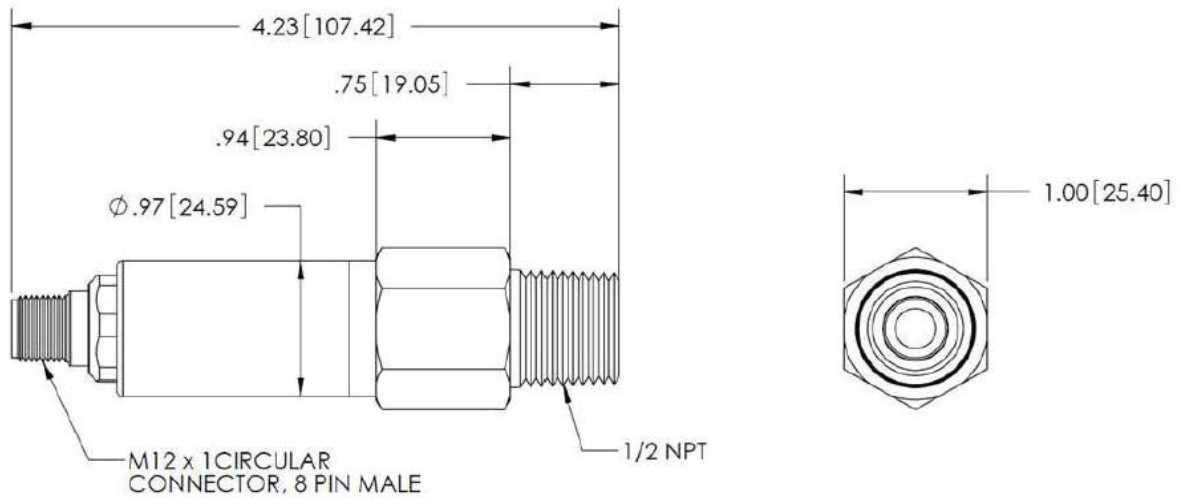
- AISI 304 Stainless Steel
- Loctite FP 4470
- Diamond like carbon
- Nickel Plated Kovar

DISCLAIMER

Vectron International reserves the right to make changes to the product(s) and or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Physical Dimensions

Dimensions in inches [mm]



M12x1 8-PIN Male Connector Pinout		
Pin #	Name	Description
1	A1	Chip Select Decode 1
2	A0	Chip Select Decode 0
3	MISO	Master In/Slave Out
4	SCK	Serial Clock
5	GND	Supply Voltage Return
6	NC	No Connect
7	MOSI	Master Out/Slave In
8	V+	Supply Voltage

Ordering Information - Sensor

Part No.	Model	Description
712200038	VS-2610	VS-2610 ViSmart Viscosity Sensor with 1/2" NPT Thread/M12 Connector/High Temp

Starter Kits with ViSmart® VS-2610 Sensor

Part No.	Description
723200122	Kit, Viscometer Starter Kit for High Temp, Non-Hazardous Locations with CANopen Protocol ⁷
723200116	Kit, Viscometer Starter Kit for High Temp, Non-Hazardous Locations with ASCII over RS485 Converter ⁷
723200113	Kit, Viscometer Starter Kit for High Temp, Non-Hazardous Locations with MODBUS RTU over RS485 Converter ⁷
723200130	Kit, Viscometer Starter Kit for High Temp, Non-Hazardous Locations, ASCII over RS232 Protocol ⁷
723200133	Kit, Viscometer Starter Kit for High Temp, Non-Hazardous Locations with Analog 4-20mA Converter ⁷

