TD Collaborative LLC

VTX423: Viscosity and Temperature Sensor for Process Applications

Highlights

- All welded construction
- Patented “Hammer and Anvil” technique
  - Increased low end sensitivity
  - Stable ratio-metric measurement
- No–moving-parts reliability
- Fast and accurate response
  - 5 measurements per second
  - 1000 ohm Platinum RTD
- Outputs for monitoring and control
  - 4-20ma, Viscosity and Temperature
  - Serial port monitoring and set up
- Easily installed

Overview: The VTX423 is a simple, cost effective way to monitor and control process fluid viscosity. It inserts directly into a 1” line using a standard “Tee” or into a tank. It’s ratings of 190 deg.C. [374F] and 1000psi [68bar], and suitability for use with opaque or contaminated fluids, makes it ideal for used oil, or residual fuel measurements, including Heavy Fuel Oil pre-combustion control. Control circuitry is housed in a rugged industrial enclosure mounted directly to the sensor. It runs on safe 24Vdc power, returning sourced 4-20ma signals AND a serial port data and setup link. The companion [optional] D422 display provides a visual high intensity 7-segment display with easy access to both the serial and 4-20ma data streams. See the D422-1 data sheet for additional details.

Operation: Every 200ms a new measurement is made of viscosity and temperature. Viscosity is measured using our proprietary vibrating cantilever beam and post [US patent 6,668,621]. Vibration of the beam is induced with a coil inside the sensor. New, fourth generation, variable reluctance techniques are used to measure beam tip vibrations. Variable reluctance is simple and reliable, AND it eliminates the need for environmentally hazardous piezoelectrics. Ratio-metric measurement virtually eliminates sensitivity shifts due to age or sensitivity drift. Our proprietary “hammer and anvil” beam tip design increases viscosity measurement sensitivity, particularly at low viscosities such as those needed for HFO pre-combustion control. Temperature is measured using a 1000 ohm precision platinum RTD positioned near the beam tip. There are no moving parts to wear or jam, no motors, no rotating seals, no shuttling bobbins to jam, no capillaries to plug and no measurable self heat to corrupt the viscosity and temperature measurements. We use no rare earth magnets. All wetted materials are corrosion resistant 316 SS and mumetal, Ebeam welding eliminates any weld stick foreign materials.

Specifications

Model	Viscosity	Temperature
VTH423-41	5-40cp optimized for HFO	0-190 degC
VTL423-32	10-300 cp	0-100 degC
Accuracy	±2.0% FScale, ±5% reading	±0.1 degC
Resolution	±.01cp to 100cp, ±0.1cp above 100cp	±0.01 degC

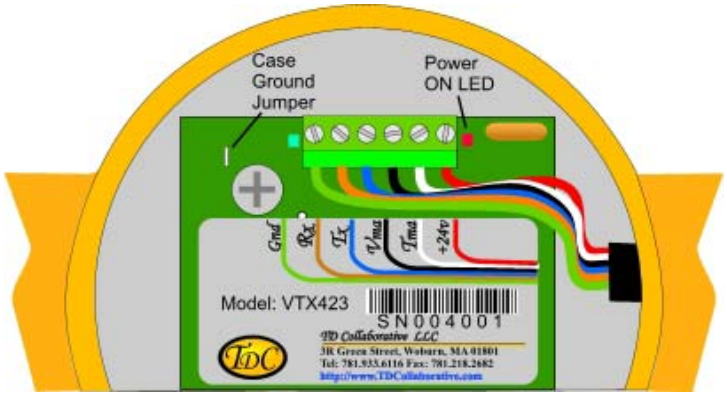
Mounting	1” NPT male thread or tank flange
Interconnect Hubs	¾” NPT for flexible or rigid conduit
Required Power	24 ±4Vdc, 300ma
Compatible Electronics	D422 display [optional]
Adaptors	1.5”NPT, 1.5BSPT, for others consult factory

Installation

VTH423 sensor in a one-inch pipe Tee.

Install in a 1” bypass line. Adaptors are available to enable use of 1.5” or other sizes. The sensor is orientation insensitive, but avoid potential gas pockets [a vertical line is ideal]. Fluid motion refreshes the sample in the measurement head. If the fluid viscosity exceeds the measurement range, there is no damage to the sensing head. The measurement beam is free, so there are no measurable pressure effects. If the fluid is hot the process line should be insulated. The Stainless Steel stem isolates the junction box and electronics, mechanically and thermally. The yellow junction box should not be disconnected from the stem or the stem from the sensor although it can be turned up to ½ turn to align as desired

Inside the screw off cap, there is a 1 x 6 terminal strip. Pins 1 and 6 are for ground and 24V power respectively. Pins 2 and 3 are Rx and Tx for “3-wire” 2400 baud, 8bit, no parity, 1 stop bit, no handshake serial communication [see TechNote 10354 for details]. Pins 4 and 5 are sourced 4-20ma outputs corresponding to viscosity and temperature respectively. It is recommended that the interconnect cable be shielded and grounded at both ends. As shipped the sensor case is connected to electrical ground through the “Case Ground Jumper”. To isolate the case cut the jumper.



Consult the factory for additional details and options or for a quote.

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