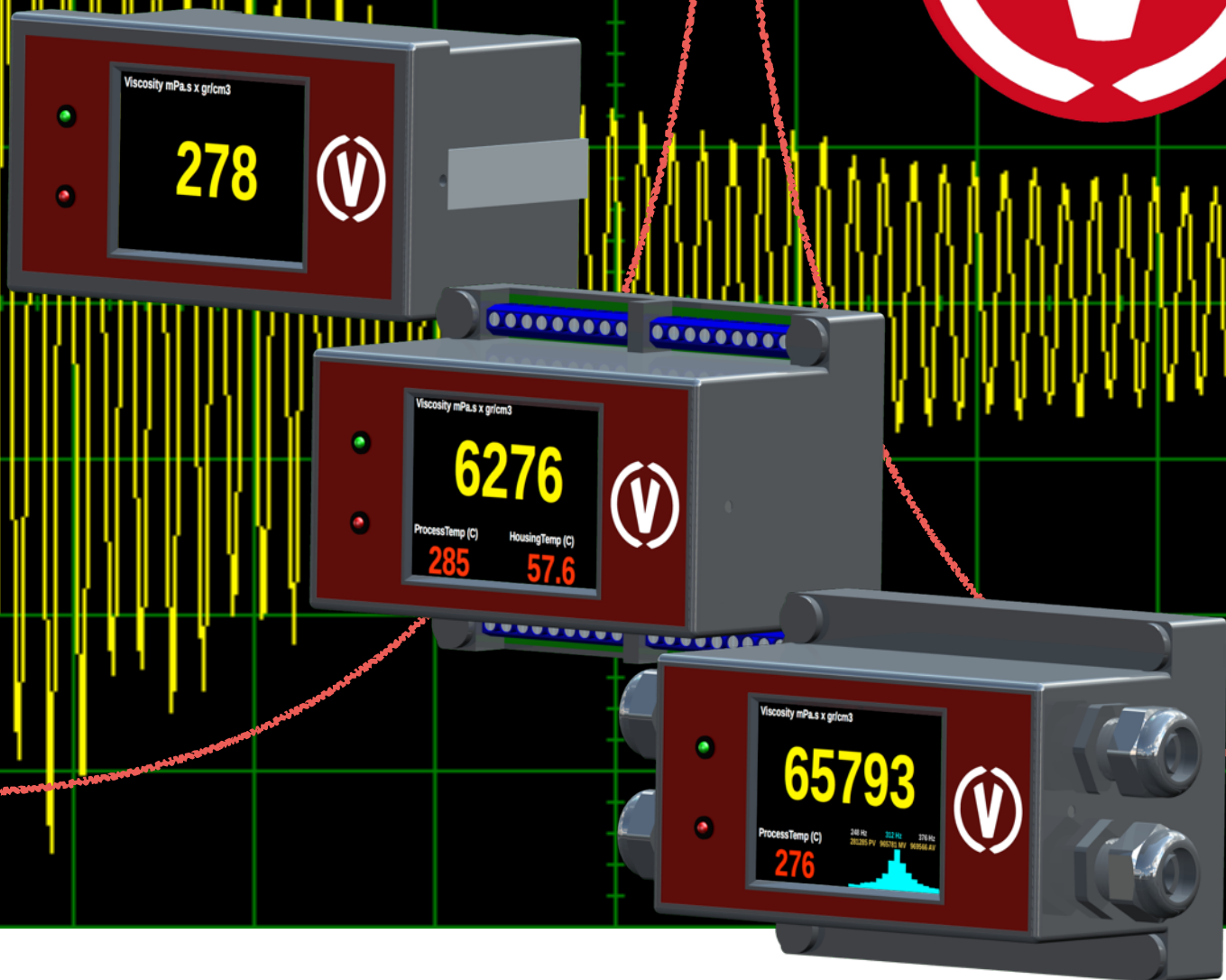


ViscoTron VT-IRFTx

Induced Resonance FFT viscosity transmitter



ViscoTron torsional resonance viscosity transmitter

- ① Viscosity, resonance and optional temperature measurement
- ① High speed frequency analysis for stable measurement
- ① Identification and rejection of mechanical vibration
- ① RS 485 interface for connection to a PLC or DCS
- ① Optional Bluetooth for configuration and data
- ① Cable length independent factory calibration
- ① Two 4 to 20 mA inputs and four outputs
- ① User calibration procedures
- ① ModBus protocol
- ① Data storage

Viscotronics Co., Ltd.

**Induced Resonance
FFT Analysis**

**Automatic rejection
of measurement
interference**

**Cable length
independent
calibration**

**Bright graphical
TFT touch panel**

**Analog inputs and
outputs**

USB Interface

Wireless Interface

RS485 Interface

ModBus Protocol

**Touch Panel
Configuration &
Calibration**

compatible with:

ViscoTron

VP-3508

VP-4508

VP-4512

VP-FT4500

VP-FT5500

VP-1000

VP-3000

**and 3rd party
Torsionally
Oscillating**

Viscometer sensors

ViscoTron IRFTx transmitters induce a natural resonance response into the sensor bulb or tube. The resonant frequency response is intelligently analyzed. The analysis time cycle is dependent on required parameters and typically about 1 second. A moving average for smoothing of erratic signals is instantly selectable between 2 to 256 samples. Viscosity is related to the power of the resonance peak. Selectable calibration curves are applied to calculate the viscosity.

VT-IRFTx transmitters are continuously performing in-line sensor diagnostics and identify other external influences. During each measurement cycle a green and a red LED indicate, if the sensor is working normally or is potentially effected by mechanical or electrical interferences.

Continuous analysis of the measurement frequency and the surrounding spectrum allows external influences to be identified. If interference from mechanical or electrical sources exceeds configurable parameters, the viscosity measurement is rejected. Once interference is below configured parameters, the viscosity is updated. Severe and continuous vibrations and interferences will result in an alarm condition.

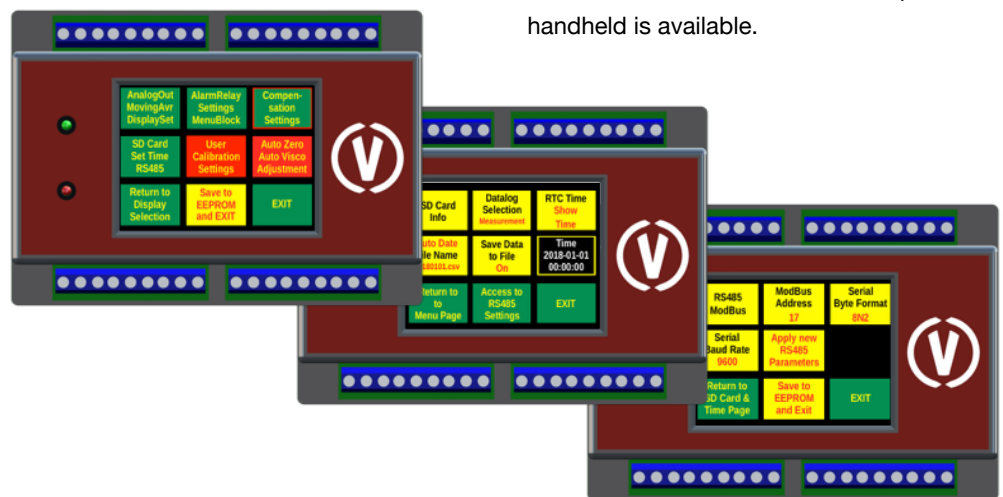
Identifying interferences is made easier with the sensor and vibration analysis display mode. In this mode interference is analyzed across a wider frequency spectrum, which displays frequencies as a histogram.

VT-IRFTx transmitters can be mounted a long distance away from the sensor, a cable resistance of up to 25 Ω is acceptable - about 500 meters with AWG 22, more than 1000 meters with AWG 18. The transmitter is small enough to be mounted inside an ex-proof enclosure and thus can be mounted in a hazardous area.

ViscoTron VT-IRFTx transmitters allow cable length changes in the field. Cable length changes do not have any influence on factory calibration, they are eliminated during start-up operations.

VT-TRFTx transmitters can be configured and calibrated in the field using only the touch panel menu. In addition to up to two factory calibration curves three completely independent user calibration curves are available for field calibration.

A USB port and optional Bluetooth provide command line support and data streaming. ModBus protocol function 3 has been implemented for the RS485 port. Optionally a dedicated wireless 5" TFT touch panel handheld is available.

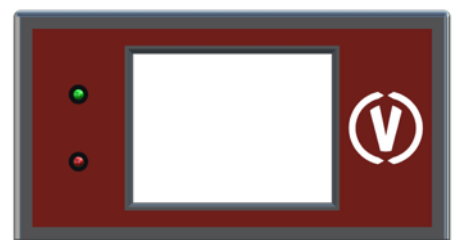
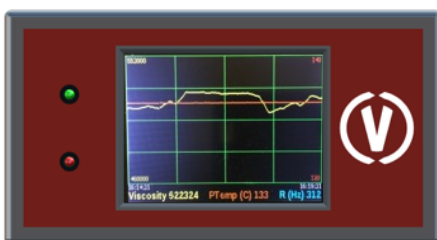


ViscoTron VT-IRFTx-TFTTP-2112-2110 DIN Rail or wall mount enclosure

The green LED continuously pulses with the measurement cycle indicating sensor is working within parameters. The second LED starts pulsing red, if external mechanical vibrations are having a potential influence.

VT-IRFTx Specifications

Item	Description
Technology	<ul style="list-style-type: none"> • Open loop induced resonance FFT analysis for fast viscosity measurement <ul style="list-style-type: none"> • typical cycle times are about 1 second dependent on sensor configuration and range. • Selectable averaging: 2, 4, 8, 16, 32, 48, 64, 96, 128, 192 & 256 samples instantly available • Identification and rejection of external mechanical vibrations • Zero procedure algorithm eliminates cable length influences • Continuous in-line diagnostics and analysis identifies sensor performance • Optionally up to two PT100 temperature inputs using 3 or 4 wires • Compatible with ViscoTron and other 3rd party torsionally vibrating sensors • RTC real time clock with battery backup
Measured parameters	<ul style="list-style-type: none"> • Viscosity • Resonant frequency of sensor • Optionally up to two temperatures
Display	<ul style="list-style-type: none"> • 320 x 240 pixels 2.8" graphical TFT with touch panel for display of viscosity, temperature, resonance and vibration analysis
Calibration & Configuration	<ul style="list-style-type: none"> • Parameter configuration via touch panel. Touch panel functions can be selectively disabled • Parameter configuration using a command line interface via USB, RS485 or Bluetooth • Factory calibration can be provided for two independent linearization models and up to 10 calibration points <ul style="list-style-type: none"> • Hybrid Spline, Cubic Spline or Linear Spline plus Rational Model or Hyperbolic Decline • Customer calibration facility independent of factory calibration, 3 individual curves can be stored <ul style="list-style-type: none"> • Usable with third party sensors, no external support is required • Function is entirely contained in the IRFTx and provides visual confirmation of the linearization. • Three linearization models are provided: Hybrid Spline, Cubic Spline and Linear Spline, best fits can be selected after calibration
Calculated parameters	<ul style="list-style-type: none"> • Standard viscosity measured by torsional resonance decay (viscosity x density) • Dynamic, kinematic and pressure (linear) compensated viscosity utilizing incoming signals from up to two analog inputs, serial interface or manual input to the transmitter • ASTM 341 or equal rate temperature compensated viscosity
Alarms and indications	<ul style="list-style-type: none"> • Continuous sensor diagnostics made visible via the TFT and a green and red LED • Low and high Viscosity, occasional and continuous mechanical vibration • Two optional alarm outputs, 48 VDC 500 mA maximum, alarm parameters configurable • One output can be configured for control of the housing temperature in FT sensors
Analog Inputs and Outputs	<ul style="list-style-type: none"> • Optionally up to two 4 to 20 mA loop powered, optically isolated analog outputs <ul style="list-style-type: none"> • Both outputs are configurable for any available parameter • Two non-isolated 4 to 20 mA inputs
Communication interfaces	<ul style="list-style-type: none"> • USB and optional Bluetooth interfaces for command line configuration and data retrieval • RS485 ModBus protocol for data retrieval • Optional wireless transceiver including dedicated 5" TFT touch panel handheld
Data storage	<ul style="list-style-type: none"> • SD Card data storage complete with time stamp from RTC
Power supply	<ul style="list-style-type: none"> • 9 to 36 or 18 to 72 VDC, galvanically isolated • 85 to 264 VAC, galvanically isolated
Ambient temperature	<ul style="list-style-type: none"> • 0 to 50°C / 32 to 122°F
Housings	<ul style="list-style-type: none"> • Panel mount enclosure: W = 130 mm, H = 70 mm, D = 75 mm <ul style="list-style-type: none"> • Panel cut-out: W = 126 mm, H = 66 mm • Wall mount enclosure: W = 125 mm, H = 90 mm, D = 74 mm • Wall / DIN rail enclosure: W = 125 mm, H = 90 mm, D = 74 mm • Blind or transparent IP67 wall mount enclosure: W = 151 mm, H = 125 mm, D = 90 mm



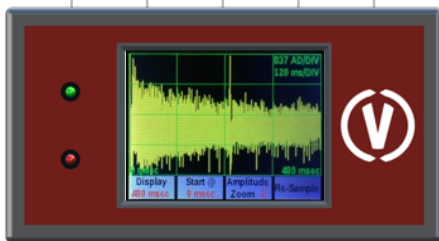
VT-IRFTx-TFTTP-2143-2010 measurement modecalibration mode..... calibration mode.....

VT-IRFTx Configuration

VT-IRFTx	ViscoTron Transmitters	
VT-IRFTx	Open loop induced resonance transmitter measuring viscosity, resonance and optionally temperatures Configuration via touch panel, ViscoTools or commands via USB, RS485 or a handheld device Two non-isolated 4 to 20 mA analog inputs and optionally up to four 4 to 20 mA loop powered analog outputs Data storage to internal SD card including automatic daily turnover of file name utilizing a real time clock Transmitter can be used with barriers for sensors requiring IECEx, ATEX or CSA approval for intrinsic safety	
	Code	Transmitter type
	TFTTP	2.8" 320 x 240 pixels TFT touch panel display for viscosity, resonance and vibration analysis, temperature
	Code	Analog outputs (isolated), both outputs configurable to any available parameter
	0	No analog outputs
	1	One loop powered 4 to 20 mA output
	2	Two loop powered 4 to 20 mA outputs
	Code	Temperature measurement
	0	None
	1	One PT100 input
	2	Two PT100 inputs
	Code	Communication interface
	1	USB and RS485 (Modbus) interface
	2	Bluetooth LE interface in addition to USB and RS485 interface
	3	Wireless transceiver c/w dedicated 5" TFT touch panel handheld in addition to USB and RS485
	Code	Housing
	1	Wall mount enclosure, c/w 5.08 mm terminals and 4 cable gland entries (IP67)
	2	DIN rail / Wall mount enclosure c/w 5.08 mm terminal blocks
	3	Panel mount enclosure c/w 5.08 mm terminal blocks
	4	Wall mount enclosure c/w 5.08 mm terminal blocks and 4 cable gland entries
	9	Specials like explosion proof enclosures on request
	Code	Power supply
	1	9 to 36 VDC Input
	2	18 to 72 VDC Input
	5	85 to 264 VAC, Input
	9	Others on request
	Code	Alarms
	0	No alarm contacts
	1	One alarm contact NC 48 VDC 500 mA maximum
	2	Two alarm contacts NC 48 VDC 500 mA maximum
	Code	Calibration
	0	No factory calibration
	1	Factory calibration with available sensor (4 points)
	2	Factory calibration with available sensor (10 points)
	Code	Special Requests
	0	None
	9	Please specify your request
VT-IRFTx	TFTTP	3 2 2 3 2 0 0 0 ORDER INFORMATION



VT-IRFTx-TFTTP-2111-1210 analysis mode



VT-IRFTx-TFTTP-2111-1200 analysis mode

Technical improvements reserved. Not all combinations are available for all configurations, some can only be combined with other options.

expert consultant at large



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