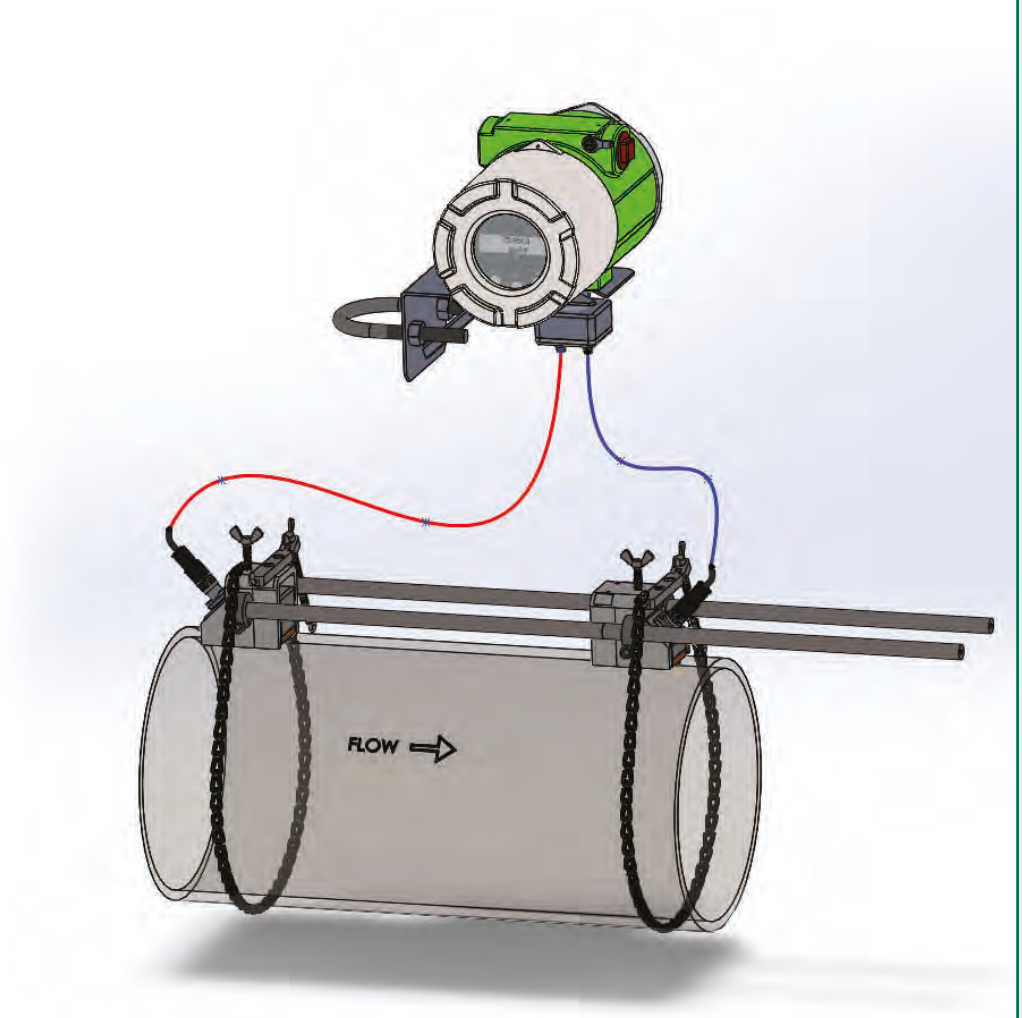
SONOPRO® Industrial Transit Time Clamp-On Ultrasonic Flowmeter



VorTek Instruments SONOPRO® industrial transit time clamp-on ultrasonic flowmeters incorporate the latest digital signal processing to deliver accurate and stable volumetric flow readings. Every SONOPRO® clamp-on transducer pair is matched and can be joined with an external temperature input to ensure accurate temperature compensation of the flow signal. Clamp on meters have no wear, create zero pressure loss and don't require the process to be stopped to install them since they are attached to the outside of the pipe. SONOPRO® transit time meters are inherently bidirectional as well.

Combine these features with the energy monitoring option and the SONOPRO® transit time ultrasonic flowmeters will accommodate your specific application requirements.

SONOPRO® Advantage:

- Non-invasive Volumetric Flow monitoring for most liquids
- Multivariable meter delivers mass flow, temperature and energy readings
- Energy Monitoring – ability to compute and output energy use
- Zero pressure loss
- Easy to install and commission – clamp on the outside of the pipe – non-invasive
- Reliable – no moving parts, no wear
- High accuracy with rangeability up to 400:1
- Transducer Temperature up to 248°F (120°C)
- Clamp On pipe sizes from 1/2" (15mm) to 200" (5000mm)
- Transducer mounting configurations include Z, V and W
- Field configurable ranges, outputs and display HART protocol and communications – Standard MODBUS, BACnet and Bluetooth communications – Optional
- Custom software interface for troubleshooting

VorTek INSTRUMENTS

Vortek is an Azbil Group Company

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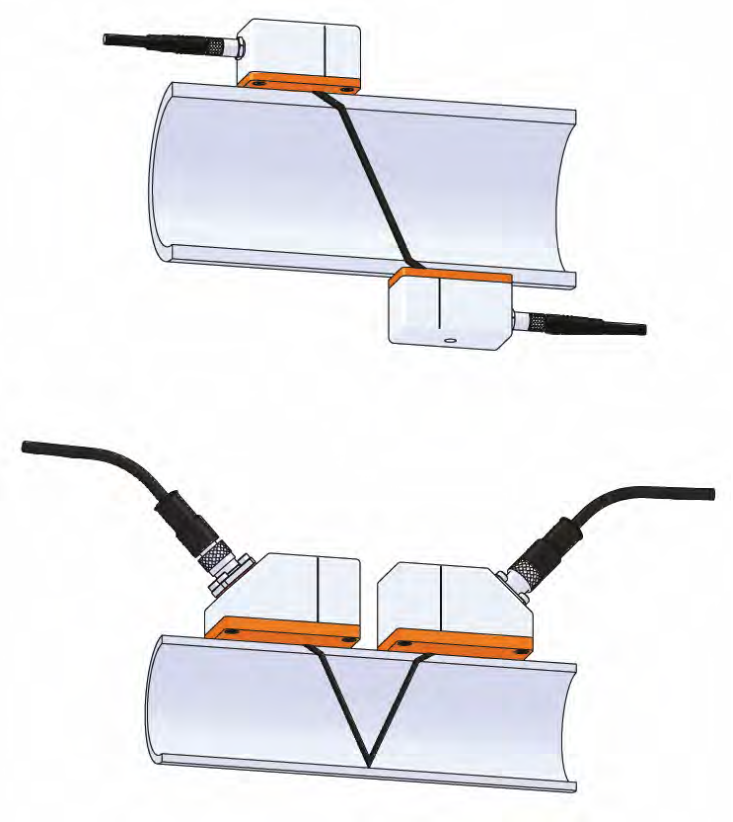
ITS INDUSTRIAL Thermal Systems The Energy Specialists

SONOPRO® Principle of Operation

The SONOPRO® industrial clamp-on ultrasonic flowmeter operates on the transit time ultrasonic measurement method. This type of measurement uses that basic fact that the transmission speed of the ultrasonic signal is influenced by the flow velocity of the fluid to be measured. This is analogous to a person paddling a canoe with the current vs. paddling against the current. The canoe is able to travel downstream with the current faster than it can be paddled back up stream against the current. The same is true for the sound waves as they travel with and against the direction of flow.

For the measurement, there are two ultrasonic transducers mounted onto the outside of the pipe, with one being downstream at a designated distance from the other. The electronics send two pulses through the pipe and into the fluid inside the pipe. One signal is sent with the direction of the flow and the second is sent against the flow. The transducers act as both transmitters and receivers. The transit time of the ultrasonic signal moving in the direction of the flow is faster than that sent against the flow. The meters electronics read these two times and calculate the time difference, ΔT, which can then be used to determine the average flow velocity.

The SONOPRO® electronics take into account the fluid flow profile and apply a correction to the velocity reading to determine the average flow through the pipe.



Performance Specifications

Accuracy

Velocity: English Units: +/- 0.01 ft/s of reading to +/- 40 ft/s
SI Units: +/- 0.003 m/s of reading to +/- 12.2 m/s

Volumetric Flow Rate: +/- 1% to 2% of rate typical
+/- 0.5% of rate is achievable with the optional special calibration

Accuracy is dependent on several variables including pipe characteristics and transducer mounting configuration

Repeatability

+/- 0.2% of rate

Pipe Sizes

Clamp-On-Transducers:

2MHz – 1/2" (15mm) to 6" (150mm)
1MHz – 2" (50mm) to 20" (500mm)
.5MHz – 12" (300mm) to 200" (5000mm)
Installation conditions can affect transducer selection

Measurement Parameters

Volume Flow, Mass Flow, Density, Temperature, Energy Units

Temperature Range

Standard Temperature -4°F to 248°F (-20°C to 120°C)

Electronics Specifications

Power Supply - 85 to 240 VAC, 50 to 60 Hz, 2 watts
12-36VDC, 5W Max.
Electronics Temperature - 40°C to +85°C

Display

Display – 2x16 character LCD digital display

Output Signals

Output Standard– 3 analog 4-20mA, 1 pulse output, 3 alarms, 1 scaled frequency
Optional Output – Output Standard plus Energy Monitoring Options*
*Optional Output is only available with models VERER-EM/VETET-EM

Input Signals

VER/VET - 1 RTD/Temperature Transmitter Input
VERER-EM/VETET-EM – 2 RTD/Temperature Transmitter Inputs

INDUSTRIAL Thermal Systems
The Energy Specialists
3914 Virginia Avenue
Cincinnati, OH 45227
Phone: 513-561-2100
Toll Free: 1-800-752-3697
Cell: 1-513-561-2100
Email: robb@industrialthermal.com
www.industrialthermal.com

Physical Specifications

Wetted Materials

Transducer - Stainless Steel
Electronics Enclosure - Epoxy Coated Aluminum

Protection Rating

Ultrasonic Sensor – IP67 Standard
Electronics Enclosure - NEMA 4X and IP66

Pending Approvals

FM, FMC Class 1, Division 1 Groups BCD
ATEX, IECEX

Fluid Types

Acoustically conductive fluids, including most clean fluids and many liquids with some entrained solids or gas bubbles. Some examples are: Refined Hydrocarbons, Petroleum products, Crude oil, Hydraulic fluids, Diesel and fuel oils, water, wastewater, Hot and chilled water, Glycol water solutions, Other liquids.

Models

SONOPRO® S32-VERER-EM/VETET-EM

The model S32-VERER-EM and S32-VETET-EM with Energy Monitoring options permits real time calculation of energy consumption for a facility or process. The meter can be programmed for hot water, chilled water, heat transfer oils, or water-glycol solutions. The model S32-VERER-EM and S32-VETET-EM can be installed in either the sent or the return leg of the system and with two RTD or temperature transmitter inputs can calculate the change in energy. Selectable units include BTU, MBTU, MMBTU, Joules, Calories, Watt-hours, Megawatt-hours, Kilojoules, and Horsepower-hours. The electronics indicate two temperatures, Delta T, mass flow, total and energy total..

SONOPRO® S32-VER/VET

The model S32-VER and S32-VET integrates either an external RTD or an external temperature transmitter to calculate and output compensated mass flow.

SONOPRO® S32-V

The Model S32-V delivers a direct reading of volumetric flow rate in applications ranging from water flow rates to hydrocarbon flow rates or for any other acoustically conductive fluids.

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The Energy Specialists
3914 Virginia Avenue
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Toll Free: 1-800-752-3697
Cell: 1-513-561-2100
Email: robb@industrialthermal.com
www.industrialthermal.com
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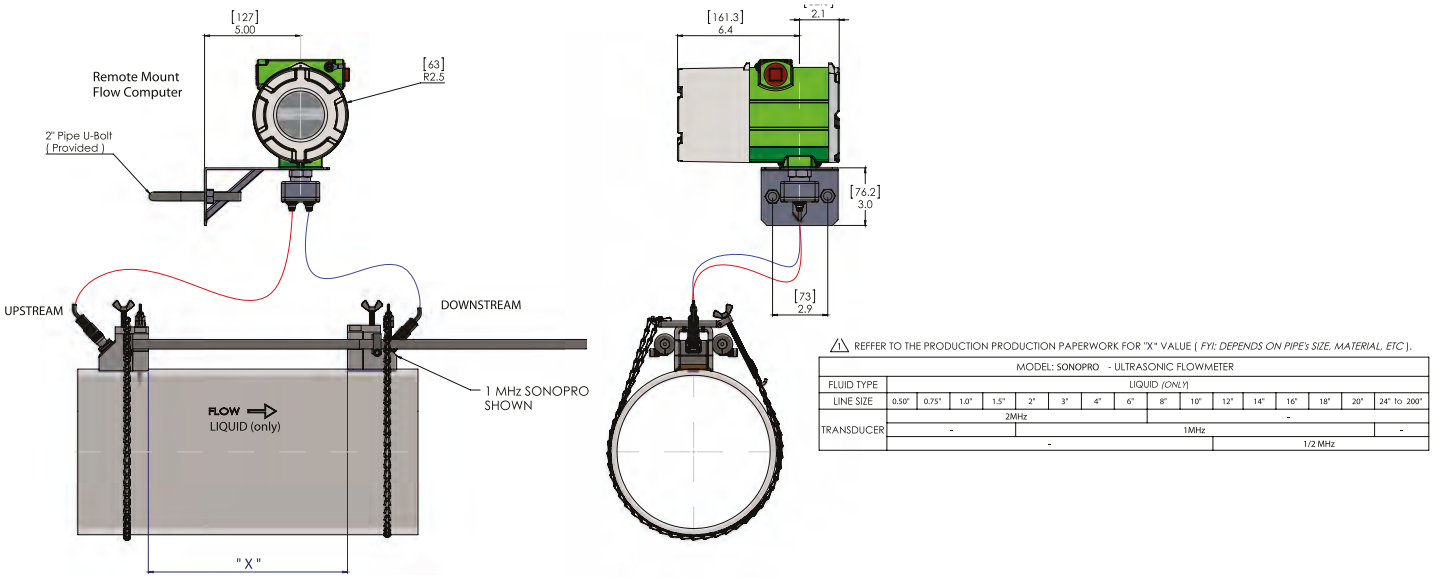
HUMAN-CENTERED AUTOMATION
VorTek INSTRUMENTS

Dimensional Outline: Remote Electronics with Ultrasonic Transducers



⚠ REFFER TO THE PRODUCTION PRODUCTION PAPERWORK FOR "X" VALUE [*FYI: DEPENDS ON PIPE'S SIZE, MATERIAL, ETC*].

MODEL: SONOPRO - ULTRASONIC FLOWMETER																
FLUID TYPE	LIQUID *(ONLY)*															
LINE SIZE	0.50"	0.75"	1.0"	1.5"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24" to 200"
TRANSDUCER	2MHz								-							
	-				1MHz											-
	-										1/2 MHz					

Model Number Information –SONOPRO® Industrial Transit Time Clamp-On Ultrasonic Flowmeter

Parent Model Code
S32 SONOPRO® Industrial Transit Time Clamp-On Ultrasonic Flowmeter

Feature 1: Multivariable Options
V Volumetric Flowmeter for Liquids
VER Velocity and External RTD[1]
VET Velocity and External Temperature Transmitter[1]
VERER-EM Velocity, Two External RTDs and Energy Output Options[1]
VETET-EM Velocity, Two External Temperature Transmitters and Energy Output Options[1]

Feature 2: Transducer
S1 (2MHz) 1/2-inch (15 mm) to 6-inch (150 mm) Line Size
S2 (1MHz) 2-inch (50 mm) to 20-inch (500 mm) Line Size
S3 (.5MHz) 12-inch (300 mm) to 200-inch (5000 mm) Line Size

Feature 3: Cable Length
1 15-Foot Length
2(xx) Custom Length in 15-Foot Segments up to 45-Feet

Feature 4: Input Power
DCH 12-36 VDC, 5W Max. - use with 3AH, 3AM, 3AB
AC 100-240 VAC, 50/60 Hz Line Power, 5W Max. - use with 3AH, 3AM, 3AB

Feature 5: Output
3A Three Analog Outputs (4-20 mA), Three Alarms, One Pulse, Scaled Frequency, HART (VERER-EM, VETET-EM Only)
3AM Three Analog Outputs (4-20 mA), Three Alarms, One Pulse, Scaled Frequency, MODBUS (VERER-EM, VETET-EM Only)
3AB Three Analog Outputs (4-20 mA), Three Alarms, One Pulse, Scaled Frequency, BACnet (VERER-EM, VETET-EM Only)

Feature 6: Communications
HAR HART **MRTU** Modbus RTU **BRTU** BACnet MS/TP **BLU** Bluetooth

Feature 7: Process Temperature
ST Standard Temperature

Feature 8: Options and Accessories
CRTD Clamp On Matched RTD's **CRTX** Clamp On Matched Temperature Transmitters **SPCA** Special Calibration

For more information contact Robb Jackson at:

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