

### SONARtrac® Volumetric Flow Monitoring System

Model VF-100

CiDRA's SONARtrac Flow Monitoring System is a breakthrough in full-bore, non-invasive flow measurement technology. By installing on existing process lines, SONARtrac clamp-on flow monitoring systems eliminate the process disruptions associated with installing other types of flowmeters.

The SONARtrac Flow Monitoring System is not an ultrasonic meter; it utilizes patented array processing techniques to listen to, and interpret, acoustic fields generated by pipe flows. This passive listening approach enables the SONARtrac flow monitoring system to measure single phase and multiphase flows as well as slurries, with the same level of accuracy and performance.

#### Sonar Technology

CiDRA's SONARtrac flow technology represents an innovative new class of industrial flowmeters. This "sonar" flow technology utilizes array processing techniques related to those used in the field of sonar processing. CiDRA's patented "sonar" flow technology was initially developed for flow measurement in one of the world's most demanding environments: downhole, offshore oil and gas production.

CiDRA has taken the proven reliability of its SONARtrac flow technology to address the challenging flow measurement needs of industrial processes.

The SONARtrac Flow Monitoring System utilizes an array of sensors that are wrapped around the pipe. Flow rate is determined using CiDRA's array processing techniques to measure the rate at which turbulent "eddies" inherent in virtually all industrial process flows, convect past the array of sensors. The flow rate is calculated directly from the velocity of the turbulent eddies.

The advantages and features of CiDRA's SONARtrac flow monitoring system enable the industry to realize the following measurable benefits:

- Low installation and life cycle costs
- Increased process uptime
- Increased asset utilization
- Lower operating costs
- Increased product quality

#### Industries:

- Oil Sands Processing
- Minerals Processing
- Power Generation
- Chemical
- Pulp and Paper
- Consumer Products
- Water and Wastewater Treatment
- Food and Beverage



#### Features:

Entirely non-intrusive, "wrap-around" flow sensor design

Transmitter with integrated flow processor

- Programmable by keypad or PC interface
- Self-diagnostics capability

Data logging capabilities

- Volumetric flow
- Flow Velocity
- Sensor Temperature

USB Port and memory stick

- Remote data logging retrieval
- Flow diagnostic reporting to CiDRA technical support

Analog /Digital Outputs

- Two (2) 4-20 mA current outputs
- Pulse/Frequency output alarm
- HART® protocol

Options:

- FOUNDATION Fieldbus™
- PROFIBUS
- MODBUS®
- Quality factor output
- Entrained Air/Gas Software Upgrade

#### Benefits:

Accurate and reliable operation for multiphase and single phase flows

- Ideal for high percent solids and bubbly flows
- No need to recalibrate when process or densities change

Quick, simple installation with no alignment or coupling gels required

- Installs while process is running

Full bore flow measurements; no pressure drops or potential for leaks

No moving parts, no inherent drift mechanism

- Requires no recalibration

Maintenance free operation

Indifferent to pipe material or liners

- Measurements on Teflon®, urethane, rubber, HDPE, double-pass chromium, ceramic and concrete-lined pipes

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FOUNDATION Fieldbus is a trademark of Fieldbus Foundation.  
PROFIBUS PROCESS FIELD BUS is a registered trademark of PROFIBUS NUTZERORGANISATION e.V.  
MODBUS is a registered trademark of Schneider Automation, Inc.  
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## SONARtrac<sup>®</sup> Volumetric Flow System Specifications

Parameter	Specifications	Comments
Pipe diameters	2" to 60"	Metric and custom sizes available <sup>(a)</sup>
Flow velocity range	Liquid: 3 to 30 ft/s (.91 to 9.1 m/s) Gas: >20 ft/sec (>6 m/s) <sup>(b)</sup>	Liquid-Only flow conditions may permit flow measurements below 3 ft/sec <sup>(c)</sup>
Flow rate accuracy	±1.0% of reading <sup>(d)</sup>	
Repeatability	±0.3% of reading	
Sensor head	Clamp-mounted onto the existing pipe section; designed for single installation	Sensor head length 30" (76 cm) Height within flange diameter of pipe Lightweight (22 lbs./10 kg for 8" meter)
Transmitter with integrated flow processor	Programmable by keypad or PC interface Self-diagnostics capability	
Operating Temperature Range:		
Transmitter	-4°F to +140°F ( -20°C to +60°C) <sup>(e)</sup>	Inquire with CiDRA for temperatures outside these specified ranges.
Sensor head process temp.	-40°F to +212°F ( -40°C to +100°C)	
Sensor head ambient temp.	-40°F to +140°F ( -40°C to +60°C)	
Storage Temperature Range:		
Transmitter	-22°F to +176°F ( -30°C to +80°C)	
Sensor head	-40°F to +185°F ( -40°C to +85°C)	
Cable between transmitter and sensor head	PLTC or armored cable with one end connectorized	Cable lengths up to 300ft (90m)
Analog input	Two (2) 4-20 mA	Enables internal logging of optional process parameters
Analog output	Two (2) isolated 4-20 mA current outputs	One (1) with HART protocol <sup>(f)</sup>
Digital outputs	Pulse/Frequency output Alarm	
Digital interfaces	10Base-T Ethernet USB/Memory Stick RS232 serial	
Communication interfaces	Standard: RS232/485 Optional: MODBUS RTU/ASCII Optional: FOUNDATION Fieldbus™ Optional: PROFIBUS PA	
Transmitter local display	LCD with backlight <sup>(g)</sup>	Provides flow rate, system status, system diagnostics
Data logging capability	Yes	
Transmitter enclosure	NEMA 4X, IP55	
Power requirements	AC version: 100 to 240 VAC, 50/60 Hz, 25 watts DC version: 18 to 36 VDC, 25 watts	
Area classification	Standard: Ordinary Location Optional: Class I Division 2, Groups A-D Optional: Class I Zone 2, Group IIC ATEX	

<sup>(a)</sup>Inquire with CiDRA for availability and specifications on sizes greater than 36".

<sup>(b)</sup>Minimum flow can be application dependent.

<sup>(c)</sup>Inquire with CiDRA for qualifying your application under 3 feet/second.

<sup>(d)</sup>For Gas, overall accuracy may be application dependent.

<sup>(e)</sup>For Zone 2: -4°F to +134°F ( -20°C to +57°C).

<sup>(f)</sup>Certain restrictions apply for Zone 2 applications.

<sup>(g)</sup>For Zone 2: No transmitter window for display.

### Contact CiDRA

To speak with a CiDRA applications engineer about the SONARtrac Volumetric Flow Monitoring System, or for information on this or other CiDRA industrial process measurement solutions, call +1.203.265.0035 or visit our web site at [www.cidra.com](http://www.cidra.com).

All information contained herein is believed to be accurate and is subject to change without notice. No responsibility is assumed for its use. Specifications are preliminary and CiDRA reserves the right to make changes, without notice to product designs, specifications, functions, components and manufacturing methods.

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