

### SONARtrac® Gas Volume Fraction Flow Monitoring System

Model GVF-100

CiDRA's SONARtrac Gas Volume Fraction Monitoring System is a breakthrough in process measurement technology. By installing on existing process lines, SONARtrac clamp-on gas volume fraction monitoring systems allow on-line real-time measurement of the amount of entrained air/gas present in any liquid-continuous-phase process fluid.

The SONARtrac Gas Volume Fraction Monitoring System does not utilize ultrasonics; it utilizes patented array processing techniques to listen to, and interpret, acoustic fields generated by the machinery, piping and flow present in virtually all industrial processes. This passive listening approach results in an in-situ measurement of the amount of entrained air/gas present in the process flow with a high degree of accuracy and repeatability.

#### Sonar Technology

CiDRA's SONARtrac technology represents an innovative new class of industrial measurement instrumentation. This "sonar" technology utilizes array processing techniques related to those used in the field of sonar processing. CiDRA's patented "sonar" technology was initially developed for flow and compositional 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 technology to provide new measurements and insight into the monitoring and optimization of industrial processes.

The SONARtrac Gas Volume Fraction Monitoring System utilizes an array of sensors that are wrapped around the pipe. The amount of entrained air/gas is determined using CiDRA's array processing techniques to measure the sound speed, or rate at which sound propagates, through the process medium. The entrained air percentage is then calculated directly from the measured sound speed.

The advantages and features of CiDRA's SONARtrac Gas Volume Fraction Monitoring System enable users to realize the following measurable benefits:

- Low installation and life cycle costs
- Increased process efficiency and quality
- Lower operating costs
- Increased product quality

#### Industries:

- Oil Sands Processing
- Minerals Processing/Chemical
- Pulp and Paper
- Consumer Products
- Water and Wastewater Treatment
- Pharmaceutical
- 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

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

#### Benefits:

- Real time measurement of entrained air/gas resulting in ability to monitor and/or assess effect of process changes on process efficiency and quality.
- May be used to compensate process instrumentation affected by entrained gas:
  - Flow measurement
  - Density measurement
  - Consistency measurement
- Optimize deaerating chemical additive usage, and monitor the effectiveness of mechanical deaeration systems
- Detect changes in process operation due to air/gas leaks caused by pump pump/valve packing or flange/pipe problems
- Accurate and reliable operation over a wide range of process flows, including high consistency and abrasive slurries and viscous fluids such as low API crude oil
- Quick, simple installation with no alignment or coupling gels required
  - Installs while process is running
- 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



## SONARtrac<sup>®</sup> Gas Volumetric Flow System Specifications

Parameter	Specifications	Comments
Pipe diameters	2" to 36"	Metric and custom sizes available <sup>(a)</sup>
Entrained air/gas range	0 to 20 %	By volume
Entrained air/gas accuracy	±5% of reading, 0.01% to 20% <sup>(c)</sup>	Assumes on-line process pressure available
Entrained air/gas repeatability	±1% of reading, 0.01% to 20%	
Sensor head	Clamp-mounted onto the existing pipe section; designed for single, permanent 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 300 ft (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>(d)</sup>
Digital outputs	Pulse/Frequency Output: Alarm Serial Output: RS232 or RS485	
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>(f)</sup>	Provides entrained air/gas, 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 on sizes greater than 36".

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

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

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

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

### Contact CiDRA

To speak with a CiDRA applications engineer about the SONARtrac Gas Volume Fraction 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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**CiDRA**  
50 Barnes Park North  
Wallingford, CT 06492  
Tel. +1.203.265.0035  
[www.cidra.com](http://www.cidra.com)