

Sarasota 2000

Ultrasonic Multipath Flowmeter for Water and Wastewater

The Sarasota 2000 measures flow in rivers and open channels without causing obstruction and without the need for weirs or flumes. Its multipath configuration and smart transducer technology ensure accurate, reliable performance in critical applications such as water resource management, abstraction licensing, and flood warning. Up to four separate channels can be monitored simultaneously.



Applications

- Water resource management
- Flood prediction
- Abstraction control
- Effluent monitoring
- Sewage plant control
- Hydro electric power generation
- Irrigation

The Sarasota 2000 ultrasonic multipath flowmeter calculates flow directly from the measurement of water velocity and depth. This velocity-area method overcomes the inherent limitations of traditional methods of volumetric flow measurement which usually require the construction of a flume or weir. These traditional methods can be expensive, obstructive, and can 'drown out' in high flow conditions.

For installation in rivers, open channels, or closed conduits, the Sarasota 2000 operates over the full bi-directional flow range without causing obstruction or head loss. While the most suitable applications are those where the water is relatively clean and free from weed and entrained

air, the Sarasota 2000 is able to meet the demands of many more challenging sites including sewage inlet monitoring.

Smart ultrasonic transducers are installed in the channel and combine with depth inputs to build an accurate flow profile. On-site characteristics such as varying water levels, skew flow, or complex channel shapes are taken into account via specific path configurations (*e.g.*, in-line, crossed, or "V"). Multidrop capability allows transducers to be connected together to minimize cabling requirements and the multichannel facility allows up to four separate channels to be monitored simultaneously.

'Front end' processing within the transducers minimizes the effects of external interference and advanced processing minimizes signal distortion. Software filtering ensures that spurious signals do not cause error, allowing the flow rate to be calculated to a typical overall accuracy of 2% to 5%.

Its low inherent power consumption with intermittent option makes the Sarasota 2000 ideal for use with alternative power sources when mains power is unavailable.

Other features include programmable data logging and GAFA Windows® PC-based software for local and remote downloading of data and diagnostics.

Thermo engineers can undertake site surveys and evaluation, installation, commissioning, and system maintenance.

Features

- Suitable for up to 32 velocity paths
- Multichannel capability—up to 4 channels
- Low power consumption
- ISO 6416 compliant
- Smart transducer technology
- Local and remote PC communications
- On-board data logging



River flow measurement application showing the transducers in crossed path configuration, mounted on vertical piles.



Flow measurement in an urban river for water resource management and flood prediction.



Measurement of flow in extreme conditions for flood prediction purposes.

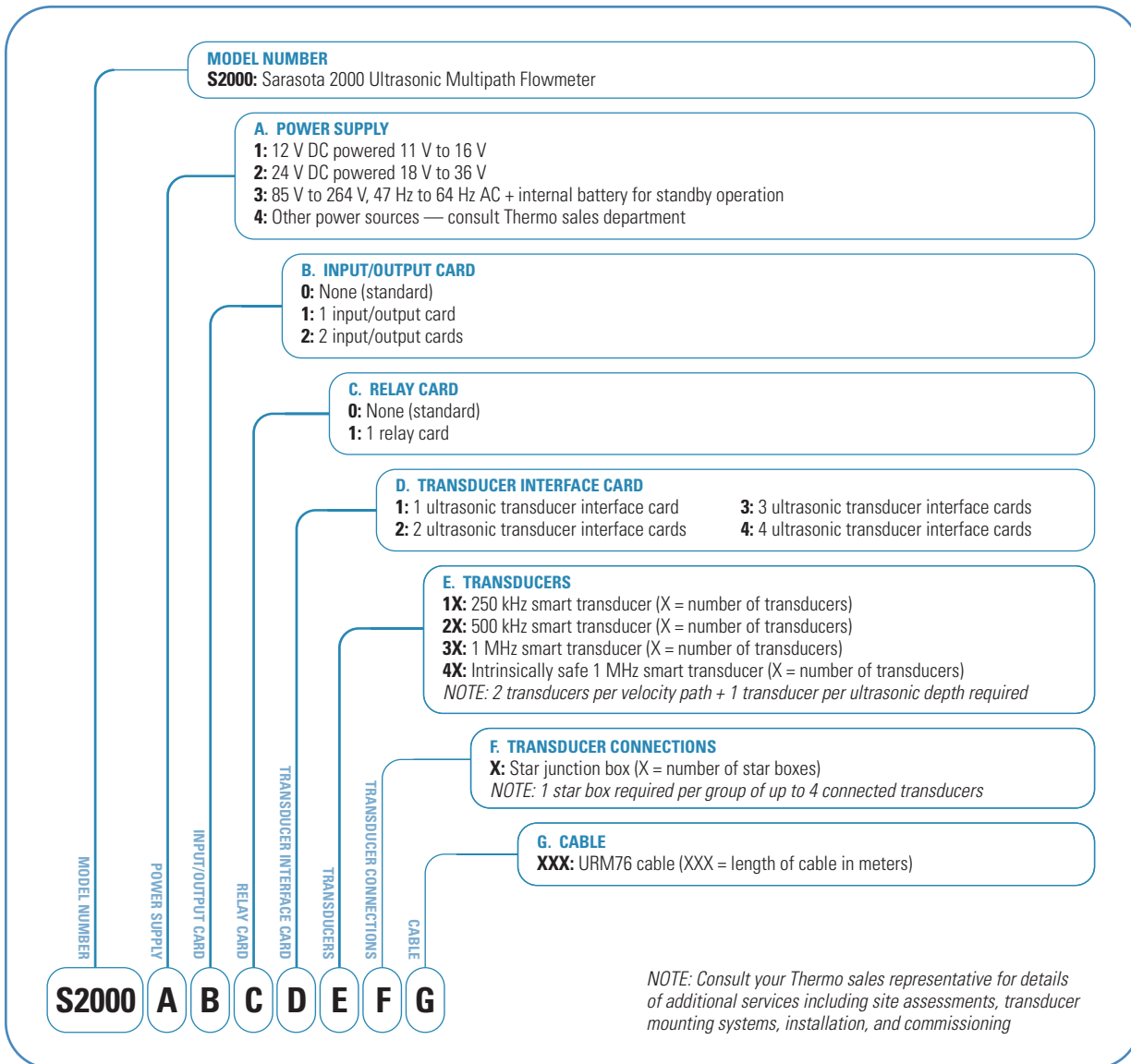
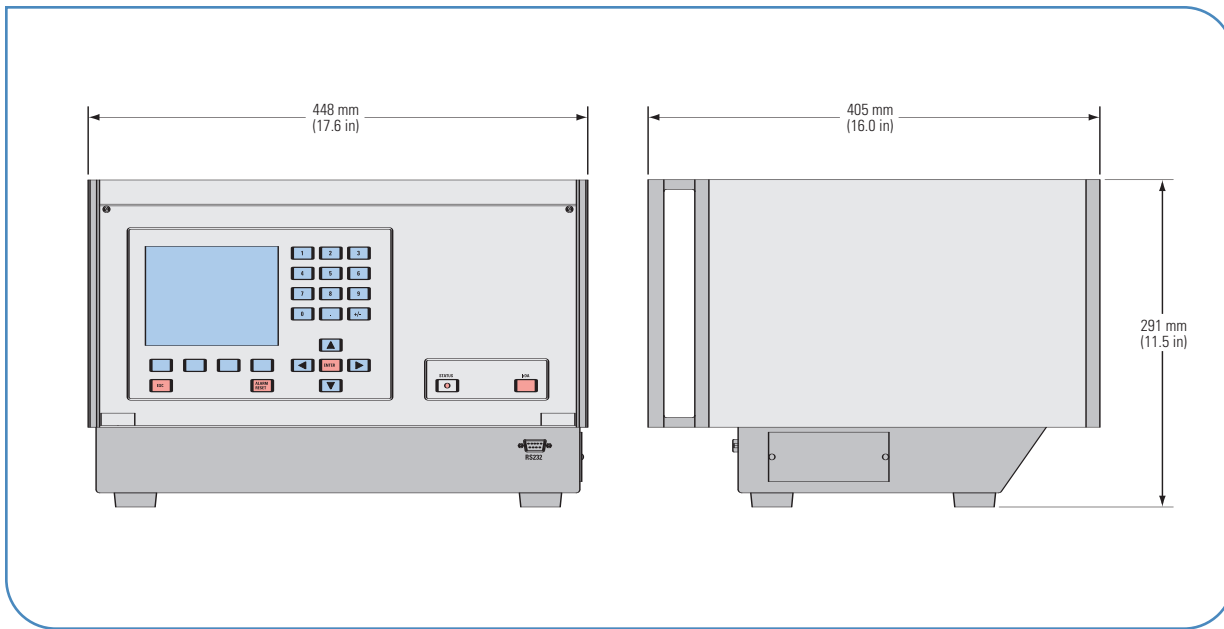


Measurement of river flow for abstraction control. This is an example of transducers in crossed path configuration, mounted in round steel piles for protection from navigation.

Measurement of river flow for abstraction control and flood prediction. This is an example of transducers in crossed path configuration, mounted on sloping racks.



Sarasota 2000 Ultrasonic Multipath Flowmeter — Dimensional Diagram



Sarasota 2000 Ultrasonic Multipath Flowmeter

Specification	
Performance Specifications	
Accuracy	Overall accuracy typically 2%-5% of flow reading, depending on site conditions; Transducer frequency 2%, matched pairs to 0.5%
Velocity Range	Bi-directional; Maximum depends on path length <i>e.g.</i> , 10 m/s for 100 m path (33 ft/s for 330 ft path)
Channel Widths	Suitable from 1 m (3 ft) to 200 m (650 ft)
Water Depths	From 100 mm (4 in) to 20 m (65 ft), subject to channel or conduit width
Channel Shape	Programmable cross section
Fluids	Tolerates suspended solids up to 2,000 ppm; Best performance achieved with minimal weed, aeration, and saline and temperature gradients
Approach Length	Recommended 5 x channel width
Flowmeter Physical Specifications	
Material	Front opening, painted, pressed steel casing, graphics front display
Dimensions	448 mm (17.6 in) x 291 mm (11.5 in) x 405 mm (16in) (width x height x depth)
Mounting	Bench top or rack mounted
Environmental Rating	IP55; Requires installation within weatherproof enclosure or building
Weight	Typically 19 kg (42 lb) including battery (depends on cards)
Front Display	Graphics LCD; LED fault indicator
Transducer Physical Specifications	
Material	Encapsulated piezo-electric transducers; 250 kHz, 500 kHz: Integral drive circuits and signal amplifiers 1MHz: drive circuit and signal amplifier in-line (T Box)
Dimensions	250 kHz 100 mm diameter, 75 mm length (approx 4 in x 3 in); 500 kHz 50 mm diameter, 75 mm length (approx 2 in x 3 in); 1MHz 37 mm diameter, 37 mm length (approx 1.5 in x 1.5 in)
Mounting	Mounted on submersible assemblies to suit application
Connections	Cable used: URM76 with additional outer polypropylene sheath for continuous immersion with overall diameter 8 mm (0.3 in) Star junction box (1 star box required per group of up to four connected transducers) 1 x URM76 cable per transducer connected to star box. Maximum length 5 m (approx 16 ft) 1 x URM76 cable per star box connected to flowmeter. Maximum length 300 m (approx 1000 ft)
Environmental Rating	250 kHz, 500 kHz open channel: IP68 continuous immersion to 2 bar 1 MHz open channel or closed conduit: IP68 continuous immersion to 15 bar
Functional Specifications	
Velocity Paths/Inputs	Up to 32 paths (64 transducers)
Depth Inputs	Up to 16 ultrasonic depth transducers; Up to 4 analog depth inputs (programmable) via optional I/O cards Up to 2 encoder pulsed depth inputs via optional I/O cards; Up to 2 x 16 bit digital BCD via optional I/O cards; (subject to a limit of 4 depths per channel)
Serial Communications	RS232 for PC communications (1200 to 38400 baud); RS232 for modem (1200 to 19200 baud); RS485 half or full duplex
Ultrasonic Transducer Interface Cards (Minimum 1, maximum 4 per unit)	Up to 8 velocity paths per card via multidrop facility (requires 2 transducers per velocity path) Up to 4 ultrasonic depth measurements per card via multidrop facility (requires 1 transducer per depth)
Optional Input/Output Cards (Maximum 2 per unit)	2 x 12 bit analog input channels (programmable, 4-20 mA or 1-5 V); 2 x 12 bit analog output channels (programmable, 4-20 mA or 1-5 V); 16bit digital BCD as input or output via on-board link; Encoder pulsed input as level input
Optional Relay Card (Max. 1 per unit)	4 x volt free contacts (programmable); 1 x diagnostic relay output
Transducer Frequency Options	1 MHz for 1-10 m (3-30 ft) paths; 500 kHz for 5-80 m (15-260 ft) paths; 250 kHz for 50-200 m (165-655 ft) paths Where there is overlap, the choice is governed by water conditions. Refer to ISO6416.
Operating Temperature Range	Transducers: -20°C to +50°C (+4°F to +122°F); Flowmeter: -10°C to +50°C (+14°F to +122°F) Note: LCD backlight will not turn on below 0°C (32°F); Flowmeter range subject to power supply's operating range
Power Supply	12 V DC powered 11-16 V or 24 V DC powered 18-36 V or 85-264 V AC, 47-64 Hz with internal battery for standby operation; Other power sources on application; Intermittent mode for low power consumption
Data Logging	1 MB capacity; Programmable for function selectable from any or all measured and calculated parameters; Programmable sampling period 30 secs to 30 mins
PC Software	GAFAs Windows®-based PC software for local PC operation or remote PC operation via modem; Software allows setting-up, diagnostics, data download, new operating software upload
Compliance	
Quality Assurance	ISO 9001:2000
CE mark	Compliant
Flowmeter Standards	Complies with ISO 6416 (equivalent to BS3680 pt 3E)
Safe Area Use	As standard
Hazardous Area Use	Applicable to 1 MHz transducers only via 1 x barrier per transducer; Subject to cable restrictions Transducer: EEx ia IIB T4 (-20°C ≤ T _A ≤ 40°C); Barrier: EEx ia IIB (-20°C ≤ T _A ≤ 40°C)
Communications Protocols	RTU; ASCII Modbus®

©2004 Thermo Electron Corporation. All rights reserved. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. Modbus is a registered trademark of Modicon, Inc., Industrial Automation Systems. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representatives for details. Literature Code PI.2020.0404

United Kingdom: King's Worthy, Winchester Hampshire S023 7QA UK +44 (0)1962 625000 +44 (0)1962 885530 fax

Process Instruments United States: 9303 W. Sam Houston Pkwy. S. Houston, TX 77099 USA (877) 290-7422 (713) 272-2273 fax

www.thermo.com