

ChronoFLO

Ultrasonic Pipe Flowmeter



KEY BENEFITS

- Works on wide range of pipe sizes.
 - Suitable for clean and waste water.
- Non invasive measurement means:
 - No pressure loss
 - No risk of leakage
 - No disruption of plant operation
 - Hygienic integrity
 - No fluid contact
- No need for zero adjustment.
- Advanced DSP coded signal correlation provides highly stable transit timing measurements, even in difficult conditions.
- Real time directly measured speed of sound compensation reduces flow error from fluid variations with temperature and pressure.
- Built in wall thickness facility standard (requires optional wall thickness transducer).
- Internal logging.
- External inputs for thermal energy and external flowmeter logging.
- External outputs for process control.
- LCD display.

The ChronoFLO Rugged Transit Time Ultrasonic Flowmeter uses advanced digital correlation processing techniques to achieve stable flow measurements even in difficult conditions and on most pipe materials.

Easy to install and suitable for clean and waste water pipes because no part of the equipment comes into contact with the fluid inside, the ChronoFLO features internal logging and a graphical LCD display to display information. Two different transducers are available. 4 Mhz sensors are designed for an outside diameter range between 15 and 75mm and 1 Mhz sensors for an outside diameter range from 50 to 200mm.

The long battery life of this unit makes it ideal for lengthy periods of monitoring. The unit can deliver 80 hours of battery life with the LCD on and the backlight off, and up to 28 days if used in low power mode logging at 5 minute intervals. By adding an external battery pack, the battery length can be doubled. Alternatively, the unit can be installed on a permanent or semi permanent basis using mains power.

The meter displays volumetric flow rate, in both directions, in all common units. The meter also has a totaliser that displays the net flow in both directions. An optional thickness gauge measures the pipe wall thickness.



PORTABLE

REALTIME
DATA

BATTERY
OR MAINS

DIGITAL



For more information call (513) 831-9335
or visit www.fluidconservation.com

A HALMA COMPANY

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FLOW MEASUREMENT DATA LOGGING LEAK DETECTION PRESSURE CONTROL ENVIRONMENTAL MONITORING

Flow	Measuring principle	Complete coded signal correlation measuring transit time difference												
	Range	Bi-directional to > 25 m/sec												
	Processor electronics resolution	<table border="0"> <tr> <td>Pipe bore mm</td> <td><u>50</u></td> <td><u>200</u></td> <td><u>10000</u></td> </tr> <tr> <td>Velocity mm/sec</td> <td>0.3</td> <td>0.075</td> <td>0.015</td> </tr> <tr> <td>Flow litre/sec</td> <td>0.0006</td> <td>0.0025</td> <td>0.0115</td> </tr> </table>	Pipe bore mm	<u>50</u>	<u>200</u>	<u>10000</u>	Velocity mm/sec	0.3	0.075	0.015	Flow litre/sec	0.0006	0.0025	0.0115
	Pipe bore mm	<u>50</u>	<u>200</u>	<u>10000</u>										
	Velocity mm/sec	0.3	0.075	0.015										
	Flow litre/sec	0.0006	0.0025	0.0115										
	Overall Resolution	<p>Defined as still water noise time difference, typically < 0.2 x 10⁻⁹ seconds peak to peak. For water and different pipe bores this equates to:</p> <table border="0"> <tr> <td>Pipe bore mm</td> <td><u>50</u></td> <td><u>200</u></td> <td><u>1000</u></td> </tr> <tr> <td>Velocity mm/sec</td> <td>6</td> <td>1.5</td> <td>0.3</td> </tr> <tr> <td>Flow litre/sec</td> <td>0.012</td> <td>0.05</td> <td>0.23</td> </tr> </table>	Pipe bore mm	<u>50</u>	<u>200</u>	<u>1000</u>	Velocity mm/sec	6	1.5	0.3	Flow litre/sec	0.012	0.05	0.23
Pipe bore mm	<u>50</u>	<u>200</u>	<u>1000</u>											
Velocity mm/sec	6	1.5	0.3											
Flow litre/sec	0.012	0.05	0.23											
Zero Bias	<p>Time difference for zero flow with internally smooth pipes typically better than 1 x 10⁻⁹ seconds. For water and different pipe bores this equates to:</p> <table border="0"> <tr> <td>Pipe bore mm</td> <td><u>50</u></td> <td><u>200</u></td> <td><u>1000</u></td> </tr> <tr> <td>Velocity mm/sec</td> <td>30</td> <td>15</td> <td>1.5</td> </tr> <tr> <td>Flow litre/sec</td> <td>0.06</td> <td>0.24</td> <td>1.2</td> </tr> </table> <p>If greater accuracy is required, the zero bias can be eliminated by a zero flow check on installation</p>	Pipe bore mm	<u>50</u>	<u>200</u>	<u>1000</u>	Velocity mm/sec	30	15	1.5	Flow litre/sec	0.06	0.24	1.2	
Pipe bore mm	<u>50</u>	<u>200</u>	<u>1000</u>											
Velocity mm/sec	30	15	1.5											
Flow litre/sec	0.06	0.24	1.2											
Repeatability	Without moving sensors, typically ± 0.15% of reading													
Accuracy	For fully developed and symmetrical flow: ±1 to 2% of reading + zero bias, without process calibration ± 0.5% of reading + zero bias, with process calibration													
Speed of Sound	Measuring principle	Complete coded signal correlation measuring mean transit time during normal operation												
	Range	800 to 2000 m/sec												
	Accuracy	< 0.25% reading												
	Resolution	2 mm/sec												
Wall thickness	Measuring principle	Complete coded signal correlation measuring reflection time. Uses separate [optional] wall thickness transducer												
	Range	2 - 30 mm												
	Accuracy	< 0.1 mm												
	Resolution	0.05 mm												
Fluids	Measuring principle	External input from 4-20mA temperature sensors												
	Range	-40 to +200 °C												
	Accuracy	1% of reading												
	Resolution	0.1 °C												
Fluids	Types	Sonically conductive												
	Sediment/air levels	<20% but volumetric fluid flow will not be accurate with entrained sediment/air												
Pipe	Outside diameter range	19 – 75 mm. 4MHz Transducers on fixture with chain fixings (optional). 50 – 2000 mm. 1MHz Transducers with chains, straps or magnetic clamps (standard)												
	Wall thickness range	1-100mm												
	Material	Metals, glass and sonically conductive polymers/plastics												
	Lining	Bitumen, glass, epoxy paint and most concrete liners. Excluding loose liners.												

FCS reserve the right to change the specification of any product without prior notice.

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Languages		Selectable: English, French, Turkish
Units		Selectable: feet, metres, ml, litres, m3, ft3, pints, gallons, US gallons, seconds, minutes, hours, days. Plus user defined units and time. Input units in metric or imperial.
Power supply	Internal batteries	NiMH (6 x D) rechargeable, 9 Ah (nominal)
	Battery life [nominal]	10 hours (LCD on, backlight on continuously) 80 hours (LCD on, backlight off) Sleep mode with burst sampling at 5 minute intervals extends life up to 1 month.
	External DC	12v @ 1.5A (back-light on, charging).
	External AC	External AC/DC adaptor. 100 to 240 v. 50/60Hz. IP40. 30 watts
	Recharge time	Fast Charge (meter off): 12 hours. Trickle Charge (meter on): 18-24 hours.
External control		RS232 [8 data, 1 stop bit, none] baud rates up to 115200 or half duplex [2 wires] RS485. Both fitted but cannot both be used at the same time.
	Transit Time/ Sound	2 sensors, single channel
Inputs	Wall thickness	External, optional wall thickness sensor for use when setting up. Plugs into one of the sensor connections.
	Temperature	2 off 4-20mA isolated inputs (pressure, level, temperature sensors)
	Frequency/pulse count	2 off 0-10 kHz inputs for open collector [or contact closure] outputs from external device.
Outputs	Digital data	RS232 [8 data, 1 stop bit, none] baud rates up to 115200 or half duplex [2 wires] RS485. Both fitted but cannot both be used at the same time.
	Analogue	1 output which can be set as current or voltage. Selectable output ranges 4-20mA, 0-20mA, 0-24mA or 0.5v, isolated. Choice of output under software control so can be set to any parameter measured by flowmeter, range, scale and window.
	Totaliser[pulse]	2 x Opto-isolated open collector outputs. Software set to be either 1 for positive and 1 for negative flow, or set to 1 for flow and 1 for direction. 2500V isolation, 5 kHz max. Max DC voltage 18v.
Site information		17 separate sites. Data rate, start/stop times, RTC setting
Settings		4Hz standard update rate, with user set moving average [1 to 999 seconds]. Logging interval user set form 1 to 9999 seconds and average over period is logged.
Display	Type and pixels	240 * 128 graphic LCD
	Backlight and Contrast	On/Off for LED backlight and contrast level control Display
	Data points	Alpha-numeric and Graphics display output, graphs and logging traces
Logging		128 k x 16 bit (2Mbit), universal multi-point datalogger. 128,000 data points – e.g. flow and temperature = 64,000 records
PC software		Win 95/98/2000/NT/XP
Keypad		16 keys. ON/OFF on Keypad
Password Protection		3 levels: Master [HWM only], Owner [Change all settings], User [Change settings as defined by owner]
External Connections		Mil-spec connectors are used throughout: 1. C1 sensor upstream 2. C1 sensor downstream and wall thickness 3. Analogue I/O (4-20mA) 4. Digital I/O (RS232 or RS485) 5. Open collector inputs/outputs 6. DC charging.

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Physical

Model 5130 Portable Flowmeter

Operating temperature range	Transducer	-30 to +80 °C.
	Cable	-20 to +80 °C
	Control Unit	-10 to +50 °C
Storage temperature range	Transducer	-40 to +80 °C
	Cable	-20 to +80 °C
	Control Unit	-20 to +80 °C
Waterproofing	Transducers and cables	IP68
	Control unit	IP67
Transducer cable lengths	Standard	2.9 m
	Optional	30 m
Transducer mounting		Rail mounting for diameters up to 2000 mm. Straps/chains for larger pipes with alternative magnetic blocks for ferrous metal pipes.
Dimensions	Control unit	270 x 250 x 125 mm
	Transducers	75 x 30 x 45 mm
Weight	Control unit	2.5 kg
	Transducers	0.1 kg each
Materials	Control Units	ABS
	Transducers	PEEK and Acetal, with aluminium/stainless steel mounting blocks/rails..

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