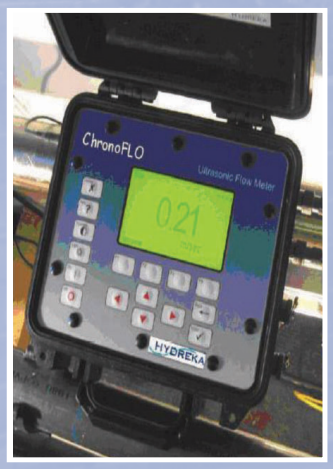
ChronoFLO

Ultrasonic Pipe Flowmeter

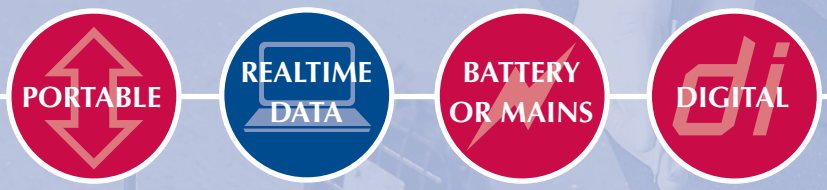
Halma Water Management



Introduction

The ChronoFLO Rugged Transit Time Ultrasonic Flowmeter uses advanced digital techniques to achieve stable flow measurements even in difficult conditions and on most pipe material. Two different transducers are available that cover pipe sizes from 15 mm to 100 mm and from 50 mm to 2 metres.

The long battery life of this unit (80 hours with the LCD on and back light off) makes it ideal for those temporary flow measurements' where the unit has to be left for periods of time. The unit can also 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.



Features

- Same unit on a wide range of pipe sizes
- Only two transducers cover 19mm to 2000mm range
- Non invasive measurement
- No pressure loss
- No risk of leakage
- No disruption of plant operation
- Hygienic integrity
- No fluid contact
- 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
- Internal logging
- External inputs for thermal energy and external flowmeter logging applications
- External outputs for process control.

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FLOW MEASUREMENT DATA LOGGING LEAK DETECTION PRESSURE MANAGEMENT

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PRODUCT SPECIFICATION 1

Measurements		ChronoFlo Portable Flowmeter			
Flow	Measuring principle	Complete coded signal correlation measuring transit time difference			
	Range	Bi-directional to > 25 m/sec			
	Processor electronics resolution	Pipe bore mm	50	200	1000
		Velocity mm/sec	0.3	0.075	0.015
		Flow litre/sec	0.0006	0.0025	0.0115
	Overall Resolution	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:			
		Pipe bore mm	50	200	1000
		Velocity mm/sec	6	1.5	0.3
		Flow litre/sec	0.012	0.05	0.23
	Zero bias	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:			
		Pipe bore mm	50	200	1000
		Velocity mm/sec	30	15	1.5
		Flow litre/sec	0.06	0.24	1.2
		If greater accuracy is required, the zero bias can be eliminated by a zero flow check on installation			
	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	< 1% reading			
	Resolution	2 mm/sec			
Wall thickness	Measuring principle	Complete coded signal correlation measuring reflection time. Uses separate [optional] wall thickness transducer			
	Range	2 - 60 mm (metal)			
	Accuracy	< 0.1 mm			
	Resolution	0.05 mm			
	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 type A on fixture with velcro fixings 50 – 2000 mm. 1MHz Transducers type B on fixture with chain fixings Transducers type B with chains, straps or magnetic clamps			
	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.			

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

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PRODUCT SPECIFICATION 2

Operational		ChronoFlo Portable Flowmeter
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) rechargable, 9 Ah (nominal)
	Battery life [nominal]	10 hours (LCD on, backlight on continuously) 80 hours (LCD on, backlight off) 400 hours (LCD off, backlight off, all I/O OFF)
	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	17 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	Speed 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
	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.
	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 [Valeport 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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PRODUCT SPECIFICATION 3

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 300 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 unit	ABS
	Transducers	PEEK and Acetal, with aluminium/stainless steel mounting blocks/rails..

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