

HYDREKA

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POUR
LE CYCLE
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ChronoFLO Portable Transit Time Ultrasonic Flowmeter



HYDREKA

34, route de St Romain – 69 450 SAINT CYR AU MONT D'OR - France
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HYDREKA's range of Transit Time Ultrasonic Flowmeters use advanced complete coded signal *and* digital correlation processing techniques to achieve stable measurements even in difficult conditions (drinking water and effluents).

The same core processing electronics are used in a number of different configurations to suit a wide range of applications. These configurations include Portable and Permanent control units, and transducers with mounting arrangements for a wide range of pipe sizes. Flow tube cells for in-line installations for very low flows and dosing control applications are also available.

Key Features

- Drinking water and effluents
- Ease of installation
- Same unit on a wide range of pipe sizes
- Non invasive measurement
 - 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 applications
- External outputs for process control
- Graphics - LCD display
- *Should we not include long battery life???*

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Measurements

Flow	Measuring principle	Complete coded signal correlation measuring transit time difference	
	Range	Bi-directional to > 25 m/sec	
	Processor electronics resolution	Typically 0.01×10^{-9} seconds. For water and different pipe bores this equates to:	
		Pipe bore mm	<u>50</u> <u>200</u> <u>1000</u>
		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 $< 0.2 \times 10^{-9}$ seconds peak to peak. For water and different pipe bores this equates to:	
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	Time difference for zero flow with internally smooth pipes typically better than 1×10^{-9} seconds. For water and different pipe bores this equates to:		
	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	
	If greater accuracy is required, the zero bias can be eliminated by a zero flow check on installation		
Repeatability	Without moving sensors, typically $\pm 0.15\%$ of reading		
Accuracy	For fully developed and symmetrical flow: ± 1 to 2% of reading + zero bias, without process calibration $\pm 0.5\%$ 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	
Temperature	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 - 50 mm. Transducers type A on fixture with chain fixings (optional) 50 - 1000 mm. Transducers type B on fixture with chain fixings (standard) 300 - 2000 mm. Transducers type B with chains, straps or magnetic clamps(optional)	
	Wall thickness range	No limits	
	Material	Metals, glass and sonically conductive polymers/plastics	
	Lining	Bitumen, glass, epoxy paint and most concrete liners. Excluding loose liners.	

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Operational

Languages		Selectable: English, French, German, Spanish, Portuguese, Italian
Units		Selectable: feet, metres, ml, litres, m ³ , ft ³ , 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, 7 Ah (nominal)
	Battery life [nominal]	10 hours continuous operation (LCD on, backlight on) 400 hours continuous operation (LCD off, backlight off) Sleep mode with burst sampling at 5 minutes interval, extends life up to 1 month
	External DC	12v @ 60mA (backlight off) 12v @ 600mA (backlight on)
	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 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/others	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 from 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
	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		Hydreka WinFluid and Win 95/98/2000/NT/XP
Keypad		16 keys. ON/OFF on Keypad
Password Protection		3 levels: Master [Hydreka only], Owner [Change all settings], User [Change settings as defined by owner]
External Connections		Mil-spec connectors are used throughout <ol style="list-style-type: none"> 1. C1 sensor upstream 2. C1 sensor downstream 3. Analogue I/O (4-20mA) (cable with Mil specs connector optional) 4. Digital I/O (RS232 or RS485) (c Hydreka WinFluid able with Mil specs connector optional) 5. Open collector inputs/outputs (cable with Mil specs connector optional) 6. DC charging

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Physical

Operating temperature range	Transducer	-40 to +120 °C [200°C pipe with ambient air temperature]
	Cable	-20 to +80 °C
	Control Unit	-10 to +50 °C
Storage temperature range	Transducer	-40 to +120 °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 with chains 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 unit	ABS
	Transducers	PEEK and Acetal, with aluminium/stainless steel mounting blocks/rails.

As part of our policy of continual product improvement, we reserve the right to alter, without notice, all specifications, designs, prices and conditions of supply of all equipment.

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