



Acoustic Multi-Path Flowmeter

Fluvius TT





Fluvius TT

Application

HydroVision's Fluvius TT is a velocity area open channel flowmeter which uses the acoustic „travel-time“ method. It is used various measurements of discharge in the hydrologic field.



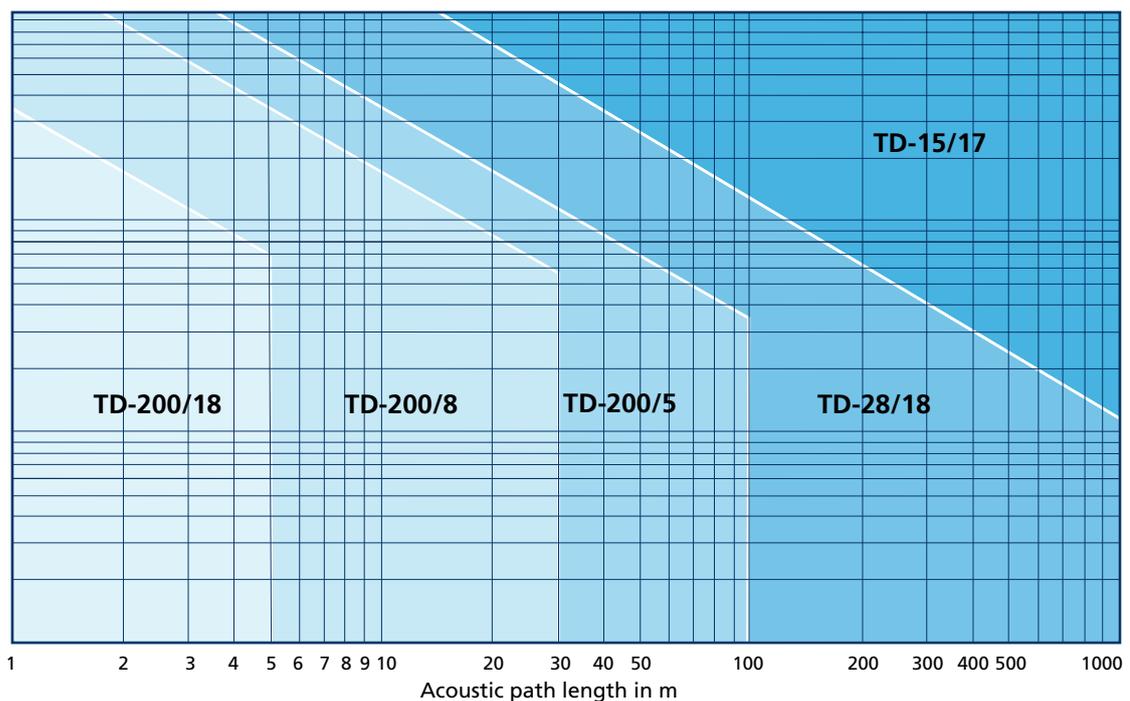
ISP™ Technology

The flow meter combines intelligent signal processing (ISP) with correlation detection methods. It uses controlled signals, whose characteristics are imposed during the transmission phase(duration, frequency, level etc.). The reception is therefore based on the suitable filtering of these characteristics, possibly accounting for the perturbations brought by the environment.

The frequency modulated signals are processed on reception by correlating the received signal with a copy of the expected signal. The use of this Intelligent-Signal-Processing is justified for very accurate measurements of transit time with an excellent time resolution and a high processing gain.

Commonly used transducer frequencies for various path lengths and sediment loads.

Sediment load in g/m^3



Technical Information



Fluvius TT ECM-IE

Travel time system
with digital signal processing

Specifications

Acoustic Paths:	1 - 8, length 1 - 1000 m
Frequency:	15, 28, and 200 kHz
Accuracy:	± 2% (typical)
Display:	4 lines, 20 characters
Datalogger:	internal, sampling interval user selectable
Communication:	RS-232, MODBUS, Ethernet, USB
Inputs:	max. 8 x 4-20 mA
Outputs:	max. 4 x 4-20 mA 2 x Relay, 2 x Pulse
Power Supply:	85-264 V _{AC} (50-60 Hz) or 24 V _{DC}
Battery Backup:	integrated, 2 Ah
Enclosure:	Aluminium, wall mounted
Dimensions:	600 x 400 x 170 mm

Application

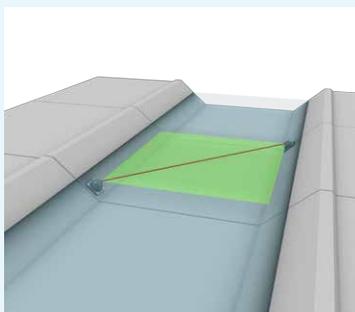
The range of application for Fluvius TT runs from small waterways to huge river systems with high suspended solids. By means of acoustic transmission a coded signal is sent through the water and the transit time is calculated providing the speed of river flow. When an acoustic wave propagates in water, part of the energy is damped by friction and suspended solids. This procedure is frequency-related. The higher the frequency, the bigger the damping. For wider distances we use low frequencies as they allow for a considerably better receiver signal.

Single-path system

In its most basic form, the ultrasonic gauge operates with a single pair of transducers.

However, it relies upon a relatively stable velocity profile, essentially unaffected by changes in the relation between water level and flow.

The main flow has to be parallel to the bank. The relationship between measured velocity and discharge is established by hydrometric calibration.

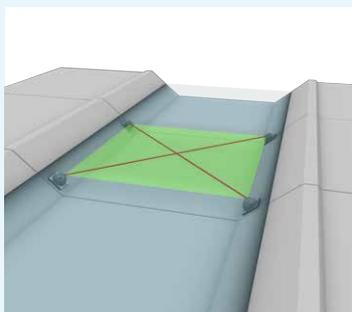


Crossed-path system

In rivers there is a high risk of cross flow. Its intensity depends mainly on the river's geometry and if there is an upstream bend in the river.

Although the cross flow does not influence the quantity of the discharge, it may affect the measurement, a second pair of transducers will be necessary.

By crosswise arrangement of four transducers, effects of changing flow direction can be eliminated.

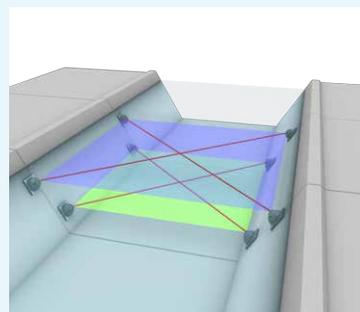


Multi-path system

An even more accurate discharge measurement can be obtained with systems using several planes.

The measured result can be further improved by using a multi path system layering each of the acoustic paths in parallel planes one above the other. This negates having an expensive hydrometric calibration.

This type of system is suitable for applications with large water level fluctuations, reverse flow or a vertical velocity distribution outside the theoretical normal.



Technical Data

Transmitter



Fluvius TT ECM-IE

Specifications Transmitter

Acoustic Paths:	1 - 18, length 1- 1000 m
Frequency:	15,28 and 200 kHz
Accuracy:	± 2% (typical)
Display:	4 lines, 20 characters
Datalogger:	internal, sampling interval user selectable
Communication:	RS232 MODBUS USB Ethernet 10/100 Mbps
Inputs:	max. 8 x 4-20 mA
Outputs:	max. 4 x 4-20 mA 2 x Pulse 2 x Relay
Power Supply:	85-264 V _{AC} (50-60 Hz) or 24 V _{DC}
Battery Backup:	integrated, 2 Ah
Enclosure:	Aluminium, wall mounted
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Mounting Assembly

Standardized mounting devices for any kind of channel geometry like rectangular, trapezoid or natural river banks are available. The flow optimized design protects the transducers against moving objects suspending in the flow stream. It also provides room for connections and protective conduits.

Specifications

Type:	TD-15/17	TD-28/18	TD-200/5	TD-200/8
Frequency:	15 kHz	200 Hz	200 Hz	200 Hz
Typical channel width:	> 400 m	400 m	100 m	30 m
Dimensions:	Ø 368 mm (14.48 inch)	Ø 183 mm (7.20 inch)	Ø 340 mm (13.38 inch)	Ø 218 mm (8.58 inch)
Height:	121 mm (4.76 inch)	142 mm (5.59 inch)	170 mm (6.69 inch)	109 mm (4.29 inch)



Ultrasonic transducers

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