INTRA-AUTOMATION

MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

TÜVRheinland® CERT ISO 9001

HANDHELD ULTRASONIC FLOWMETER

NON-INVASIV / CLAMP-ON-SENSOREN

Baureihe: IS210-H

Technische Information

2013

FLOW

THE EXPERT FOR LEVEL AND FLOW

Handheld Ultrasonic-Flowmeter – Principle of Measurement

IS210 transit time flow meter utilizes two transducers that function as both ultrasonic transmitters and receivers. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. The transducers can be mounted in V-method in which case the ultra sound transverses the pipe twice, or W-method in which case the ultra sound transverses the pipe four times, or in Z-method in which case the transducers are mounted on opposite sides of the pipe and the ultra sound transverses the pipe only once. The selection of mounting method depends on pipe and liquid characteristics. When the flow meter works, the two transducers transmits and receives ultrasonic signals amplified by multi beam which travels firstly downstream and then upstream (Figure 1). Because ultra sound travels faster downstream than upstream, there will be a difference of time of flight(Δ t). When the flow is still, the time difference (Δ t) is zero. Therefore, as long as know the time of flight both downstream and upstream, we can work out the time difference, and then the flow velocity (V) and flow volume (Q) via the following formula.

$$V = K \, x \, D \, x \, \Delta t$$

$$Q = S \, x \, V$$

Whereas:

K = Constant
D = Distance between the two transducers
S = pipe cross section
V = Liquid velocity
Δ t = Difference in time of flight
Q = flow rate

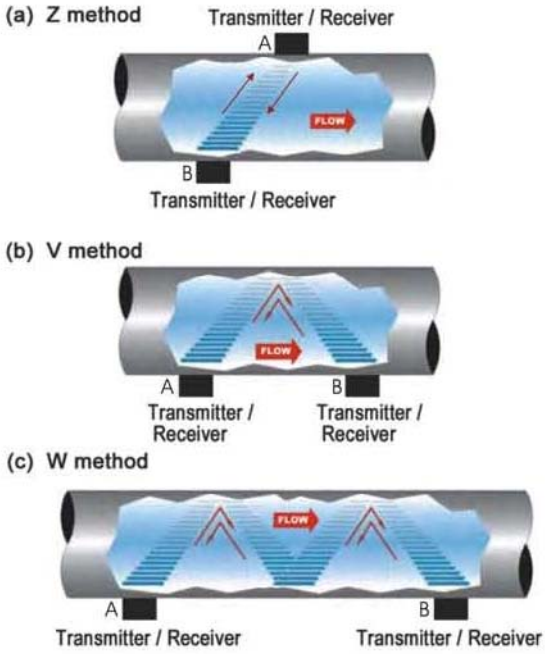


Figure 1

Clamp-on Handheld Ultrasonic-Flowmeter Series IS210-H

Series IS210-H Handheld Transit Time Ultrasonic Flow Meter is carefully designed so that it is very compact and easy to use. A user can use hand to hold as well as to operate the flow meter main unit .The user-interface is self-explanatory and very easy to follow. Besides, the unique clamp-on fixture design makes the installation very simple and no special skills or tools required .Due to the non-intrusive nature of the clamp-on technique, there is no pressure drop, no moving parts, no leaks and no contamination.

Features:

♦ Carefully designed so that is very compact and ease to use.
♦ Advanced MultiPulseTM Technology
♦ Convenient for mobile measurement, flow rate calibration, data comparing, meters running status checking
♦ Wide liquid applications
♦ Provides Data Logger functions. The capacity is based on how much the users selected, and maximum can reach to 8GB.

Applications:

♦ Water, including hot water, chilled water, city water, sea water, etc.
♦ Sewage and drainage water with small particle quantity.
♦ Oil, including crude oil, lubricating oil, diesel oil, fuel oil, etc.
♦ Chemicals, including alcohol, acids, etc.
♦ Solvents
♦ Beverage and food processors
♦ HVAC hot and cool water, water /glycol solutions.
♦ Water and waste treatment
♦ Power plants (nuclear power plants, thermal & hydropower plants), heat energy boiler feed water.
♦ Energy consumption supervision and water conservation management
♦ Metallurgy and miming applications (e.g., acid recovery)
♦ Marine operation and maintenance
♦ Pulp and paper industries
♦ Pipeline leak detection, inspection, tracking and collection
♦ Energy measurement and balancing
♦ Network monitoring

Clamp-on Handheld Ultrasonic-Flowmeter / Order information

Code	Description
IS210-H	Handheld type transit-time ultrasonic flowmeter
	Output selection 1
	N n/a
	1 Frequency (Flow rate or totalizer)
	2 RS232
	3 Data logger & software
	Output selection 2
	N n/a
	1 Frequency (Flow rate or totalizer)
	2 RS232
	3 Data logger & software
	Power supply (charger connector)
	D 90-240 V AC

IS210-H			**D**	/Transducer Code

Transducer Code

Code	Description
DH	Portable Transducer
	Transducer type
	S Small (DN20…DN50)
	M Medium (DN40…DN1000)
	L Large (DN1000…DN4500
	KXX Small-pipe round clamp-on
	Transducer mounting frame
	N none
	FS DN20…DN50
	FM DN40…DN600 (larger pipes on request)
	Transducer Temperature
	N -40…+121 °C
	H -40…+250 °C (only S, M transducer, larger on request)
	Mounting type
	N Common
	M Magnetic force (pipe > DN 80
	Cable length
	4m 4 meters straight cable
	Xm Common cable, max 300 m
	XmH High temperature cable, max 300 m

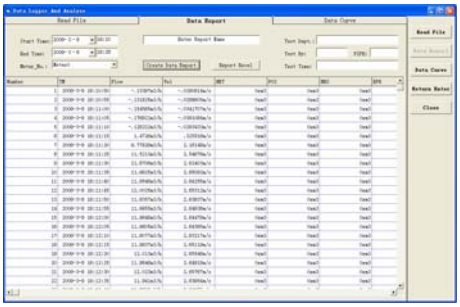
DP						

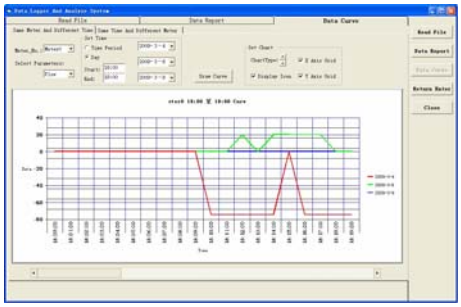
Technical Specifications:

Transmitter	Power Supply	3 AAA Ni-H built-in batteries. When fully recharged it will last over 12 hours of operation. 100V-240VAC for the charger
	Velocity	0 …± 12 m/s (0 … ±40 ft/s), bi-directional
	Display	4 line x 16 English letters LCD back lit, can display total flow, flow rate, velocity and meter running status etc.
	Units Rate Totalized	User Configured (English and Metric); Rate and Velocity Display; (FWD, NET, REV or BATCH) gallons, ft³, barrels, lbs, liters, m³,kg
	Output	4…20 mA, Pulse, Relay, RS232C or RS485, options: Up to 8 GB Data logger
	Accuracy	± 1,0 % - 2,0 % of reading at rates > 0,5 m/s ± 0,005 m/s of reading at rates < 0,5 m/s
	Sensitivity	Flow Rate: 0,0003 m/s (0,001 ft/s)
	Repeatability	0,2 % of reading
	Security	Keypad lockout, access code enable
	Dimensions and Weight	100 x 204 x 34, weight < 0,6 kg
Transducer	Liquid Types Supported	Virtually most any liquid containing less than 2 % total Suspended solids (TSS) or aeration
	Suited Liquid Temperature	Std. Temp. Transducer: -40…+121 °C High Temp. Transducer: -40…+250 °C
	Dimensions and Weight	Type S: 42 x 25 x 25; weight <0.3kg Type M: 60 x 43 x 43; weight <0.6kg Type L: 80 x 53 x 53; weight <1.0kg
	Pipe-∅	Sensor Type S: 12…50 mm Sensor Type M: 40…1000 mm (Standard) Sensor Type L: 1000…4570 mm Sensor Type K: 12…50 mm
Accessories	Portable Case	Size: 445 x 290 x 130; weight < 3,5 kg
	Couplant	Dow Corning 111 or 732 (112 for high temperature)
	Elastic Belts	2 bundles
	Battery Charger	1 pcs
	Data Logger & Software	Optional 512 MB to 8 GB SD card Windows-based Software Utility, data logging, data report, data curve and analyze.

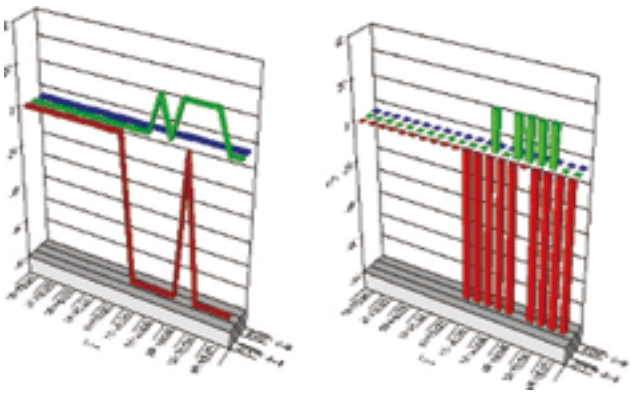
Data Logger and Software Utility

Provides data logging, based SD card data memory structure, the memory capacity can be 512M, 1GB, 2 GB, 4 GB, 8 GB based SD card capacity. Normally, 1 GB can store 5 years data with 5 minutes logging interval.
Very easy to read data from SD card just plug out from Dynameters Data Logger, and run Dynameters Data Logging and Analyze software, browse the SD card file.
Data report and Data Curve functions:





The Analyze Functions Include:
The curve based on the same Meter number but different time;
The curve based on the same time but different Meter number.
Logging Parameters: Flow Rate, Velocity
User can delete the uninterested parameters on the Excel Table and then print the data table.



We have two types of data logger, one for dedicated (including IS210-B, IS210-C, IS210-D, IS210-F,
IS210-HF) and Portable (IS210-P) Series, the other for Handheld
(IS210-H) Series.
Users can download the software from our website: www.intra-automation.de

Parts and Dimensions

Handheld Transmitter

Transducer Type L

Transducer Type S

Transducer Type M
(Standard)

Transducer Type K

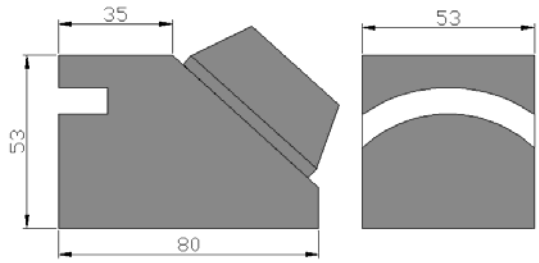
S-S Belts

Couplant

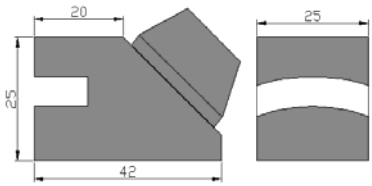
Elastic Belts

Parts and Dimensions / Continuation

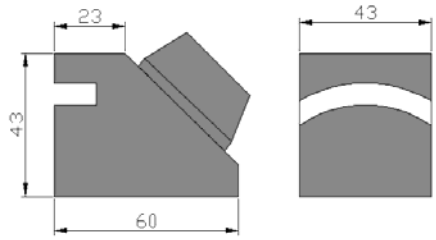
Handheld Transmitter



Transducer Type L



Transducer Type S



Transducer Type M

Besides the products covered by this brochure, Intra-Automation GmbH also manufactures other high-quality and high precision instruments for industrial measurement tasks. For more information, please contact us (contact details on the backside of this brochure).

Flow Measurement

Itabar®-Flow-Sensor

Level Measurement

ITA-mag. level gauges

MAGLINK level indicators

Other measurement tasks:

DigiFlow Flow and Level Computers

IntraCont digital Controllers

IntraDigit digital indicators

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MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

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