

## ULTRASONIC FLOW METER FDT-22



### Features

FDT-22 ultrasonic flow meter is designed to measure the fluid velocity of liquid in a full/closed pipe. It is a handheld measurement system which is both easy to install and use. The FDT-22 operates according to the difference in the transit time of flight measured, and determines the flow velocity by measuring the travel time of a pulse from one transducer to the next. Flow in the same direction takes less time to travel to the second transducer than does flow in the opposite direction. Electroacoustic transducers receive and emit brief ultrasonic pulses through the liquid of the pipe. Transducers are vertically placed at both sides of the measured pipe. Sensors are placed on the pipe and fastened by means of a clamp. The display will quickly show the flow velocity. The FDT-22 can be used for metallic, plastic and rubber tubes.

### Technical Data

**Measuring Range (Velocity)** :  $\pm 0.01$  to 30 m/s bi-directional

**Flow Rate Range (Flow Rate)** : see table on page 2

**Accuracy** :  $\pm 2\%$  of reading

**Repeatability** : 0.2%

**Linearity** : 0.5%

**Response Time** : 0 to 999 seconds (user configured)

**Operating Temperature (Sensors)** : -30 to +160 °C

**Operating Temperature (Device)** : 0 to 50 °C

**Operating Humidity** : 0...90 %RH

**Pipe Size** : DN 15 to 700 mm (1/2" to 28") standard sensors up to DN 6000 mm (240") (optional sensors)

**Sensor Frequency** : 1 MHz

**Units** : m<sup>3</sup>, ft<sup>3</sup>, litres, barrel, US gallon (user configured)

**Flow Rate Units** : All units /s or /min or /hr (user configured)

**Totalizer** : 7-digit totals for positive, negative and net flow

**Liquid Types** : Most liquids including clean water, sea water, waste water, chemical liquids, oil, crude oil, alcohol, beer, and more

**Particle Concentration** : Clean liquids that have less than 3% by volume of particulate content

**Pipe Material** : All metals, most plastics such as carbon steel, cast iron stainless steel, PVC HDPE, Asbestos, etc.

**Display** : 4 x 16 english letters

**Sensors Cable Length** : 5 m

**Power** : Lithium batteries (included and can be replaced by manufacturer) with 90 to 230 Vac charger

**Operating Time** : fully charged lasts over 12 hrs

**Memory capacity** : 120 data set flow all, 450 data set for flow rate and totalizer, 700 data for only flow rate and 660 data for only totalizer

**Software** : recording 100,000 data set for recording by connecting notebook or PC (option : SOFT-PCE-TDS)

**Exporting** : text file and excel

**Interface** : USB for download data via software (option : SOFT-PCE-TDS)

**Totalizer/Calibration** : 7-digit press-to-go for calibration

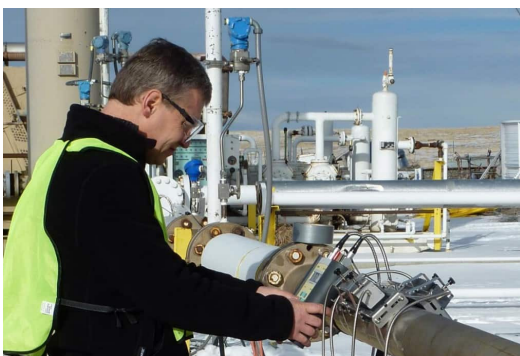
**Housing** : ABS plastic

**Case** : aluminum alloy

**IP Protection** : IP54 (device), IP65 (sensor), IP65 (Case)

**Dimensions** : 100 H x 66 W x 20 mm D (3.9 x 2.6 x 0.8")

**Weight** : 514 g (1.2 lb)



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**Flow rate table**

Nominal diameter		Flow range (m <sup>3</sup> /hr)
DN	inch.	
15	1/2"	0-19.09
20	3/4"	0-33.94
25	1"	0-54.04
32	1" 1/4	0-86.89
40	1" 1/2	0-135.77
50	2"	0-212.14
65	2" 1/2	0-358.52
80	3"	0-543.09
100	4"	0-848.57
125	5"	0-1,325.89
150	6"	0-1,909.29
200	8"	0-3,394.29
250	10"	0-5,303.57
300	12"	0-7,637.14
350	14"	0-10,395.00
400	16"	0-13,577.14
450	18"	0-17,183.57
500	20"	0-21,214.29
600	24"	0-30,548.57
700	28"	0-41,580.00

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## ULTRASONIC FLOW METER FDT-22

### Tube types & Installation

- Tube types**

The types of pipes that can be used with a portable flow meter are as follows:



Carbon steel tube



Stainless steel tube



Cast iron tube



Copper tube



Aluminium tube



PVC tube

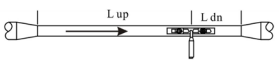
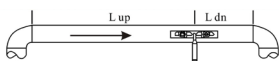
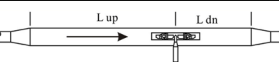
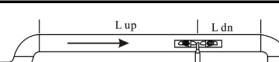


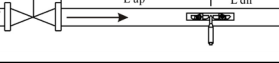


Asbestos tube



Fiber glass tube

- Installation**

Type of pipe characteristic and the sensor location	Upstream	Downstream
	Distance <b>before</b> the center of the sensor ( <b>L up</b> )	Distance <b>After</b> the center of the sensor ( <b>L dn</b> )
	10 x diameter	5 x diameter
	15 x diameter	5 x diameter
	15 x diameter	5 x diameter
	15 x diameter	5 x diameter
	20 x diameter	5 x diameter
	30 x diameter	5 x diameter
	30 x diameter	5 x diameter

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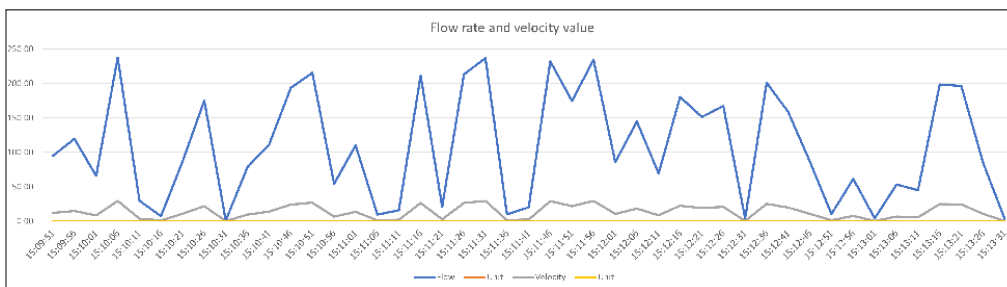
Software : SOFT-PCE-TDS (Option)

Date	Time	Flow	Velocity	Net	Pos	Neg	State	Total time
14.12.2021	03:14:26 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:42:30
14.12.2021	03:14:31 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:42:35
14.12.2021	03:14:36 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:42:40
14.12.2021	03:14:41 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:42:45
14.12.2021	03:14:46 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:42:50
14.12.2021	03:14:51 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:42:55
14.12.2021	03:14:56 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:43:00
14.12.2021	03:15:01 PM	0 m <sup>3</sup> /h	0 m/s	-9177511	19280781	-11055971		5 d 11:43:05

● Example of excel file

Date	Time	Flow	Unit	Velocity	Unit	Net	Unit	Pos	Unit	Neg	Unit	State	Total time	Q/day	Unit	Up	Down	Quality	Display
14.12.2021	15:09:55	89.76	m <sup>3</sup> /h	11.22	m/s	4.00	m <sup>3</sup>	4.00	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:37:55	4.00	m <sup>3</sup>	0	0	0	0.7511x (MS2)Data Director/L To Buffer
14.12.2021	15:09:56	164.72	m <sup>3</sup> /h	26.59	m/s	8.12	m <sup>3</sup>	8.12	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:00	8.12	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer
14.12.2021	15:10:01	111.33	m <sup>3</sup> /h	13.92	m/s	10.90	m <sup>3</sup>	10.90	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:05	10.90	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer
14.12.2021	15:10:06	137.35	m <sup>3</sup> /h	17.17	m/s	14.33	m <sup>3</sup>	14.33	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:10	14.33	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer
14.12.2021	15:10:11	233.72	m <sup>3</sup> /h	28.22	m/s	20.18	m <sup>3</sup>	20.18	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:15	20.18	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer
14.12.2021	15:10:16	186.88	m <sup>3</sup> /h	19.86	m/s	24.15	m <sup>3</sup>	24.15	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:20	24.15	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer
14.12.2021	15:10:21	77.49	m <sup>3</sup> /h	9.69	m/s	26.09	m <sup>3</sup>	26.09	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:25	26.09	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer
14.12.2021	15:10:26	118.53	m <sup>3</sup> /h	14.82	m/s	29.05	m <sup>3</sup>	29.05	m <sup>3</sup>	0	m <sup>3</sup>	0	5 d 11:38:30	29.05	m <sup>3</sup>	0	0	0	0 (MS2)Data Director/L To Buffer

● Example of graph



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# Technical Data Sheet

## Ultrasonic Flow Meter FDT-22

### Ultrasonic Thickness Gauge meter : UTG-100 (Option)

#### Features

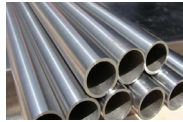
- Small and compact, Easy to use
- Used for measuring thickness and corrosion of pressure vessels, chemical equipment, boilers, oil storage tanks, etc. in industries of petroleum, shipbuilding, power station, and machine manufacturing.
- Compatible with the ultrasonic flow meter FDT-21, FDT-22, FDT-24

#### Application

- Applicable to measure the thickness of many materials
- e.g. Steel, Cast iron, Aluminum, Red copper, Brass, Zinc, Quartz glass, Polyethylene, PVC, Gray cast iron, Nodular cast iron



Carbon steel tube



Stainless steel tube



Cast iron tube



Copper tube



Aluminium tube



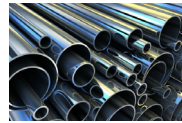
PVC tube



Asbestos tube



Fiber glass tube



Zinc tube



Brass tube

### Technical Data

**Measuring range :** 1.0 - 200.0 mm

**Sensor type :** Ultrasonic

**Resolution :** 0.1 mm

**Accuracy :**  $\pm 0.5$  % of reading + 0.1

**Display :** LCD display 4 digits

**Power supply :** x4 Battery AAA 1.5V

**Ambient temperature :** 0 - 40 °C

**Ambient humidity :** 30 - 85 %RH

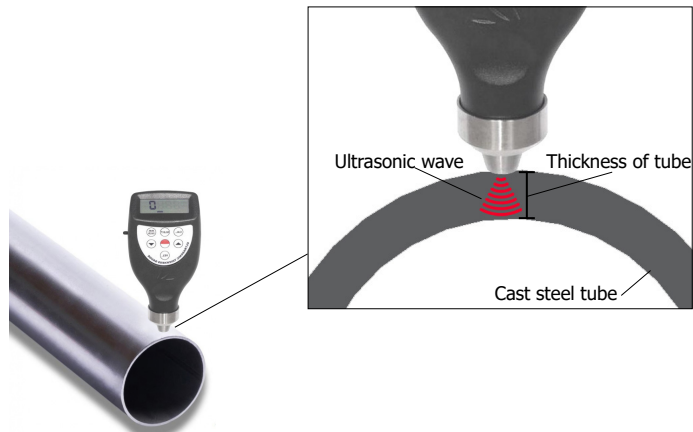
**Dimensions :** 135 x 65 x 27 mm

**Weight :** 120 g (not including battery)



Packaging

#### Measuring a thickness of tube



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Sensor Type	HS-HT 	HM-HT 	TL-1-HT (option) 
Pipe size (mm)	DN15 to 100	DN50 to 700	DN300 to 6000
Pipe size (inch)	1/2" to 4"	2" to 28"	12" to 240"
Material	Aluminium+ABS		
Frequency	1 MHz		
Calibration	Calibrate with the main unit		
Magnetism	Magnetic		
Temperature	-30 to +160 °C		
Protection Class	NEMA 4 (IP65)		
Dimensions(mm)	325X150X60	575X150X60	97X54X53
Weight g (oz)	691 (24.4)	1033 (36.7)	1080 (38)
Liquid Types	water, sea water, chemical liquids, oil, crude oil, alcohol, beer, etc.		
Particle Concentration	Clean liquids that have less than 3% by volume of particulate content		
Pipe Material	All metals, most plastics, etc.		
Dedicated Shielded Transducer Cable	Standard length 5 meter x 2		

### Option :

**SOFT-PCE-TDS** : Software

**UTG-100** : Ultrasonic Thickness Gauge Meter

**TL-1-HT** : Large pipe high temperature transducer

**CAL-FDT-9001** : Calibration certificate according with ISO 9001/9002

**CAL-FDT-17025** : Calibration certificate according with ISO17025

**B-FDT21** : Battery for Ultrasonic flow meter

**G-FDT21** : Grease for Ultrasonic flow meter



### Delivery scope :

- 1 x Carry case
- 1 x Handheld device
- 1 x HS-HT (flow sensor)
- 1 x HM-HT (flow sensor)
- 1 x Connected cable flow sensor
- 1 x Chain cable for flow sensor
- 1 x Tape measure
- 1 x Power supply cable

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