Ambiductor
Flow & Energy Analysis Systems

TDS-100F

Portable, clamp-on water meter

Applications

Flow measurement of hot and cold water for local reading or for pulse/analog signal to the energy calculator for energy measurement. Suitable for both permanent and temporary installations with pipe dimensions from DN25 up to DN6000.

Characteristics

- Economical flow measurement without contact with the medium
- Easy setup and installation
- Wide range of pipe dimensions and materials
- Velocity, volumetric and summed flows
- Keypad for easy use
- Data logger
- Configurable digital output
- Analog output
- Frequency output
- SD card (option)

Strengths

- 3 different sensor pairs enable DN25...DN6000
- Simple assembly/disassembly without the need for specialist knowledge
- Prepared for connection to integrator for energy measurement
- Also suitable for fixed installations
- Can also measure pipes with lining (coating in the pipe so-called lining)

Description

Medium

Water meter TDS-100F is of ultrasonic technology, which means that it is static (no moving parts). It measures the flow rate of liquid in a pipe from the outside of the pipe using a pair of ultrasonic transducers. The liquid should fill the tube completely, without particles or bubbles.

Examples of applicable liquids are:

- water (hot water, cold water, city water, sea water, etc.)
- sewage water
- oil (crude oil, lubricating oil, diesel oil, fuel oil, etc.)
- chemicals (alcohol, acids, etc.)
- beverages and liquid foods
- solvents
- other liquids

Mounting

TDS-100F is a so-called ”clamp-on” water meter for mobile installations, but can also be used for fixed installation, even in industrial use. ”Clamp-on” means that it is attached to the outside of the pipe, without any contact with the liquid. This means that assembly and disassembly can take place without interrupting the flow.

Assembly and commissioning is simple and no specialist knowledge or tools are needed.

In addition, there is no pressure drop, no moving parts, no leaks and no contamination. The system itself is completely non-contact with the medium, which means that hazardous liquids can be measured without the need to add bypass lines.

Data management

The water meter has pulse outputs for remote reading, alarm handling and energy measurement. There is also a frequency output signal and a 4...20mA output signal for instantaneous values.

The water meter has a built-in data logger, which enables the storage of 2,000 lines of data. The stored information can be downloaded to a computer via RS-232 (serial port). Converters to USB are available as accessories.

About the meter

TDS-100F a modern clamp-on water meter for fixed and mobile installation with instantaneous measurement of flow using ultrasonic technology. It comes with a complete set of parts that allow the operator to perform accurate flow measurements in all possible media and pipe dimensions in a very short time.

The flow measurement is done by sending ultrasound signals in both directions through the liquid. When there is a flow, the signal’s transport time is longer upstream than upstream. This is how the speed is measured. With the help of the pipe dimension, the flow can then be obtained.

Sensors

The sensors are mounted on the outside of the pipe without contact with the liquid for easy assembly and disassembly. Sensors S2 and M2 are equipped with magnets, but can also be attached to the pipe using stripes. Larger sensors must be striped.

Applications

Here are some applications where the TDS-100F fits:

- Drinking water
- Waste water (with limited particle content)
- Sea water
- Sewage water

Other liquids used in industrial use.

- Power plants
- Energy measurement
- Metallurgy and mines
- Petroleum and chemicals
- Food and pharmaceutical industry
- Marine use
- Pulp and paper

The meter is designed to meet all needs in connection with flow measurement and energy measurement.

The flow medium must be clean or very lightly contaminated by particles or bubbles (less than 10,000 ppm and particle size less than 80 µm)

Liquid types

Acoustically conductive liquids without gas bubbles:

1. Sea water
2. Kerosene
3. Petrol
4. Fuel oil
5. Crude oil
6. Propane(-45°C)
7. Butane (0°C)
8. Other
9. Diesel oil
10. Castor oil
11. Peanut oil
12. Petrol 90 octane
13. Petrol 93 octane
14. Alcohol
15. Water (+125°C)

Piping

Sensor type	Pipe dimension
S2	DN 25...100 mm (1/2...4”)
M2	DN 50...700 mm (2...28”)
L2	DN 300...6000 mm (12...240”)

Pipe wall thickness: Max 76 mm

Pipe material

0. Carbon steel
1. Stainless pipe
2. Cast iron
3. Ductile iron
4. Copper
5. PVC
6. Aluminum
7. Asbestos
8. Fiberglass epoxy
9. Other

Lining (coating in pipes)

1. Epoxy
2. Rubber
3. Mortar
4. Polypropylene
5. Polystyrol
6. Polyester
7. Polyethylene
8. Ebonite
9. Teflon

Measurement data

Specification	Data
Accuracy	±1...3 %
Linearity	0,5 %
Reproducibility	0,2 %
Response time	1...999 s (Configurable)
Speed (bidirectional)	0 ~ 30 m/s
Measurement parameters	Instantaneous flow Summary flow (4 summary works). Velocity.

Measurement methods

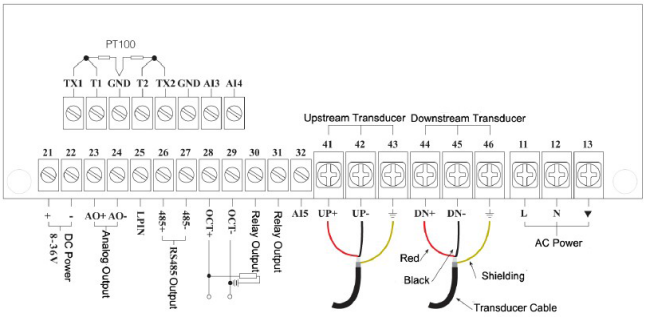
Specification	Data
The V method	The most common measurement method where the ultrasound signal bounces once and the sensors are placed opposite each other on the same side of the pipe
The Z method	The ultrasound signal goes diagonally through the pipe and the sensors are placed opposite each other on each side of the pipe
The W method	The ultrasound signal bounces 3 times and the sensors are placed opposite each other on the same side of the pipe
The N method	The ultrasound signal bounces 2 times and the sensors are placed against each other on each side of the pipe

Electronics

Specification	Data
Converter	Instantaneous
Enclosure, electronics	IP 65
Enclosure, sensors	IP 67
Dimensions, electronics	270x190x93 mm
Weight, electronics	3 kg
Display	2 lines of 20 characters. Backlit LCD display.
Keypad	16 buttons
Power supply	110-240 VAC and 24 VDC
Power consumption	2 W
Operating temperature	Sensor: 0...160 °C Electronics: -10...55 °C
Storage temperature	-40...70 °C
Input	2 sensor inputs. 2 analog inputs 4-20 mA (0,1 % accuracy). 3 analog inputs, option.
Output	1 analog output 4-20 mA (0-20 mA) configurable 1 galvanically isolated frequency (max 10 kHz) Relay output 0,5 A at 240 VAC or 2 A at 30 VDC, for ON/OFF-control, alarm, or counter output. RS 232, 75...115 200 bps
Data logger	2000 rows of data
European conformity	EMC Directive 89/336/EEC, 73/23/EEC LVD (installation category II, pollution degree 2)
Sensor assembly	Magnetic, chain or strap
Sensor cable	5 m standard Any length up to 500 m

Electrical connection

Connect as below



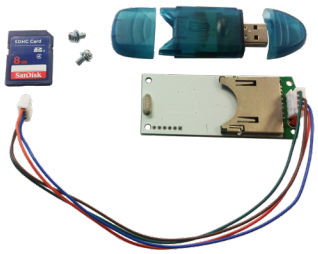
Accessories

For the TDS-100F, there are e.g. the following accessories:

Contact paste

Case

SD card reader with data logger



Thickness gauge

Temperature sensor (for energy measurement)

Also available for surface mounting

LoRa converter

Converter for communication via LoRaWAN.

Extra sensor for other material thicknesses

It is possible to switch between different sensors for the flow measurement.

Sensor S2 = DN 25...100

Sensor M2 = DN 50...700

Sensor L2 = DN 300...6000

Minimal flow

To achieve accurate measurement results with the TDS-100F, a minimum flow of over 1 liter per second is required.

About Ambiductor

Ambiductor is an engineering company in metering, automation, remote reading with focus in the following areas:

- **Smart water meters and thermal energy meters**
- **Smart buildings, industry and society through LoRa, NB-IoT etc.**
- **AmbiSolution - IoT platform for utilities, energy and buildings**
- **Oil meters and meters for industrial liquids**

Read more at www.ambiductor.se

Instructional videos and guides in Swedish at
www.ambiductor.se/supportsidan

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