



## ULTRASONIC TRANSIT TIME FLOWMETERS TTFM100-NG SERIES



The Transit Time Flow Meter of TTFM100 NEW GENERATION (NG) series measures flow rate by calculating the spreading time of an ultrasonic wave in a liquid, going upstream and downstream into a pipe.

This flow meter is mostly used to measure the flow rate of homogeneous fluids, also with a **quite high percentage of suspended solids**.

The measuring system is composed of a couple of ultrasonic transducers acoustically coupled to the external pipe's wall (it is also possible to use transducers in direct contact with fluid to be measured - called wetted sensors) and a HOST unit elaborating the signal that are sent and received from the transducers.

The HOST unit has a DSP microprocessor, it gives signals for **interfacing with the process or the control systems**.

### Main Features

The TTFM100-NG series includes a range of flow meters whose electronics is composed of a single board: high precision, high fidelity, high competitiveness.

The main features are:

- Clamp-on sensors: it is not necessary to stop the flow to install them;
- Wetted sensors.
- AC and DC supply: 110-230VAC and 12-36VDC; battery supply, depending from the type of device. LLB-PTTFM2000-NG can be supplied by solar panel too.
- The time difference during the measuring process could be 0.2 ns.
- Analog (4-20 ma), pulses (relays), frequency (OCT) and RS485 MODBUS or RS232 outputs.
- Serial communication interface RS485 MODBUS (model TTFM100-F1-NG & TTFM100-F18-NG).
- Serial communication interface RS232 (Hand-held type TTFM100B-HH-NG).

### Typical Use

- Water treatment, slurry and process water pumping;
- Flow balancing;
- Hydro-electric, cooling, anti-fire stations;

- Water District;
- Oil and chemical industries;
- Extraction industries;
- Food, paper and pharmaceutical industries;
- Car industries

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## TTFM100-F1-NG Wall Mounting Stationary Type



<b>High Accuracy Measurement</b>	Linearity: better than 0.5% - Repeatability: better than 0.2%, - Accuracy: better than $\pm 1\%$
<b>Data Logging</b>	Built-in SD Card with 2Gb memory
<b>Wide Measuring range</b>	Several types of transducers available, measuring pipe sizes from DN15mm to DN6000mm with four different types of sensors + PT100 ohm when if used as heat meter
<b>Menu Languages</b>	TTFM100-F1-NG can support Italian, English or Turkish menus. German and Spanish will be implemented shortly.
<b>Power Supply</b>	24VDC and/or 85-264VAC
<b>Dimensions/ Protection Grade</b>	220mm x 179mm x 70mm IP65
<b>Output</b>	Relay OCT / 4-20mA / RS485
<b>Protocol</b>	MODBUS

## TTFM100-F18-NG DIN RAIL Mounting Stationary Type With Display & Keypad



<b>High Accuracy Measurement</b>	Linearity: better than 0.5% - Repeatability: better than 0.2%, - Accuracy: better than $\pm 1\%$
<b>Wide Measuring range</b>	Several types of transducers to be selected, measuring pipe sizes from DN15mm to DN6000mm with four different types of sensors + PT100 ohm when if used as heat meter
<b>Menu Languages</b>	TTFM100-F1-NG can support Italian, English or Turkish menus. German and Spanish will be implemented shortly.
<b>Power Supply</b>	12...36 VDC
<b>Engineering Units</b>	Flow: Imperial and metric Calories: BTU; GJ; KW; KCal
<b>Dimensions Protection Grade</b>	90 x 90 x 36mm IP20
<b>Set-up</b>	By integrated keypad
<b>Output</b>	Relay OCT / 4-20mA / RS485
<b>Protocol</b>	MODBUS



## ULTRASONIC SENSORS

### Clamp-on Sensors – Standard Type



**Temperature Range – 30...+90°C**

**Max Cable length: 200mt**

TTS-100-TS2-NG Range: DN15...100

Working Frequency 1.5 MHz

TTS-100-TM1-NG Range: DN50...1000

Working Frequency 1 MHz

TTS-100-TL1-NG Range: DN300...6000

Working Frequency 0.6 MHz



### Clamp-on Sensors - High Temperature

**Temperature Range – 30...+160°C**

**Max Cable length: 200mt**

TTS-100-TS1-NG-HT Range: DN15...150

TTS-100-TM1-NG-HT Range: DN50...700

Working Frequency 1 MHz

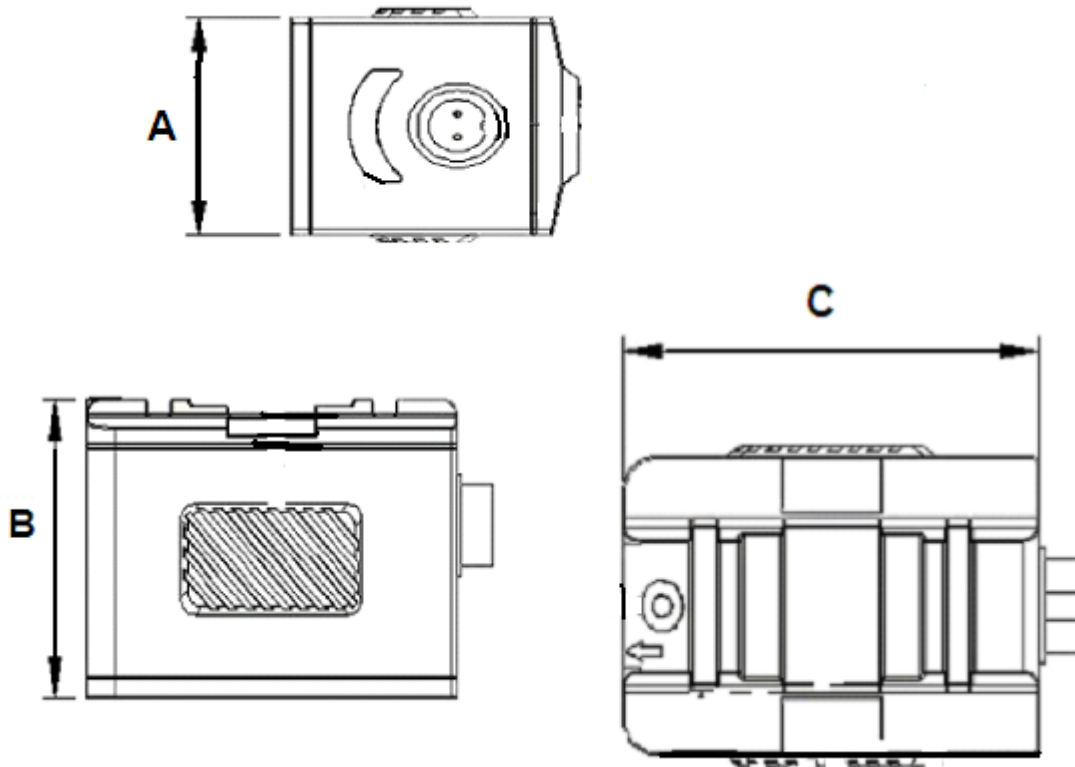
Clamp-on Sensors, both Standard and High Temperature, can be fixed by using 3 different tools:

1. Steel Belts
2. Stretchers
3. Rail Guide Mounting System





**Clamp-on Sensors Dimensions:**



Sensor Type	A	B	C
TTS100-TS2-NG	28 mm	25 mm	45 mm
TTS100-TM1-NG	39 mm	44 mm	64 mm
TTS100-TL1-NG	53 mm	54 mm	97 mm
TTS100-TS1-NG-HT	28 mm	25 mm	45 mm
TTS100-TM1-NG-HT	39 mm	44 mm	64 mm





## Insertion Sensor – Wetted Sensors

**Max. Pressure 20 bar**

**Temperature Range -20 +130 °C**

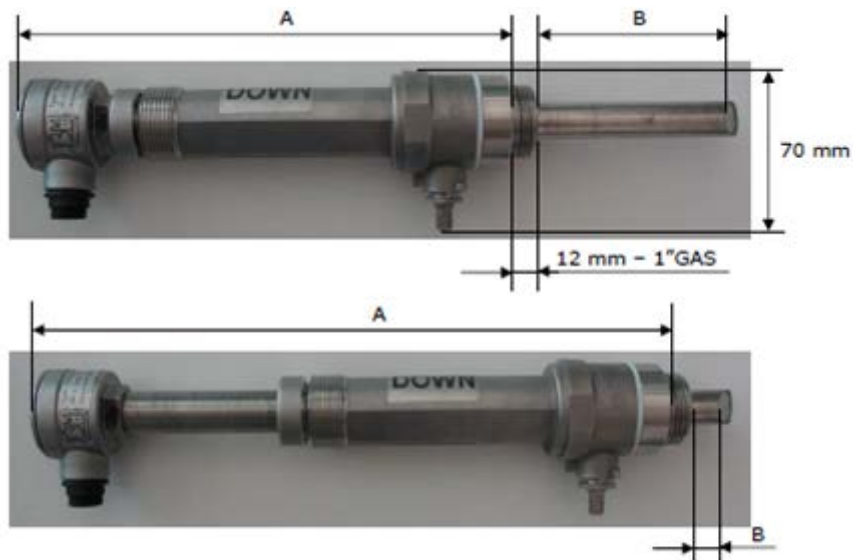
**Max Cable length: 200mt**

TTS100-B1-NG-1" (Short Type) Range: DN50...2000

TTS100-B2-NG-1" (Long Type) Range: DN50...2000

Working Frequency 1 MHz

### Insertion Sensors Dimensions:



Sensor Type	Insertion	A	B
TTS100-B1-NG-1" (Short)	Minimum	160mm	8mm
	Maximum	137mm	30mm
TTS100-B1-NG-1" (Long)	Minimum	295mm	8mm
	Maximum	220mm	85mm



## FLANGED Sensors

**Max. Pressure 16 bar depending from the DN**

**Temperature Range -40 + 160 °C**

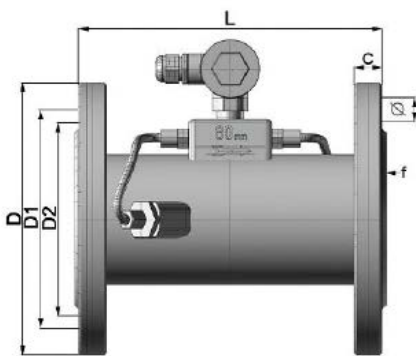
**Max Cable length: 200mt**

**TTS100-BNG-DNXX**

*From DN50 to DN1000*

*Nominal Pressure Rate PN16*

### Flanged Sensors Dimensions:



NOMINAL SIZE DN	LENGTH mm L	FLANGE DIAM mm D	BOLT HOLE CENTER mm D1	BOLT HOLE QUANTITY Ø * n	SEALING SURFACE D - f	FLANGE THICKNESS mm C
50	180	165	125	18*4	99 - 3	20
65	200	185	145	18*4	118 - 3	20
80	225	200	160	18*4	132 - 3	20
100	250	220	180	18*8	156 - 3	22
125	275	250	210	18*8	184 - 3	22
150	300	285	240	22*8	211 - 3	24
200	350	340	295	22*12	266 - 3	24
250	450	405	355	26*12	319 - 3	26
300	500	460	410	26*12	370 - 4	28
350	550	505	460	22*16	428 - 4	30
400	600	565	515	26*16	482 - 4	30
450	700	615	565	26*20	532 - 4	30
500	800	670	620	26*20	585 - 4	32
600	1000	780	725	30*20	685 - 5	36
700	1100	860	810	26*24	772 - 4	42
800	1200	975	920	30*24	878 - 4	44
900	1300	1075	1020	30*24	978 - 4	48
1000	1400	1175	1120	30*28	1078 - 4	52



## TTFM10B-HH-NG Hand Held Type



<b>High Accuracy Measurement</b>	Linearity: better than 0.5% - Repeatability: better than 0.2%, - Accuracy: better than $\pm 1\%$
<b>Wide Measuring range with Clamp-on Sensors</b>	Three types of clamp-on sensors for size from DN15-100, DN50-10000, DN300-6000, no pressure drop, no pipe disturbance
<b>Italian, French or English Menu</b>	TTFM100B-HH-NG can support Italian, English, Spanish, French or Turkish menus. German will be implemented shortly.
<b>Battery and Power Supply</b>	3 x NIMH rechargeable battery type AA 2100 mAh for 10 hours of continuous operation. Charger 100-240 VAC adapter.
<b>Protection Grade</b>	IP20 handled unit; IP68 Clamp-on Sensors with BNC connectors
<b>Output</b>	RS232 to download the stored data by free software Hyperterminal or RS232 Data Logger
<b>Data Logger</b>	- Built-In 24 K Data Logger can store over 2000 lines of data. - SD card 2GB: available soon.
<b>Standard Configuration</b>	1 x Handled Unit; 2 x Couples of clamp-on sensors; 2 x 5 mt spiral cables for clamp-on sensors connection; 2 x Stretcher 3 mt; 1 x Data Line cable ;1 x Power Cord; 1 x Coupling Grease, 1 x Carrying Case. Optional: 2 x 10 mt cables for clamp-on sensors connection.





## TT100-8812-NG Ultrasonic Thickness Gauge



<b>Measuring Range (Metric / Imperial)</b>	1.2-225 mm / 0.05-9 Inch.
<b>Measured Materials</b>	Any hard materials including steel, cast iron, red copper, brass, zinc, polyethylene, PVC, and other materials
<b>Sound Speed</b>	500-9000 mt/sec.
<b>Accuracy / Resolution</b>	+/- (0.5% n + 0.1) - Calibration block included Resolution 0.1 mm
<b>Large Capacity Battery</b>	4x1.5 V AAA - Low battery indicator
<b>Small Size &amp; Light Weight</b>	120x62x30 mm; Weight 164 g without battery
<b>Low Limit Steel Pipe</b>	15 x 2.0 mm
<b>Output</b>	RS232 interface
<b>Display</b>	4 Digits LCD
<b>Configuration / Set-up</b>	By Friendly Push Button Key Pad