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 competitivity.

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), frequence (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

TTFM100-F1-NG
Wall Mounting Stationary Type

High Accuracy Measurement	Linearity: better than 0.5% - Repeatability: better than 0.2%, - Accuracy: better than ± 1%
Data Logging	Built-in SD Card with 2Gb memory
Wide Measuring range	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
Menu Languages	TTFM100-F1-NG can support Italian, English or Turkish menus. German and Spanish will be implemented shortly.
Power Supply	24VDC and/or 85-264VAC
Dimensions/ Protection Grade	220mm x 179mm x 70mm IP65
Output	Relay OCT / 4-20mA / RS485
Protocol	MODBUS

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

High Accuracy Measurement	Linearity: better than 0.5% - Repeatability: better than 0.2%, - Accuracy: better than ± 1%
Wide Measuring range	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
Menu Languages	TTFM100-F1-NG can support Italian, English or Turkish menus. German and Spanish will be implemented shortly.
Power Supply	12…36 VDC
Engineering Units	Flow: Imperial and metric Calories: BTU; GJ; KW; KCal
Dimensions Protection Grade	90 x 90 x 36mm IP20
Set-up	By integrated keypad
Output	Relay OCT / 4-20mA / RS485
Protocol	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
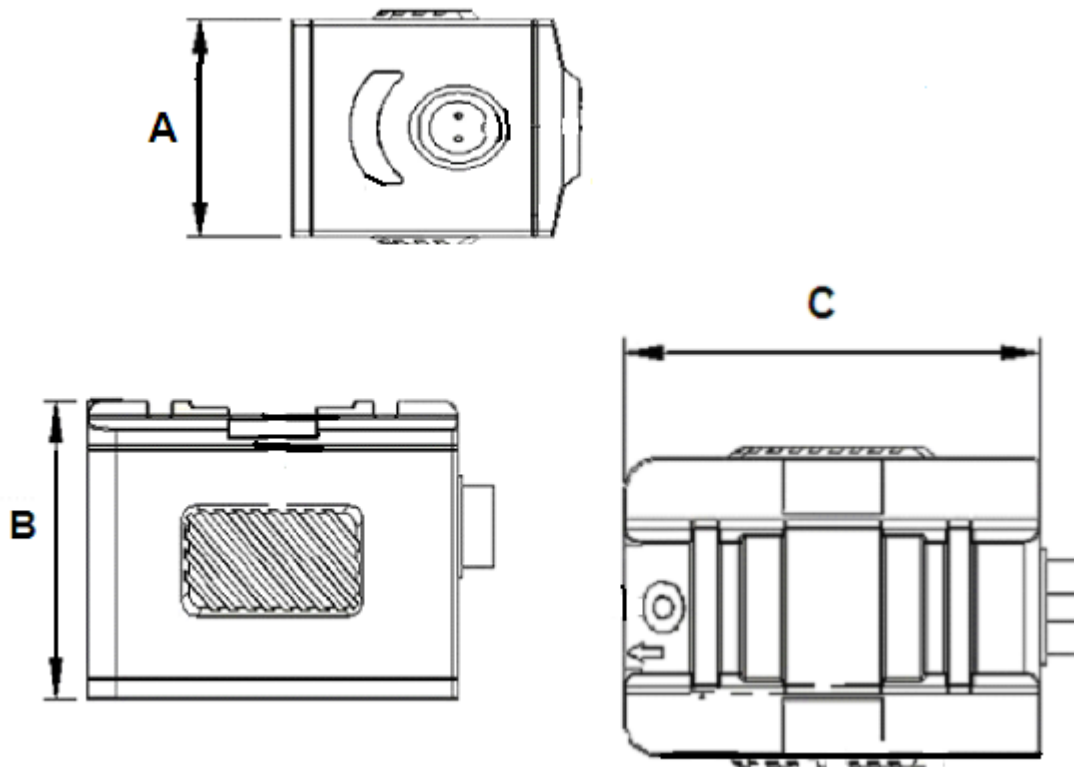TTS-100-TM1-NG-HT Range: DN50…700
Working Frequency 1 MHz

New Clamp-on Sensors, both Standard and High Temperature, can be fixed by using 3 different tools:
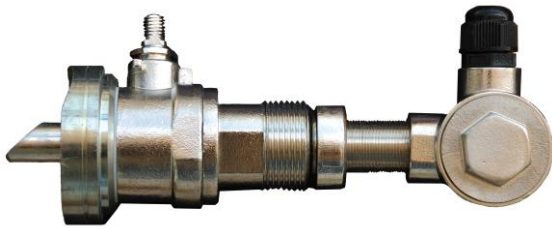1. Steel Belts
2. Stretchers
3. Rail Guide Mounting System

Steel belt fixing
Stretcher fixing

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
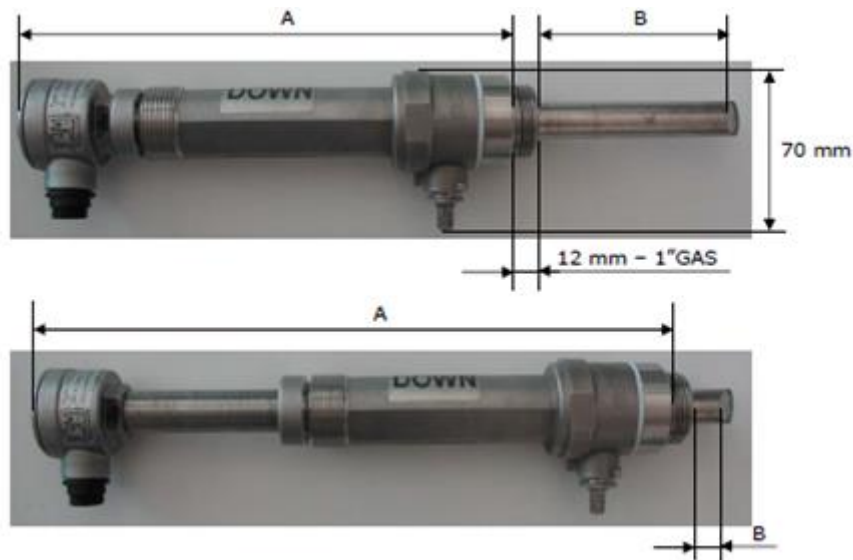**Temperature Range -20 +130 °C**
Max Cable length: 200mt
TTS100-B1-NG-1" (Short Type) Range: DN50…2000
TTS100-B2-NG-1" (Long Type) Range: DN50…2000
Working Frequency 1 MHz

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
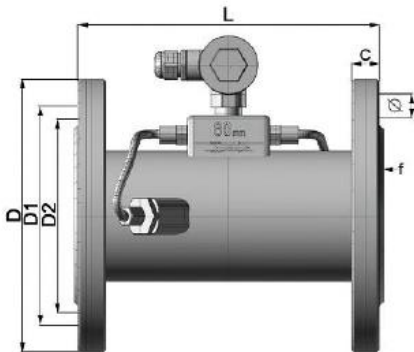**Temperature Range -40 + 160 °C**
Max Cable length: 200mt
TTS100-BNG-DNXX

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

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

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