Series GTTFP   Portable

Series GTTFP Portable Transit Time Ultrasonic Flow meter is a state-of-the-art universal transit-time flow meter using MultiPulseTM technology and low-voltage broadband pulse transmission, feature the worlds advanced non-invasive flow measurement technology providing a measuring system with unsurpassed accuracy, versatility, ease of installation and dependability.

Although designed primarily for cleaner liquids, the flow meter can reliably measure liquids containing moderate amounts of suspended solids or aeration.

GTTFP is designed for long or short term flow measurement surveys on full-pipe liquid systems and is ideal for verifying calibration of permanently mounted flow meters of all types.

▲ **Transmitter & Transducer**

▲ **Full set of Portable**

Features

1. Advanced DSP and MultiPulse™ Technology.
2. 40-hour battery (rechargeable), back-lit 4 lines display all integrated into a rugged, watertight enclosure.
3. Cost-effective and versatile, Providing SD card data logger function, can search the event of totalized flow, flow rate, velocity etc. The SD card capacity is based on users' choice and the maximum can reach 8GB.
4. Works reliably in both clean and somewhat dirty liquids.
5. Lightweight and easily transportable in box.
6. Various outputs of 4-20mA, Frequency (for flow rate), RS232 and Data logger, etc.
7. Optional Heat flow BTU function, a pair of temperature sensors for inlet and outlet temperature display and heat flow rate, total heat flow display.

Applications

- Water (Hot water, Cooling water, Potable water, Sea water etc.)
- Petroleum products
- Chemicals, including alcohol, acids, etc
- HVAC, energy measurement system
- Beverage, food and pharmaceutical processors
- Secondary sewage, waste treatment, etc.
- Power plants (nuclear power plants, thermal & hydropower plants), heat energy boiler feed water.
- Metallurgy and miming applications
- Pipeline leak detection, inspection, tracking and collection

K transducer

Size	A	B	C	D
K1: 3/4", 1"	55	39	42	34
K2: 3/4", 1", 1-1/4"	64	46	42	43
K3: 1-1/4", 1-3/4", 2"	80	46	42	61
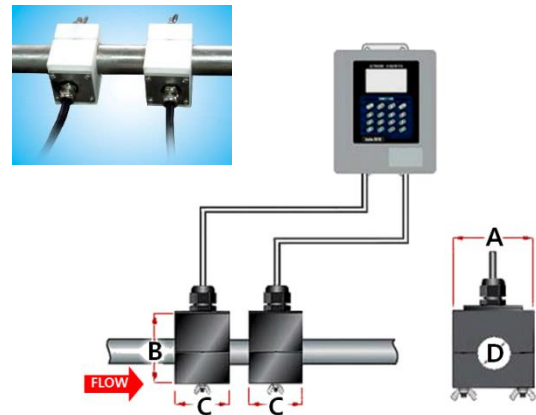
Note: K transducers utilize the Round-Clamp method, and the transducers' transmitting and receiving sides are connected with the pipe surface thoroughly to acquire enough coupling area, better reliability, stability, etc.

Principle of Measurement

GTTF 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 ($\triangle$t). When the flow is still, the time difference ($\triangle$t) is zero. Therefore, as long as we 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.

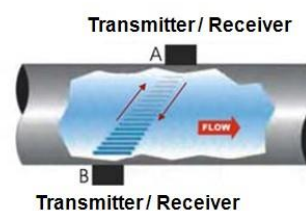$$V = K * \triangle t$$
$$Q = S * V$$

Where:

V: Liquid velocity

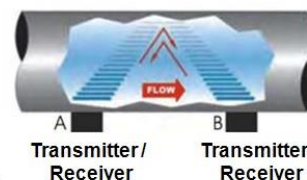**K**: Constant

$\triangle$t: Difference in time of flight

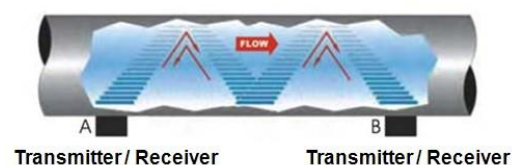**Q**: Flow rate

S: Sectional area of pipe

(a) Z method
Transmitter / Receiver
A
FLOW
B
Transmitter / Receiver

(b) V method
A
FLOW
B
Transmitter / Receiver   Transmitter / Receiver

(c) W method
FLOW
A
B
Transmitter / Receiver   Transmitter / Receiver

Technical Specifications

Transmitter	
Power Supply	Internal 12AH Charging battery, Provides 42 hrs. Of continuous operation @ 20°C. Charging power: 110/220VAC
Velocity	0.003 to 12m/s, bi-directional
Display	4 line×16 English letters LCD, it can display total flow, flow rate, velocity and meter running status etc.
Units Rate Totalized	User Configured (English and Metric); Rate and Velocity Display; gallons, ft³, barrels, lbs, liters, m³, kg
Output	Data storage function, 4~20mA, Frequency (For Flow rate or Total flow), Relay (For Total flow or Alarm), RS485(Modbus-RTU) Options: Wireless handheld operator, GPRS
Accuracy	±1.0% of reading at rates >0.5 m/s ±0.005 m/s of reading at rates <0.5 m/s
Sensitivity	0.003m/s
Repeatability	0.2% of reading
Security	Keypad lockout, access code enable

Transducer	
Liquid Types Supported	Virtually most any liquid containing less than 2% total suspended solids (TSS) or aeration
Suited Liquid Temperature	Standard Temp.: -40°C ~121°C High Temp.: -40°C ~250°C
Cable Length	Standard: 6m (20 feet); Opt: Maximum: 300m (990 feet)
Pipe Size (mm)	Standard M transducer: DN40 -1000mm L transducer: DN1000-4500mm S transducer: DN20-50 K-mode round transducer: DN20-50mm (For K, S transducer on the stainless steel pipe, It is better that the thickness of the pipe is more than 2.5mm. If not, please consult us, we have another solve plan.) (Above transducers material is POM, is you need stainless steel transducers, please contact the factory.)
Dimensions and weight	S: Size: 42*25*25; weight: < 0.2kg M: Size: 60*43*43; weight: < 0.5kg L: Size: 80*53*53; weight: < 1.0kg

Parts Identification

- **Transmitters:**

Portable transmitter

- **Transducers:**

K transducer

High temperature transducer
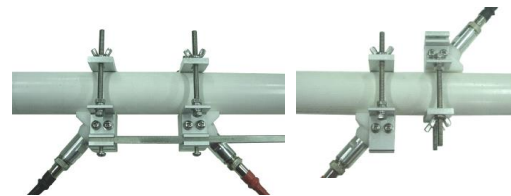

S-Transducer

M-Transducer

L-Transducer

M-Mounting Frame (V method and Z method)

S-Mounting Frame (V method and Z method)

- **Accessories:**

Portable Case

Flexible belts

Couplant

Model Selection

Model: GTTFP		Portable Ultrasonic Flow Meter * (Transducers)
Output Selection 1	N	None
	0	Data storage function
	1	4-20mA
	2	Frequency Output (Flow rate Totalizer)
	3	Electric Relay (Totalizer or Alarm)
	4	RS485 Output (ModBus-RTU) (Output Selections 4 and 6 can be selected one.)
	5	Wireless handheld operator
	6	GPRS Wireless Module (Excluding software)
Output Selection 2		Same as above
Output Selection 3		Same as above
Power Supply (Charger connector type)	D	100-240VAC

Model: DP			Clamp-on Transducer type
Transducer type	S		Small (DN20-DN50)
	M		Medium (DN40-DN1000)
	L		Large (DN1000-DN4500)
	Kxx		K Small-Pipe Round Clamp-on (DN20-DN50), xx is inside DN (Above transducers material is POM, if you need stainless steel transducers, please contact the factory.)
Transducer Mounting Frame	N		None
	FS		for DN20-DN50
	FM		for DN50-DN1000
Transducers Temperature	N		-40~121°C
	H		-40~250°C (For larger transducer, consult us.)
Mounting Type		N	Common
		M	Magnetic (suitable for pipe above DN80)
Cable Length		6m	6 meters straight cable (STD.)
		Xm	Common cable Max 300m
		XmH	High temp. cable Max 300m

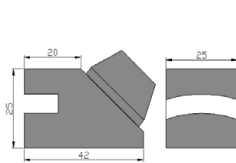**Parts Number Construction example:**

GTTFP-0 4 N-N-D /DP-M -N-N-N-8m

Description:

GTTFP portable ultrasonic flow meter, Data storage function and RS485 output, with 100~240V AC power supply; Standard M type transducer, no mounting frame, standard temperature, Common, 8m straight cable.
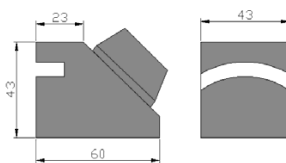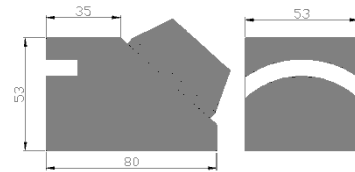
Parts & Dimension

● Portable Case

● S Transducer   ● Std. M Transducer   ● L Transducer
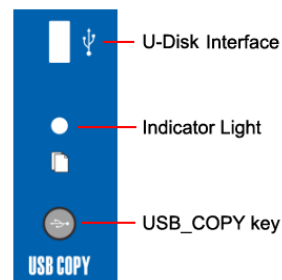
Wiring Connection

Fig 1   GTTFP wiring-1

Fig2   GTTFP Data Storage Function

Notes for outputs:

1. Data Storage Function
   Plug a U-Disk into U-Disk interface, and then press USB_COPY key to download data.
2. Current Output:
   The current output 4-20mA is connected to the terminal OUTPUT 4-20mA as showed in Fig 1.
3. OCT Output:
   The frequency (OCT) output is connected to the terminal OCT Output.
   Frequency output is for flow rate or totalizer output.
4. Communication interface: (only one of bellow options is available at one time.)
   Option 1: RS485 (ModBus-RTU)
   Option 2: GPRS
5. Heat Flow Function
   We provide temperature sensor Pt1000.
6. Wireless Handheld Operator
   Read data and operate the meter by wireless communication.