



GROWCO INTERNATIONAL

TOTAL MEASUREMENT SOLUTIONS

GDMTFP SERIES Portable Transit Time Ultrasonic Flow Meter

Bulletin GDMTFP-TT-08 Rev01

Growco GDMTFP Series Portable Transit Time Ultrasonic Flow Meter is a state-of-the-art universal transit-time flow meter designed using our unique 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. GDMTFP 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



▲ Data logger

Features:

1. Advanced Unique Technology.
2. 42-hours 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 be reached up to 8GB.
4. Works reliably in both clean and somewhat dirty liquids.
5. Lightweight and easily transportable in box.
6. 4-20 mA, OCT pulse (flow rate or total flow) output as standard output.
7. Optional Heat flow BTU function, two temperature transmitters 4-20mA input for inlet and outlet temperature display and heat flow rate, total heat flow display.

Applications:

- ◆ Water (hot water, cooling water, De-ionized water, potable water)
- ◆ Petroleum products
- ◆ Chemicals, including alcohol, acids, etc
- ◆ HVAC, energy measurement system
- ◆ Beverage, food and pharmaceutical processors

Principle of Measurement:

Growco GDMTFP 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 (Δt). When the flow is still, the time difference (Δt) 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.

$$V = K * D * \Delta t$$

V: Liquid velocity

K: Constant

D: Distance between the two transducers

Δt : Difference in time of flight

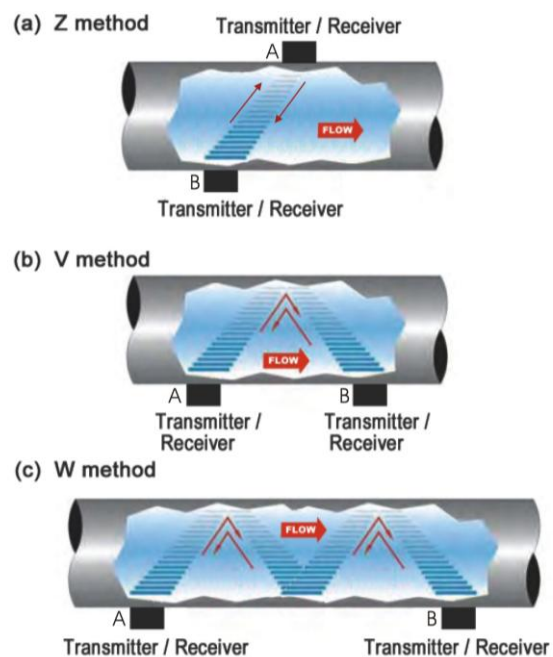


Figure 1

Specifications:

Transmitter	Power Supply	Internal 7.2AH charging battery, Provides 42 hrs of continuous operation at 20 °C. Charging power: 95VAC – 280VAC.
	Velocity	0 ~± 40 ft/s (0 ~ ±12m/s), bi-directional
	Display	4 line×16 English letters LCD back lit, can display total flow, flow rate, velocity and meter run status, etc.
	Units Rate Totalized	User Configured (English and Metric); Rate and Velocity Display; (FWD, NET, REV or BATCH) gallons, ft ³ , barrels, lbs, liters, m ³ ,kg
	Output	4~20mA, Pulse, Relay, RS232C or RS485, options: up to 8 GB Data logger, Hart +(4~20mA), Modbus
	Accuracy	±1.0% of reading at rates >0.5 m/s);
		±2.0% of reading at rates <0.5 m/s);
	Sensitivity	Flow Rate: 0.001f/s (0.0003m/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	Std. Temp. Transducer: -40°C~121°C High Temp. Transducer: -40°C~250°C
	Cable Length	Std: 20 feet (6m); Opt: Maximum: 990 feet (300m)
	Pipe Size	Std M transducer: DN40-1000 L transducer: DN1000-4500 S transducer: DN15-50 K-mode round transducer: DN15-50
	Transducer Size	S: Size:42×25×25; weight:<0.3kg M: Size:60×43×43; weight:<0.6kg L: Size:80×53×53; weight:<1.0kg

Parts Identification:

Transmitter:

Portable transmitter



Transducer:



K mode Transducer



S-Transducer



Transducers with Magnetic Mounting Frame



M-Transducer



L-Transducer

Accessories:



Portable Case



Couplant



Flexible Belts

Portable Ultrasonic Flow Meter Selection Table

Model	GDMTFP	- X	-X	-X	- X	-X/	* (Transducers)
Portable Series							
Output							
N: N/A							
1: 4-20mA							
2: OCT Pulse (Flow rate or totalizer output)							
3: RS232 Note: RS232 and RS 485 cannot be used at the same time. RS232 is Standard. Also Data logger is via RS232 port too.							
4: Data Logger							
Output Selection 1							
Same as Output Selection 1							
Output Selection 2							
Same as Output Selection 1							
Power Supply (Charger connector type)							
A: 110VAC							
B: 220VAC							
Extend the battery life							
N: N/A							
A: Operation time is more than 120 hours (Build-in, Charging time is more than 15 hours)							

Model	DP	- X	-X	- X	- X	- X
Transducer Type						
S: Small (DN15-40)						
M: Middle (DN40-1000)						
L: Large (DN1000-4500)						
Kxx: Small-Pipe Round Clamp-on (DN15-50, xx is Inner Diameter.)						
(For K, S transducer on the stainless steel pipe, It is better that the thickness of the pipe is more than 3mm. If not, please consult us for other options.)						
(Above transducers material are PTFE, if you need stainless steel transducer, please consult us.)						
Transducer Mounting Frame						
FS (DN15-50)						
FM (DN40-250) (For larger pipe size, please consult us.)						
Transducers Temperature						
N: -40~121°C						
H: -40~250°C (only available for S, M type Transducers, for L type, please consult us.)						
Mounting Type						
N: Common						
M: Magnetic force (only available for M, L type; M type means DN80—1000.)						
Cable Length						
S1: 4m Flexible cable S2: 4m Straight cable						
L1: 8m Flexible cable L2: 4-300m Straight cable						
(Note: Spiral cable cannot be high temp.)						

Parts Number Construction example:

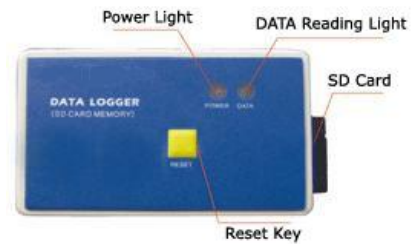
GDMTFP-2NN-A /DP-MNS2-N

Description: GDMTFP portable ultrasonic flow meter, OCT pulse output, Non-multiple output selections, with 110VAC power supply; Standard M type transducer, no mounting frame, standard temperature, 4m straight cable, standard battery.

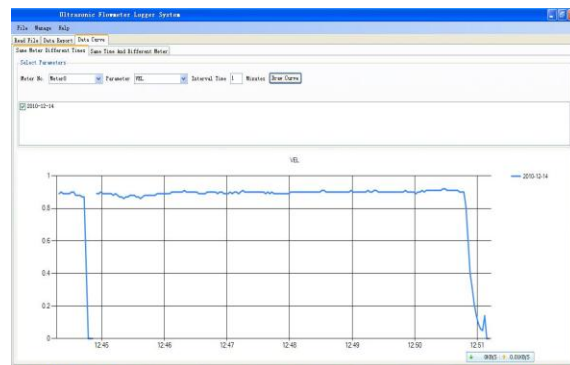
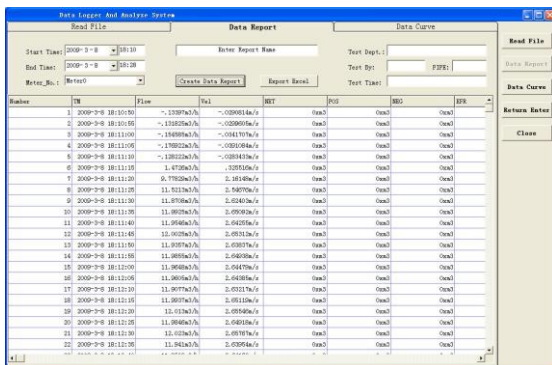
Data Logger and Software Utility:

Features:

1. Provides data logging, based on SD card data memory, the memory capacity can be 512M,1GB, 2GB, 4GB, 8GB. Normally, 1GB can store 5 year data with 5 minutes logging interval.
2. Very easy to read data from SD card (just plug it out from Data Logger, and run Data Logging and Analyze software, browse the SD card file).



▲ Data logger

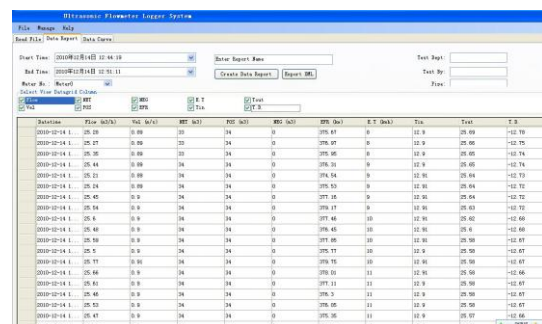


3. Data report and Data Curve functions.

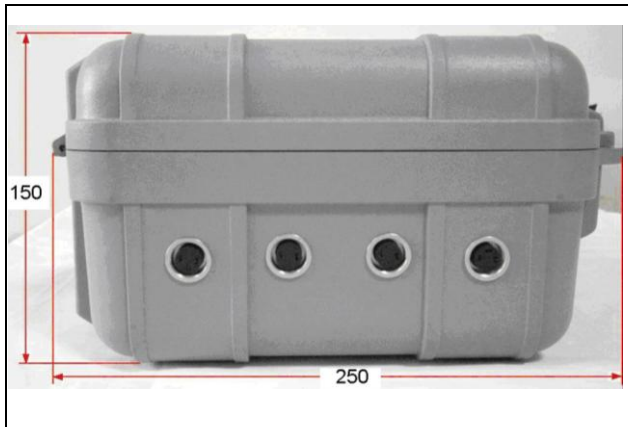

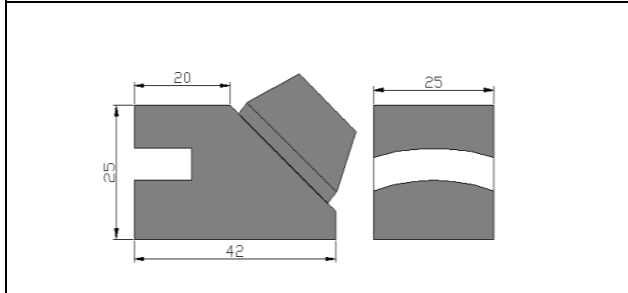
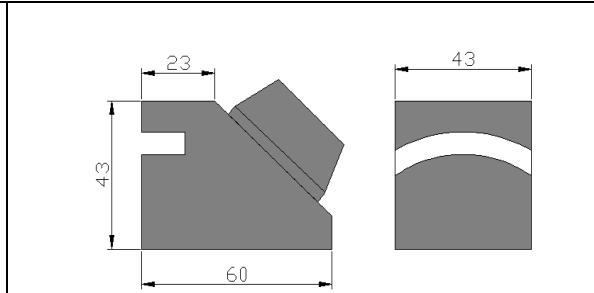
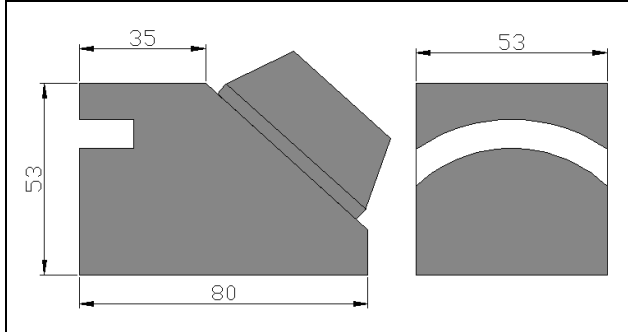

4. User can edit and Excel report and print it on PC.

5. Logging Parameters:

Flow Rate, Velocity, Positive total flow, Negative total flow, Net total flow, Total Heat flow, Temperature in, Temperature out, Temperature difference and Heat flow rate. If user is interested in other parameters, please consult us. Users can delete the unnecessary parameters from Excel Table and then print the data table.

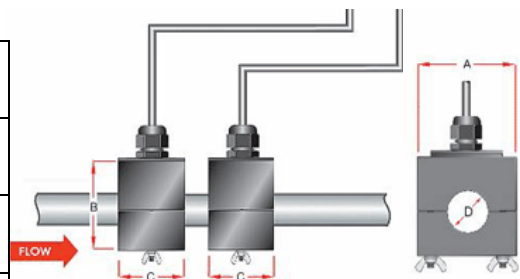


Dimensions:

	
Portable Case Dimensions	
	
S Transducer	Std. M Transducer
	
L Transducer	Mounting Frame Transducer

Note: K mode transducers utilize the Round-Clamp method, and the transducers' transmitting and receiving sides are connected with the pipe surface thoroughly, so that this series have the features of reliability, enough coupling area, excellent stability, etc.

Size	Material	A	B	C	D	Measuring Range
1/2" (15)	PTFE	50	42	44	18	2-100LPM
3/4"~1" (20-25)	PTFE	50	53	44	28	4-375LPM
1-1/4" (32)	PTFE	50	63	44	35	15-570LPM
1-3/4" (40)	PTFE	66	71	44	45	18-830LPM
2" (50)	PTFE	74	92	66	56	30-1500LPM



K mode transducer for Pipe DN15-50

Examples of K mode codes :

K1 = 15 - 20 mm, K2 = 20 - 32 mm,
K3 = 40 - 50 mm

Hence, it is recommended to buy the three types of K mode transducers for pipe sizes range from 15 - 50 mm.

Wiring Connection:



Fig 1. wiring-1



Fig2. wiring-2



Fig 3. GDMTFP Heat Flow Function

Notes for outputs:

1. Current Output:
The current output 4-20mA is connected to the terminal OUTPUT 4-20mA as showed in Fig 1.
2. OCT Pulse Output:
The OCT pulse output is connected to the terminal OCT Output as showed in Fig 2.
3. Communication interface: (only one of bellow options is available at one time.)
Option 1: RS232: connected to PC or laptop through RS232 interface.
Option 2: RS485: connected to PC or laptop through RS232 interface.
Option 3: ModBus: connected through RS232 interface with related protocol.
Option 4: Hart (+4-20mA): connected through RS232 interface with relative protocol.
Option 5: GPRS/GSM: connected through RS232 interface. One end of the connecting cable is provided with a connector to the GPRS module.
4. Heat Flow Function: We use temperature transmitter Pt100 (or Pt500, Pt1000) which are connected to the terminals Tin, Tout. as showed in Fig 3.

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