Series DMHF Heat Meter

The Series DMHF adopt the MultiPulse™ Technology, Digital Signal Processing Technology and Error Correction Technology, which are the state-of-the-art non-invasive flow measurement technology, with a measuring system of very high accuracy, versatility, low cost of installation and ownership. The meter can calculate automatically caloric content of water under 0 ℃ ~200 ℃ temperatures, and can obtain instantaneous caloric value and totalized caloric value. The pipe range should be DN20-2500 (For series Insertion, the allowed pipe range is DN65-2500. For series Flanged, the allowed pipe range is DN20-2500.).

Features

1. For transmitter, users can select fixed types or Portable types.
2. For transducer, non-invasive Clamp-on and Insertion type are available.
3. For temperature sensor, utilize Pt1000 with 0.1%, clamp-on and the Insertion type are available.
4. Internally configured batch controller makes batch control convenient and accurate.
5. No moving parts, no pressure drop, no need of maintenance.
6. Easy and economical installation, hot-tapped installation.
7. Daily, monthly and yearly totalized flow: totalized flow for the last 64 days and months as well as for the last 5 years can be reviewed.
8. Optional SD card Data logger output, can memory Total heat flow, Heat flow rate, etc.

Applications

- Measuring heat flow
- Sewage and drainage water with small particle quantity
- Beverage and food processors
- HVAC hot and cool water
- Water and waste treatment
- Power plants, heat energy boiler feed water.
- Energy consumption supervision and water conservation management
- Metallurgy and miming applications
- Pipeline leak detection, inspection, tracking and collection
- Energy measurement and balancing
- Network monitoring

Principle

DYNAMETERS Heat Meter is designed to measure the fluid velocity and temperature of liquid within a closed pipe. The transducers are a non-invasive, clamp-on type, which will provide benefits of non-fouling operation and easy installation. The temperature sensors are Pt1000 and have high accuracy.

When measuring velocity, the DMHF transit time heat 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 where the sound transverses the pipe twice, or W-method where the sound transverses the pipe four times, or in Z-method where the transducers are mounted on opposite sides of the pipe and the sound crosses the pipe once. This selection of the mounting method depends on pipe and liquid characteristics. The heat meter operates by alternately transmitting and receiving a frequency modulated burst of sound energy between the two transducers and measuring the transit time that it takes for sound to travel between the two transducers. The difference between the transit-time is directly and exactly related to the velocity of the Liquid in the pipe, as shown in Figure 1.

$$V = K*D* dt$$

Where: V: Liquid velocity
K: Constant
D: Distance between the transducers
dt: difference in time of flight

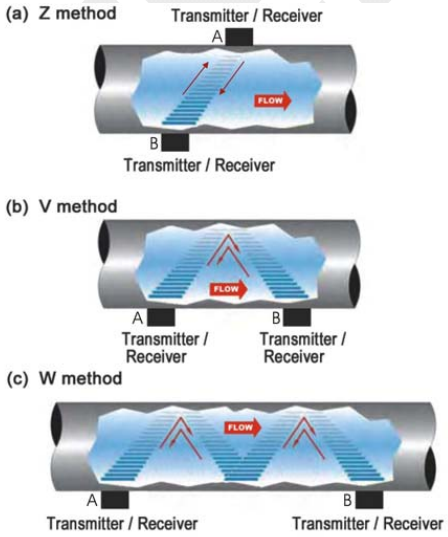


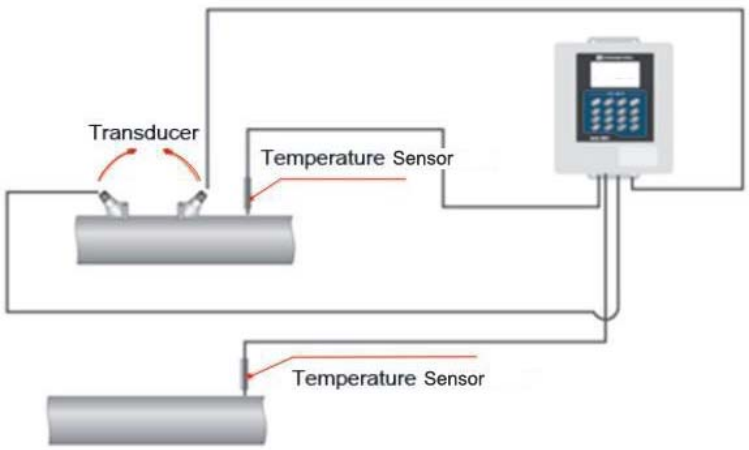
Figure 1

When measuring temperature, the two temperature sensors of Pt1000 clamp on the pipeline or insert in the pipe, and get two temperature values.

The value of energy is indicated / measured based on the following mathematical model:

$$Q = \int_{V2}^{V1} k(t1 - t2)dV$$

Where: Q – Volume of heat taken
V – Volume of flowing water
k – Heat coefficient of water
t1 – Inlet temperature of water
t2 – Outlet temperature of water



Specifications

Transmitter	Power Supply	90-240VAC 50/60Hz ±15%, 5VA max. 10 - 28 VDC, 2.5VA max. Solar supply 12VDC
	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 running 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, Frequency, Relay, RS232C or RS485(Modbus), options: up to 8 GB Data logger, Hart +(4~20mA), ZigBee, 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	Flow Rate: 0.001ft/s (0.0003m/s)
	Repeatability	0.2% of reading
	Security	Keypad lockout, access code enable
Transducers	Liquid Types Supported	Virtually most any liquid containing less than 2% total suspended solids (TSS) or aeration
	Suited Liquid Temperature	Std. Temp.: -40℃~121℃ High Temp.: -40℃~250℃ (for Clamp-on) -40℃~150℃ (for Insertion)
	Cable Length	Std: 20 feet (6m); Opt: Maximum: 990 feet (300m)
	Pipe Size	L transducer: DN1000 – 2500 M transducer: DN40 –1000 S transducer: DN20 – 50 K round clamp transducer: DN20 – 50 Insertion transducer: DN65 – 2500 Flanged transducer: DN65 – 2500 (mm)
	Transducer Size	S: Size: 42×25×25(mm); weight: < 0.2kg M: Size: 60×43×43(mm); weight: < 0.5kg L: Size: 80×53×53(mm); weight: < 1.0kg
Temperature Sensors (Pt1000)	temperature	0℃~200℃
	Type	Clamp-on and Insertion
	Accuracy	±0.1%

Parts Identification:

1. Transmitters:

Std. wall-mounted

Explosion-proof (ATEX)

portable

2. Transducers:

Clamp-on type

Insertion type

Flanged type

3. Temperature Sensors:

Clamp-on Pt1000

Insertion Pt1000

Model selection for DMHF Ultrasonic Heat Meter

Model **DMHFB/C/F** **-X** **-X** **-X** **-X * (Transducers)**

Clamp-on/Insertion/Flanged

Power Supply

A—110VAC
B—220VAC
E—24VDC
S—Solar supply (including solar board)

Output Selection 1

N—N/A
1—4-20mA
2—Frequency Output (Flow rate)
3—Electric Relay (Totalizer or Alarm)
4—RS232
5—RS485 (ModBus-ASCⅡ)
6—RS485 (ModBus-RTU)
7—Hart+(4-20mA) (2 loops)
8—Data Logger & Software
9—GPRS Wireless Module (Excluding software)
10—ZigBee Wireless Module

emperature Input Type (Please contact with the factory if use thermal resistance directly.)

C1-Pt1000 Clamp-on(20-1000mm) (0～200℃) Two-wire system temperature sensor input
C2-Pt1000 Insertion(100-2500mm) (0～200℃) Two-wire system temperature sensor input

Transducer Type

Refer to DB (Clamp-on), DC (Insertion), DF (Flanged) transducer type selections

Note:

1. Output Selection: 4-10 can be select one.

2. Our price for Hart output is very reasonable because we are not member of Hart Communication Foundation. Hope you are informed.

Model DB -X -X -X -X -X -X

Transducer Type

S— Small (DN20-50)

M— Medium (DN40-1000)

Ex-M—Ex-proof Medium (DN40-1000)

L— Large (DN1000-4500)

Kxx— K Small-Pipe Round Clamp-on (DN20-50), xx is inside Diameter.

(Above transducers material is PTFE, if you need stainless steel transducers, please contact the factory.)

Transducer Mounting Frame

N— None

FS— for DN20-50

FM— for DN50-1000

Transducer Temperature

N— - 40～121℃

H— - 40～250℃(Only for S,M transducer. If larger transducer, consult us.)

Mounting Type

N— Common

M— Magnetic (suitable for pipe above DN80)

Pipeline Diameter

DNX – DN20, DN4500

Cable Length

Xm - Common cable, Max 300m

XmH - High temp. cable Max 300m

Parts Number Construction example:

For example：DMHFB-B-1 2 3-C1/ DB-M-N-N-N-DN400-30m

Description: DMHFB clamp-on heat meter, 220VAC power supply, 4-20mA output, Frequency and relay output; Pt1000 Clamp-on temperature input; standard M type transducer, no mounting frame, standard temperature, common mounting type, used in pipeline DN400, transducer cable length 30m.

Model **DC** **-X** **-X** **-X** **-X** **-X**

Transducer Type

1—For Welded Pipe (Carbon steel etc.)

2—For Cast Iron Pipe

3—For Cement Pipe (Cement pipe wall thickness less than 110mm)

Ex-1—Explosion-proof for Welded Pipe (Carbon Steel etc.)

Ex-2—Explosion-proof for Cast Iron Pipe

Ex-3—Explosion-proof for Cement Pipe (Cement pipe wall thickness less than 110mm)

Transducers Temperature

N— - 40～121℃

H— - 40～150℃

Pipeline Diameter

DNX— DN65, DN4500

Cable Length

Xm - Common cable, Max 300m

XmH - High temp. cable, Max 300m

Work Underwater

0—NO

1—YES

Model **DF** **-X** **-X** **-X** **-X** **-X** **-X**

Flanged Series

Transducer Type

0—Standard flanged type (DN65-2000)

1—Small flanged type (DN20-65)

Pressure Level

A—1.0 MPa

B—1.6 MPa

C—Please contact the factory if High Pressure.

Pipeline Material

0—Carbon Steel

1—Stainless Steel

Transducer Temperature

N— - 40～121℃

H— - 40～150℃

Pipeline Diameter

XXXX – DNXXXX, 0065—DN65, 4500—DN4500

Cable Length

Xm - Common cable, Max 300m

XmH - High temp. cable Max 300m

Model **DMHFP -X X X -X * (Transducers)**

Series Portable

Output Selection 1

N—N/A

1—4-20mA

2—Frequency (Flow rate, if need relay for totalizer output, please specify)

3—RS232 **Note: RS232 and Data logger cannot be used at the same time.**

4—Data Logger

Temperature Sensor Type (Please contact with the factory if use thermal resistance directly.)

C1-Pt1000 Clamp-on (20-1000mm) (0～200℃)Two-Wire System Temperature sensor input

C2-Pt1000 Insertion (100-4500mm) (0～200℃)Two-Wire System Temperature sensor input

Power Supply (charger connector type)

A—110 VAC

B—220 VAC

Transducer Type

Refer to DP (Portable) transducer type selections

Model **DP -X -X -X -X -X**

Transducer Type

S— Small (DN20-50)

M— Medium (DN40-1000)

L— Large (DN1000-4500)

Kxx— K Small-Pipe Round Clamp-on (DN20-50), xx is inside Diameter.

(Above transducers material is PTFE, if you need stainless steel transducers, please contact the factory.)

Transducer Mounting Frame

N— None

FS— for DN20-50

FM— for DN50-1000

Transducers Temperature

N— - 40～121℃

H— - 40～250℃

Mounting Type

N-Common

M-Magnetic force (suitable for pipe above DN80)

Cable Length

8m—8 meters straight cable (STD.)

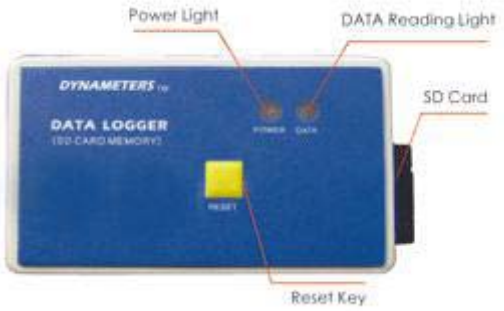
Xm—Common cable Max 300m

XmH—High temp. cable Max 300m

Data Logger and Software Utility

Features:

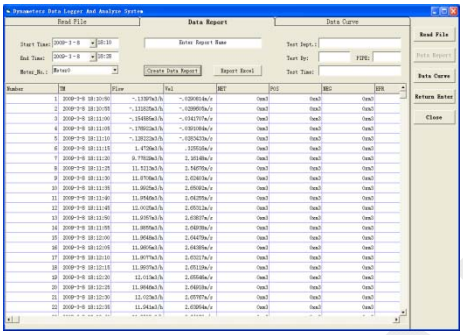
1. Provides data logging, based on SD card data memory, the memory capacity can be 512M,1GB, 2GB, 4GB, 8GB. Normally, 1GB can store 5 years data with 5 minutes logging interval.



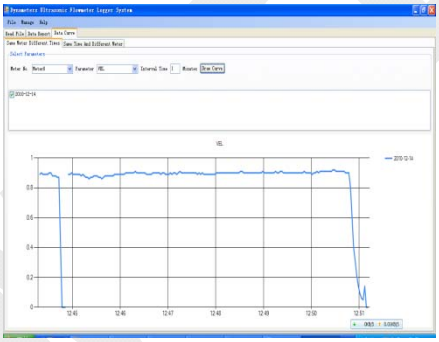
▲Data logger

2. Very easy to read data from SD card (just plug it out from Dynameters Data Logger, and run Dynameters Data Logging and Analyze software, browse the SD card file).

3. Data report and Data Curve functions (Figure2, Figure3).



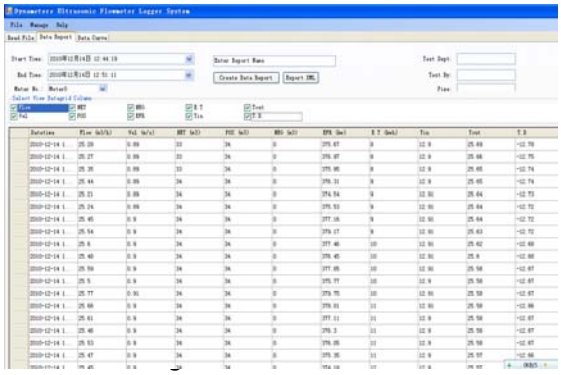
▲Figure 2



▲Figure 3

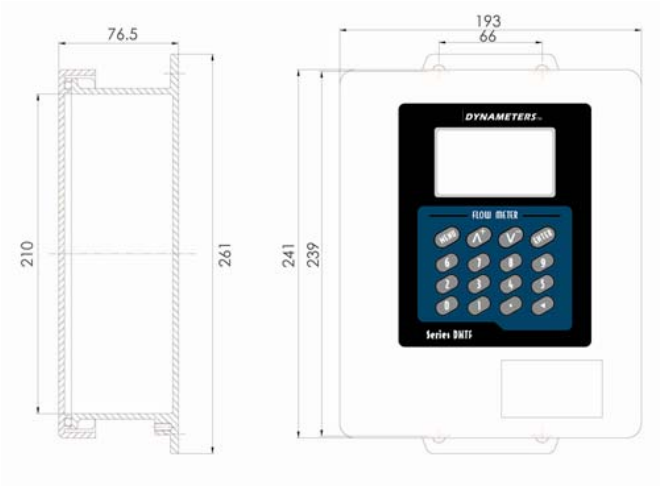
4. User can edit, generate Excel report and print it on PC (Figure 4).

5. Logging Parameters: Date and Time, 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.

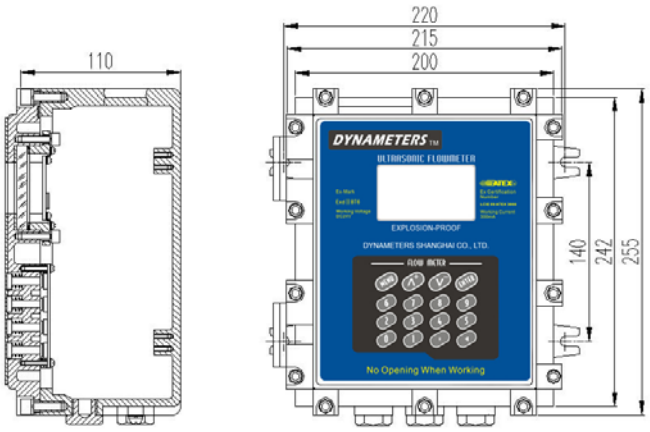


6. Users can download the software from our website: www.dynameters.com

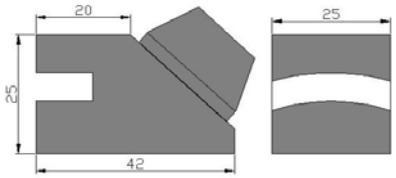
Parts & Dimensions



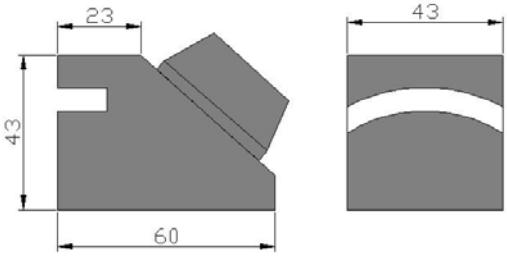
Standard Transmitter



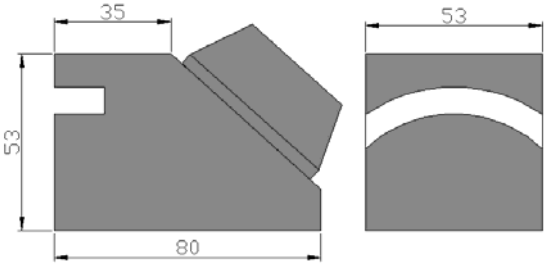
Explosion-proof Transmitter



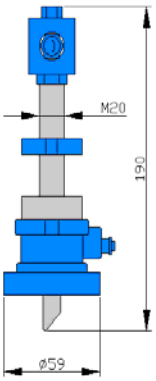
S Clamp-on Transducer



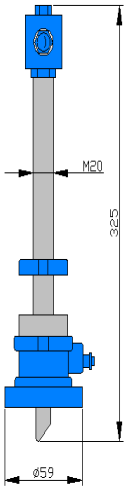
Std. M Clamp-on Transducer



L Clamp-on Transducer



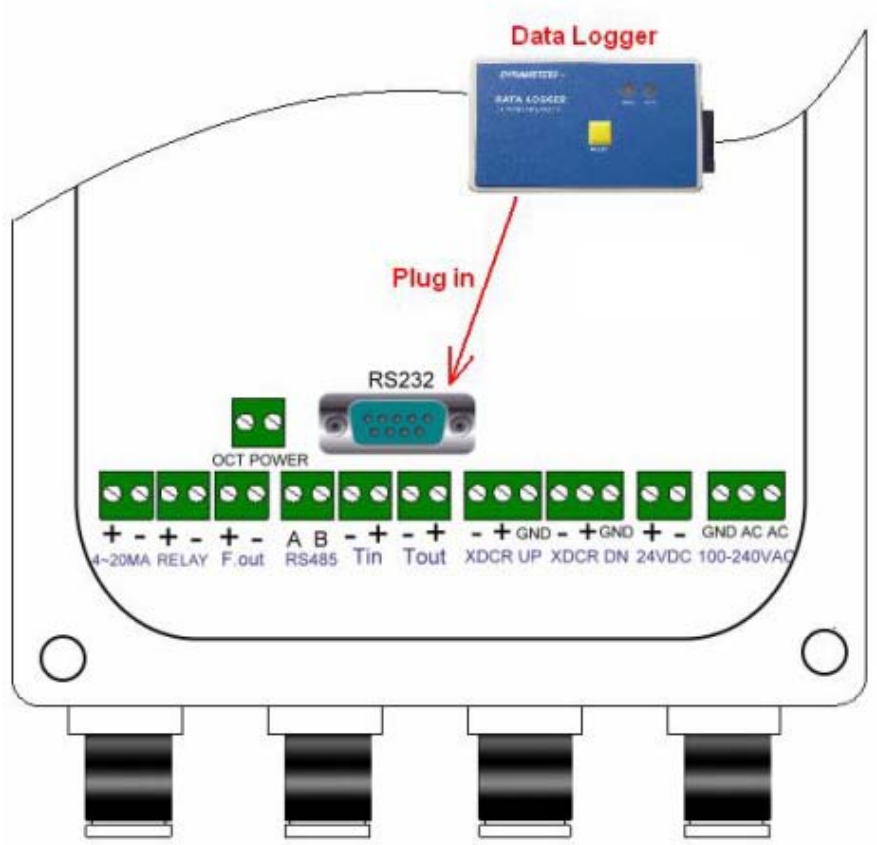
Std. Insertion Transducer



Extended Insertion Transducer

Wiring Terminals

Conduit holes: M18×1.5 for DMHFB/C/F, and M20×1.5 for DMTF-Ex.
Housing: NEMA 4 X [IP65], aluminum alloy diecasting for DMTF B/C/F.
NEMA 4 X [IP65], aluminum casting alloy for DMTF-Ex.



DYNAMETERS TM

Dynameters Shanghai Co., Ltd
No.751 Shulin Rd, Eastward New Area,
Songjiang Industrial Zone, Shanghai 201611
Tel :(86)21 6760 2289 Fax :(86)21 6760 2287
E-mail: info@dynameters.com
Web: www.dynameters.com