

## DMDF Series Ultrasonic Doppler Flowmeter



## Company Brief

Dynaflow Shanghai Co., Ltd is a professional manufacturer of series ultrasonic flow meters. It locates in the Eastward New Area, Songjiang Industrial Zone, a state-level development area of Shanghai.

We have been authorized both the certificates of National Measurement Instruments Production Permission for Transit-time Ultrasonic Flow Meters and Doppler Ultrasonic Flow Meters by People's Republic of China, and our products have been awarded ATEX Certificate and ISO9001: 2008 Certificate. We also have many patents applied to our products.



We have a Standard Flow Laboratory based on our years' experiences of ultrasonic flow meters. It utilizes the German Sartorius Weighing System and can calibrate the flow in pipes ranging from DN10 to DN600 (mm). The calibration system accuracy of reading can come up to 0.10%R. Also we have first-class facilities such as transducer aging rooms, high and low temperature testing system, etc., so we can guarantee to produce first-class products for customers all over the world.

Our main products are Transit-time Ultrasonic Flow Meters (including Clamp-on Series, Insertion Series, Flanged Series, Centre-Insertion Series, Handheld Series, Portable Series, and Explosion-proof Series etc.), Doppler Ultrasonic Flow Meters (including Clamp-on Series, Insertion Series, Portable Series and Explosion-proof Series), Ultrasonic Water Meters, Ultrasonic Heat Meters, Partially-filled pipe and Open Channel Ultrasonic Flow Meters.

Our Doppler flow meters can measure liquids containing a certain amount of air bubbles or suspended solids which are common in industrial environments such as Petroleum, Petro-chemical, Chemical, Power Plant, Metallurgy, Sewage treatment, Scientific Researches, Measurement Tests, etc. (The application in the aspect of water flow measurement of each industry is very prominent and our experience is very rich). At present, our products have been exported to many countries and regions such as the United Kingdom, Italy, Germany, Denmark, Netherlands, Belgium, Sweden, Slovenia, Greek, Russia, Turkey, United States, Australia, India, Iran, Pakistan, Thailand, Korea, Taiwan (China), HK China, Mexico, Chile, Peru, Argentina, South Africa, etc. Based on innovative R&D capability and advanced devices, Dynaflow can manufacture the best qualified ultrasonic flow meters to global customers. Dynaflow also welcome OEM

**See Dynaflox**



Dynaflox Office Building



Reception Desk



Standard Calibration Center



Weighing System



Dynaflox Product Family



Showroom

## Dynaflow Four Major Advantages

### 1. Creative We are not just speaking; we do and provide innovative products and technologies.



We have been awarded ISO, CE, ATEX certificates. More importantly, our Centre Insertion Ultrasonic Flow Meters have been authorized as a patent product by the state. The high temperature transducer we developed is able to stand up with high temperature of 250 °C . The round K mode transit-time transducer designed for small pipes, it can connect the surface of the small pipe perfectly, which makes the behavior of the transducer so stable that it can calibrate the

flow in small pipes of DN15 accurately. Our company keeps on launching new technologies and products.

### 2. Accurate We insist on the principle of process optimization to be your reliable partner.

We have the Standard Flow Laboratory based on our many years' experience. It utilizes



German imported Sartorius Weighing System, and can calibrate the pipes ranging from DN10 to DN600 (mm). The calibration accuracy can be up to 0.10% reading.

The pipe system includes pipes of: DN10-600, DN10-100, and DN10-50. Every flow meter will be calibrated in our Standard Flow Laboratory before they go out of factory.

### 3. Dedicated Perfection we pursue with permanent patience.

Dynaflow keeps on enlarging and perfecting its marketing and service network and trying its best to provide fast and best service to users.



Top-end facilities, advanced technologies, high-qualified employees together assure the high standard of our service. With hot-tapped testing and installation, professional training and lecturing for users, our specialized work team are leading the way in this field and never will slow down our steps of providing exactly what users need. We take it as our goal to get closer and closer to users.

### 4. Reliable We provide ideas, solve problems and create values.



Dynaflow is dedicated to providing best products and optimized solutions to users. We solve practical problems in flow measurement confronted by users and therefore create values. To solve series of problems we met in chemical industry, food service industry, medicine industry, such as micro flow calibration and instability of small pipe measurement, Dynaflow strengthened the research power and developing and successfully launched new products: round K mode transducer for small pipes and micro flow transducer, which remove the above troubles.



Many new products are pushed out by us, such as Ultrasonic Water meters, Heat meters, Partially filled pipe flow meter and Open Channel flow meter, etc.

## Dynaflow Series DMDF

### Ultrasonic Flow meter's Features

- ◆ For dirty liquids, which contain a certain amount of air bubbles or suspended solids
- ◆ Excellent low flow rate measurement ability, low to 0.05 m/s
- ◆ A wide range of flow measurement, high flow rate can reach 12m/s
- ◆ Regardless of the clamp-on type or insertion type, don't need to shut down the pipe flow when installing the transducers
- ◆ User-friendly configuration, only need to input diameter parameter, and then realize flow measurement
- ◆ 4-20mA for flow rate, dual relay outputs for totalizer and alarm
- ◆ High-temperature transducer is suitable to liquids of  $-40^{\circ}\text{C} \sim 250^{\circ}\text{C}$
- ◆ Explosion-proof products awarded: ATEX certificate. The explosion-proof instrument can be operated directly on panel keypad
- ◆ Accuracy: 0.5%~2.0%F.S.
- ◆ Complete in specifications, and can provide a variety of applications



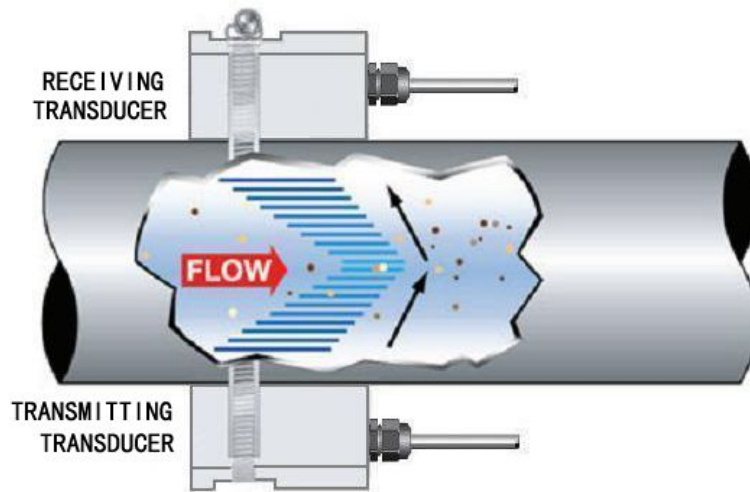
## Dynaflow Series DMDF

### Principle of Measurement

The Doppler ultrasonic flow meter is designed to measure volumetric flow of liquid within closed conduit, the pipe line must be full of liquids, and there must be a certain amount of air bubbles or suspended solids in liquid.

Transducers are clamp-on or hot-tapped insertion types, user don't need to shut down the pipe flow when install transducers.

The flow meter operates by transmitting an ultrasonic sound from its transmitting transducer, the sound will be reflected by useful sonic reflectors suspended within the liquid and recorded by the receiving transducer. If the sonic reflectors are moving within the sound transmission path, sound waves will be reflected at a frequency shifted (Doppler frequency) from the transmitted frequency. The shift in frequency will be directly related to the speed of the moving particle or bubble. This shift in frequency is interpreted by the instrument and converted to various user defined measuring units.



There must be some particles large enough to cause longitudinal reflection – particles larger than 100 micron.

When install the transducers, the installation location must have enough straight pipe length upstream and downstream. Commonly, the upstream needs 10D and downstream needs 5D straight pipe length, where D is pipe diameter.

## Dynaflow Clamp-on Doppler Flow Meter

Series **DMDFB** Doppler ultrasonic flow meter is designed to measure volumetric flow of liquid within closed conduit, the pipe line must be full of liquids, and there must be a certain amount of air bubbles or suspended solids in liquid.



The Doppler ultrasonic flow meter can display flow rate and flow totalizer, etc., and is configured with 4-20mA, Relays for Totalizer and Alarm outputs.

### Features:

- ◆ It is suitable for pipe sizes ranging from 40 to 4000mm
- ◆ For dirty liquids, a certain amount of air bubbles or suspended solids shall be contained
- ◆ Excellent low flow rate measurement ability, low to 0.05m/s
- ◆ A wide range of flow measurement, high flow rate can reach 12m/s
- ◆ High-temperature transducer is suitable to liquids of  $-40^{\circ}\text{C} \sim 250^{\circ}\text{C}$
- ◆ Do not need to shut down the pipe flow when installing the transducers
- ◆ User-friendly configuration
- ◆ 4-20mA, Relay Totalizer and Relay Alarm outputs
- ◆ Accuracy: 2.0% Calibrated span




### Applications:

- ◆ Raw sewage
- ◆ Activated sludge
- ◆ Ground water
- ◆ Pulp and paper slurries
- ◆ Chemical slurries
- ◆ Drainage
- ◆ Mining recirculation





### Technical Parameters:

|  |   |  |
|--|---|--|
|  <p>Transmitter</p>  <p>Standard Transducer</p>  <p>High Temp Transducer</p>  <p>S-S Transducer</p>  <p>Couplant</p>  <p>S-S</p> | Accuracy  | 0.5%~2.0%F.S.  |
|  | Flow Velocity Range   | 0.05m/s~12m/s  |
|  | Liquid Types  | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron. |
|  | <b>Transmitter</b>  |  |
|  | Enclosure   | NEMA 4X [IP65], cast aluminum<br>261L×193W×80H(mm),<br>10.2L×7.6W×3.2H(inch)                           |
|  | Power Supply  | Standard: 100~240VAC, 50/60Hz ±5%, 5VA Max<br>Optional: 12~28VDC, 2.5VA Max                            |
|  | Display   | 2 line × 8 characters LCD,<br>8-digit rate or 8-digit total (resettable)                               |
|  | Response Time   | User selectable: 0-99 seconds  |
|  | Outputs   | 4-20mA, Relays for Totalizer and alarm outputs   |
|  | Temperature   | -40 to +70 °C  |
| <b>Transducer</b>  |   |  |
| Measuring Range  | 0.05m/s ~ 12m/s   |  |
| Type   | Clamp-on  |  |
| Liquid Temperature   | Standard: -40 to +121 °C;<br>Optional high temperature: -40 to +250 °C  |  |
| Cable Length   | Standard Lengths: 6m [20Feet]<br>Optional Lengths: to 300m [990 Feet]   |  |
| Housing Material   | Standard Transducer: Aluminum<br>High Temp Transducer: Engineering plastic<br>Stainless Steel Transducer: Stainless Steel |  |
| Protection Class   | Standard: IP65<br>Optional: IP68, can work under water  |  |

### Model Selection Table of DMDFB Flow Meter

| MODEL  | DMDFB | -X | -X    | -DDB  | -X    | -X    | -X    | -X    | -X    |
|--|-------|----|-------|-------|-------|-------|-------|-------|-------|
| <b>Power supply</b>                                    | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| A-110VAC   |       |    |       |       |       |       |       |       |       |
| B-220VAC   |       |    |       |       |       |       |       |       |       |
| E-24VDC  |       |    |       |       |       |       |       |       |       |
| S-Solar Supply   |       |    |       |       |       |       |       |       |       |
| <b>Output Selection</b>                                | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| N-None   |       |    |       |       |       |       |       |       |       |
| 1-4-20mA   |       |    |       |       |       |       |       |       |       |
| 2-Relay for Totalizer                                  |       |    |       |       |       |       |       |       |       |
| 3-Relay for Alarm                                      |       |    |       |       |       |       |       |       |       |
| <b>(Can select the three outputs at the same time)</b> |       |    |       |       |       |       |       |       |       |
| <b>Transducer Type</b>                                 | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| 1-Standard Clamp-on (40~4000mm)                        |       |    |       |       |       |       |       |       |       |
| <b>Transducer Material</b>                             | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| N- Standard material                                   |       |    |       |       |       |       |       |       |       |
| SS-Stainless Steel                                     |       |    |       |       |       |       |       |       |       |
| <b>Liquid Temperature</b>                              | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| N- -40~121℃  |       |    |       |       |       |       |       |       |       |
| H- -40~250℃ (-40~150℃ for SS transducer)               |       |    |       |       |       |       |       |       |       |
| <b>Mounting Type</b>                                   | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| N- Common (Only for Temperature Type: H)               |       |    |       |       |       |       |       |       |       |
| M- Magnetic (Only for Temperature Type: N)             |       |    |       |       |       |       |       |       |       |
| <b>Transducer Cable</b>                                | _____ |    | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| XXX- XXX m, Standard 6m, Max 300m                      |       |    |       |       |       |       |       |       |       |

**Selection example:**

DMDFB-A-123-DDB-1-N-N-M-030

**Description:** DMDFB Doppler ultrasonic flow meter; 110VAC power supply; 4-20mA, Relays for totalizer and alarm outputs; Standard Clamp-on Transducer, Material: Aluminum; Liquid Temperature: -40 to 121℃; Standard Magnetic Mounting Type; Transducer cable length is 30m.

## Dynaflow Insertion Doppler Flow Meter

**Series DMDFC** Doppler Ultrasonic Flow Meters measure metal or plastic pipes with a certain amount of air bubbles or suspended solids.



Advanced technique allows this instrument to operate with high reliability and low maintenance. Insertion transducers permit the instrument to be installed without interrupting system pressure or flow.

In addition, no pressure loss is created. Therefore system pump horsepower requirements are reduced. The DMDFC transmitter has a full keypad designed for simple field setup and application versatility. The Two-line and eight characters LCD display for flow rate, total flow (resettable) in a variety of user selectable engineering units.

### Features:

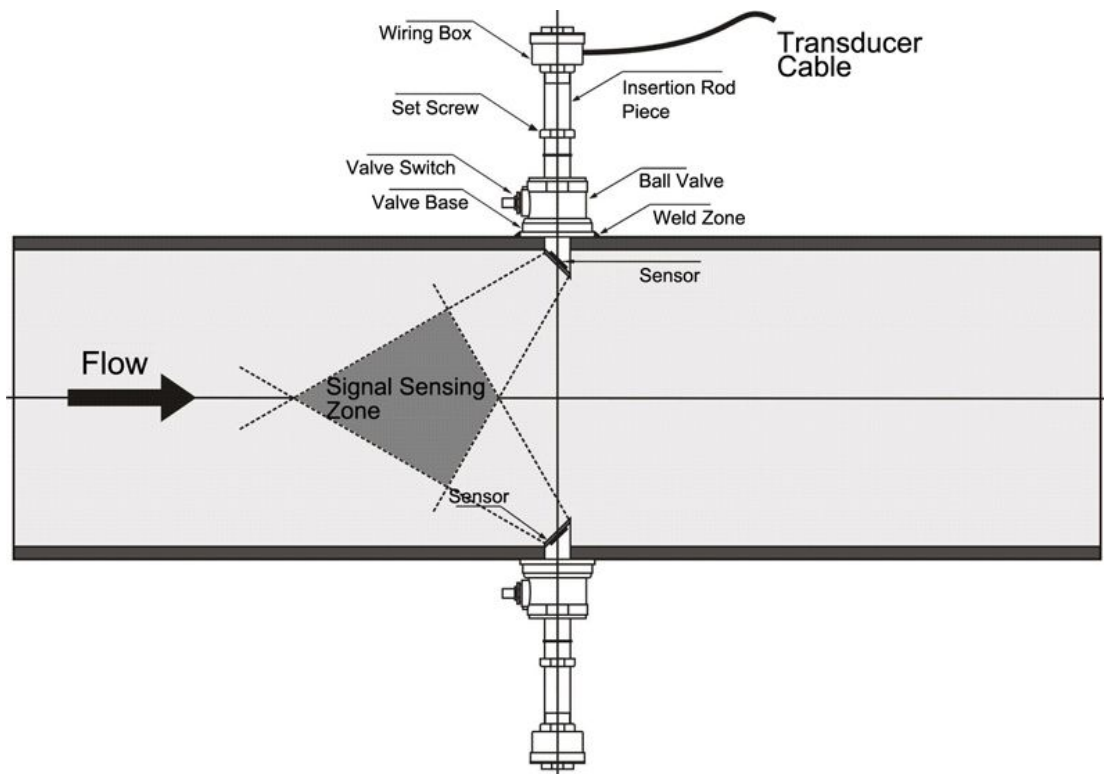
- ◆ The system can be field configured to pipe sizes ranging from 65 to 4000mm.
- ◆ Hot-tapped installation and demounted online, do not need to shut down the pipe flow when installing the transducers.
- ◆ Excellent low flow rate measurement ability, low to 0.05 m/s
- ◆ A wide range of flow measurement, high flow rate can reach 12m/s
- ◆ Automatically signal gain adjustment
- ◆ User-friendly configuration
- ◆ 4-20mA, Relays for totalizer and alarm outputs
- ◆ Accuracy: 2.0% Calibrated span

### Applications:

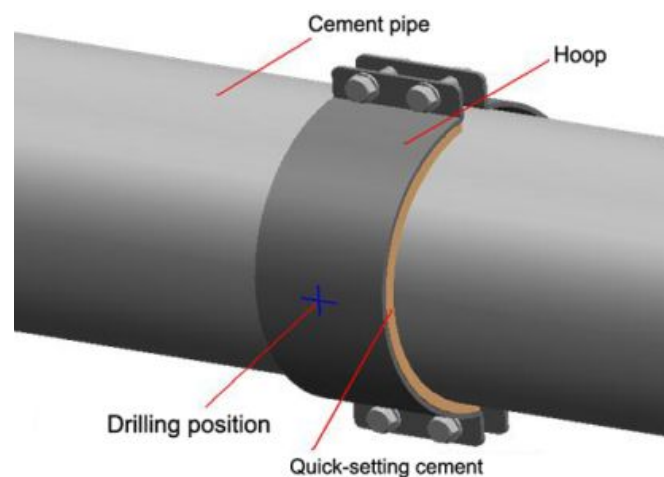
- ◆ Raw sewage
- ◆ Activated sludge
- ◆ Ground water
- ◆ Pulp and paper slurries
- ◆ Chemical slurries
- ◆ Drainage
- ◆ Mining recirculation



When installing the insertion transducer, Hot-tapped installation and demounted online, do not need to shut down the pipe flow.






While the pipe can't be welded directly, such as cement pipe, ductile iron or other unweldable material, please notify manufacturer for extended transducers (wall thickness of pipe can be up to 110mm). In this case, it also needs to install a weldable (usually carbon steel) hoop shown as below.



Installation Drawing of Weldable Hoop

### Technical Parameters:

|   |   |  |
|---|---|--|
|  <p>Transmitter</p>  <p>Standard Transducer</p>  <p>Extended Transducer</p> | Accuracy  | 0.5%~2.0%F.S.  |
|   | Flow Velocity Range   | 0.05m/s~12m/s  |
|   | Liquid Types  | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron. |
|   | <b>Transmitter</b>  |  |
|   | Enclosure   | NEMA 4X [IP65], cast aluminum<br>260L×193W×80H(mm)<br>10.2L×7.6W×3.2H(inch)                            |
|   | Power Supply  | Standard: 100~240VAC, 50/60Hz ±5%, 5VA Max<br>Optional: 12~28VDC, 2.5VA Max                            |
|   | Display   | 2 line × 8 characters LCD<br>8-digit rate or 8-digit total (resettable)                                |
|   | Response Time   | User selectable: 0-99 seconds  |
|   | Outputs   | 4-20mA, Relays for Totalizer and alarm outputs   |
|   | Temperature   | -40 to +70℃  |
|   | <b>Transducer</b>   |  |
|   | Measuring Range   | 0.05m/s ~12m/s   |
|   | Type  | Insertion (DN65-4000)  |
| Liquid Temperature  | Standard: -40 to +121℃<br>Optional: -40 to +150℃                      |  |
| Cable Length  | Standard Lengths: 6m [20Feet]<br>Optional Lengths: to 300m [990 Feet] |  |
| Housing Material  | Stainless Steel   |  |
| Protection Class  | Standard: IP65<br>Optional: IP68, can work under water                |  |

### Model Selection Table of DMDFC Flow Meter

| MODEL  | DMDFC | -X | -X | -DDC | -X | -X | -DNX | -X | -X |
|--|-------|----|----|------|----|----|------|----|----|
| <b>Power supply</b>  | _____ |    |    |      |    |    |      |    |    |
| A-110VAC   |       |    |    |      |    |    |      |    |    |
| B-220VAC   |       |    |    |      |    |    |      |    |    |
| E-24VDC  |       |    |    |      |    |    |      |    |    |
| S-Solar Supply   |       |    |    |      |    |    |      |    |    |
| <b>Output Selection</b>  | _____ |    |    |      |    |    |      |    |    |
| N-None   |       |    |    |      |    |    |      |    |    |
| 1-4-20mA   |       |    |    |      |    |    |      |    |    |
| 2-Relay for Totalizer  |       |    |    |      |    |    |      |    |    |
| 3-Relay for Alarm  |       |    |    |      |    |    |      |    |    |
| <b>(Can select the three outputs at the same time)</b>                       |       |    |    |      |    |    |      |    |    |
| <b>Transducer Type</b>   | _____ |    |    |      |    |    |      |    |    |
| 1- Standard Insertion (65~4000mm)  |       |    |    |      |    |    |      |    |    |
| 2- Extended Insertion (65~4000mm, wall thickness of pipe can be up to 110mm) |       |    |    |      |    |    |      |    |    |
| <b>Liquid Temperature</b>  | _____ |    |    |      |    |    |      |    |    |
| N- -40~121℃  |       |    |    |      |    |    |      |    |    |
| H- -40~150℃  |       |    |    |      |    |    |      |    |    |
| <b>Pipeline Diameter</b>   | _____ |    |    |      |    |    |      |    |    |
| DN X – DN65, DN3000  |       |    |    |      |    |    |      |    |    |
| <b>Transducer Cable</b>  | _____ |    |    |      |    |    |      |    |    |
| 6m - 6 meters straight cable (STD.)  |       |    |    |      |    |    |      |    |    |
| Xm - Common cable, Max 300m  |       |    |    |      |    |    |      |    |    |
| XmH - High temp. cable Max 300m  |       |    |    |      |    |    |      |    |    |
| <b>Work underwater</b>   | _____ |    |    |      |    |    |      |    |    |
| 0- No  |       |    |    |      |    |    |      |    |    |
| 1- Yes   |       |    |    |      |    |    |      |    |    |

**Selection example:**

DMDFC-A-123-DDC-1-N-DN100-6m-0

**Description:** DMDFC Doppler ultrasonic flow meter; 110VAC power supply; 4-20mA, Relays for Totalizer and alarm outputs; Standard Insertion Transducer; Liquid Temperature: -40 to 121℃; Pipeline diameter is 100mm, transducer cable length is 6m; don't need to work underwater.

## Dynaflow Portable Doppler Flow Meter

**Series DMDFP** Doppler ultrasonic flow meter is designed to measure volumetric flow of within closed conduit, the pipe line must be full of liquids, and there must be a certain amount of air bubbles or suspended solids in liquid.



The Doppler ultrasonic flow meter can display flow rate and flow totalizer, etc., and is configured with 4-20mA, Relays for Totalizer and Alarm outputs.




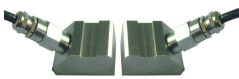


### Features:

- ◆ The system can be field configured to pipe sizes ranging from 40 to 4000mm.
- ◆ For dirty liquids, a certain amount of air bubbles or suspended solids contain
- ◆ Excellent low flow rate measurement ability, low to 0.05 m/s
- ◆ A wide range of flow measurement, high flow rate can reach 12m/s
- ◆ High-temperature transducer is suitable to liquids of  $-40^{\circ}\text{C} \sim 250^{\circ}\text{C}$
- ◆ Do not need to shut down the pipe flow when installing the transducers.
- ◆ User-friendly configuration
- ◆ 4-20mA, Relays totalizer and alarm outputs
- ◆ Accuracy: 2.0% Calibrated span
- ◆ weight about 7 Kgs
- ◆ Built-in lithium battery, can work up to 40 hours

### Applications:

- ◆ Raw sewage
- ◆ Activated sludge
- ◆ Ground water
- ◆ Pulp and paper slurries
- ◆ Chemical slurries
- ◆ Drainage
- ◆ Mining recirculation

### Technical Parameters:

|   |                     |  |                            |  |
|---|---------------------|--|----------------------------|--|
|  <p>Transmitter</p>            | Accuracy            | 0.5%~2.0%F.S.  |                            |  |
|   | Flow Velocity Range | 0.05m/s~12m/s  |                            |  |
|  <p>Standard Transducer</p>   | Liquid Types        | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron.                                 |                            |  |
|   | <b>Transmitter</b>  |  |                            |  |
|  <p>High Temp Transducer</p> | Enclosure           | NEMA 4X [IP65], ABS<br>358L×250W×150H(mm)<br>14.1L×9.8W×5.9H(inch)   |                            |  |
|   | Power Supply        | rechargeable lithium battery, 12VDC, 12Ah<br>Over 40 hours working time on a full-charge<br>Charger: 110/220VAC, 50/60 Hz ±5%, 5VA Max |                            |  |
|  <p>S-S Transducer</p>       | Display             | 2 line × 8 characters LCD<br>8-digit rate or 8-digit total (resettable)  |                            |  |
|   | Response Time       | User selectable: 0-99 seconds  |                            |  |
|  <p>Couplant</p>             | Outputs             | 4-20mA, Relays for Totalizer and alarm outputs   |                            |  |
|   | Temperature         | -40 to +70 °C  |                            |  |
|  <p>S-S Strap</p>            | <b>Transducer</b>   |  |                            |  |
|   | Measuring Range     | 0.05m/s ~ 12m/s  |                            |  |
|   | Type                | Clamp-on   |                            |  |
|   | Liquid Temperature  | Standard: -40 to +121 °C<br>Optional: -40 to +250 °C   |                            |  |
|   | Cable Length        | Standard Lengths: 6m [20Feet]<br>Optional Lengths: to 300m [990 Feet]  |                            |  |
|   | Housing Material    | Standard Transducer: Aluminum<br>High Temp Transducer: Engineering plastic<br>Stainless Steel Transducer: Stainless Steel              |                            |  |
|   | Protection Class    | Standard   | IP65                       |  |
|   |                     | Optional   | IP68, can work under water |  |



### Model Selection Table of DMDFP Flow Meter

| MODEL  | DMDFP | -X | -X | -DP-X | -X | -X | -X | -X |
|--|-------|----|----|-------|----|----|----|----|
| <b>Charging</b>  |       |    |    |       |    |    |    |    |
| A—110VAC   |       |    |    |       |    |    |    |    |
| B—220VAC   |       |    |    |       |    |    |    |    |
| <b>Output Selection</b>  |       |    |    |       |    |    |    |    |
| N-None   |       |    |    |       |    |    |    |    |
| 1-4-20mA   |       |    |    |       |    |    |    |    |
| 2-Relay for Totalizer  |       |    |    |       |    |    |    |    |
| 3-Relay for Alarm  |       |    |    |       |    |    |    |    |
| <b>(Can select the three outputs at the same time)</b>                             |       |    |    |       |    |    |    |    |
| <b>Transducer Type</b>   |       |    |    |       |    |    |    |    |
| 1-Standard Clamp-on (40~4000mm)  |       |    |    |       |    |    |    |    |
| <b>Transducer Material</b>   |       |    |    |       |    |    |    |    |
| N- Standard material   |       |    |    |       |    |    |    |    |
| S- Stainless Steel (Only for Standard Clamp-on and Small Size Clamp-on transducer) |       |    |    |       |    |    |    |    |
| <b>Liquid Temperature</b>  |       |    |    |       |    |    |    |    |
| N- -40~121℃  |       |    |    |       |    |    |    |    |
| H- -40~250℃ ( -40~150℃ for S-S transducer)   |       |    |    |       |    |    |    |    |
| <b>Mounting Type</b>   |       |    |    |       |    |    |    |    |
| N- Common (Only for Temperature Type: H)   |       |    |    |       |    |    |    |    |
| M- Magnetic (Only for Temperature Type: N)   |       |    |    |       |    |    |    |    |
| <b>Transducer Cable</b>  |       |    |    |       |    |    |    |    |
| 8m - 8 meters straight cable (STD.)  |       |    |    |       |    |    |    |    |
| Xm - Common cable, Max 300m  |       |    |    |       |    |    |    |    |
| XmH - High temp. cable Max 300m  |       |    |    |       |    |    |    |    |

**Selection example:**

DMDFP-A-123-DP-1-N-N-M-8m

**Description:** DMDFP Doppler ultrasonic flow meter; 110VAC power supply; 4-20mA, Relays for Totalizer and Alarm outputs; Standard Clamp-on Transducer; Material: Aluminum; Liquid Temperature: -40 to 121℃; Magnetic mounting type; Transducer cable length is 8m.

## Dynaflox Explosion-proof Doppler Flow Meter

**Series DMTF-Ex** Doppler ultrasonic flow meter is designed to measure volumetric flow of liquid within closed conduit, the pipe line must be full of liquids, and there must be a certain amount of air bubbles or suspended solids in liquid.



The Doppler ultrasonic flow meter can display flow rate and flow totalizer, etc., and is configured with 4-20mA, Relays for Totalizer and Alarm outputs.

### Features:

- ◆ The system can be field configured to pipe sizes ranging from 50 to 4000mm.
- ◆ For dirty liquids, a certain amount of air bubbles or suspended solids contain
- ◆ Excellent low flow rate measurement ability, low to 0.05 m/s
- ◆ A wide range of flow measurement, high flow rate can reach 12m/s
- ◆ Automatically signal gain adjustment
- ◆ Do not need to shut down the pipe flow when installing the transducers.
- ◆ User-friendly configuration
- ◆ 4-20mA, Relays for totalizer and alarm outputs
- ◆ Accuracy: 2.0% Calibrated span

**Approvals: II 2G, Exd II BT6, LCIE 09 ATEX 3088**

### Solutions:

For petrochemical plant and oil field, oily wastewater discharge, wastewater, sewage, oil drilling slurry, or all explosion-proof occasion of flow monitoring and measurement.

When installing insertion transducer, Hot-tapped installation and demounted online, do not need to shut down the pipe flow.

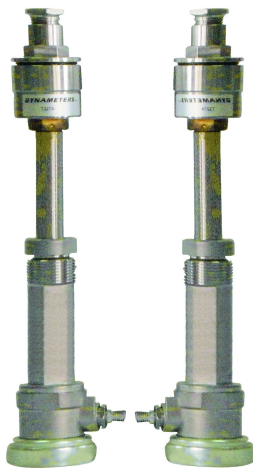


Standard Explosion-proof Clamp-On

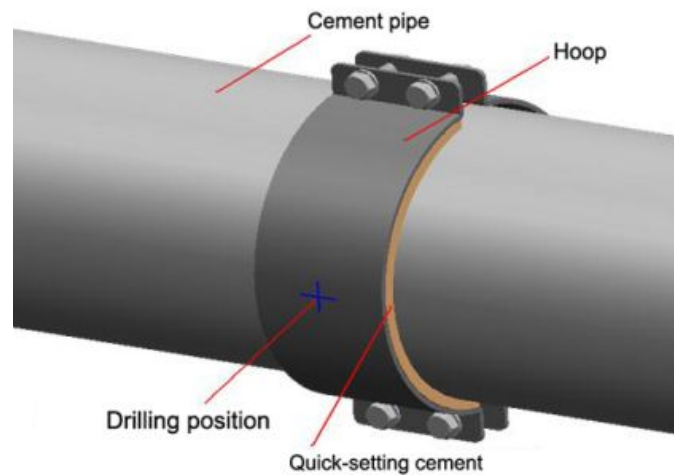


Standard Explosion-proof Insertion

When installing insertion transducer, the pipe can't be welded directly, such as cement pipe, ductile iron or other unweldable material, please notify manufacturer for extended transducers (wall thickness of pipe can be up to 110mm). In this case, it also needs to install a weldable (usually carbon steel) hoop shown as below.




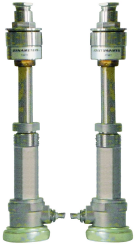




Extended Explosion-proof Transducers



Installation Drawing of Weldable Hoop

### Technical Parameters:

|  |                                      |  |                            |
|--|--------------------------------------|--|----------------------------|
| <br>Transmitter   | Accuracy                             | 0.5%~2.0%F.S.  |                            |
|  | Flow Velocity Range                  | 0.05m/s~12m/s  |                            |
|  | Liquid Types                         | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron.       |                            |
|  | <b>Transmitter</b>                   |  |                            |
|  | Enclosure                            | NEMA 4X [IP65], cast aluminum<br>310L×226W×127H (mm)<br>12.2L×8.9W×5H (inch)                                 |                            |
|  | Power Supply                         | 24VDC±5%, 2.5VA Max  |                            |
|  | Display                              | 2 line × 8 characters LCD<br>8-digit rate or 8-digit total (resettable)                                      |                            |
|  | Response Time                        | User selectable: 0-99 seconds  |                            |
|  | Outputs                              | 4-20mA, Relays for Totalizer and alarm outputs   |                            |
|  | Temperature                          | -40 to +70 °C  |                            |
| Approval   | II 2G, Exd II BT6, LCIE 09 ATEX 3088 |  |                            |
| <br>Ex-Clamp-On Transducer<br><br><br>Ex-Insertion Transducer<br><br><br>Extended Ex-Insertion Transducer<br><br><br>Couplant<br><br><br>S-S Strap | <b>Transducer</b>                    |  |                            |
|  | Measuring Range                      | 0.05m/s ~ 12m/s  |                            |
|  | Type                                 | Clamp-on and Insertion   |                            |
|  | Liquid Temperature                   | Standard: -40 to +121 °C<br>Optional high temperature: -40 to +250 °C<br>(-40 to +150 °C for Insertion Type) |                            |
|  | Cable Length                         | Standard Lengths: 6m [20Feet]<br>Optional Lengths: to 300m [990 Feet]  |                            |
|  | Housing Material                     | Clamp-On: Aluminum<br>Insertion: Stainless Steel   |                            |
|  | Protection Class                     | Standard   | IP65                       |
|  |                                      | Optional   | IP68, can work under water |
|  | Approval                             | II 2G, Exd II BT6, LCIE 09 ATEX 3088   |                            |

## Model Selection Table of DMTF-Ex Doppler Flow Meter

| MODEL   | DMTF | -X | -X | -X | -X | -X | -X | -X | -X |
|---|------|----|----|----|----|----|----|----|----|
| <b>Approvals</b><br>Ex-ExdIIBT6   |      |    |    |    |    |    |    |    |    |
| <b>Power supply</b><br>E-24VDC  |      |    |    |    |    |    |    |    |    |
| <b>Output Selection</b><br>N-None<br>1- 4-20mA<br>2- Relay for Totalizer<br>3- Relay for Alarm<br><b>(Can select the three outputs at the same time)</b>  |      |    |    |    |    |    |    |    |    |
| <b>Transducer Type</b><br>DDB1_Ex -Standard Explosion-proof Clamp-On (50~4000mm)<br>DDC1_Ex -Standard Explosion-proof Insertion (65~4000mm)<br>DDC2_Ex -Extended Explosion-proof Insertion (65~4000mm, wall thickness is up to 110mm) |      |    |    |    |    |    |    |    |    |
| <b>Transducer Material</b><br>N- Standard material<br>S- Stainless Steel (Only for Standard Clamp-on transducer)  |      |    |    |    |    |    |    |    |    |
| <b>Liquid Temperature</b><br>N- -40~121℃<br>H- -40~150℃   |      |    |    |    |    |    |    |    |    |
| <b>Transducer Cable</b><br>6m - 6 meters straight cable (STD.)<br>Xm - Common cable, Max 300m<br>XmH - High temp. cable Max 300m  |      |    |    |    |    |    |    |    |    |
| <b>Work underwater</b><br>0- No<br>1- Yes   |      |    |    |    |    |    |    |    |    |

### Selection example:

DMTF-Ex-E-123- DDC1\_Ex -N-N -6m-0

**Description:** DMTF-Ex Doppler ultrasonic flow meter; ATEX certificate; 24VAC power supply; 4-20mA, Relay Totalizer and Relay alarm output; Standard Explosion-proof Insertion Transducer; standard material, transducer cable length is 6m; Liquid Temperature: -40 to 121℃; Don't need to work underwater.

## Notes for Location and Installation

If the Insertion Ultrasonic Flow Meter is installed underground, it requires a certain space for the installation, field calibration and maintenance, etc. Generally speaking, the distance between pipe and the wall of mounting well is at least 540mm. The width of well (W) is larger than  $(D+540\times 2)$ mm(Figure 6); cement pipe need more space and maybe more than  $(D+750\times 2)$ mm; the length of well (L) is larger than  $(D+1000)$ mm.

Special drilling tools can assure transducers to be hot-tapped. This eliminates the interruption to normal working of the pipeline, so it is with future maintenance. When mounting the base of the ball valve, we just weld the ball valve base onto the outside of the weldable pipe (Figure 7); for unweldable pipes, we utilize a weldable hoop tailored for the pipe (with a sealing cushion) onto which the ball valve base will be welded in advance, and then we fix the hoop on the pipe directly with perfect sealing to prevent leakage. Because the transducers of centre-insertion ultrasonic flow meters are mounted on the same side of the pipe, it requires only half the transverse horizontal space of the standard insertion type and almost no longitudinal space.

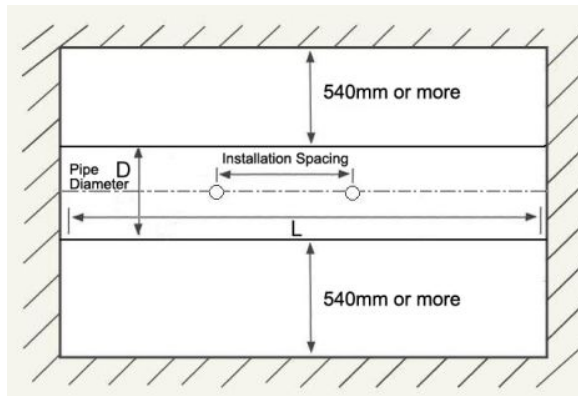


Figure 6

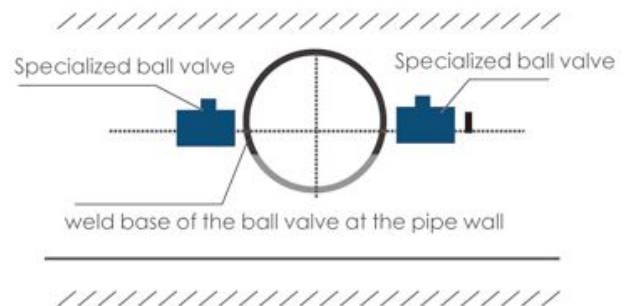


Figure 7

## Transducer Installation Locations

In order to ensure the measuring accuracy, we must choose a proper installation location in the progress of installation.

-----The location should have a straight pipe length at least 10 times the inner diameters upstream and 5 times the inner diameters downstream from any throttling valves or other flow disturbances, such as pipe reducers, elbows, tees, etc.

-----Avoid welds on the surface of the mounting pipe, or bump, or inequality. Insulation layer must be stripped of thermal barrier (if it has) and rust; meanwhile, it's better to have uniform pipe material. Inner liner (if it has) must be tightly connected with the pipeline.

-----Choose a section of pipe which is always full of liquid, such as a vertical pipe with flow in the upward direction or a full horizontal pipe.

-----Ensure that the pipe surface temperature at the measuring point is within transducer's suitable temperature range.

-----The bare metal pipe surface of the mounting point shall be slightly larger than the probe head, and keep clean, without loose paint layer, rust, mud and dirt, etc. If the pipe is plastic, clear the paint, resin and sticky material, ensuring the mounting surface smooth and clean.

-----If it is impossible to mount the transducer horizontally and symmetrically, we can mount the transducer vertically or with a tilt angle with the condition that there is no bubbles in the upper part of the pipe. For the circumstances of pipes buried partially, our patented product-Centre Insertion Ultrasonic Flow meter can solve this problem. For detailed installation method, please consult our technical engineer.

## Location selection of transducers on straight pipeline

For general pipe, the mounting location of the transducer on the pipeline requires 10D upstream and 5D downstream. If the pipelines contain special components, the specific mounting locations refer to the following table.

Requests of different resistance objects for the upstream and downstream pipelines

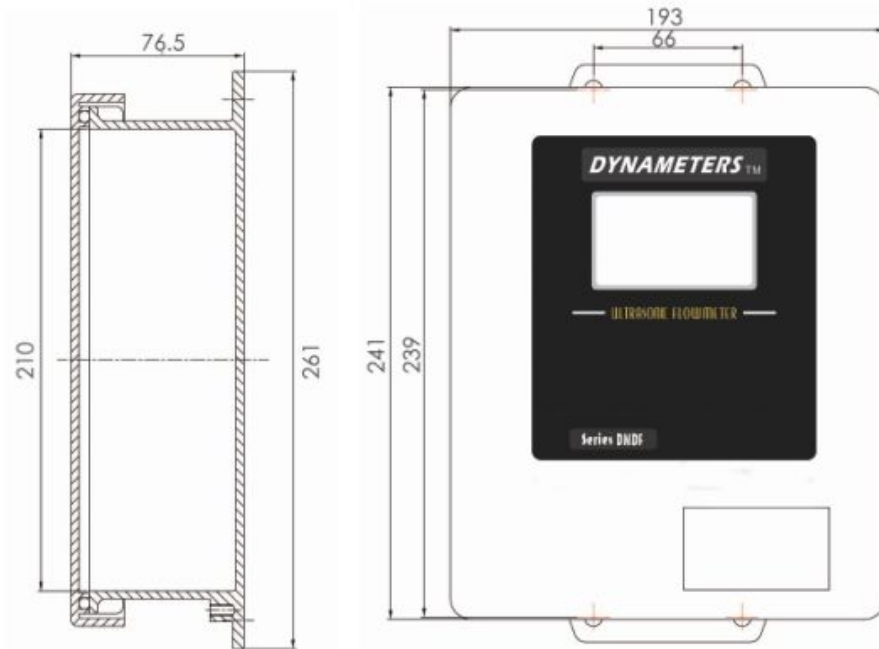
| Pipe Configuration and Transducer Location  | Upstream Distance<br>(Unit: D, inner diameter) | Downstream Distance<br>(Unit: D, inner diameter) |
|---|--|--|
|    | 10   | 5  |
|   | 14   | 5  |
|  | 24   | 5  |
|  | 30   | 5  |
|  | 10   | 5  |
|  | 24   | 10   |



### Transmitter outlook Dimension and Fixed Mounting Holes

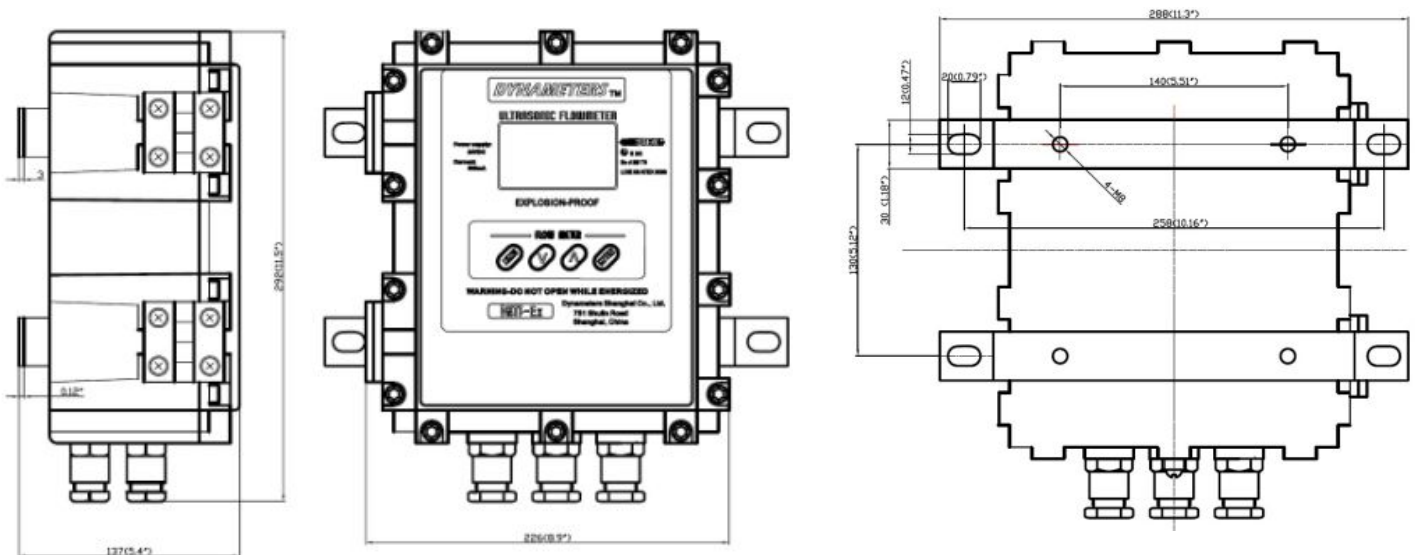
Conduit holes: M18×1.5.

Housing: NEMA 4 X [IP65], aluminum alloy diecasting.



Conduit holes: M20×1.5, inner bore is Φ8.5mm, or Φ10mm.

Housing: NEMA 4 X [IP65], aluminum casting alloy.



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