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DYNAMETERS™

SERIES PARTIALLY FILLED PIPE AND OPEN CHANNEL ULTRASONIC FLOWMETERS

ISO 9001:2008 LCIE 09 ATEX 3088

CE Ex

www.dynameters.com

Partially Filled Pipe & Open Channel Ultrasonic Flow Meters

Dynameters 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.

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.

DYNAMETERS partially filled pipes and open channels flow meter as below:

- **DMDF-OP-A Combined Partially Filled Pipe Ultrasonic Flow Meter**, it is applied for partially filled pipes;
- **DMDF-OP-B Area-Velocity Ultrasonic Flow Meter**, it is applied for partially filled pipes, channels and rivers;
- **DMDF-OP-C Flumes and Weirs Ultrasonic Flow Meter**, it is applied for open channels.

Applications

- Partially filled pipes
- Culvert
- Channel
- River and stream
- Water treatment
- Sewage treatment
- Irrigation
- Industrial waste
- Environmental monitoring

DMDF-OP-A Combined-Type Partially Filled Pipe Ultrasonic Flow Meters

Principle

DMDF-OP-A Combined-Type Partially Filled Pipe Ultrasonic flowmeter is designed for partially filled pipe applications. **It consists of flow calculator unit, velocity measurement unit and level measurement unit.**

Velocity measurement: DMDF-OP-A utilizes ultrasonic Transit-time or Doppler measuring method on the fluid velocity measurement. Ultrasonic Transit-time measuring method is applied for clean water, and ultrasonic Doppler measuring method is applied for dirty water.

Level measurement: The level sensor uses ultrasonic level meter of special small-scale and low dead zone to measure the level. When installing the level meter, users need to fix a welding base, and the height of welding base is usually 80-100mm, so it can ensure high measurement accuracy.

The flow formula of partially filled pipe: Q=V·A

Where V——Fluid velocity in pipe

A——Cross-sectional area of flow in pipe

A is the function of liquid level and inner diameter, A=f（D·h）

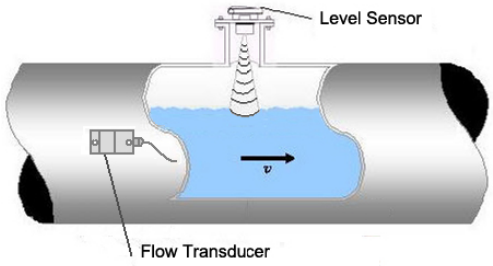
Where D——Inner diameter of pipe

h——Liquid level

Features

- Excellent low flow rate measurement ability
- Automatically signal gain adjustment
- 4-20mA, RS485(Modbus)/GPRS and SD card logger outputs
- Very suitable for large pipe sewage measurement
- Complete in specifications, and can provide a variety of applications

DMDF-OP-A Combined Partially Filled Pipe Ultrasonic Flow Meters



Measuring Diagram

Velocity and Level Measurement

Velocity and Level Measurement

Note：DMDF-OP-A is used to the situation that the liquid in pipe must be more than half filled.

Flow Calculator Unit

The flow calculator receives 4-20mA signal of velocity and level, and then calculate the flow in partially filled pipe. 4-20mA signal of velocity is from transmitter, and 4-20mA signal of level is from level sensor.
The flow calculator can display the velocity, level, flow rate and flow totalizer. It also can be available with 4-20mA, RS485(Modbus)/GPRS and SD card logger outputs.

Fixed Flow Calculator

Velocity Measurement Unit

Transmitter

The transmitter receives signal from flow transducers and outputs 4-20mA velocity signal to flow calculator.

Transmitter

Flow Transducers

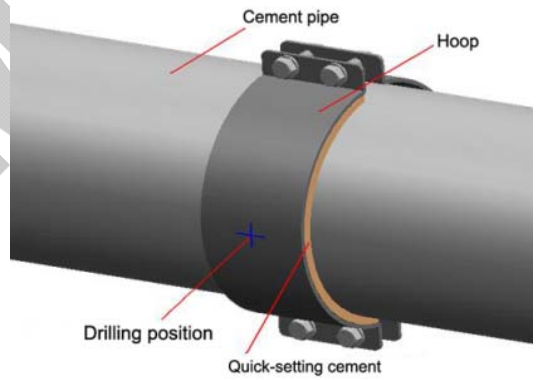
The flow transducer includes two types: Clamp-on and Insertion, both of them are hot-tapped installation and demounted online.

Clamp-on Flow Transducer

Installation Drawing of Insertion Flow Transducer

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

Extended Length Flow Transducers



Installation Drawing of Weldable Hoop

Level Measurement Unit

Level Sensor

The level sensor takes advantage of ultrasonic echo technology to get level signal, and outputs 4-20mA of level to flow calculator.

When installing the level meter, users need to fix a welding base, and the height of welding base is usually 80-100mm, so it can ensure high measurement accuracy.

Technical Specifications

Flow Calculator

Transmitter

Clamp-on of Doppler

Clamp-on of Transit-time

Standard Insertion

Level Sensor

Accuracy	Generally 2.0%F.S.
Pipe Sizes	DN100-3000
Flow Calculator Unit	
Enclosure	NEMA 4X [IP65], cast aluminum 260L×193W×80H (mm), 10.2L×7.6W×3.2H(inch)
Power Supply	Standard: 100~240VAC, 50/60HZ ±5%, 5VA Max Optional: 12~28VDC, 2.5VA Max
Outputs	4-20mA, RS485(Modbus), GPRS, SD card logger
Velocity Measurement Unit	
Transmitter	
Enclosure	NEMA 4X [IP65], cast aluminum 260L×193W×80H (mm), 10.2L×7.6W×3.2H(inch)
Power Supply	Standard: 100~240VAC, 50/60HZ ±5%, 5VA Max Optional: 12~28VDC, 2.5VA Max
Output	4-20mA
Flow Transducers	
Measuring Range	0.05m/s -12m/s
Type	Clamp-on and Insertion
Liquid Temperature	-40℃- 121℃
Cable Length	Standard Lengths: 6m [20Feet] Optional Lengths: to 300m [990 Feet]
Housing Material	Clamp-on: Aluminum for Doppler Engineering Plastic for transit-time Insertion: Stainless Steel
Protection Class	IP65, IP68 (Optional)
Level Measurement Unit	
Accuracy	±0.25% F.S.
Resolution	3mm
Process Temperature	-20 to +60℃
Power Supply	12-36 VDC
Housing Material	Engineering Plastic, NEMA 4X [IP65]
Output	4-20mA

Model Selection Table of DMDF-OP-A Flow Meters

MODEL: DMDF-OP-A -X -X -X -X -X -X -X

Flow Calculator Unit

F—Fixed

Power Supply

A—110VAC B—220VAC

E—24VDC S—Solar Supply

Output

N—None

A—4-20mA

R—RS485 (Modbus)

G—GPRS (Outputs R and G only can be selected one)

S—SD Card

Velocity Measurement Unit

FDB—Doppler transmitter and clamp-on transducers

FDC—Doppler transmitter and Insertion transducers

FTB—Transit-time transmitter and clamp-on transducers

FTC—Transit-time transmitter and Insertion transducers

Cable Length of Velocity Measurement Unit

6m—Std. 6m

Xm—Optional, up to 300m

Level Measurement Unit

N—Standard (FLOWLINE level meter, 0.15 to 5.4m)

D1—DynaProbe level meter -Complete type (see brochure for details)

D2—DynaProbe level meter -Combined type (see brochure for details)

Cable Length of Level Measurement Unit

6m—Std. 6m

Xm—Optional, up to 300m

If installation environment requires explosion-proof, please contact manufacturer to order DMDF-OP-A Explosion-proof partially Filled Pipe Flow meters.

DMDF-OP-B Area-Velocity Ultrasonic Flow Meters

Principle

Velocity Measurement

When sound is reflected from a moving target, the frequency of sound is varied by the velocity of target. This variation is known as a Doppler shift.

To measure water velocity in open channels or pipes, DMDF-OP-B exploits the particles moving with the water as acoustic targets (or scatterers) from an instrument fixed to the bed, bank or bottom. Each Doppler shift is directly related to the water velocity component along the beam. This is a physical relationship and if you know the speed of sound in water you can calculate the velocity of the reflector and thereby the velocity of the surrounding water.

Level Measurement

Water level is measured using a solid state pressure sensor mounted underneath the DYNAMETERS transducer and vented to atmospheric pressure via a vent tube inside the signal cable. Water pressure is sensed via a pressure damping manifold which has been designed to sense level in front of the flow transducer.

Flow Rate Calculation

The flow formula: Q=V·A

Where V——Fluid velocity

A——Cross-sectional area of flow

A is the function of liquid level and width of channels or inner diameter of pipes, A=f (D·h)

Where D——Width of channels or inner diameter of pipes

h——Liquid level

Features

- **Open Channel, River and Partially Filled Pipe applications**
- Excellent low flow rate measurement ability, low to 0.021 m/s
- Superior measurement accuracy
- 4-20mA, RS485(Modbus)/GPRS and SD card logger outputs
- Very suitable for sewage measurement
- User-friendly configurations
- Complete in specifications, and can provide a variety of applications

DMDF-OP-B Fixed Area-Velocity Ultrasonic Flow Meters

DMDF-OP-B Flow Meter consists of flow calculator, DYNAMETERS integrated transducer to measure velocity and level at the same time.

Based on digital signal processing techniques, DMDF-OP-B is able to perform in a wide range of environments. It is used to measure flows in pipes, channels and streams and operates in a wide range of water qualities from fresh streams to primary sewage channels.

Flow Calculator

The flow calculator can display the velocity, level, flow rate and flow totalizer. It also can be available with 4-20mA, RS485(Modbus)/GPRS and SD card logger outputs.

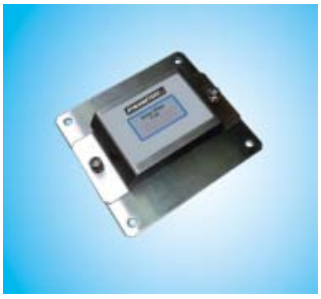
The flow calculator can calculate the cross-sectional area of partially filled pipe, open channel stream or river, for stream or river, it can input up to 20 coordinate points describing the river's shape of cross section. It is suitable for various applications.

Fixed Flow Calculator

Velocity and Level Transducer

One transducer can measure both velocity and level at the same time. This instrument is intended for economically recording flows in channels, rivers, culverts and pipes. It can also be used where existing techniques are unsuitable or too expensive. It is particularly useful at sites where no stable stage/velocity relationship exists and where flows are affected by variable tailwater conditions, culvert entry blockages, pipe surcharging, other unstable flow conditions, or even reverse flows.

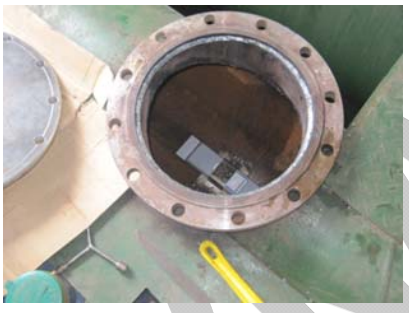
Transducer

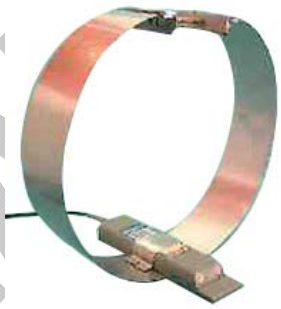


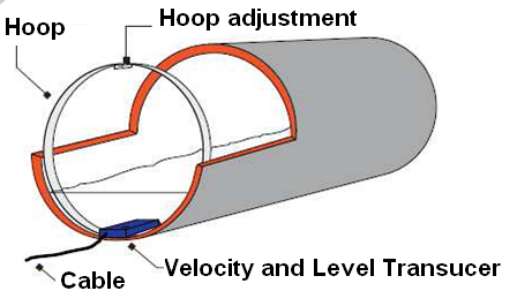
Mounting Bracket

DYNAMETERS velocity and level transducer is mounted on (or near to) the bottom of the channel/stream/pipe/culvert and measures the velocity and depth of the water flowing above it.

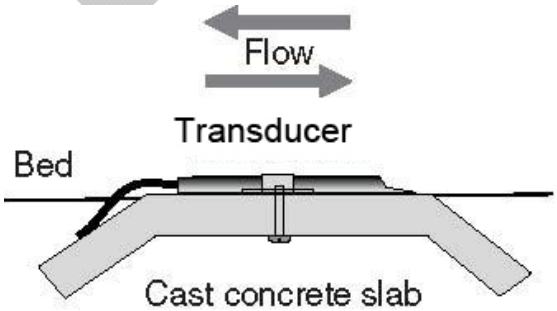
When installing transducer in pipes or culverts, users can directly weld the mounting bracket in pipe, and then put the transducer into mounting bracket. Or users can make an expanding hoop shown as below, weld the mounting bracket on it, put the transducer into the mounting bracket, and then fix the whole component into pipes.

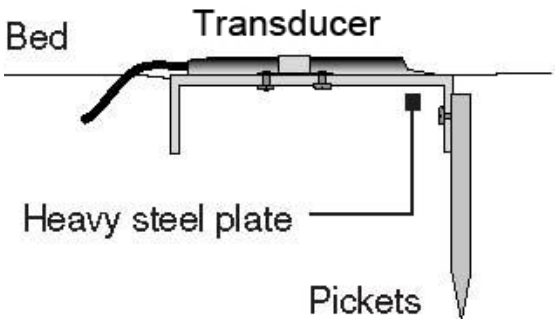




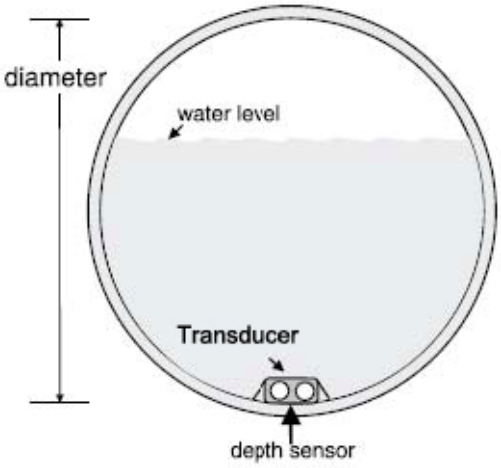


The transducer can also be located in the bed of a natural or artificial channel. Again it should be installed and located in such a way as below to avoid accumulating debris, being buried by alluvial material or getting washed away. The cable should be protected from damage.

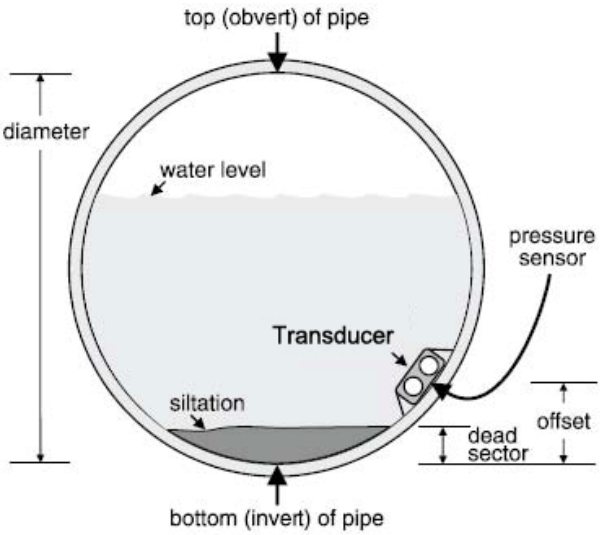




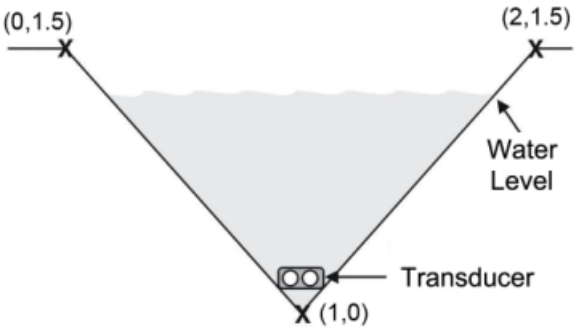
Typical Applications



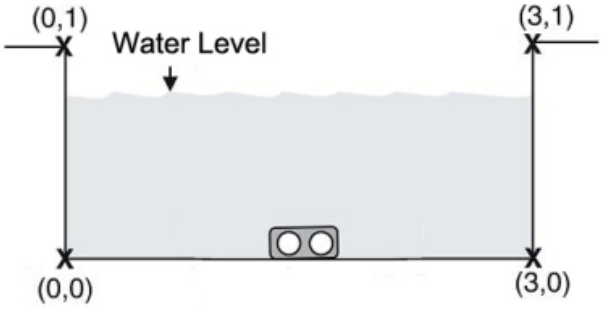
Application in pipe



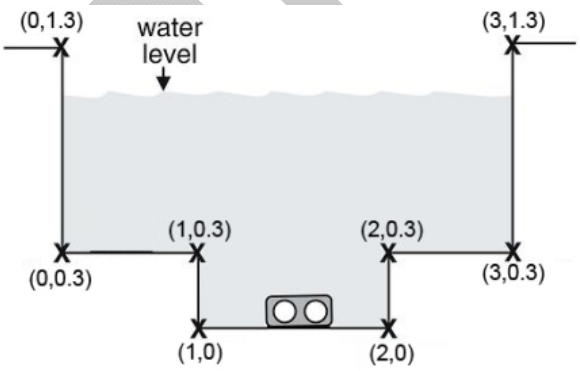
Application in pipe with siltation on bottom



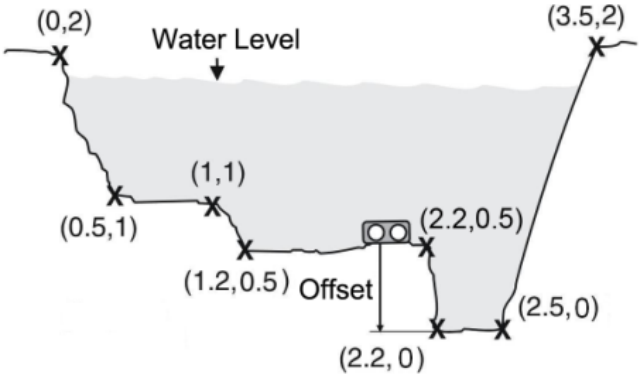
Application in Triangle channel



Application in Rectangular channel

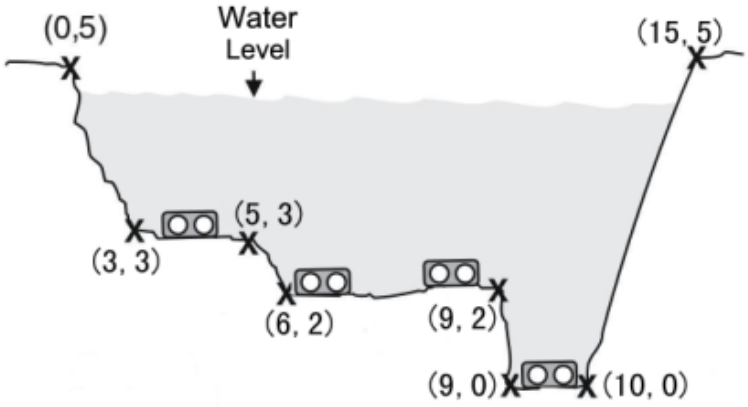


Application in Polygonal channel



Application in Irregular-shaped channel

While the width of river/channel is large, or the river's shape of cross section is rather complicated, we can provide DMDF-OP-B multi-path ultrasonic flow meter to get better accuracy. Its installation is simple, and users can change the installation point as require, high adaptability and high cost performance.



Technical Specifications

Fixed Flow Calculator

Transducer

Mounting Bracket

Measuring range	Pipe: 300-5000mm Channel: 200-5000mm	
Flow Calculator		
Enclosure	NEMA 4X [IP65], cast aluminum 260L×193W×80H (mm), 10.2L×7.6W×3.2H(inch)	
Power Supply	100~240VAC, 50/60 Hz ±5%, 5VA Max Or 12~28VDC, 2.5VA Max.	
Outputs	4-20mA, RS485(Modbus), GPRS, SD card logger	
Temperature	-40 to +70℃	
Velocity and Level Transducer		
Enclosure	290L×70W×25H(mm); 11.4L×2.8W×1H(inch)	
Material	PVC body, Stainless steel mounting bracket	
Accuracy	Velocity	2% of measured
	Level	±0.25% of calibrated lower range
Measuring Range	Velocity	21mm/s to 4500mm/s bidirectional
	Level	0 to 2m（D2） 0 to 5m（D5）
Temperature	0°C to 60°C water temperature	
Cable Length	15 meters, 9 way vented cable «SQL» Compatible	

Model Selection Table of DMDF-OP-B fixed flow Meters

MODEL DMDF-OP -B -X -X -X -X -X

Flow Calculator

F—Fixed

Power Supply

A—110VAC

B—220VAC

E—24VDC

S—Solar Supply

Output

N—None

A—4-20mA

R—RS485 (Modbus)

G—GPRS

S—SD Card

(Outputs R and G only can be selected one)

Level Range

D2—0 to 2m

D5—0 to 5m

Transducer Cable length

15m— Std. 15m, need more length, please contact us.

Example: DMDF-OP-B-F-B-AGS-D2-15m, it means DMDF-OP-B fixed flowmeters, 220VAC power supply; 4-20mA, GPRS and SD card outputs, level range is 0 to 2m, and the transducer cable length is 15m.

DMDF-OP-B Portable Area-Velocity Ultrasonic Flow Meters

We also can provide DMDF-OP-B Portable Area-Velocity Ultrasonic Flow Meters.

A set of DMDF-OP -B Portable Flow meters

Technical Specifications

Portable Flow Calculator

Transducer

Mounting Bracket

Measuring range	Pipe: 300-5000mm Channel: 200-5000mm	
Flow Calculator		
Enclosure	NEMA 4X [IP65], ABS 358L×250W×150H (mm), 14.1L×9.8W×5.9H(inch)	
Power Supply	Rechargeable built-in lithium battery, 12VDC, 12Ah, Over 50 hours working time on a full-charge Charger: 110/220VAC, 50/60 Hz ±5%, 3A Max	
Outputs	4-20mA, RS485(Modbus), GPRS	
Temperature	-40 to +70℃	
Velocity and Level Transducer		
Enclosure	290L×70W×25H(mm); 11.4L×2.8W×1H(inch)	
Material	PVC body, Stainless steel mounting bracket	
Accuracy	Velocity	2% of measured
	Level	±0.25% of calibrated lower range
Measuring Range	Velocity	0.021m/s to 4.5m/s bidirectional
	Level	0 to 2m（D2） 0 to 5m（D5）
Temperature	0°C to 60°C water temperature	
Cable Length	15 meters, 9 way vented cable «SQL» Compatible	

Model Selection Table of DMDF-OP-B Portable Flowmeters

MODEL DMDF-OP -B -X -X -X -X -X

Flow Calculator

P-Portable

Charging

A-110VAC

B-220VAC

Output

N—None

A—4-20mA

R—RS485 (Modbus)

G—GPRS

(Outputs R and G only can be selected one)

Level Range

D2—0 to 2m

D5—0 to 5m

Transducer Cable length

15m— Std. 15m, need more length, please contact us.

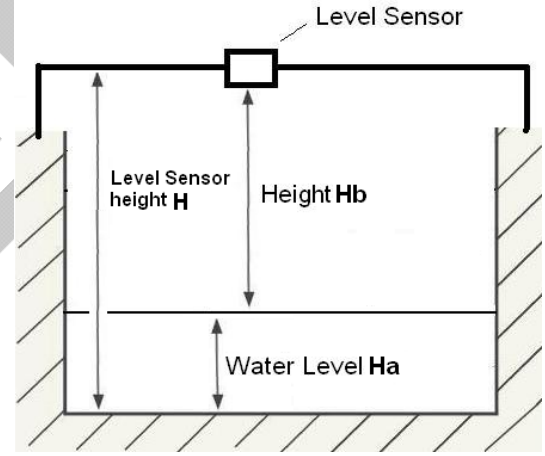
Example: DMDF-OP-B-P-B-AG-D2-15m, it means DMDF-OP-B portable flowmeters, 220VAC charging power supply; 4-20mA and GPRS outputs, level range is 0 to 2m, and the transducer cable length is 15m.

DMDF-OP-C Flumes and Weirs Ultrasonic Flow Meters

Principle

Direct measurement of this product is the level. When using this product for open channel measurement, we should install weirnotch in open channel. The certain weirnotch has a physical level-flow relation. The level sensor measures the level in weirnotch and transfers the level signal to transmitter, the transmitter calculate the flow by the level-flow relation of the corresponding weirnotch. Due to the Non-contact measurement, it can be applied in harsh environment.

The level measurement system operates by transmitting an acoustic wave signal from its level sensor towards the liquid being monitored. The reflected signal or echo is received by the sensor and processed. The time between transmission of the acoustic signal and reception of the echo is measured, and using the speed of sound through air, the distance Hb from the sensor to the water level is calculated, and then water level Ha is calculated (Ha=H-Hb, H is the installation height of level sensor).



Features

- Multiple outputs: 4-20mA, RS485, Pulse output, two line Relays alarm outputs and GPRS
- Display the flow rate, total flow and active level directly
- Remote transmitter installation is flexible
- Complete in specifications, and can provide a variety of applications
- Intelligent acoustic analysis technology, and make the level accuracy up to 0.3%.
- Non-contact measurement, low failure rate.

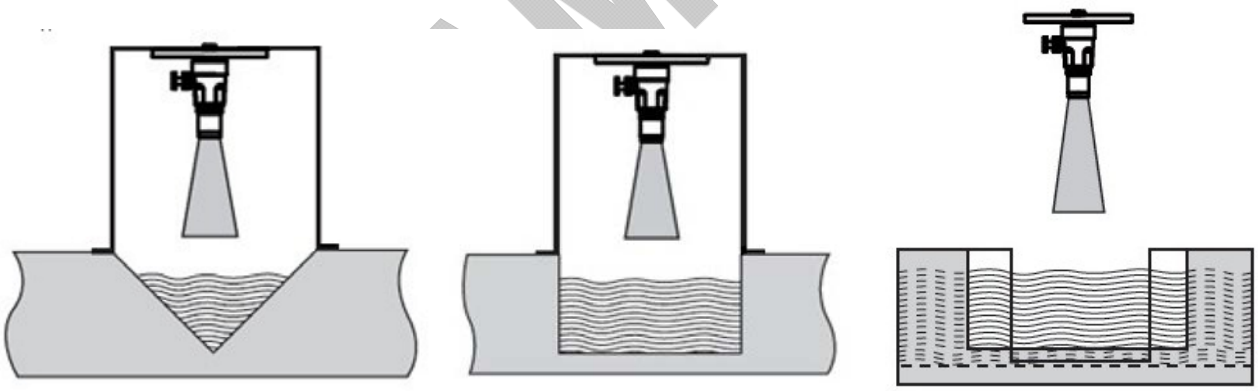
DMDF-OP-C Flumes and Weirs Flow Meter is only applied for open channel, and consists of transmitter, level sensor and weirnotch.

DMDF-OP-C Flumes and Weirs Ultrasonic Flow Meters

DYNAMETERS series DMDF-OP-C Flumes and weirs ultrasonic flowmeter is designed for continuously monitoring the flow rate and total flow in open channel. It is suitable to measure flow under open channel condition of water conservancy, hydropower, environmental protection and other industrial and agricultural environment. The meter is built in EEPROM module, ensure that total flow will not be lost when power failure.

We can provide drawing of Parshall flume, and other weirs for customers to buy or construct them locally. In order to ensure the accuracy of flowmeter to be the greatest degree, and reduce the difficulty of debugging, please improve the precise of the size of matching weirnotch as far as possible.

Typical Applications



V Sharp Weir | Rectangular Sharp Weir | Parshall Flumes

Technical Specifications

Fixed Transmitter

Portable Transmitter

Level Sensor

Transmitter	
Enclosure	Fixed: NEMA 4X [IP65], cast aluminum; 260L×193W×80H (mm), 10.2L×7.6W×3.2H(inch) Portable: NEMA 4X [IP65], ABS; 358L×250W×150H (mm), 14.1L×9.8W×5.9H(inch)
Power Supply	Fixed: 85~264VAC, 50/60HZ ±5%, 5VA Max; Or 18~36VDC, 2.5VA Max Portable: Rechargeable built-in lithium battery, 12VDC, 12Ah, Over 40 hours working time on a full-charge. Charger: 110/220VAC, 50/60 Hz ±5%, 3A Max
Measuring Range	0.36m^3/h～3.6×10^4 m^3/h
Flow Accuracy	1% - 5% (Decided by different weir plate)
Temperature	-40 to +70℃
Display	Four lines display for total flow, flow rate, level and height.
Output	4-20mA output for flow rate RS485(ModBus) Pulse output for total flow Two line Relays outputs for alarm
Level sensor	
Measuring Level	0-3m
Level Accuracy	0.3%
Level Dead Band	0.25m-0.5m
Level Resolution	1mm
Ambient Temperature	-20℃ - +60℃
Protection Grade	IP67
Mounting Mode	Mounting by frame or flange
Enclosure	ABS
Remote Distance	Less than 50 meters (Remote installation)

Model Selection Table of DMDF-OP-C Flowmeters

Model **DMDF-OP-C** **- X** **- X** **-X** **- X** **- X** **- X** **- X**

Flow Transmitter

F—Fixed

Power Supply

A—110VAC

B—220VAC

E—24VDC

S—Solar Supply

Output

N—None

M—4-20mA for flow rate

R—RS485(ModBus)

P—Pulse output for total flow

T—Two line Relays output for alarm

G—GPRS (Excluding software)

(Outputs R, M and G only can be selected one)

Level sensor Enclosure

S—Standard waterproof Type

F—Acids, alkalis resistance and Anti-corrosion Type

Cable length

6m—Std. 6m, max. 50m.

Weirnotch Type

PN—P1-P9 Parshall flumes

SN—S1-S5 triangular weir

JN—J1-J5 rectangular weir

For example: P1 means Parshall 1, if need more details, please contact us.

Weirnotch Material

F—FRP (Fiber Reinforce Plastic)

S—Stainless steel

U—User homemade (Can buy it in local)

Example: DMDF-OP-C-F-B-MTG-S-6m-P1-U means fixed open channel ultrasonic flowmeter, 220VAC power supply; 4-20mA, relays and GPRS output; level sensor is standard waterproof; 6m cable length; Weirnotch is Parshall 1 and bought in local.

Model DMDF-OP-C -X -X -X - X -X -X -X

Flow Transmitter

P-Portable

Charging Power Supply

A-110VAC

B-220VAC

Output

N—None

M—4-20mA for flow rate

R—RS485(ModBus)

P—Pulse output for total flow

T—Two line Relays output for alarm

G—GPRS (Excluding software)

(Outputs R, M and G only can be selected one)

Level sensor Enclosure

S—Standard waterproof Type

F—Acids, alkalis resistance and Anti-corrosion Type

Cable length

8m—Std. 8m, max. 50m.

Weirnotch Type

PN—P1-P9 Parshall flumes

SN—S1-S5 Triangular weir

JN—J1-J5 Rectangular weir

For example: P1 means Parshall 1, if need more details, please contact us.

Weirnotch Material

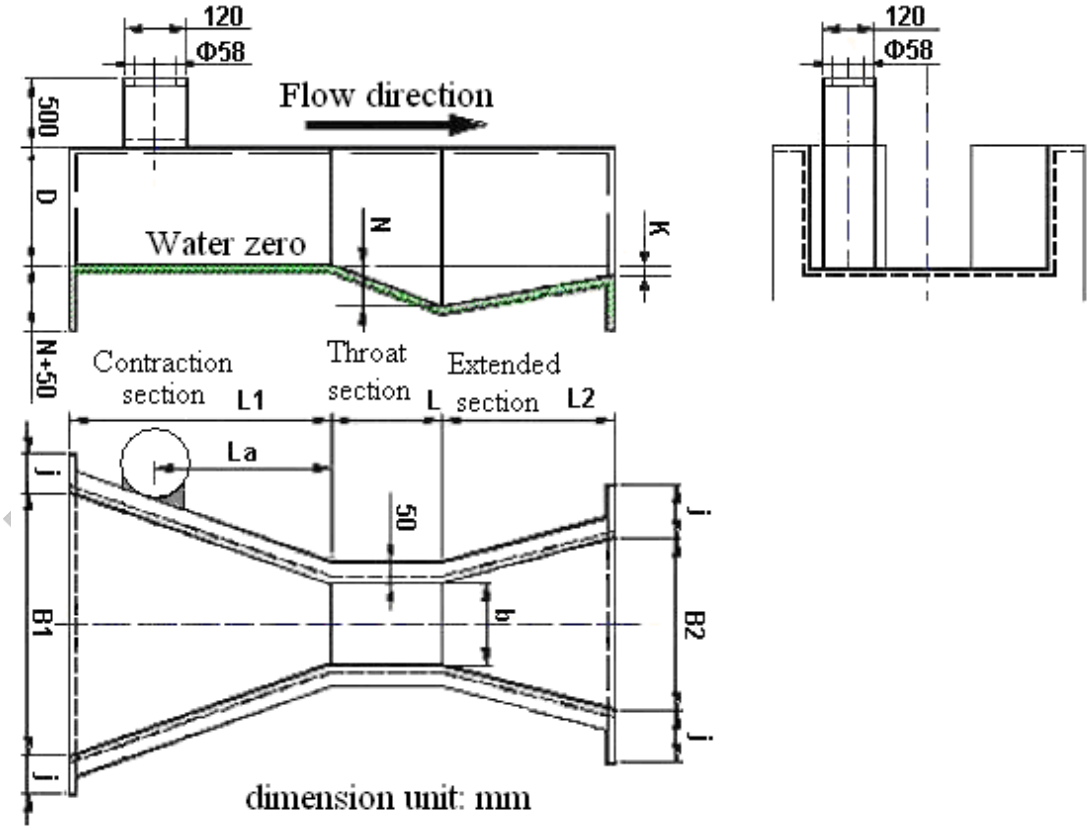
F—FRP (Fiber Reinforce Plastic)

S—Stainless steel

U—User homemade (Can buy it in local)

Example: DMDF-OP-C-P-B-MTG-S-8m-P1-U means portable open channel ultrasonic flowmeter, 220VAC charger; 4-20mA, relays and GPRS output; level sensor is standard waterproof; 8m cable length; Weirnotch is Parshall 1 and is bought in local.

Parshall Flumes



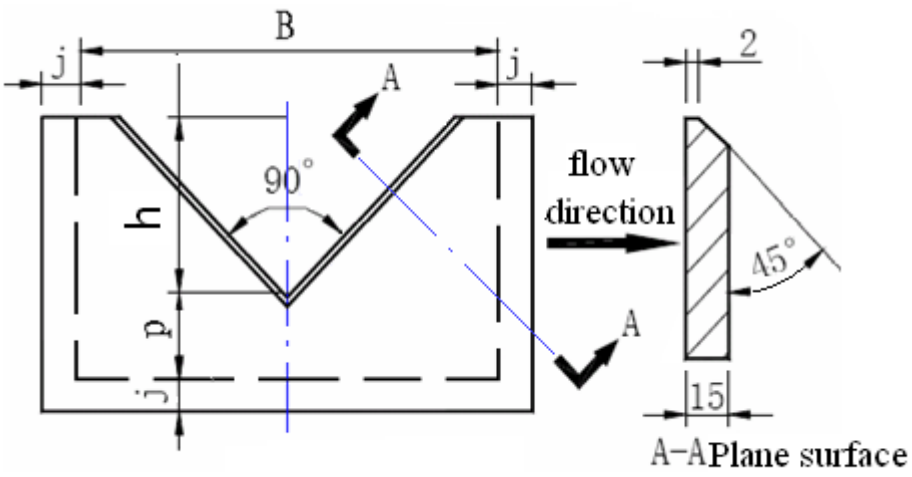
Parshall Flumes Dimension (mm)

Flumes	Throat section			Contraction section			Extended section			Height	Parameter		flow (m^3/h)	
	b	L	N	B1	L1	La	B2	L2	K	D	C	n	Qmin.	Qmax.
1	25	76	29	167	356	242	93	203	19	229	217.44	1.550	0.32	19.44
2	51	114	43	214	406	276	135	254	22	254	434.52	1.550	0.65	47.52
3	76	152	57	259	457	311	178	305	25	457	637.56	1.550	2.77	115.56
4	152	305	114	400	610	415	394	610	76	610	1372.32	1.580	5.4	399.6
5	228	305	114	575	864	587	381	457	76	762	1927.44	1.530	9	903.6
6	250	600	230	780	1325	900	550	920	80	800	2019.6	1.513	10.8	900
7	300	600	230	840	1350	920	600	920	80	950	2444.4	1.521	12.6	1440
8	450	600	230	1020	1425	967	750	920	80	950	3736.8	1.537	16.2	2268
9	600	600	230	1200	1500	1020	900	920	80	950	5050.8	1.548	45	3060
10	750	600	230	1380	1575	1074	1050	920	80	950	6379.2	1.557	90	3960
11	900	600	230	1560	1650	1121	1200	920	80	950	7729.2	1.565	108	4500
12	1000	600	230	1680	1705	1161	1300	920	80	1000	8629.2	1.569	108	5400
13	1200	600	230	1920	1800	1227	1500	920	80	1000	10454.4	1.577	126	7200
14	1500	600	230	2280	1950	1329	1800	920	80	1000	13204.8	1.586	162	9000
15	1800	600	230	2640	2100	1427	2100	920	80	1000	15984	1.593	288	10800
16	2100	600	230	3000	2250	1534	2400	920	80	1000	18779.2	1.599	342	12960
17	2400	600	230	3360	2400	1636	2700	920	80	1000	21614.4	1.605	360	14400

Note:

1. Should ensure level installation in open channel;
2. Parshall flumes centerline and channel centerline should be overlapping;
3. Open-channel should ensure the smooth drainage;
4. Flumes should be installed firmly in the channel, and closely connected to channel wall and bottom, no leaking.

Triangular Weir



Triangular Weir Common Specification Installation Dimensions (mm)

Flumes / Parameter		1	2	3	4	5
flow (m^3/h)	Q Max.	20	40	80	182	395
	Q Min.	0	0	0	0	0
B		275	360	475	660	900
h		110	144	190	264	360
p		110	144	190	264	360
For channel > width × height		>275×220	>360×288	>475×380	>660×528	>900×720
Parameter	n	2.50	2.50	2.50	2.50	2.50
	C	5100	5100	5100	5100	5100

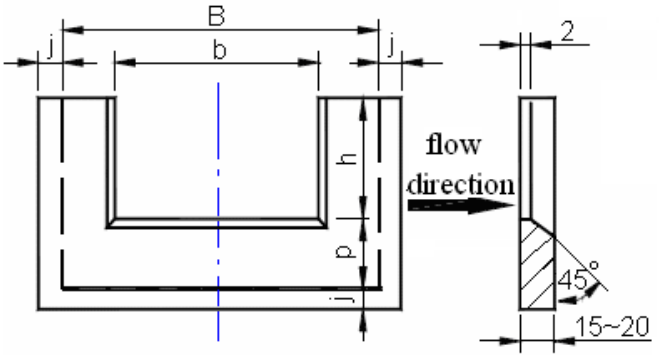
Note:

1. The dimensions of the triangle mouth should be accurate. The surface is flat and smooth without distortion;

2. Triangular weir centerline and channel centerline should be overlapping;

3. j is the part embedded in channel wall, the dimension is decided according to the site condition.

Rectangular Weir



Rectangular Weir Common Specification Installation Dimensions (mm)

Flumes / Parameter		1	2	3	4	5
flow (m^3/h)	Q Max.	414	803	1662	3332	6504
	Q Min.	0.08	0.10	0.15	0.19	0.26
B		750	850	1000	1250	1450
b		375	510	700	875	1160
h		308	387	501	683	857
p		442	463	499	567	593
For channel > width × height		>750×750	>850×850	>1000×1000	>1250×1250	>1450×1450
Parameter	n	1.50	1.50	1.50	1.50	1.50
	C	2406	3318	4669	5886	8178

Note:

1. The dimensions of the rectangular mouth should be accurate. The surface is flat and smooth without distortion;
2. Rectangular weir centerline and channel centerline should be overlapping;
3. j is the part embedded in channel wall, the dimension is decided according to the site condition.

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