

OPEN-CHANNEL FLOWMETER

OCF Series



CE





Introduction :

Open-Channel Flowmeter

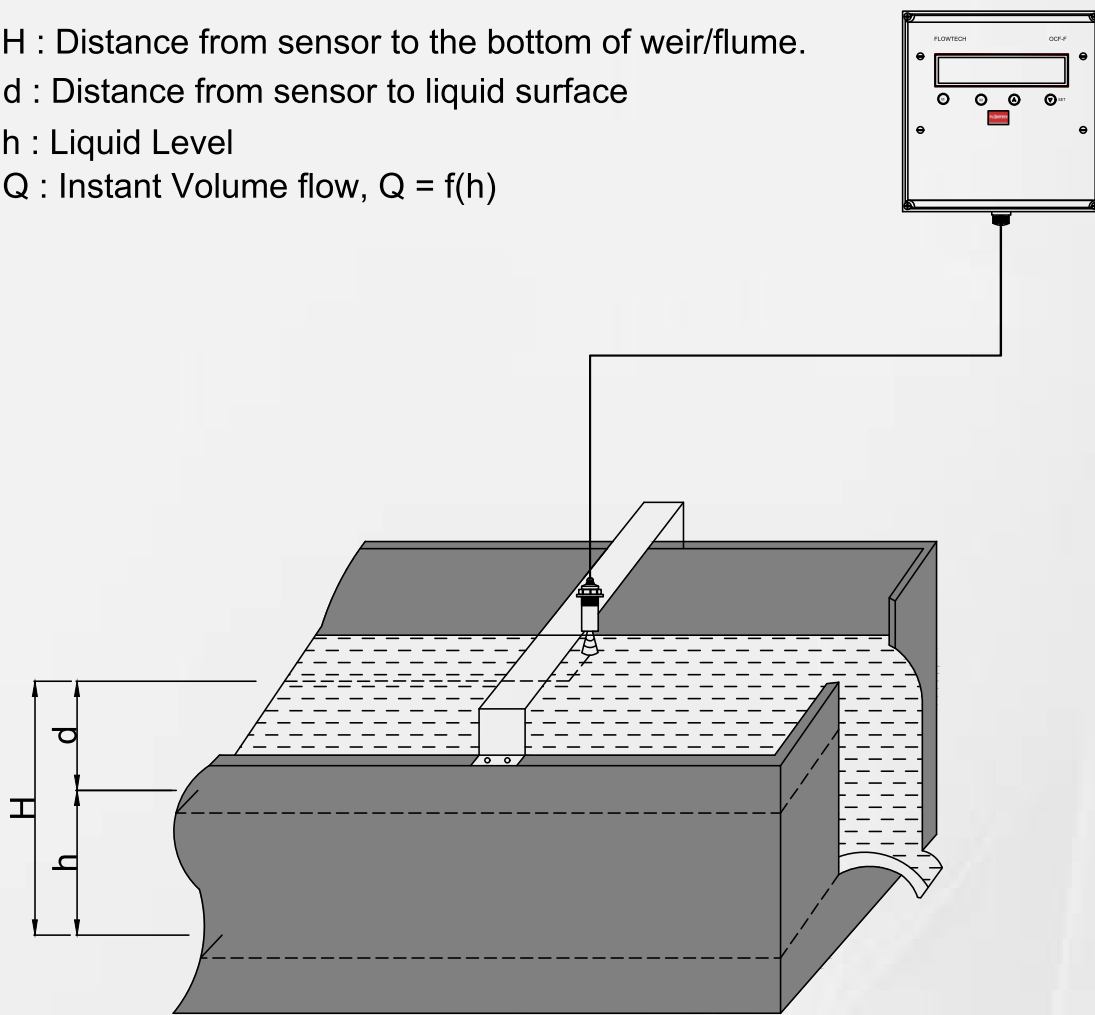
Ultrasonic Open channel flow meter contain main unit and sensor, connect sensor to main unit through cable. Sensor detect the liquid level in weir or flume base on the principle of sound wave reflection, then main unit use the related formula to calculate the liquid volume flow which pass weir or flume. Ultrasonic Open channel flow meter is non-contact instrument, widely service groundwater flow monitoring system, Industrial wastewater discharge monitoring, accurately measuring open channel flow.

Advantage :

- Non-contact measuring, sensor does not contact the measured medium, without hazard of abrasion and corrosion, long span and easy to maintain
- High accuracy, liquid level change 1mm, the volume flow will also change correspondingly
- Suitable for many weir/flume, support international and ISO version of weir/groove, such as Parshall flume, triangular weir (30°, 45°, 60°, 90°, 120°), rectangular weir(can customize weir's width),can input formula of calculating volume flow.
- LCD display with backlight, operation language option: Chinese / English
- Can set flow unit, correct accumulated flow and set many menu item
- Simple to programming, easy to operate
- Sensor weather proof grade: Ip68
- Sensor has strong anti-interference performance, low blind area, high sensitivity, the length of cable connecting sensor to main unit can reach to 1000m
- Can supply 6 relay outputs, pulse output of accumulated flow
- Can supply RS485 communication base on Modbus-RTU protocol
- Can supply corresponding manipulator for operate expediently
- Can customize solar power supply mode, wireless transmission(database server is in China)

Principle diagram :

- H : Distance from sensor to the bottom of weir/flume.
- d : Distance from sensor to liquid surface
- h : Liquid Level
- Q : Instant Volume flow, $Q = f(h)$



Ultra sensor is installed on the top of weir/flume(shown as diagram above), sensor emit a bunch of sound wave to liquid surface periodically, when this bunch of wave reach to liquid surface, it will be reflected back and received by sensor, main unit will measure the transmission time (**t**) of this process. The known sound wave velocity is "**V**".

$$d=V*t/2, h=H-d$$

The temperature of gas in weir/flume will affect sound wave velocity, so need to measure the gas temperature to correct the sound wave velocity "**V**".

For the known weir/flume, there is a certain function relationship between the volume flow and the corresponding liquid level value. That is **Q= f (h)**. In main unit, you can set parameter value of weir/flume according to the known weir/flume, the main unit will calculate volume flow automatically during measuring process.


Ultrasonic open channel flow meter firstly measures the distance from sensor to the liquid surface, then calculate the liquid level value, then calculate the volume flow.

It is important for Installation and commissioning to know this flow meter's working principle.

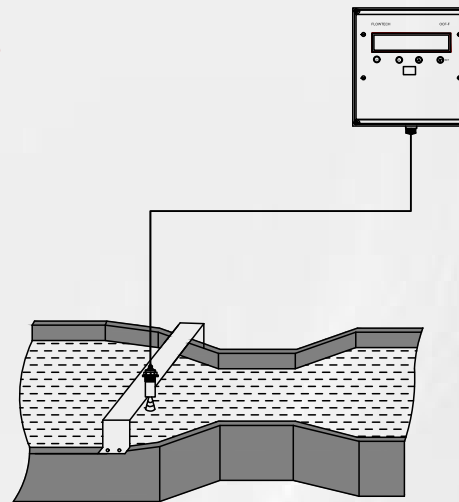
Main Unit Technical Parameter :

	Main unit parameter description
Weir/flume type	<p>ISO type: Parshall flume (No.1 to 23), rectangular weir(25/50/75/100cm or customize weir width), triangular weir(30°, 45°, 60°, 90°, 120°), customized weir/flume</p> <p>China National type: Parshall flume (No.1 to 25), rectangular weir (25/50/75/100cm or customize weir width), Right-angled triangle weir, customized weir/flume.</p>
Level resolution	1mm
Level error	1mm or 0.2%FS @ stable condition
Display	LCD display with graph and backlight
Op. Language	Chinese / English (can be selected)
Parameter setting	Keys operation (manipulator is option)
Instant flow display range	0.000 – 999999L/S or m3/h, m3/min (automatically conversion base on selected flow unit)
Total flow display Max. value	99999999.9 m3/h
Analog output	4-20mA (corresponding to instant flow)
Load resistance	0-500Ω
Communication	RS485 interface, Modbus-RTU protocol
Relay output	Upper limit/lower limit alarm (to control instant flow or liquid level) Pulse output (for accumulated flow, pulse equivalent can be selected)
Relay switch mode	Normal open / Normal close (can select)
Relay Number	6 pcs at most
Relay specification	5A 250VAC / 30VDC
Power supply	24VDC (±5%) 0.2A; 220VAC(±20%) 0.1A
Measure cycle	1 second as default (can set)
Ambient Temp.	-40 to 75 C
Housing material	ABS
Weather proof	IP67
Cable gland	PG9 / PG11 / PG13.5
Mounting	Wall mounted
Size	250*185*125 mm

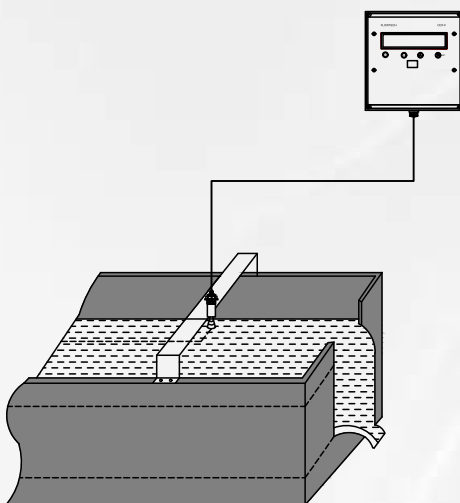
Sensor Technical Parameter :

	Sensor parameter description
Level Range	0.00 ~ 4.00 m, 6.00m, 8.00m, 12.00m, 20.00m, 30.00m, 40.00m
Blind area	0.20m
Operation Temp.	-40 to 70°C
Weather proof	Ip68
Shell material	Option: ABS / PVC / PTFE
Pressure rating	0.2 Mpa
Cable length	Standard configure: 10m, (can extend to 1000m)
Beam angle	8°(3db)
Mounting	Thread, Flanged, Bracket

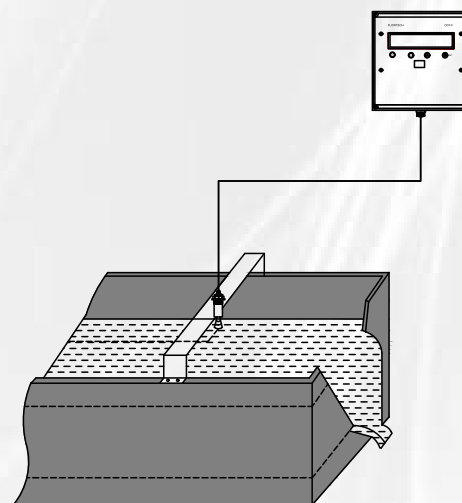
Installation diagram for often used weir/flume



Parshall flume



Rectangular weir



Triangular weir

Product Ordering Information

Order Code for Open Channel Flow Meter Model

Code	Description	Remark
UOPF	Ultrasonic open channel flow meter	
A	220VAC	Power supply
D1	24VDC	
D2	3-5VDC (for RS485 type)	
D3	9-12VDC (for RS485 type)	
I	ISO type	Weir/flume type
C	National type	
F1	4-20mA output	Output
F2	4-20mA output with HART	
F3	RS485 communication-Modbus protocol	
R"X"	With relay output, "X" is relay quantity	
L"X"	"X" is customized cable length, unit in meter, cable length is not more than 1000m (standard configure cable length is 10m)	
P	With protect case for main unit	
S"X"	"X" is level measure range, unit in meter	
E	With Ex-protection Exia IIBT6	

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