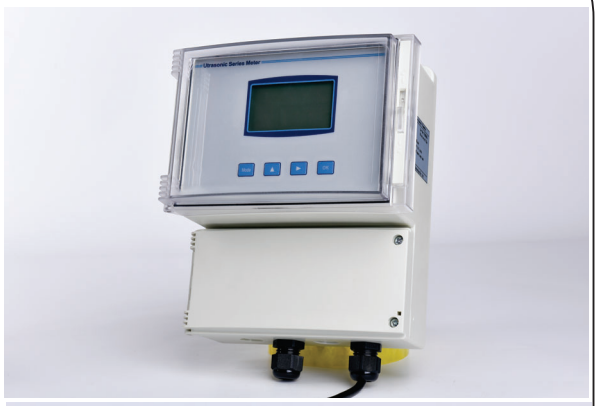
VPOC-100 Series

Ultrasonic Level and Open Channel Flowmeter



Features

- High accuracy, with level measurement sensitivity of 1 mm and built-in temperature compensation.
- Suitable for a variety of flumes and weirs, such as Parshall flume (ISO), V-Notch weir, Rectangular weir (with or without end contractions) and custom formula type weir
- Displays flow rate in l/s, m3/h or m3/min
- Excellent anti-interference capability
- Clear display with Graphical LCD (with backlit)
- Sensor cable length up to 1000 m
- The sensor with leak-proof structure and IP68 compliant.
- Chemical resistant sensor materials for maximum application flexibility
- 4-20mA output and RS485 serial communication (MODBUS RTU) output
- 6 relays for alarms
- Three buttons panel or remote control for easy configuration and operation（opt.）

Application

- Water Treatment
- Sewage Treatment
- Industries Wastewater Treatment
- Irrigation System

Introduction

The VPOC-100 Series Ultrasonic level sensor is a remote type of ultrasonic level meter which is ultrasonic sensor able to extend up to 1000 meters away. It easy to maintain due to self-cleaning effect by the membrane pulsing.

The sensor has wide option of material such as ABS, PTFE or PVC. With a patented smart echo processing technology, it can effectively and reliably deal with echo.

Ultrasonic level sensor is widely used to measure level and flow for different kinds of liquid in various industrial such as water, waste water and tank application.

WorkingPrinciple

Ultrasonic level meter works according to the transit time method. The sensor is mounted on the top of the flume/weir, and ultrasonic pulse is transmitted by the sensor to the surface of the liquid being monitored. Ultrasonic pulse is reflected back and received by the sensor. The meter measures the time (t) between pulse transmission and reception. The meter uses the time (t) and the velocity of sound (c) to calculate the distance (d) between the bottom of sensor and the monitored liquid surface.

$$d = c \cdot t/2$$

The meter installation height (H) is set in parameters setting. Therefore, it can calculate the liquid level as follows:

$$h = H - d$$

Since speed of sound through air is affected by changes in temperature, the O.C.M. has integrated a temperature sensor to improve accuracy.

To determined flume/weir flow rate, there is a fixed functional relationship between the instantaneous flow rate and liquid level.

The formula;

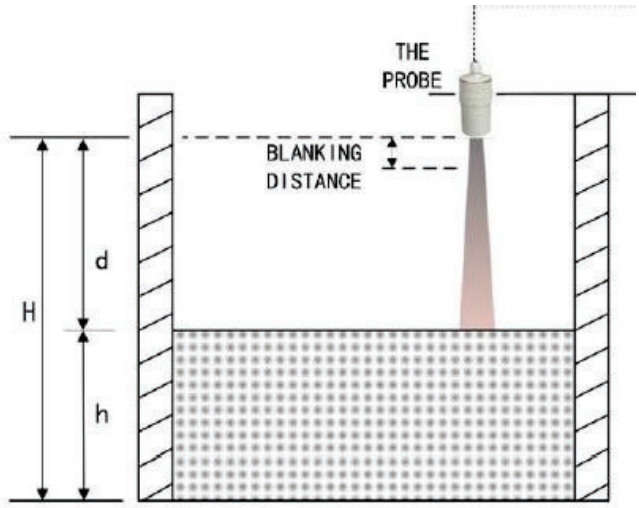
$Q = X * (h)$

X = fixed constant for each type of flumes / weirs

Q = instantaneous flow

h = liquid level in flumes. the meter can calculate the flow rate though determined flumes and the level value.

It is very important to understand the working principle for further installation and operation.



- Blocking Distance: Level echo from the blind zone cannot be evaluated due to the transient characteristics of the sensor. Span may not extend into the blanking distance (B).
- H: Sensor installation Height, Empty Distance
- d: measure distance
- h: liquid level (h=H-d)

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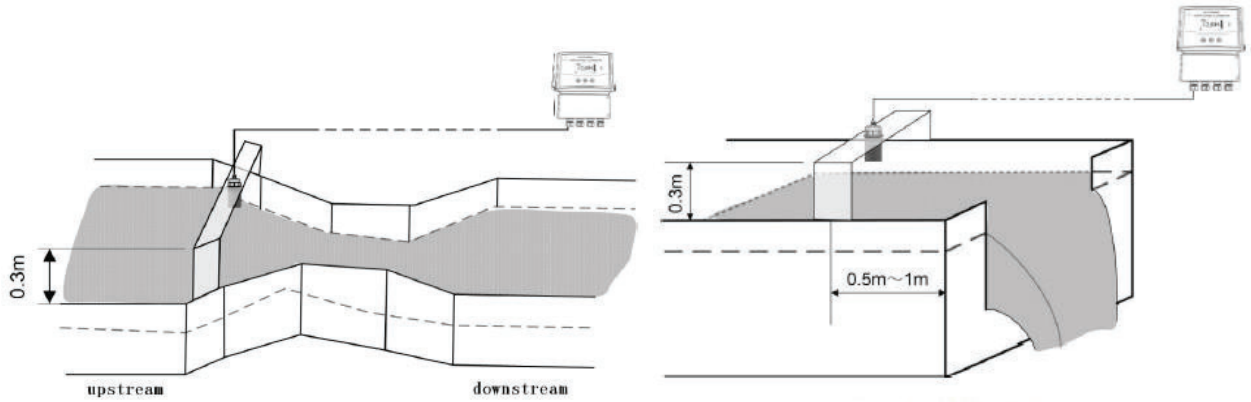
Installation



Parshall flume

Rectangular weir

Specifications

Specifications of meter	
Power supply	240 VAC 50Hz, 24 VDC 0.2A,
Display	Graphical LCD, can be set to Level or Flow
The instantaneous flow rate range	0.000~999999 l/s, m3/h or m3/min
The maximum of cumulative flow	99999999.9 m3 (can be user-defined)
Accuracy of change in level	1mm or 0.2% of measured distance
Resolution	1mm
Analogue output	4-20mA into 500 Ohms, corresponding to instantaneous flow rate.
Relays outputs	6 multi-function SPDT relays at most(optional),rated 5A /250VAC/30VDC, High, low and failsafe alarm and control corresponding to instantaneous flow rate or level. also, can be set as the pulse output.
Serial communication	RS485, MODBUS RTU protocol
Ambient temperature	-20℃~70℃
Measure cycle	1 second (changeable)
Material	ABS
Protection	IP67
Dimension	150H*135W*85D (mm)

Specification of sensor	
Range	5.00 m, 8.00m, 12.00m, 20.00m, 30.00m, 40.00m
Blind zone	0.20 m, 0.25m, 0.30m, 0.50m, 0.80m, 1.20m, 1.50m
Ambient temperature	-40℃~75℃
Temperature compensation	Automatic, Integrate in sensor
Pressure range	0.1 MPa
Beam angle	8° at 3db
Cable length	10m standard (can be extended to 1000 m)
Material	ABS, PVC or PTFE (optional)
Protection	IP68
Dimension	Screw (G3/4) or flange (DN65/DN80/etc.)