

HLFM Ultrasonic Open Channel Flow Meter



Application

The ULFM series is a remote version ultrasonic open channel flow meters (O.C.M.). It consists of two elements, a wall mounted host, which has a display and an integral keypad for programming, and a probe, which must be mounted directly above the surface to be monitored. Both of the host and the probe are plastic leak-proof structure. The ULFM series OCM can be widely applied to the environmental protection, water treatment, irrigation, chemical, and other industries.

Features

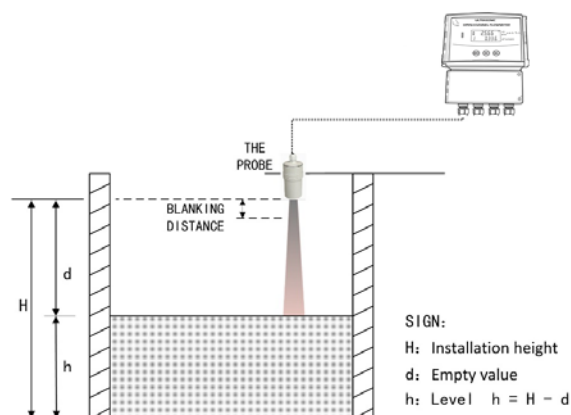
ULFM series O.C.M. is capable of the following functions:

- High detection accuracy, the flow meter measurement changes with 1mm, the accuracy of change in level is 1 mm;
- Suitable for a variety of weirs and flumes, Parshall flumes (ISO), Right-angle triangle weir, Rectangular weir;
- Displays flow rate in L/S or M³/h;
- Excellent anti-interference capability;
- Clear display with enhanced 14 digit two line backlit LCD;
- The cable length between probe and host up to 1000m;
- The probe with leak-proof structure and IP68 protect grade;
- Chemically resistant probe materials for maximum application flexibility;
- Provided 4-20mA output and RS485 serial communication (MODBUS-RTU) output;
- Provided programmable 6 relays at most for alarms;
- Three button for programming or remote control for easy configuration and operation (opt.);

Measuring principle: Time-of-flight method

The probe is mounted on the top of the flume, and ultrasonic pulses is transmitted by the probe to the surface of the monitored material. There, they are reflected back and received by the probe. The host measures the time t between pulse transmission and reception. The host uses the time t (and the velocity of sound c) to calculate the distance d between the sensor bottom and the monitored liquid surface: $d = c \cdot t/2$. As the host knows the installation height H from parameters setting, it can calculate the level as follows: $h = H - d$. Since speed of sound through air is affected by changes in temperature, the ULFM O.C.M. has integrated a temperature sensor to improve accuracy.

For determined flumes, there is a fixed functional relationship between the instantaneous flow and liquid level. The formula is $Q=h(x)$. Q means instantaneous flow, h means liquid level in flumes. So the host can calculate the flow rate though determined flumes and the level value. It is very important to understanding the working principle for further installation and operation.



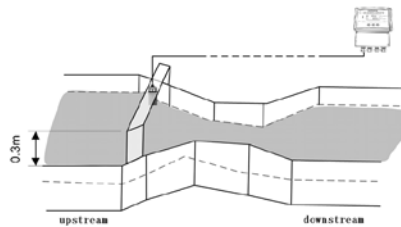
Blind zone: Level echo from the blind zone cannot be evaluated due to the transient characteristics of the sensor. Span F may not extend into the blanking distance B.

Technical data

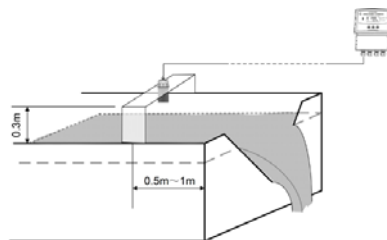
The host Type	ULFM (host)
Power supply	DC24V ($\pm 5\%$) 0.2A; AC220V ($\pm 20\%$) 0.1A
Display	2 lines 14 digit backlit LCD
The instantaneous flow rate range	0.0000~99999L/S or m ³ /h
The maximum of cumulative flow	9999999.9 m ³ /h
Accuracy of change in level	1mm or 0.2% of measured distance from the probe at still water. (whichever is greater)
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.
Serial communication	RS485, MODBUS-RTU standard protocol
Ambient temperature	-40 $^{\circ}$ C ~ 70 $^{\circ}$ C
Temperature compensation	Integral in probe
Pressure range	± 0.1 MP (press definitely)
Measure cycle	1 second (changeable)
Parameter setting	3 induction buttons / remote control
Cable gland	PG9 /PG11/ PG13.5
Material	ABS
Protect grade	IP67
Fix	Hang
Dimensions	248H*184W*122D(mm)

The probe Type	LB-4 (probe)
Range	0.00-4.00m
Blind zone	0.20m
Ambient temperature	-40 °C ~ 70°C
Temperature compensation	Integral in probe
Pressure range	0.2MPa
Beam angle	10 (3db)
Cable length	10m standard (can be extended to 1000m)
Material	ABS, PVC or PTFE (optional)
Protect grade	IP68
Fix	Screw (G2) or flange (DN65/DN80/etc.)

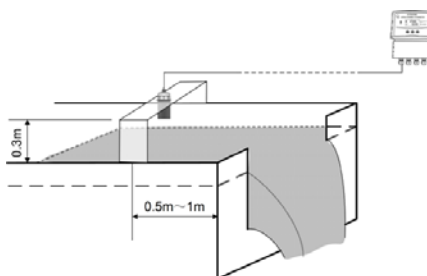
Applications



Parshall flume



Triangular weir



Rectangular weir

Model Selection

HLFM	Power Supply	
	A	AC220V(±5%)
	D	DC24V(±20%)
	O	Others
	Weir and flume Standard	
	I	ISO Standard
	C	National Standard
	Output	
	O	No output
	1	4-20mA output
	Communication	
	C0	No Communication
	C1	RS485 Communication
	Relay	
	R0	No
	Rx	“x” represents the number of relays , max 6
	Cable Length	
	L10	Standard 10 meters
	Lx	“x” is the length, max 1000m
	Protection Box for host	
	0	With protection box
	1	Without protection box