BFU300 Series Ultrasonic Doppler Flow Meters

(Portable Version and Fixed Version)

Introduction

The BFU-300 area velocity flow meter uses a submerged sensor to continuously measure both velocity and level in the channel . The sensor design resists fouling and is made from corrosion resistant materials The flow meter is configured with the standard IP68 submerged doppler velocity-level sensor and depth pressure sensor with temperature..

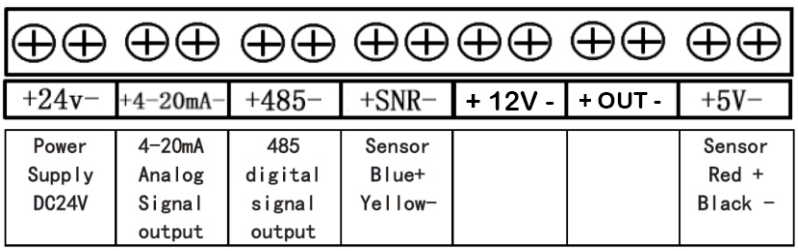
Measures Bi-directional flow through partially filled pipes, channels, canals and culverts without a flume or weir.

Features

- TFT high-resolution color screen display
- Solves the problem of partially full pipes and open channel flow measurement
- 4-20mA transmission output, relay high and low alarm control output, RS485 communication output and other variable outputs (Wall Mount Version)
- Double relay :: upper and lower limit alarm output (optional) (Wall Mount Version)
- Intelligent, multi-function measurement performance

Electrical Connection (Wall Mount Unit)

Attention: In order to ensure the safety of the user and the instrument, the instrument **accepts** DC24V power supply (if AC220V is required, please use the factory standard 220VAC to 24VDC adapter)



+24v−	+4−20mA−	+485−	+SNR−	+ 12V -	+ OUT -	+5V−
Power Supply DC24V	4−20mA Analog Signal output	485 digital signal output	Sensor Blue+ Yellow−			Sensor Red + Black −

Display introduction

Button	Introduction
MENU	Menu key: enter menu options
UP	Increase key: used to adjust parameter digits 0-9 and menu option selection
MOV	Move key: switch interface, Cursor shift in setting mode
ESC	Back key: Exit/return to the previous menu, the current setting is not confirmed if pressed
ENT	Enter key: set the current parameter change to confirm and save

Note: 4-20 current output always corresponds to the instantaneous flow value.

Menu Setting

Press the **MENU** button to enter the password interface and enter the correct user password (3000) to get to the setting mode; press the **UP** button to display each menu item in turn, press **OK** to enter the corresponding menu item. After entering the secondary menu, move the cursor via the **MOV** button, and then press **OK** to save the set parameter. Note: **UP** key (0-9 digit increase), Note: after modifying any parameter, you need to press the **OK** key to save, otherwise it will be regarded as invalid.

Password setting instructions

Press Menu Button	Enter 3000

Menu	Description
Introduce	information of the instrument
Section	According to the user requirements, choose different cross- section types (such as quadrilateral, circular, etc.)
Current setting	Set the instantaneous flow rate corresponding to 20mA and 4mA respectively (Wall Mount version only)
Modbus ID	Enter the units Address for RS485 communication (Wall Mount version only)
Relay 1 (Wall Mount version only)	Select upper limit alarm or lower limit alarm and enter the corresponding alarm value. Press ESC to move on
	Set the return difference required to cancel the alarm
Relay 2 (Wall Mount version only)	Select upper limit alarm or lower limit alarm and enter the corresponding alarm value. Press ESC to move on
	Set the return difference required to cancel the alarm
Relay 3 (Wall Mount version only)	Select upper limit alarm or lower limit alarm and enter the corresponding alarm value. Press ESC to move on
	Set the return difference required to cancel the alarm
Relay 4 (Wall Mount version only)	Select upper limit alarm or lower limit alarm and enter the corresponding alarm value. Press ESC to move on
	Set the return difference required to cancel the alarm

Time	Enter the correct time
Calibration-mA	Correct the deviation of 4mA and 20mA output, Under normal circumstances, 4mA corresponds to 200 and 20mA corresponds to 1000. (Factory Default)
Calibration-Flow	The value of the flow rate that needs to be

	increased or decreased (only supports fine adjustment)
Calibration-Temp	Input required temperature modification value (only supports fine adjustment)
Small signal cut	Enter Low cut-off Value to reduce bottom end spurious readings
Wave Filtering	Filter to reduce the effect of disturbances
Statistics	Cumulative flow statistics table (Wall Mount Version Only)
Font color	Modify background color, font color, prompt color, border color (Factory Password Only)
Modify Sum	Enter the starting cumulative flow value required
Running time	View the current cumulative device running time value (Factory Password Only)
Allow time	N/A
Mode setting	Choose different modes according to working conditions. (Factory Password Only).
Unit setting	The unit of instantaneous flow can be changed to: m^3 /h or L/s
Baud Rate	RS485 Speed Setting (Wall Mount Version Only)
Damping	Larger damping value smooths the reading changes.
Return Factory	Restore all settings to factory defaults

Standard Technical Parameters

Parameter	Range	Accuracy
(m/s) Velocity	0.03～5.00	±1.0%±1cm/s
Temperature (℃)	-10～60	±1（℃）
Water depth (m) (5cm above sensor min)	0.05～10	0.5%±0.5cm
Display power supply（VDC）	12V Hand / 24V Wall	
Sensor power supply（VDC）	9-24 V	
Protection level （Display）	IP65	
Protection level （Sensor ）	IP68	

Note: There is a vent conduit in the sensor cable, which needs to be connected to atmosphere in order to compensate the reading. Ensure that the cable is not bent, otherwise it will affect the accuracy of liquid level measurement.

Communication

1. Modbus communication protocol of BFU-300 Wall Mount Doppler/open channel flow meter

Address	Send（PC）	Example	Response	Example
	Address (ID)	0x01	Address (ID)	0x01
	Function code	0x03	Function code	0x03
	Upper byte of data first add.	0x00	Data length	0x0E
0000-0001	Lower byte of data first add.	0x00	Instantaneous flow (It's 10 times of real flow rate. E.g., the value is 291 and the flow rate is 29.1) (unsigned long)	0x00
	Upper byte of data length	0x00	Instantaneous flow	0x00
	Lower byte of data length	0x07	Instantaneous flow	0x01
	CRC check	0x04	Instantaneous flow	0x23
0002-0003	CRC check	0x08	Cumulative flow (unit: m^3) (unsigned long)	0x00
			Cumulative flow	0x04
			Cumulative flow	0x12
			Cumulative flow	0x03
0004			Flowrate upper byte (1000 times of real value. E.g., the value is 291, the real value is 0.291m/s)	0x01
			flow rate lower byte	0x23
0005			Level upper byte (1000 times of real value, E.g., the value is 291, the real value is 0.291m)	0x01
			Level lower byte	0x23
0006			Temperature upper byte (100 times of real value, E.g. if the value is 291, the real value is 2.91°C)	0x01
			Temperature lower byte	0x23
			CRC	0x43
			CRC	0x2e

For example: PC host sends: 01 03 00 00 00 07 04 08
Instrument returns value: 01 03 0E 00 00 01 23 00 04 12 03 01 23 01 23 01 23 43 2E
The return value analysis information is (the above data has been converted from hexadecimal to decimal): instantaneous flow: 29.1m3/h (0x00000123), cumulative flow: 266755m3 (0x00041203), flow velocity: 0.291m/s (0x0123), Liquid level: 0.291m (0x0123), temperature: 2.91°C (0x0123)