FvLuoky VANE
Turbine flowmeter

FTF70 Series

User Manual

FY/JC 50 A / O 15/11 V 1.3

FuYi Intelligent Instrument (Shanghai) Co., Ltd.

CONTENT

1、Summary

FTF70 turbine flowmeters are widely used in low flow rates, Low viscosity liquid measurement. Designed by a microcomputer Processor Sensor signal is converted into intelligent signal output

2、Main Parameter

2.1 Flow meter specifications, basic parameters and performance indicators

2.2 Sensor accuracy: + / - 1%, + / - 1.5%

Use condition：

a、Ambient Tem：-20℃～+50℃

b、Medium Tem:0℃～+120℃

c、Relative humidity：5%～95%

2.4 Electrical Specification:

a、Field display type (built-in lithium battery) power supply, 2 3V lithium battery parallel, the battery voltage is 2.7-3v can work normally. When the voltage is lower than 2.7v, the undervoltage indicator appears, the explosion proof type。

b、Pulse output type: external power supply +12VDC or +24VDC, remote transmission and computer acquisition card interface, remote transmission distance of 250m, common type and explosion proof type。

c、4-20mA output type: external power supply +24VDC (two-wire system) remote transmission and computer acquisition card interface, remote transmission distance of 500m, explosion-proof type。

DN mm	Standard m3/h	Downline range m3/h	MPa
4	0.04-0.25		4.0
6	0.1-0.6		4.0
10	0.2-1.2		4.0
15	0.7-6	0.6-6	4.0
20	0.7-8	0.6-8	4.0
25	1.2-10	1-10	4.0
40	2.5-20	2-20	4.0
50	5-40	4-40	4.0
65	7-70	7-70	1.6
80	12-100	10-100	1.6
100	25-200	20-200	1.6
125	30-300	30-300	1.6
150	50-400	40-400	1.6
200	100-800	80-800	1.0
250	150-1200	120-1200	1.0
300	300-2500	250-2500	1.0

d、Split remote transmission display type: external power supply ~ 220VAC, intelligent display device far to the instrument cabinet。

e、Split remote display type (with 4-20mA) output, external power supply ~ 220VAC, intelligent display far to the instrument cabinet, with 4-20mA output and computer connection.

3、Working principle

The turbine placed in the sensor rotates under the action of the fluid to change the magnetic field of the signal detector. Therefore, an alternating voltage is induced in the coil of the signal detector, and then amplified, filtered, and shaped by the amplifier to output a square wave signal. The frequency of this signal voltage is proportional to the rotational speed of the turbine, ie proportional to the flow rate (flow rate) of the fluid.

4、Design Features

4.1 The FTF70 turbine flowmeter has the only flowmeter in China with a working pressure of 50Mpa. It is mainly used for the measurement of water injection volume by oilfield water injection system. It is also suitable for flow detection of various high and low pressure water systems.

4.2 Fully hard alloy (tungsten carbide) shielded cantilever beam structure bearing, integrating rotary bearing and pressure bearing, greatly improves bearing life and can work in medium with a small amount of sediment and dirt.

4.3 It adopts Icr18Ni9Ti all stainless steel structure (the turbine adopts 2Cr13) and has good anti-corrosion performance.

4.4 As a signal detector, samarium cobalt permanent magnet alloy has strong output signal and good magnetic temperature.

4.5 Wide temperature range: It can work normally in the range of 0-120 °C.

4.6 Easy to maintain, the flowmeter has self-rectifying structure, small and light, simple structure, which can be disassembled in a short time, and the internal cleaning is simple.

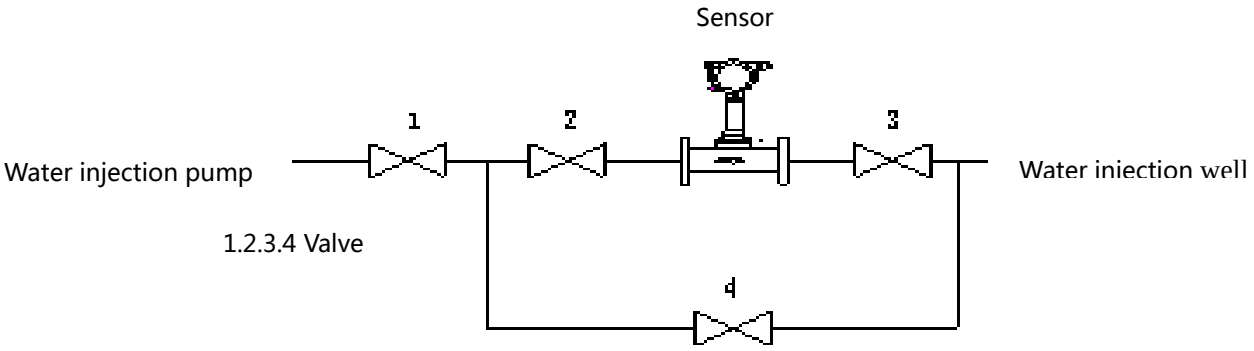
5、 instrument installation

5.1 When installing the sensor, it must be noted that the flow of the nameplate must not be reversed.

5.2 The sensor can be installed horizontally or vertically. Since the sensor is limited by the upstream matching conditions, it is recommended that there should be a straight pipe section before and after the sensor. The length of the front straight pipe section should be 10 times the diameter of the selected sensor. The length of the rear straight pipe section should be the diameter of the selected sensor. 5 times.

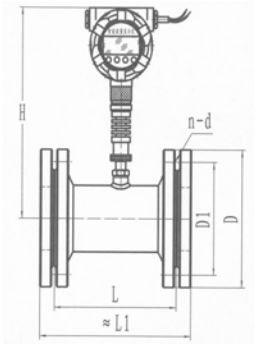
5.3 The connection shape and dimensions of the sensor are shown in the second table. If there are special requirements, the order can be negotiated.

6、Installation diagram

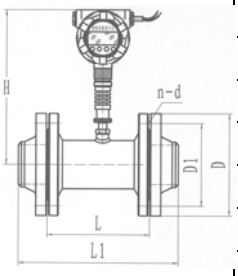


6．1 Installation dimension drawing

	DN (mm)	MPa	L	L1	H	D	D1	n-d
	15	4.0	100	132	265	95	65	4-Φ14
	20	4.0	110	146	270	105	75	4-Φ14
	25	4.0	120	156	275	115	85	4-Φ14
	32	4.0	160	200	278	135	100	4-Φ18
	40	4.0	168	208	280	145	110	4-Φ18
	50	4.0	186	230	285	160	125	4-Φ18
	65	1.6～4.0	200	248	293	180	145	8-Φ18
	80	1.6～4.0	200	252	300	195	160	8-Φ18
	100	1.6	220	272	310	215	180	8-Φ18
		2.5～4.0				230	190	8-Φ22
	125	1.6	250	300	325	245	210	8-Φ18
		2.5～4.0				270	220	8-Φ26
	150	1.6	300	360	335	280	240	8-Φ22
		2.5～4.0				300	250	8-Φ26
	200	1.6	360	425	360	335	295	12-Φ22
		2.5				360	310	12-Φ26
		4.0				375	320	12-Φ30
	250	1.6	420	480	375	405	355	12-Φ26
		2.5				425	370	12-Φ30
		4.0				445	385	12-Φ33
	300	1.6	432	502	415	460	410	12-Φ26
		2.5				485	430	12-Φ30
		4.0				530	460	12-Φ36

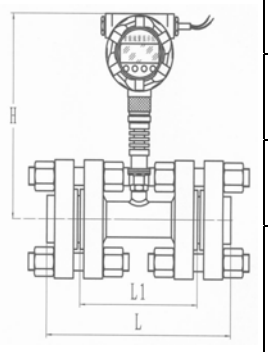


Low pressure flange connection



Medium pressure flanged connection

DN (mm)	MPa	L	L1	H	D	D1	n-d
25	6.3	130	230	270	135	100	4-Φ18
32	6.3	160	270	278	150	110	4-Φ23
40	6.3	168	290	280	165	125	4-Φ23
50	6.3	194	305	285	175	135	4-Φ23
65	6.3	206	325	293	200	160	8-Φ23
80	6.3	206	325	300	210	170	8-Φ23
100	6.3	230	360	310	250	200	8-Φ25
125	6.3	260	395	325	295	240	8-Φ30
150	6.3	310	460	335	340	280	8-Φ33
200	6.3	370	555	360	405	345	12-Φ33
250	6.3	430	630	375	470	400	12-Φ36
300	6.3	440	660	415	530	460	16-Φ36



High pressure flanged connection

DN (mm)	MPa	L	L1	H	D	D1	n-d
25	16～26	260	160	275	160	108	4-Φ26
	42	325					
32	16～26	280	180	278	185	130	4-Φ26
	42	345					4-Φ29.5
40	16～26	310	200	280	205	146	4-Φ29.5
	42	410					4-Φ32.5
50	16～26	340	200	285	235	171.5	8-Φ26
	42	430	220				8-Φ29.5
65	16～26	350	220	293	245	190.5	8-Φ29.5
	42	460	250				8-Φ32.5
80	16	380	250	300	305	228.5	8-Φ26
	26						8-Φ32.5
	42	480	280				8-Φ35.5
100	16	460	260	310	310	241.5	8-Φ32.5
	26						8-Φ35.5
	42	635	350				8-Φ42
150	10	530	310	335	355	292	12-Φ29.5

7、Output type

There are two forms of flowmeter output: a pulse output turbine flow sensor and a 4-20 mA output turbine flow meter.

7.1 pulse type main technical parameters

a, working voltage: +12VDC or +24VDC (the customer must select a power supply before ordering).

b. Signal transmission distance: less than 250 meters.

c. Output signal: square wave signal.

d, amplitude: +12VDC power supply amplitude is about 10V.

The +24VDC supply has an amplitude of approximately 20V.

e. Installation: The amplifier and turbine flow sensor are connected to m16×1.5 thread. After the turbine flow sensor is installed, screw the amplifier to the turbine flow sensor and hand-tighten it to the bottom of the sensor amplifier before tightening the lock nut.

f. Wiring: The pulse output type amplifier has three external leads, red line, white line and shield. The red line is connected to the positive power supply, and the white line is connected to the pulse output and other display instruments or devices, and the shield is grounded.

Note: Be sure to complete all wiring and check that the wiring is correct before power-on. Do not reverse the connection, otherwise the amplifier board may be damaged.

7.2 Main technical parameters of 4-20mA output type

a, working voltage: external power supply +24VDC (two-wire system)

b. Output signal: 4-20mA or 1-5V, 4mA corresponds to the zero flow of the turbine flow sensor, 20mA corresponds to the maximum flow of the turbine flow sensor, and the flow range is shown on the nameplate of the turbine flow sensor.

c. Signal transmission distance: less than 250 meters.

d. Installation: After the turbine flow sensor is installed, screw the amplifier to the turbine flow sensor connector (m16×1.5 thread) and hand-tighten the lock nut after the sensor amplifier has been turned to the end.

e, wiring: 4-20mA output amplifier wiring reference 8 electrical connection.

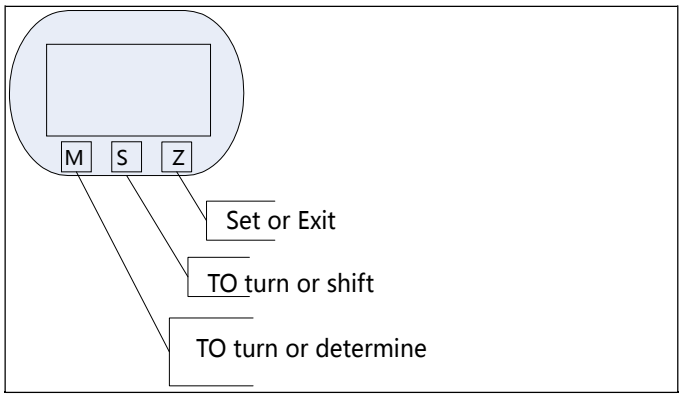
8、Converter parameters

8.1 display

The flowmeter converter adopts digital signal processing technology (DSP technology). The digital circuit module can automatically adapt to all caliber and gas-liquid medium conditions, automatically adjust signal processing parameters, and completely abandon the traditional dial-switch design. Stability and anti-interference ability; Efficient power supply design makes the circuit power consumption extremely low, greatly extending the battery life. The large-screen LCD display can display a wealth of configuration information, all of which can be easily configured by pressing a button.Show the following picture:

8.2 Live button function and setting method

◆Basic function description of the button



◆ Field configuration enters and exits

In the "normal display" state, press the "Z" key to enter the "field configuration". The "Field Configuration" parameter can be set using the "Direct Digital Input" and "Menu Selection" methods.

In the "Field Configuration" state, press the "Z" key to exit the "Field Configuration" and enter the "Display" state.

Note: This meter records the status when the button is set to exit the last time. Press "Z" to return to the state when it was last exited.

◆ Data setting method

The field setting parameters are divided into two types: "direct digital input" and "menu selection".

1) "Direct digital input" setting method

Press and hold the M key until the symbol flashes to indicate that the setting can be changed.

Short press the M button to switch the symbol.

Press S key to shift, the first digit will start flashing, indicating that it can be modified, short press M key, and the number is increased by one.

Press the S key again to set the second to fifth digits in turn, and the setting method is exactly the same as the first digit.

After setting the fifth digit, press the S key to start setting the decimal point. The four decimal points start to flash at the same time, indicating that the decimal point can be set. At this time, press the M key shortly to switch the decimal point position cyclically.

In the data setting process, you can press and hold the M button at any time to save the settings; or press the Z button to exit the settings.

2) "Menu selection" setting method

Press and hold the M key until the setting content flashes to indicate that the setting can be changed.

Short press the M button, scroll up the option, or press the S button to scroll down the option.

During the data setting process, press and hold the M key until the setting content does not flash to save the settings. ;

Description:

During the setting process, press and hold the "M" button for three seconds to save and end the data setting.

During the setting process, press the "Z" key to exit the current setting without saving.

After completing the settings or exiting the settings, they all stay in the current settings interface.

8.3 Field configuration function

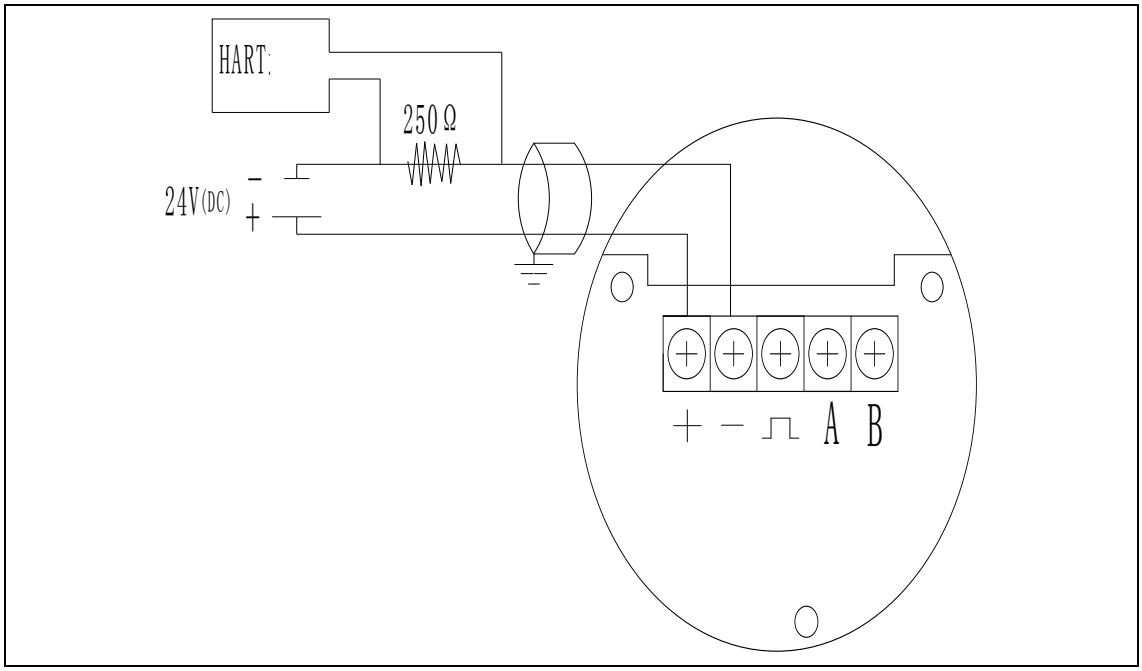
When configuring the field, the "88" character in the lower left corner of the LCD is used to indicate the setting variable type. The corresponding relationship is

Display	Setting variables	Setting method	Remark
01	Write protection	Long press M key to switch	ON (ON) / OFF (OFF)
02	Lower alarm limit	Direct digital input	unit:%
03	Upper limit of alarm	Direct digital input	unit:%
04	Flow model	menu selection	LIq_0：liquid volume ST_0：Steam volme LIq_1：liquid quality ST_1：Steam quality GAS_0：Gas volume： ST_2：Saturated vapor mass（(temperature compensation)） GAS_1：Gas quality： ST_3：Saturated vapor mass（Pressure compensation）
05	Instantaneous flow unit	Manual selection	Nm3/h，m3/d，m3/h，m3/m，m3/s，l/h，l/m，l/s，t/d，t/h，t/m，kg/d，kg/h，kg/m，kg/s，g/h，g/m，g/s， Note: the cumulative flow unit is determined according to the instantaneous flow unit. See the relationship between instantaneous flow unit and cumulative flow unit.
06	Range upper limit	Direct digital input	
07	Density	Direct digital input	Gas Density(unit：kg/m3） Liquid Density(Unit:g/cm3）
08	Gas pressure	Direct digital input	Unit：kpa，when meansure liquid,no the item

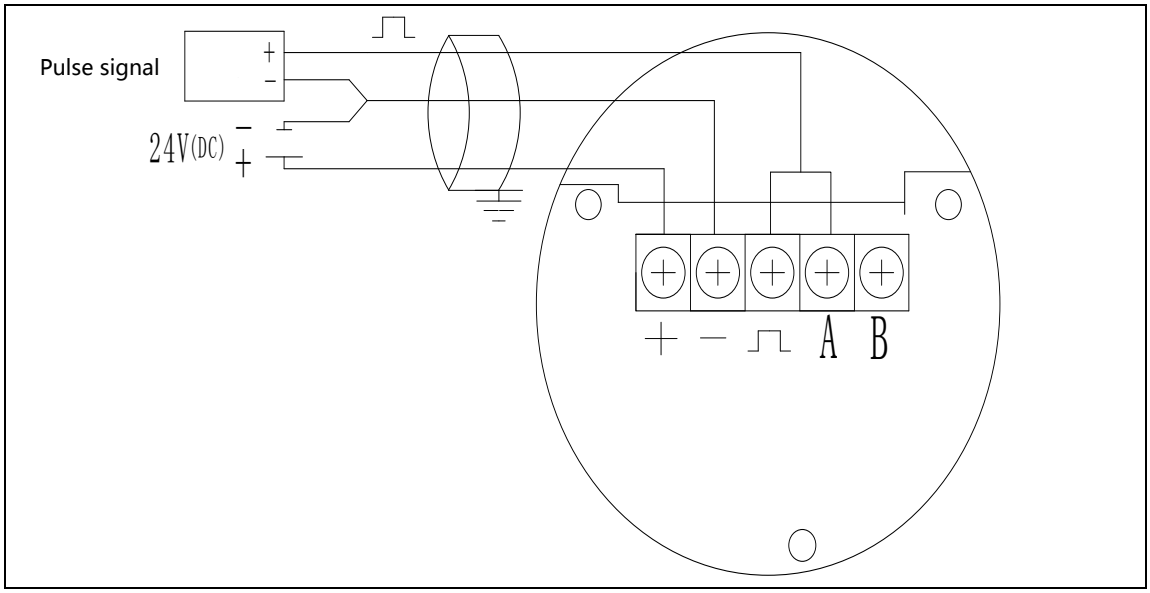
09	Gas Temp	Direct digital input	Unit：℃，When measure liquid, no the item
10	Low flow resection	Direct digital input	Range：0%～20%
11	damping	Direct digital input	Range：0s～64s
14	The accumulated flow is cleared	Manual selection	When Lcd display ACC_y , long press M key to achineve cumulative flow cleaning zero
15	Cumulative flow overflow times	Only read	The cumulative flow is greater than 9999999 and the number of overflow is increased by one.
50	Operation code	Direct input	Enter ***50 to enter item 51 to 55 of the setup.
51	signal intensity	Only rea	LCD show： 450.00 mean：450.00 as enlargement factor 51 2 - 1 51 :as a reminder 2:channel number 1: signal intensity
52	Vortex diameter&medium condition	Manual selection	options：DN15mm～DN350mm， Remark：LCD show d_15：15mm When medium is gas, the setup screen as below: d — 25 52 GAS When medium is liquid ,the setup screen as below: d — 25 52 LIq After changing the aperture of vortex street or the state of medium, items 53 ～ 56 must be reset. Please refer to the "special instructions" at the end of the table for details.
53	Maximum measuring frequency	Direct digital input	Determine according to caliber and measuring medium。
54	Miximum measuring frequency	Direct digital input	Determine according to caliber and measuring medium
55	Maximum magnification	Direct digital input	It is recommended to be between 200 and 1000. Usually around 500.
56	Instrument coefficient (coefficient)	Direct digital input	Determine according to caliber and measuring medium.
57	Output pulse coefficient	Direct digital input	he number of output pulses corresponding to input 1m3.

9、Electrical connection

9.1 Two-wire system power supply/LCD / 4-20ma output



9.2 Power supply/LCD/pulse output of two-wire system



10、Selection Code

Sensor code									Transmitter code					optional	Description
FTF70	-X	X	( )	-X	X	X	X	X	-X	X	X	-X	X	-X	Capacity(m3/h)
Type	-F														Flanged
	-W														Clamped
Ex type		—													Standard
		Ex													CT4-6
Caliber			DN												Digital type
Pipe material				-N											SUS304
				-L											SUS316
				-X											The special consultation
Impeller material					6										SUS316L
					S										Duplex phase steel alloy
Protection grade						1									IP65
						2									IP67
Pressure class							1								4.0MPa
							2								1.6MPa
							3								1.0MPa
							X								The special consultation
Structure type								Y							one type
								F							Split type
Power supply									-1						24V DC
									-2						24VDC+3.6VDC battery
Output Signal										1					4~20MA
										2					Pulse signal
Communication protocol											1				RS485
											2				HART
Electrical interface												-M			M20*1.5
												-N			1/2" NPT
Accuracy grade													A		1.0
													B		0.5
Accessories															Flange,signal cable (m)

Illustration

Model: FTF70-F (50)-N611Y-112-MA-4-40m3/h

Flange connection, caliber :DN50， pipe material :SUS304 ,Impeller material :SUS316L ,IP：65 ,pressure : 4.0MPa，Structure type：one type，supply：24V DC，output：4-20mA+HART，Electrical interface：M20*1.5，Cast aluminum housing with LCD head，Tolerance：1.0，no explosion-proof，measure range：4-40m3/h。

FuYi Intelligent Instrument (Shanghai) Co., Ltd.

Tel : 021-5227 8523 Fax : 021-5227 8525

E-mail: Sales@fvluoky.com

http://www. fvluoky.com