

The selection is detailed on page 6



FC90 Gear Flowmeter

Working principle

The speed of the gear transmitter is detected by the sensing coil in the signal amplifier installed on the watch case. The signal amplifier is not in contact with the measured medium. When the transmitter gear cuts the magnetic field lines generated by permanent magnets inside the casing, it will cause changes in the magnetic flux in the sensing coil. The sensing coil sends the detected magnetic flux periodic change signal to the preamplifier, amplifies and reshapes the signal to generate a pulse signal proportional to the flow rate, sends it to the Conversion of units and flow integration circuit to obtain and display the cumulative flow value, and also sends the pulse signal to the frequency current conversion circuit to convert the pulse signal into an analog current, thus indicating the instantaneous flow value.

Product description

Gear flow transmitter is a type of positive displacement flow transmitter. It is a transmitter for measuring volume flow with high precision. With the flow of medium, the gears mesh and rotate, and under the action of fluid flow, a pressure difference is formed between the two ends of the instrument inlet and outlet, without power supply. A pair of gears rotate freely, and the cavity between them is filled with liquid, and the liquid is discharged with the rotation. The flow rate of liquid flowing through the instrument can be known by measuring the number of revolutions of the gears.

Gear transmitter has high machining precision and precise installation. The rotation of the gear is non-contact scanned, and each tooth generates a pulse with very high resolution. Cylindrical gear transmitter can measure very small flow and quantify small volume of liquid.

Functional performance

- High pressure resistance (1.0-45MPa)
- High and low temperature resistance (-196°C -200°C)
- Can measure various viscous media.
- High precision and high repeatability
- Pulse output/analog output optional
- Wide range ratio (1: 100)
- Wide measuring range

Product application

- Measurement of hydraulic oil, lubricating oil and grease
- Measurement of liquid nitrogen, frozen liquid and solvent
- Measurement of edible oil, fish oil and food filling
- Chemical engineering and anticorrosion requirements-Fluid measurement
- Fluid quantitative control system



Technical parameter

Model	Measuring range L/H	K coefficient P/L	Maximum pressure Bar		temperature	Accuracy	Interface
			Aluminum alloy	stainless steel			
FC90-A	5-50	4780	150	400	-15-80°C	+/- 0.5% (Range 1:10) +/- 1.0% (Range 1:100)	G1/4
FC90-B	5-200	4780	150	400	-15-80°C		G1/4
FC90-C	10-500	2468	150	400	-15-80°C		G1/2
FC90-D	50-1200	1280	150	400	-15-80°C		G1/2
FC90-E	200-3000	126.75	150	400	-15-80°C		G3/4
FC90-F	1000-12000	61.1	150	400	-15-80°C		G1
FC90-G	2000-20000	59.9	150	400	-15-80°C		M35×1.5

Product diagram



Threaded



Quick clamp connection



Ferrule connection

Characteristic

Gear flow transmitter is a new type of volumetric flow transmitter used for precise continuous or intermittent measurement of liquid flow or instantaneous flow in pipelines.

Small size, light weight, low vibration and noise during operation, and stable operation. It can be used for measuring small flow rates of small pipe diameters. Small initial flow rate, wide range ratio, suitable for measuring liquid flow rates with large fluctuations. The measurement accuracy is not affected by pressure and flow changes, stable performance, long service life, and large flow capacity.

Formula

The K coefficient (flow coefficient) of a gear flowmeter accurately defines the number of pulses per liter corresponding to a unit flow rate.

Apply the following formula:

$$Q = F \times 60 / K$$

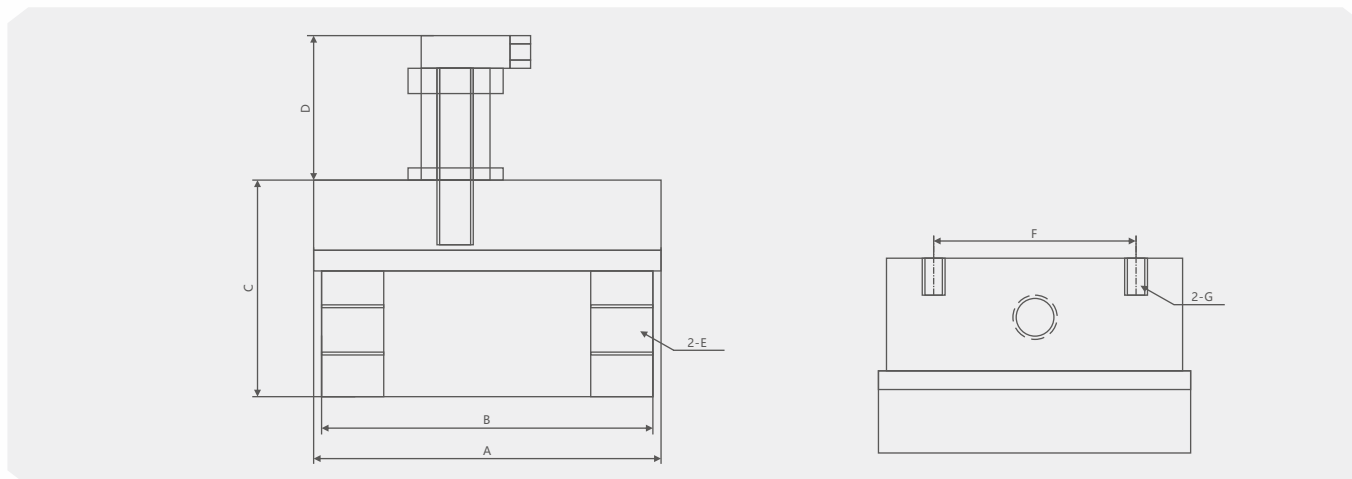
Q=Instantaneous flow rate liter/minute

F=Output pulse frequency HZ

K=coefficient pulse/minute of gear flow meter



Size mm

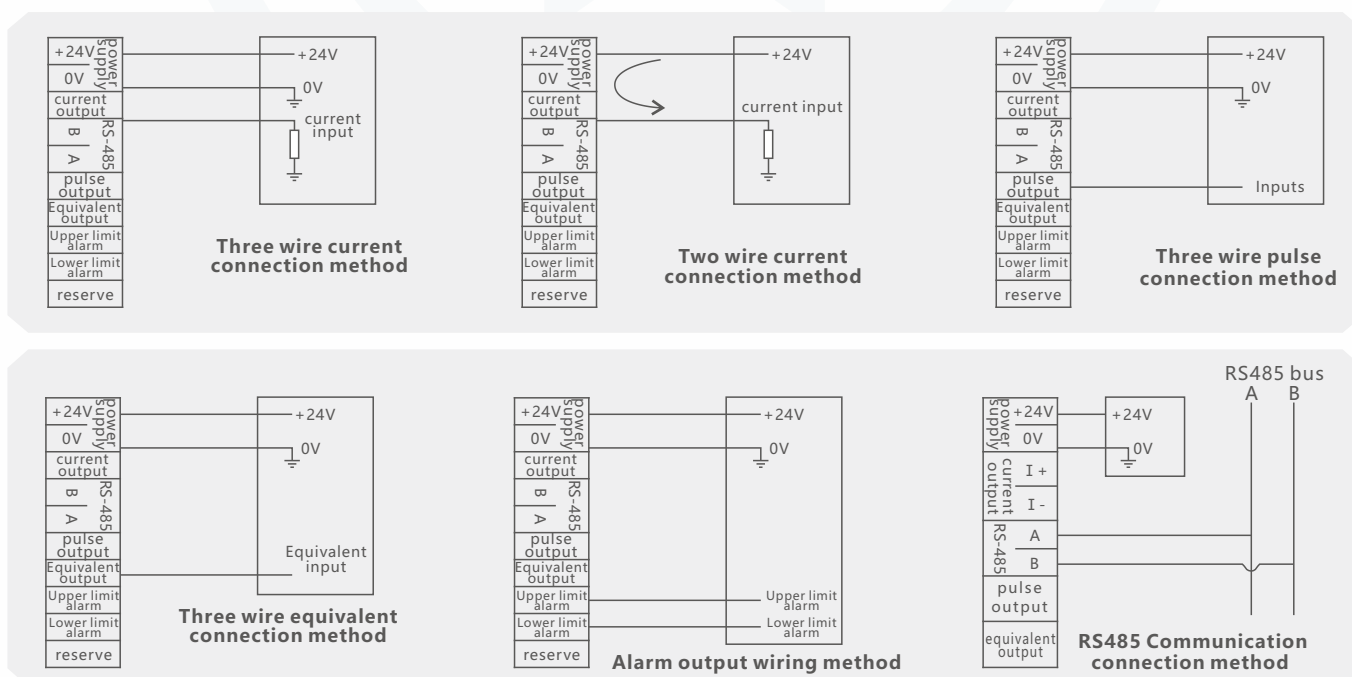


size model	A	B	C	D	E	F	G
FC90-A	Φ 63	60	37	65	G1/8	40	M5
FC90-B	Φ 83	80	50	65	G1/4	55	M6
FC90-C	Φ 83	80	67	65	G1/2	55	M6
FC90-D	Φ 83	80	67	65	G1/2	55	M6
FC90-E	Φ 113	110	63	65	G3/4	90	M6
FC90-F	Φ 158	149	85	65	G1	110	M8
FC90-G	Φ 218	160	100	65	M35×1.5	180	M8

The above dimensions are standard product dimensions. In special circumstances, customization can be made according to the customer's on-site needs.

Electrical installation and wiring diagram:

- 1) Hersman pulse wiring method: (pulse output): three wire system wiring method: brown: +11V-26V, blue: GND, black: IN;
- 2) Electrical output wiring terminal description and wiring method:



Installation requirements

The field installation position of transmitter should be as far as possible away from the environment with high temperature, strong mechanical vibration, strong magnetic field interference and strong corrosiveness, and should be installed in a position that is easy to maintain and repair.

· Generally, the transmitter should be installed horizontally, and the sensor must be firmly installed on the assembly body with screws. If it must be installed vertically, the liquid direction must be upward. The pipeline shall be filled with liquid, and there shall be no bubbles.

The upstream side of the transmitter should have a straight pipe section with a length of 20 times the nominal diameter or a rectifier installed, and the downstream side should have a straight pipe section with a length of 5 times the nominal diameter.

When installing various accessories of the transmitter, the base center line should be aligned with the center line of the pipeline, and the gasket at the joint should not protrude into the liquid.

When the flow regulating valve needs to be installed, it must be installed on the downstream side of the sensor.

When installing a sensor on a new pipeline, it is recommended to install a filter upstream of the transmitter in order to prevent impurities in the pipeline from entering the transmitter.

In order not to affect the normal transmission of liquid during maintenance, a bypass pipeline should be installed at the installation of the transmitter.

The magnetic field near the gear flow transmitter and similar interference sources may affect the sensor to pick up the signal. The connection between the transmitter and the display instrument should adopt a shielded cable with metal, and the shielding layer of the transmission cable is grounded at the display instrument end.

Use and maintenance

When using, the liquid to be tested should be kept clean and free of fibrous and granular impurities.

Opening and closing sequence of valves when transmitter is put into operation

For the transmitter without bypass pipe, first open the upstream valve of the transmitter at a moderate opening, then slowly open the downstream valve to run at a small flow rate for 10 minutes, then fully open the upstream valve to the required normal flow rate for the transmitter with bypass pipe, first open the upstream valve at a moderate opening, then slowly open the downstream valve, then turn down the opening of the bypass valve, so that the transmitter can operate at a small flow rate for 10 minutes, then fully open the upstream valve and fully close the bypass valve (to ensure no leakage), and finally adjust it.

When opening and closing the valve, it should be as gentle as possible. If automatic control is adopted, it is best to adopt the mode of "two-stage opening and two-stage closing" especially for medium and large caliber sensors to prevent sudden impact of liquid.

The water hammer effect is generated and the gear is damaged.

In order to ensure the long-term normal operation of the transmitter, the operation inspection should be strengthened at ordinary times, and measures should be taken in time to eliminate any abnormality once it is found. Pay special attention to monitoring the gear rotation, and check the transmitter in time if you hear abnormal sounds.

The maintenance period of the transmitter is generally three months. When checking and cleaning, be careful not to damage the internal parts and assemble them according to the original assembly position.

When the transmitter is not in use, the internal liquid should be cleaned and protective sleeves should be added at both ends of the transmitter to prevent dirt from entering, and then stored in a dry place.

The matched filter should be cleaned regularly. When not in use, a protective cover should be added to prevent dirt from entering, and then stored in a dry place.

The transmission cable of the sensor can be laid overhead or buried (plastic pipe or iron pipe should be covered when buried).



Fault handling

Fault phenomenon	Eause analysis	Elimination method
The liquid flow is normal, but the display instrument has no display.	<ol style="list-style-type: none"> 1. The power supply is not connected or the wiring between the sensor and the instrument is wrong.Or there are faults such as open circuit, short circuit and poor contact. 2. The preamplifier is faulty. 3. The gear is stuck 	<ol style="list-style-type: none"> 1, connect the power supply or check whether the wiring is correct, with a multimeter Fault point. 2. Check the preamplifier. 3. Remove foreign bodies and clean or replace gears. Replace the gear should be renewed Check to get a new instrument coefficient.
There is no operation to reduce the flow, but the flow display value is gradually decreasing.	<ol style="list-style-type: none"> 1. Whether the filter is blocked. 2. The valve core on the sensor pipeline is loose, and the valve opening automatically decreases. 3. The gear of the transmitter is blocked by sundries, which increases the resistance and slows down the speed. 	<ol style="list-style-type: none"> 1. Clean the filter 2. Repair or replace the valve 3. Remove the sensor for cleaning
The liquid does not flow, and the flow display is not zero or the display value is unstable.	<ol style="list-style-type: none"> 1. The transmission wire is poorly shielded and grounded, and external interference signals are mixed into the input end of the display instrument. 2. When the pipeline vibrates, the gear vibrates to generate an error signal. 3, display instrument internal fault interference. 	<ol style="list-style-type: none"> 1. Check whether the grounding terminal of the shielding display instrument is well grounded. 2. Reinforce pipes or sensor screws. 3, repair the display instrument

FC90-Selection and composition

Type selection example **FC90** **A** **H** **N** **1-10t/h** **C** **G** **N** **S** **W** **A**

1 2 3 4 5 6 7 8 9 9.1

1.Instrument type	A	Integrated
	B	Other installation forms
2.working power supply	G	Ac 220V
	H	Dc 24VDC
	I	Battery powered 3.6V
3.output signal	N	4-20mA
	O	4-20mA HART
	P	pulse
	Q	RS485
	X	4-20mA+Switch output
4.Range range	R()	Range (Note Range)
5.Explosion-proof requirements	A	Intrinsically safe explosion-proof
	B	Flameproof
	C	No explosion-proof
6.medium temperature	G	< 65°C
	H	< 120°C
	I	-196°C-200°C
7.Texture of wood	N	304 stainless steel
	O	316 stainless steel
	P	aluminium alloy
	Q	PP
	T()	Other materials
8.Sealing material	S	FKM
	U	PP
	T()	Other materials
9.attended mode	W	threaded connection
	X	flanged connection
	Y	Sanitary flange
	Z	cutting sleeve
9.1.threaded connection (Flange item is not selected)	A	1/2NPT
	B	3/4NPT
	C	1/4NPT
	D	M8×1.0
	E	M10×1.0
	F	M12×1.5
	G	M14×1.5
	H	M18×1.5
	I	M20×1.5
	J	G1/2
	K	G3/4
M	G1/4	
N	G1/8	
O	G3/8	



FC90-Selection and composition

Type selection example **FC90** A H N 1-10t/h C G N S W A

1 2 3 4 5 6 7 8 9 9.1

9.2.flanged connection (Threads are not selected)	P	DN4
	Q	DN6
	R	DN10
	S	DN15
	U	DN25
	V	DN32
	W	DN40
	X	DN500
	T ()	Other flange connections
10.special requirements	A	high-temperature
	B	high-pressure

Description:

The FC90 gear flowmeter is one piece, the power supply is 24VDC, the output signal is 4-20mA, the measuring range is 1-10t/h, the medium temperature is < 65°C, the material is 304 stainless steel, the sealing material is FKM, the connection mode thread 1/2NPT (9.1,9.2) is one of the three options. No. 10 in the above table is optional.

Product Certification

Compliance and approval; Rodwig flow meters meet key standards and certifications for process measurement technology; To ensure the highest reliability in such settings;

