

HUGE

INSTRUCTION MANUAL

Insertion Turbine Flow Meter



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1. Overview

1.1 General

CY501 insertion type flow sensor (hereinafter referred to as the "flow sensor"), is in an airtight pipe insert the turbine to a special position, make the turbine speed and the fluid flowing through a pipe flow within a certain range to achieve linear proportional, with fixed turbine to measure the unsteady pipe flow, due to a single and convenient, greatly reduces the production cost and use cost, is suitable for large diameter pipeline detection.

This manual describes the CY501 series flow sensor technology specification, selection, installation, use and maintenance as well as the choice of auxiliary instrument. Please users for this product, carefully read this manual first, especially in the next section, "installation".

1.2 Handling precautions

In order to prevent the flow sensor is damaged, please don't open the packing before use the destination.

1.3 Deposit should be paid attention to

- As far as possible don't store opened the package
- storage after use, clean surface flow probe, try to make it in a state of freedom
- Location: rain moisture, small mechanical vibration, avoid collisions, a comfortable temperature

2. Installation

Any position on pipeline, open a hole, install a female G1-1/4 "installation, the flow sensor directly rotation can be achieved on connection. In use, the user can also directly pipes connected to order (reference the delivery form), save their processing pipelines and high setting inappropriate and make the inaccurate measurement of trouble.

2.1. Installation position

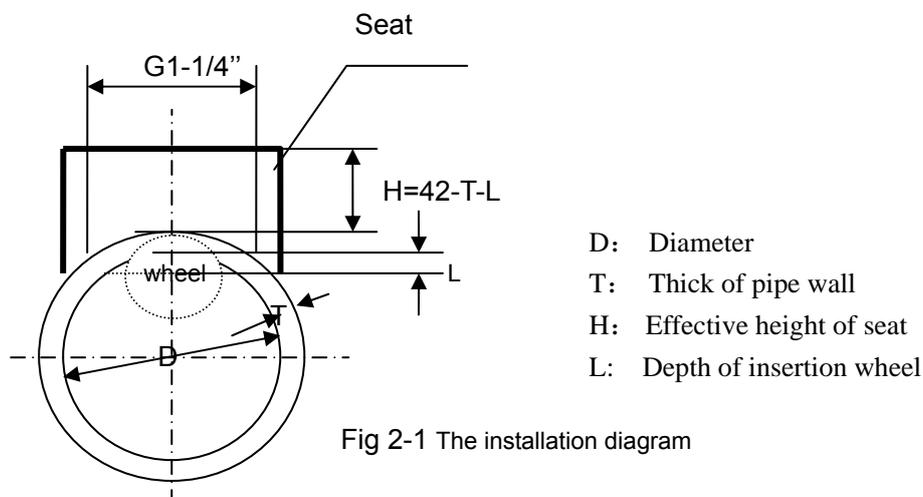


Fig 2-1 The installation diagram

Table 2-1. Different straight pipe size at different pipe state

Direction	Up /down straight pipe size	Direction	Up /down straight pipe size
	10 D / 5 D		30 D / 5 D
	15 D / 5 D		40 D / 5 D
	20 D / 5 D		50 D / 5 D

2.2. The flow sensor installation requirements

- 1) Flow sensor installation shall be in accordance with the relevant provisions in the high dimension of welding (or stick), to ensure that the insertion depth.
- 2) Flow sensor retractor direction should be visual perpendicular to the pipe axis, to ensure that the turbine with vertical flow under the visual can feel vertical, can basic guarantee measurement accuracy and stability.
- 3) Environmental conditions: ventilation, avoid thermal radiation, strong mechanical vibration, high frequency noise sound, strong electromagnetic interference, etc..
- 4) Requirements: to flow in a fluid is measured flocculent should not contain any impurities, otherwise the filter shall be installed in pipeline before the flow sensor and regular cleaning; The measurement of body temperature not higher than 80 °C.
- 5) Flow sensor should be installed in the low position, as far as possible to ensure that the pipe in measuring full state.

2.3 Flow sensor probe insertion depth

Flow sensor probe insertion depth is different, also can directly affect the measurement accuracy and stability. This product gives the data of the flow rate is constant in the table below, user during the installation, please pay attention to the reference table 2-2.

Table 2-2 CY501 installation size (Unit: mm)

T Thick	D Diameter	L Depth	H Height of seat	K-factor P/L
3	32	7	32	145.5
3	40	8	31	67.73
4	50	9	29	43.35
4.5	65	11	26	25.67
4.5	80	13	25	16.93
4.5	100	15	23	10.84
5	125	18	18	6.94
5.5	150	25	12	4.82
6	200 *	30	38	2.71
8	250*	30	30	1.73
Calibrate for larger pipe at actual flow				

*Note: Make sure L insert depth can ensure that the value of the flow coefficient of the P/L different needs to adjust constants such as insertion depth.

3. The flow sensor measurement range and requirements

Flow sensor accuracy grade is determined by the measurement range, this manual gives different flow range of different precision, the user can choose the corresponding parameters, in order to obtain a reasonable instrument accuracy. Don't have to calibration, the company will not increase the burden of the user.

Table 3-3 Flowrange and accuracy of CY501

DN(mm)	3%(m3/h)	1.5%(m3/h)	1%(m3/h)
32	1.5~15	2~12	5~12
40	4~40	5~25	10~25
50	5~50	7~40	15~40
65	8~80	11~70	25~70
80	12~120	17~100	30~100
100	20~200	30~160	50~160
125	30~300	40~260	80~260
150	40~400	60~350	100~350
200	100~660	200~600	300~500
250	200~1000	300~800	400~700

4. Other specification

- Power supply: 12-24VDC
- Output signal: Pulse
- Accuracy: $\pm 1.5\%$
- Repeatability: 0.3%
- Environment temperature : (-20~55) $^{\circ}\text{C}$
- Relative humidity : 85%
- Medium temperature: 60 $^{\circ}\text{C}$
- Protection grade: IP67
- Weight: 0.5kg

5. Model Selection

Table 5-1 Model description

Item		Code			
Insertion type		CY501			
Pipe size	Less than 150 (include 150)	1			
	More than 150	2			
Medium	Normal	1			
	Corrosive fluids	2			
Auxiliary device	SS pipe with welded seat	1			
	PVC pipe with plastic seat	2			
	Clamp type with SS	3			
	Flange type with SS	4			
	1-1/4" SS Seat	5			
	1-1/4" Plastic Seat	6			
Output signal	Pulse		1		
Cable length: / meter					3

6. Theory and outline size

6.1 Theory

CY501 series flow sensor, is to use a quantitative turbine in different pipe inserted into the depth of the quantitative, the quantitative turbine in different pipeline stability detection range can be found, because of the fixed turbine inherent linear stability, it can satisfy various pipes of size measurement, pipeline must be, must be inserted depth, frequency of the turbine is sure.

6.2 Outline size

6.2.1 Single flow transducer

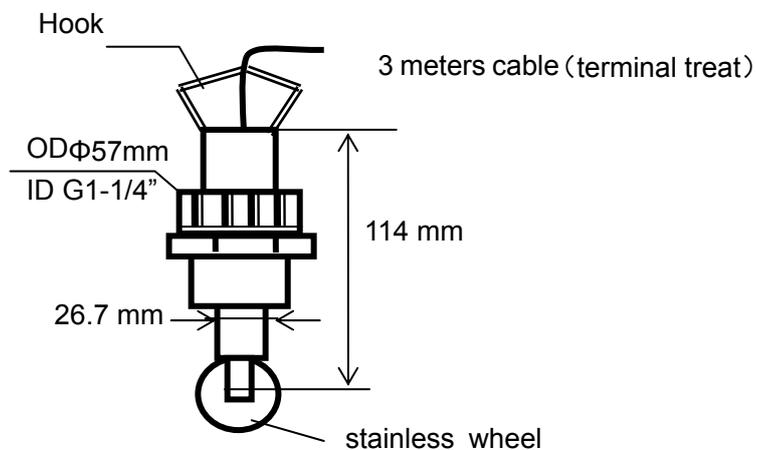


Fig.6-1

6.2.2 Flow transducer with seat and pipe

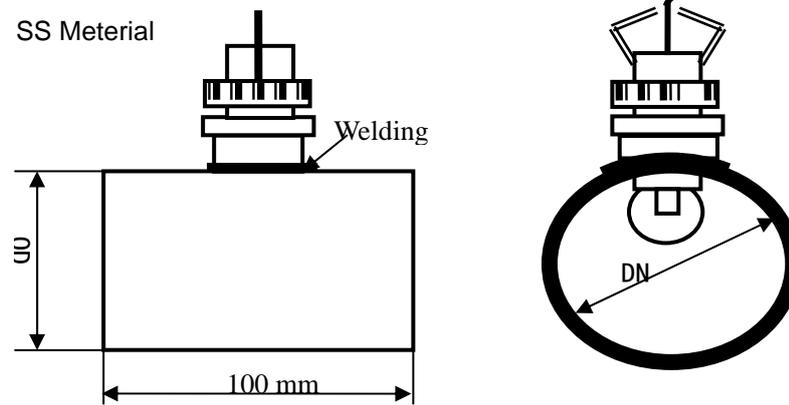


Fig. 6-2

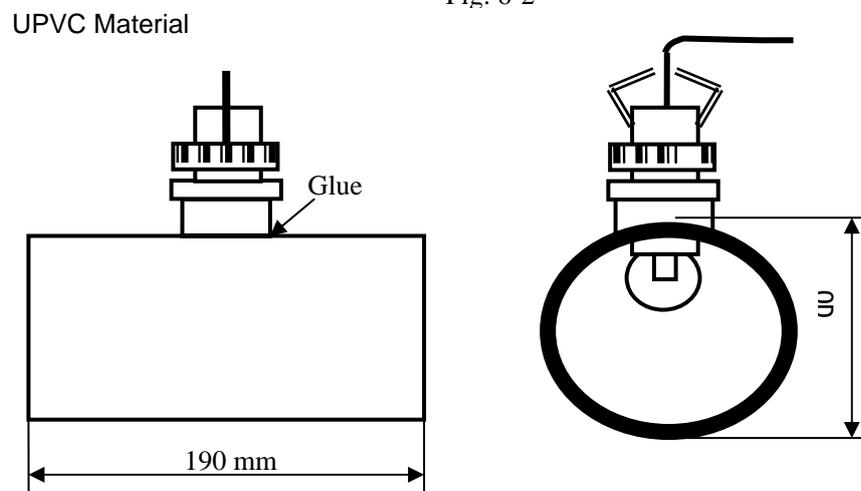


Fig. 6-3

7. Operation

7.1. Wiring

Brown color---+24VDC
 White color---0VDC
 Blue color---Pulse out
 Black color---GND

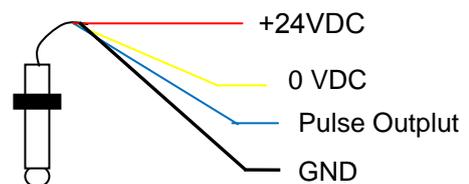


Fig. 7-1

7.2. Operating valve

Flow sensor back-end should have a regulating valve, closed first, such as pipe filled with fluid, and open the valve, the valve movement should be slow, the measured liquid flow stability and achieve satisfactory flow.

8. Adjust K-factor

8.1 Why do you want to correct the K-factor

Flow sensor factory inspection, it is to use room temperature water for calibration, certificate of approval for the average flow rate constant is also in this case of calibration, if use situation changes, such as the condition of determining the nature of fluid and the factory identification of water is not at the same time, using constant factory flow to reading, can appear deviation, modify it at this time will flow rate constant of the factory or to calibrate with the actual fluid.

But for the viscosity is less than $5 \times 10^{-6} \text{ m}^2 / \text{S}$ (5 mpas) fluid, adjusting is not needed.

8.2 Adjust procedure

【Example】CY501 factory flow rate constant K was 10.84 for 100 P/L, the user to use it in bigger than water viscosity of light oil, use, found in the container actually have 1000 liters (V) in light oil, and integrating instrument shows only 960 liters (V), the flow rate is constant at this time to adjust.

【Adjusting】

$$\begin{aligned} \text{New K-factor} \quad K_N &= K \times (1 + (V_a - V_s) / V_s) \\ K_N &= 10.84 \times (1 + (960 - 1000) / 1000) \\ K_N &= 10.41 \quad \text{P/L} \end{aligned}$$

Before correction in the revision record after several deviation data, obtains the deviation from the mean value, usually with a single adjustment flow constant, if, after the new flow integrating instrument constant input, there is still a deviation, can be repeated several times adjustment steps, until satisfied.

9. Failure and maintenance

9.1 Maintenance

- 1) CY501 series flow sensor switch part is secure engineering plastics, to use the environment request is not high, lead and converter internal is epoxy resin sealing, waterproof and dustproof.
- 2) To pull up the flow sensor, please hold the upper hook, must not hold lead.
- 3) When fluid flow, conditions allow, can often remove the probe, clean up debris on the turbine, etc., also can hit bearing of turbine shaft, polishing and grinding, keep the turbine rotating flexible.

9.2 Failure and calibration

- 1) Flow sensor in sent to the company (or the company designated service provider) maintenance, please press the table self -checking processing method is presented.
- 2) The fault of induction

Table 9-1 The fault and troubleshooting

Fault phenomenon	Reason	Troubleshooting
No signal	Wrong wiring	Re-wiring
	Turn the turbine for sundry death	Clear dirt
	Axis and turbine corrosion	Change axis and rotor
	Blocked or the power supply voltage is too small	Adjust power voltage
	Display instrument failure	Check displayer
	Wire break	Change transducer or repair it
Interference signal	The outside strong electromagnetic interference	Check shield connection or eliminate electromagnetic interference
	To interference with high-voltage electrical control box	Independent power supply cable
	Pipeline vibration caused by turbine swing	Reinforcing pipe
	Receive instrument problems	Inspect meter
Display the values do not tally with the actual	Interference	As above
	Converter bad	Change converter
	There are gas mixed in pipeline	Set up air separator or increase back pressure
	No back pressure	Increase pressure or change position
	Bearing wear	Exchange rotor assembly
	The turbine on sundry	Clear turbine
	Bad matching pipes	Adjust matching pipes

10. Auxiliary device

10.1 Supply form and attachments

1) Pipe and supply form



SS pipe with welded seat



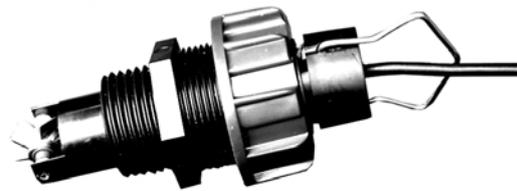
PVC pipe with plastic seat



Clamp types with SS material



Flange type SS material



Single type

2) Seat

The attachment is long enough, the user must according to the corresponding nominal diameter high interception, to ensure that the depth of flow sensor insert.



1-1/4" SS seat



1-1/4" Plastic seat

11. Files

- 1) Instruction manual
- 2) Certificate (optionnal)

12. Storage

- 1) The environment temperature : -15°C~50°C
- 2) Relative humidity : ≧90%
- 3) Store: In room

Contact Distributor



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