FSE Flow Sensor Use Guide

CE

201208.V03

FSE Paddle wheel flow sensor use guide

■ Order Information

Model selection Ex. : FSE-N-C-V-S-N-010							
DNFS -	**X-**	**X-**	**X-**	**X-**	**X**	**-XXX**	**Description**
Sensor type	**N-**						Accept 5V DC
	P-						Accept 12-30V DC
Sensor body		**C-**					CPVC
		P-					PTFE
		S-					SUS316L
O ring			**E-**				EPDM
			V-				Viton
			P-				Viton coating PTFE
Sensor size (According to the installed fitting)				**S**			Short
				L			Long
Operation Conditions (Use the SUS cap) (Fluid temp. > 80℃ or Working Pressure > 6 bar)					**N**		No
					Y		Yes
Electronic wiring (3 wire isolated cable, standard 10M, up to 150 M)						**-NNN**	M12/4Pin connector
						-010~-150	3 wire isolated cable length
						-XXX	Compact version with F1 series
						-TBP	With plastic terminal box
						-TBA	With aluminum alloy terminal box
						-TBS	With SUS316 terminal box

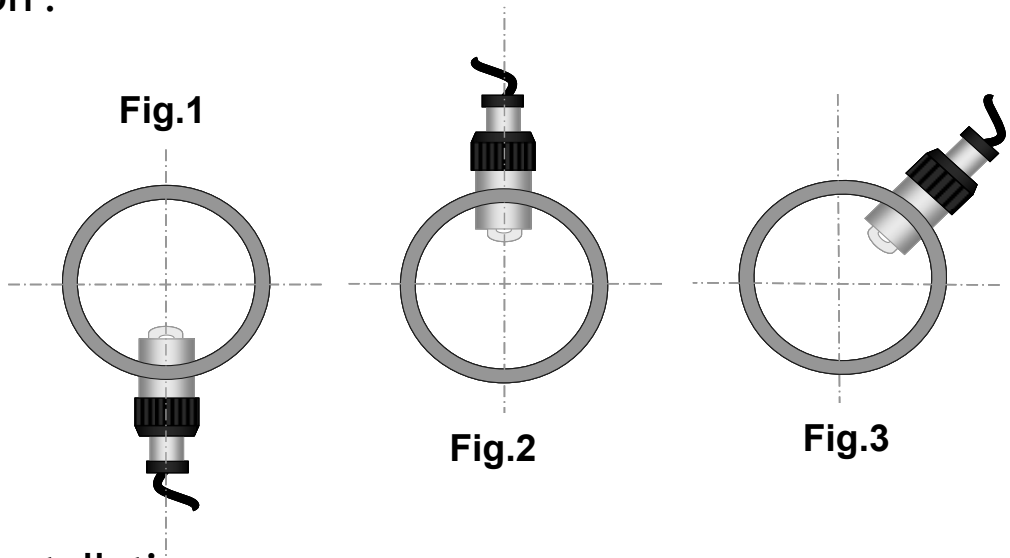
■ General：

- Please study the use guide before installation, avoid improper usage.
- Let the skilled labor execute installation and wiring.
- Take the FSE, rotating the rotor by finger, make sure it runs smoothly.
- The paddle wheel flowmeter only apply in clean fluid or with few suspension particle size less than 0.5mm .
- To purchase FSE with isolated cable / IP68, should not re-wiring at the tray.
- Make sure the connection before wiring, the wrong wiring will damage the sensor.
- Do not draw the sensor under pressurized.

■ The improper location：

- Do not install after pump discharge，it will be bad detected result caused by turbulence.
- Do not install the piping system have water hammer, which damage the rotor and shaft.
- Do not install at the stream flow top to bottom, it will wrong sensing caused by un-fill pipe.
- Do not equipped with the air-operating diaphragm pump, the wave-flow can not be measured.

■ Installation position :



A. Horiztonal piping installation :

Fig. 1 : the fluid without sediments.

Fig. 2 : the fluid without air bubbles.

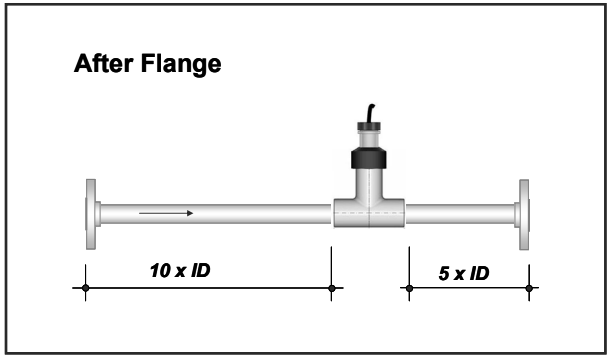
Fig. 3 : the best position.

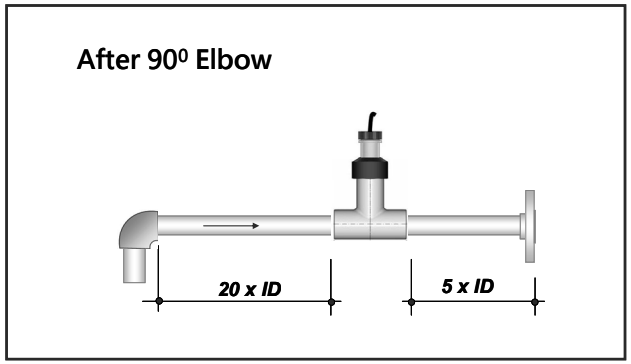
B. Vertical piping installation :

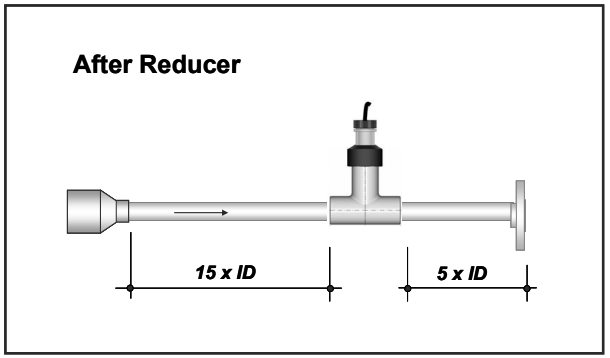
You can install any position, but the stream flow from bottom to top.

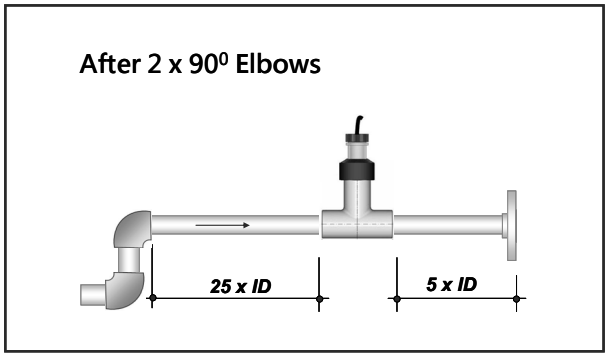
■ Installation Location :

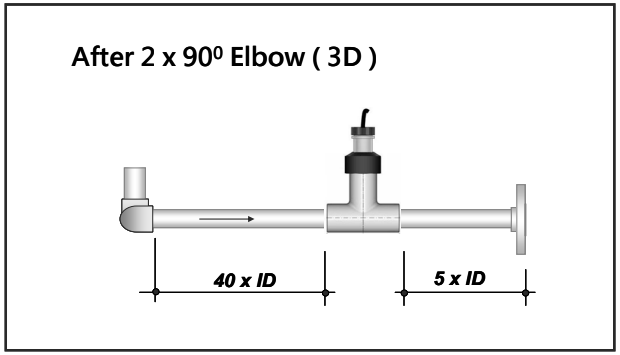
Refer to EN ISO 5167-1 standard (ID = Inside Dimension)

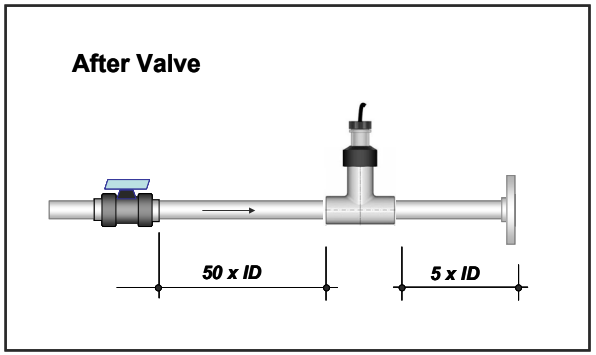






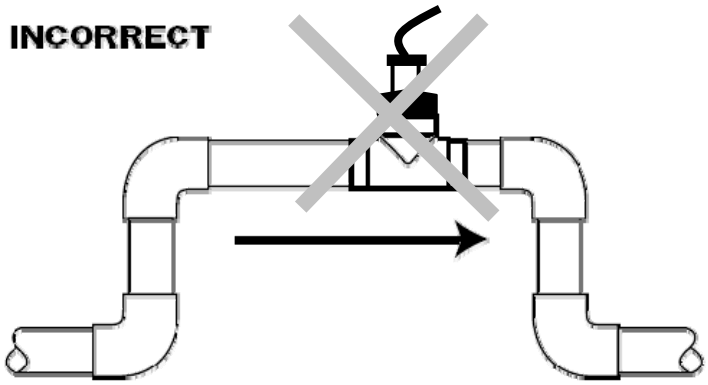


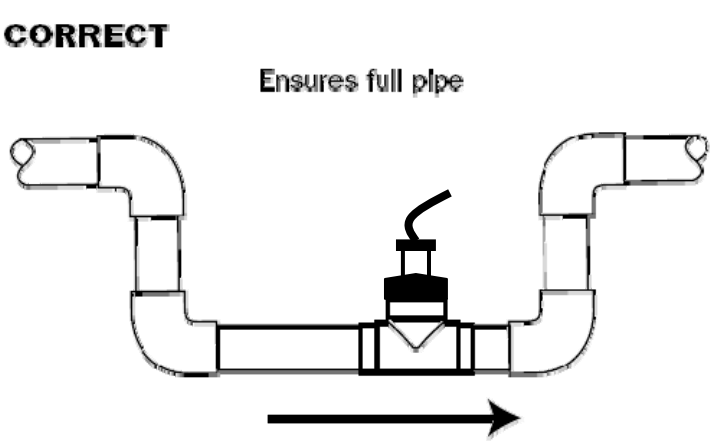


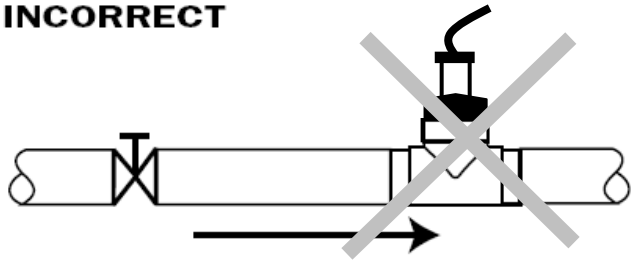


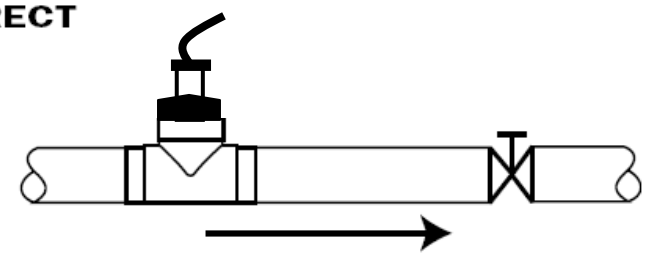
The above shows the straight pipe length needed of the flow sensor location after pipe fitting or valve；If there is without the enough length, to do the K factor calibration is necessary.

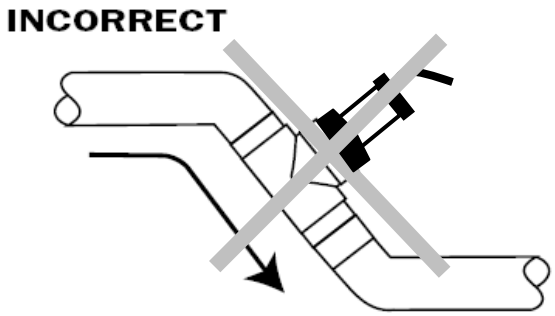
■ Incorrect & Correct position :



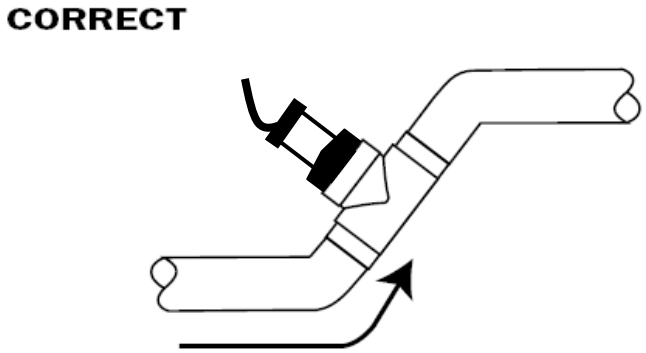








Air can be trapped



Allows air to bleed off

■ Installation :

A. FSE sensor installed :

- Use the silicon lubricator to lubricate the O-ring, for insert easily. Do not use the petrochemical lubricator, which will damage the O-ring.
- Insert the sensor into the fitting, make sure the sensor jut aim at the gap of the fitting, to ensure the correct installation of sensor.
- Fasten the cap of sensor by hand only ; please do not use the tool to fasten, such will hunt the cap and threads of fitting.

<Cont.>

B.1 Flange fitting：

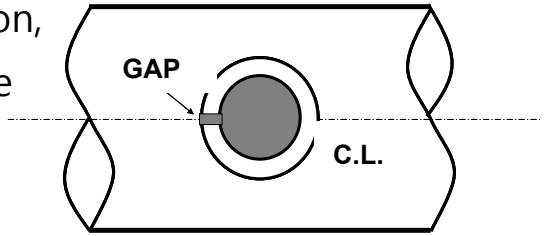
- At proper position of the pipe, to left the space according to the length of flange fitting face to face, weld on the opposed flanges, then prepare the gasket、nuts and tools to complete the installation, and must to enforce the pipe support.

B.2 Saddle fitting

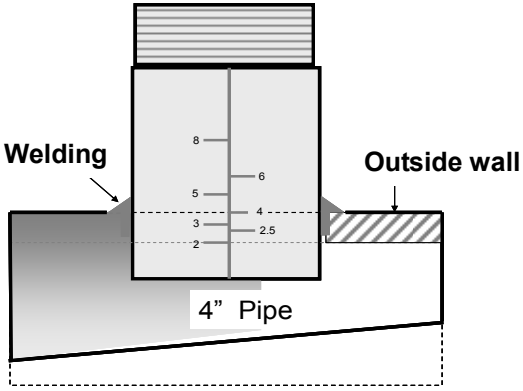
- Install the saddle fitting, to select the correct position, mark it, then cut off the valve on upper stream or ensure the pipe under un-pressurized.
- Drill the hole on pipe according to the saddle needed, then clean the trash over the hole, to avoid the fault action of flow sensor.
- Take the upper saddle first, make sure the seal O-ring at the seat.
- The upper saddle put over the pipe, and the central insertion part aim the opened hole ; Then take the FSE flow sensor, insert the sensor into the saddle fitting carefully.
- Cover the lower saddle, fix the saddle by the SUS screws & nuts ; The plastic body, do not over-tighten.

B.3 Weld – on fitting：

- For larger size plastic or metal pipe ; To select the correct position, mark it, then cut off the valve on upper stream or ensure the pipe under un-pressurized.

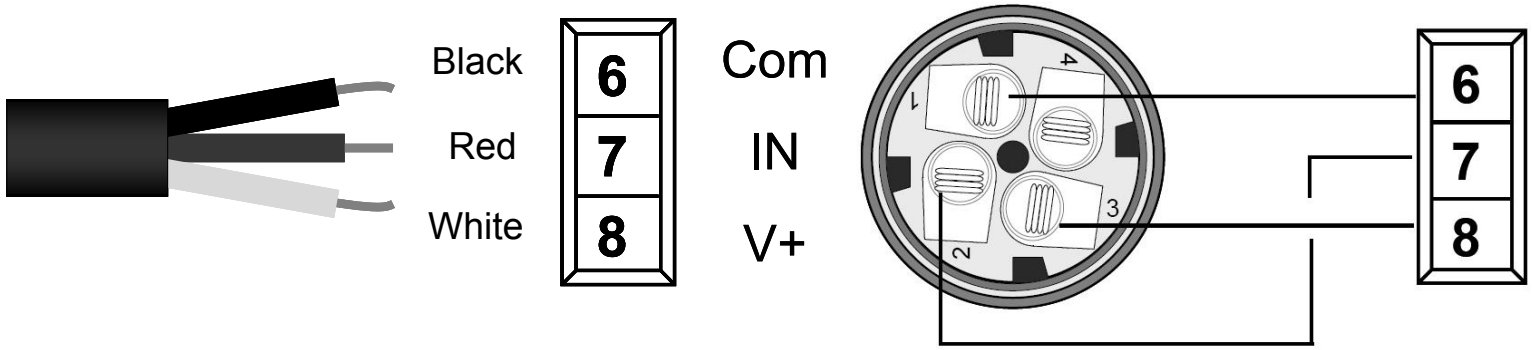


  - Drill the hole on pipe according to the saddle needed, then clean the trash over the hole, to avoid the fault action of flow sensor.
  - Welding by the same material weld rod, to weld the fitting on the pipe by skilled labor ; Attention specially：The gap over the weld-on fitting must be collimated the central line of the pipe, such make the rotor rotating smoothly. (See Fig.)
  - Insert the fitting into the drilled hole, till the pipe size mark collimated the outside wall of the pipe, which is the correct inserted depth. (See Fig.)
  - Then take the FSE flow sensor, insert the sensor into the fitting carefully, ensure the sensor jut aim at the gap of the fitting, fasten the cap of sensor by hand only (No tool).

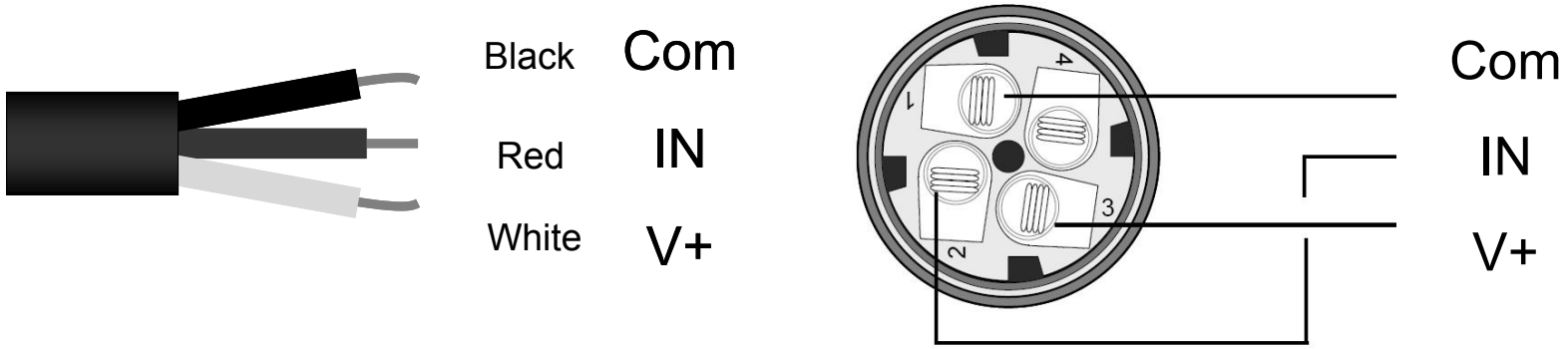


■ Wiring :

A. FSE-N series, use 5V DC power, equipped with FSE / F1-TR / F1-BA / F1-BTU.



B. FSE-P series, use 12 ~ 30V DC power, NPN type pulse output, connect to PLC directly or equipped with other brand meters .



■ The Maintains of Sensor：

Crud	Contents	Maintain
Inorganics	Lime, Greasy, Crumb, Muck	1. Check the oneness of sensor 2. Put the rotor into the diluted acidic solution 5 minutes (For Greasy use the domestic cleaner) 3. Washing by water, and brush the details.
Organics	Moss, Fiber, Hair, Suspension	1. Washing the adhesion by water. 2. Check the cleanness of rotor. 3. Put the rotor into the diluted acidic solution 5 minutes. 4. Washing by water, and brush the details.

To do the maintain of sensor, three months per once we recommend.

■ Trouble Shooting：

Problem	Cause	Solution
No Signal Output	■ No power supply. ■ The bad wire connection. ■ The rotor can not moved.	■ Check the power source, and rewire the cable. ■ Pull out the sensor and check the rotor.

	■ The pipeline is not filled. ■ The flow rate is lower than the min. value.	■ Change the location. ■ Confirm the actual flow rate, and select the correct size.

■ Appendix : K factor table

Tee fitting

SIZE	K factor		
	***PVC**	**PP**	**SUS**
1/2”	215.65	194.33	-
3/4”	121.30	115.22	-
1”	89.12	87.01	84.46
1-1/4”	57.04	54.13	48.82
1-1/2”	41.56	40.80	35.80

Saddle fitting

SIZE	K factor		
	PVC SCH80	**PVC SCH40**	**PP/PN10**
2”	31.90	27.86	28.51
2-1/2”	21.72	19.05	19.49
3”	13.02	11.54	12.72
4”	5.53	4.96	6.31
6”	2.29	2.05	3.30
8”	1.24	1.11	1.71

Weld-on fitting – Plastic

SIZE	K factor		
	PVC SCH80	**PVC SCH40**	**PP/PN10**
2”	19.83	17.32	17.72
2-1/2”	13.73	12.05	12.32
3”	9.19	8.15	8.98
4”	4.46	4.00	5.10
5”	2.79	2.52	3.12
6”	1.88	1.68	2.71
8”	1.05	0.94	1.45
10”	0.57	0.63	0.88
12”	0.40	0.44	0.55
14”	0.38	0.42	0.49
16”	0.28	0.31	0.38

Weld-on fitting – Metal (SUS、CS、GIP pipe)

SIZE	K factor	
	SCH 40S	**SCH 80S**
2”	17.32	19.38
2-1/2”	12.05	13.73
3”	8.15	9.19
4”	4.00	4.46
5”	2.52	2.79
6”	1.68	1.88
8”	0.95	1.05
10”	0.57	0.63
12”	0.40	0.44
14”	0.38	0.42
16”	0.29	0.31

Limited Warranty

「Advanced Technology、Service Priority and Customer Satisfaction」is the target of EYC-TECH Co., Ltd. ("EYC")，We, EYC, consistently position ourselves to be above industry norm，which is part of our commitment to customer satisfaction。All of EYC' s products are warranted and tested to be free from defects in material or process and to conform to the published specification。During the warranty period should you E Y C product fail under normal use in the recommended surrounding due to improper process or material，EYC will repair the product or replace it with a comparable one。

Duration of Warranty

EYC products warranty period is 12 months from the date of purchase。According to the S/N no. to trace the date。EYC will inspect the product and decide whether to repair or replace it。EYC reserve the right to provide a function equivalent product or a refurbished replacement product。

Limitations

This warranty does not apply to product failure caused by accidents、abuse、

mishandling or improper installation、alteration、acts of nature or problems with electrical power。EYC is not responsible to the inner store data recovering and backup during period of inspection and repair。EYC products must be used with devices that conform to the recommended industry standard。EYC will not be liable for damages resulting from a third party device that causes the EYC product to fail。 EYC shall in no event be liable for any consequential，indirect，or incidental damages，lost profit、lost business investments，lost goodwill，or interference with business relationship as a result of lost data。EYC is also not responsible for damage or failure of any third party equipment，even if EYC has been advised of the possibility。The limitation dose not apply to the extent that it is illegal or unenforceable under applicable law。