

S-TURB

SMART LINE Series

Turbine flowmeters



Applications

- Instant flow, total flow, flow rate volumetric of e.g, water, diesel fuel
- Chemical, textile, pharmaceutical industry
- Metallurgical industry

Features and Benefits

- Compact and separate version
- Standard or high accuracy sensor
- Version with display and battery or mains power supply
- High-capacity rechargeable batteries (> 10 hours)
- Threaded, flanged, wafer connections
- Accuracy 0.5% standard, 0.2% optional



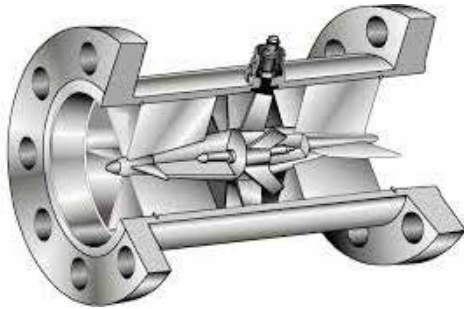
S-TURB

EXTREMELY CONVENIENT FLOW MEASURE FOR PROCESS AND SERVICE APPLICATIONS

The S-TURB flowmeter of the SMERI Smart Line is based on the turbine principle.

The liquid flows through the turbine body and causes the movement of the internal rotor. During the rotation, an electrical impulse is generated in the coil via a pickup. This impulse is converted to engineering units and indicated on the display.

Optional modules are available to export the signal to other processing devices.



MEASURABLE FLOW RANGE

Nominal diameter		Standard flow range	Extended flow range
(mm)	(inch)	(m ³ /h)	(m ³ /h)
4	0.15	0,04 - 0,25	0,04 - 0,4
6	0.25	0,1 - 0,6	0,06 - 0,6
10	0.4	0,2 - 1,2	0,15 - 1,5
15	0.5	0,6 - 6	0,4 - 8
20	0.75	0,8 - 8	0,45 - 9
25	1	1 - 10	0,5 - 10
32	1.25	1,5 - 15	0,8 - 15
40	1.5	2 - 20	1 - 20
50	2	4 - 40	2 - 40
65	2.5	7 - 70	4 - 70
80	3	10 - 100	5 - 100
100	4	20 - 200	10 - 200
125	5	25 - 250	13 - 250
150	6	30 - 300	15 - 300
200	8	80 - 800	40 - 800

Note: the values are for reference only.
Contact us for special requirements..

FUNCTIONS

The S-TURB sensor is suitable for measuring liquids without any impurity such as fibre and which does not corrode stainless steel SS304, 2Cr13, Al2O3 and rigid alloy.

The instrument data reported in the inspection certificate is for media viscosity smaller than $5 \times 10^{-6} \text{ m}^2/\text{s}$ at the operating temperature.

With liquids viscosity $> 5 \times 10^{-6} \text{ m}^2/\text{s}$, the sensor must be calibrated according to the measured liquid.



TECHNICAL DATA

Measuring system	
Measured medium	Liquids: water, diesel, etc 1. without impurity 2. low viscosity
Measured value	Primary measured value: flow rate Secondary measured value: volume flow
Design	
Modular construction	The measurement system consists of a flow sensor and a signal converter. It is available as compact and as separate version.
Compact version converter	Type N: pulse output without local display
	Type A: 4-20 mA output, without local display
	Type B: local display, Lithium battery power, without output
	Type C: local display, 24VDC power, 4-20mA output Optional function: 1. Backup power supply: Lithium battery 2. Modbus RS485
Connection	Thread: DN4-DN50 Flange: DN15-DN200 (DIN, ANSI, JIS) Wafer: DN15-DN100
Turn down	Standard 10:1, optional 20:1
Measuring accuracy	
Reference conditions	Flow conditions as to EN 29104 Medium: water Electrical conductivity: $\geq 300 \mu\text{S/cm}$ Temperature: $+10\dots+30 \text{ }^\circ\text{C}$ / $+50\dots+86 \text{ }^\circ\text{F}$ Inlet run: $\geq 10 \text{ DN}$ Operating pressure: 1 bar / 14.5 psig
Flowmeter accuracy	Standard: $\pm 0.5\%$ of rate Optional: $\pm 0.2\%$ of rate

Operating conditions	
Temperature	Process temperature: T1 Level: $-20\dots+80 \text{ }^\circ\text{C}$ T2 Level: $-20\dots+120 \text{ }^\circ\text{C}$ T3 Level: $-20\dots+150 \text{ }^\circ\text{C}$ Ambient temperature (all versions): Standard (with aluminium converter housing): $-20\dots+55 \text{ }^\circ\text{C}$ Storage temperature: $-20\dots+70 \text{ }^\circ\text{C}$
Pressure	EN 1092-1: DN100-DN200: PN 16 DN15-DN80: PN 25 ASME B16.5: 1/2...8": 150 lb RF JIS: 1/2...8": 10 K Others on request

Explosion-proof certification pending.



TECHNICAL DATA

Materials	
Sensor housing	SS304; other materials on request
Flanges	SS202 / SS304; other materials on request
Rotor	Standard 2Cr13 EN10088-3 1.4021 X20Cr13 AISI 420 BS 420S37 JIS SUS410J1 Optional: CD4MCu DN15-DN80
Bearings and shaft	Tungsten carbide
Converter housing	Standard: polyurethane coated die-cast aluminium



Process connection	
Flange	EN 1092-1: DN15-200 in PN 6-40 ASME: 1/2-8" in 150 lb RF JIS: 1/2-8" in 10-20K
Gasket surface	RF Other sizes or pressure ratings on request
Thread	DN4-DN50 in PN63

Installation conditions	
Installation	The flow sensor should be always completely filled.
Flow direction	Forward, the arrow on the flow sensor indicates the flow direction.
Inlet run	≥ 10 DN
Outlet run	≥ 5 DN

VERSIONS

COMPACT VERSION



SEPARATED VERSION

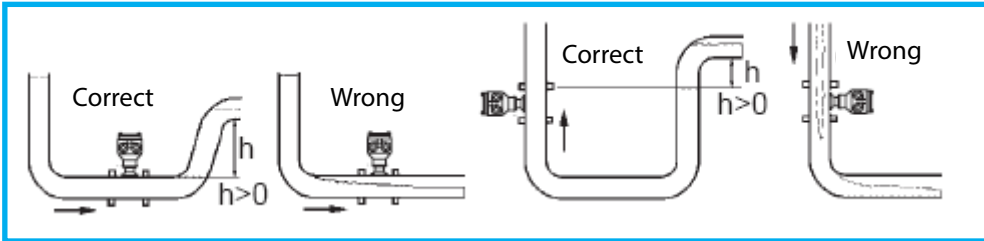


INSTALLATION

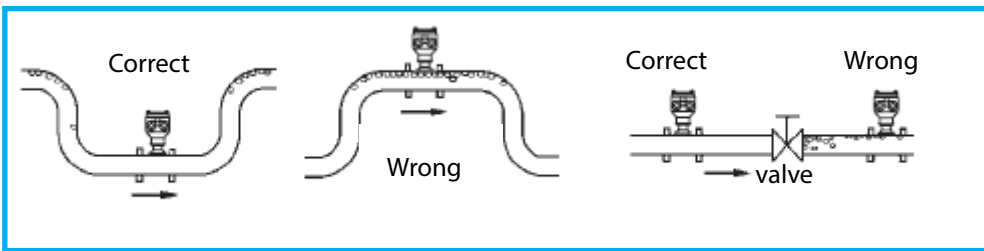
MOUNTING POSITION

The pipes should be filled with the medium.

It is essential that the pipes are always completely filled. Otherwise, measurement errors may occur.



Air bubbles must be avoided in the measuring tube: they can cause incorrect readings and measurement errors.

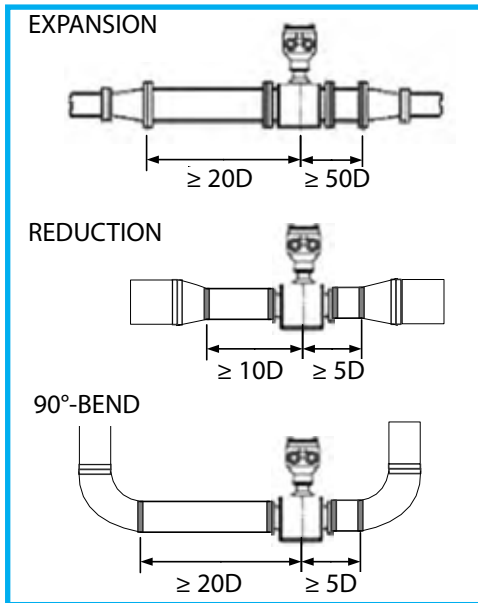


- Avoid positions in the pipeline where pulsating flow occurs, for example the outlet side of piston or diaphragm pumps
- Avoid locations near equipment that causes electrical interference, such as electric motors or transformers
- Install the meter leaving enough space to allow access and maintenance.
- Protect the meter from direct sunlight and rain, if installed outdoor.

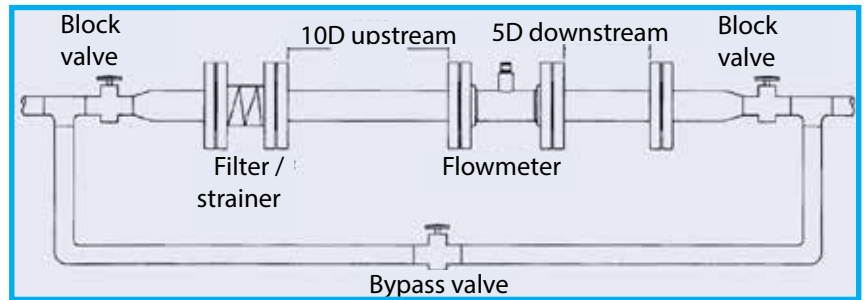


INLET AND OUTLET RUNS

Equipment that affects the flow, such as bends, valves and reducers, can alter accuracy. Here are some typical installation types for the turbine flowmeter.



Typical installation



Here are general guidelines for maximizing accuracy and operational performance. Distances shown are minimum requirements.

- Allow a straight run upstream of at least 10 times the internal diameter of the pipe.
As an example, with a 50 mm pipe, the straight section immediately upstream should be at least 500 mm; ideal 1000 mm (double).
- Downstream, there must be a straight run of at least 5 times the internal diameter of the pipe.
As an example, with a 50 mm pipe, the straight section immediately downstream should be 250 mm; ideal 500 mm (double).

CAVITATION

Cavitation may be due to the air penetration. It can seriously damage the rotor of the turbine meter.

A quantity of air (or other gases) greater than 100 mg/l causes measurement errors.

Cavitation can also be due to too low backpressure on the flowmeter.

A back pressure (downstream pressure) of at least 1.25 times the vapour pressure plus 2 times the pressure drop across the meter must be ensured:

$$P_b \geq 1.25 \times P_V + 2 \times (P_{in} - P_{out})$$

(P_b = back pressure, P_V = vapour pressure)

To create backpressure, a check valve can be installed on the downstream side of the meter at the distance shown above.

NOTE

- If there are materials in the fluid that can clog the meter rotor and reduce measurement accuracy, install filters to separate impurities from the incoming fluids.
- To ensure accurate measurements, vent all air from the system before use.
- If your meter includes removable cover plates, leave them installed unless otherwise requested by the accessory modules.
- Do not disassemble the cover plates if the meter is powered; risk of electric shock and explosion.

SELECTION GUIDE

S-TURB-LWGY-

The order code consists of the root of the product (S-TURB-LWGY-) followed by the 9 positions based on the selected options.

1	SIZE	
	DN4	004
	DN6	006
	DN 10	010
	DN 15	015
	DN 20	020
	DN 25	025
	DN32	032
	DN 40	040
	DN 50	050
	DN 65	065
	DN 80	080
	DN 100	100
	DN 125	125
	DN 150	150
	DN 200	200
	Other	X
2	CONVERTER	
	24VDC, without display, pulse	N
	24VDC, without display, 4-20mA	A
	Lithium battery, with display, without output	B
	24VDC, with display, pulse	C(P)
	24VDC, with display, 4-20mA	C
	24VDC, with display, pulse, 4-20mA, RS485	C1
	24VDC, with display, pulse, 4-20mA, HART	C2
3	ACCURACY	
	0.5% of full scale value	05
	0.2% of full scale value	02
4	FLOW RANGE	
	Standard	S
	Extended	W
5	BODY MATERIAL	
	SS304	S
	SS316	L
6	HOUSING TYPE - safe area	
	Standard	N
7	PRESSURE RATING	
	Standard according to size	N
	Special	H
8	CONNECTIONS	
	DIN (PN06-PN10-PN16-PN25-PN40)	DXX (DIN - XX = PN)
	ANSI (150psi - 300psi - 600psi)	AX (Ansi - psi)
	Thread DN 4 - DN 50	TH (Filettato)
9	FLUID TEMPERATURE	
	-20...+80°C	T1
	-20...+120°C	T2
	-20...+150°C	T3

Version with separate electronics (4-20 mA + display), with housing for pipe mounting and 10 m cable.



We are a company with more than 50 years of experience in the field of industrial measurement and control instrumentation.

Specifically, we look at the internalization of some measuring systems that, due to shipping speed, performance, and low costs, can be offered in multiple industrial branches, from food to petrochemicals, from pharmaceuticals to energy production, from naval to water treatment.

Each process has specific requirements, which depend on the characteristics of the system, the environment, and the fluid to be treated.

SMERI International offers tailor-made instrumentation for liquids and gases, from the most common to the most critical ones.

We have the luck and the merit to benefit from a young and highly dynamic team of experts, who can recommend ad-hoc solutions for each application to optimize customers' processes in terms of economic efficiency and safety.

The motto is *Finding solutions together* and summarizes the spirit of SMERI: **a close collaboration with the customer and according to an ethical behavior of respect, fairness, and confidentiality.**

In the European market, SMERI is represented and distributed by companies well-known in the industrial world for their seriousness and experience.

SMERI s.r.l.

Via Mario Idiomi, 3/13

I - 20090 Assago (MI)

Tel. +39 02 539 8941

E-mail smeri@smeri.com

www.smeri-international.com

