

S 450/452 HEAVY DUTY INDUSTRY FLOW/CONSUMPTION SENSOR



Features

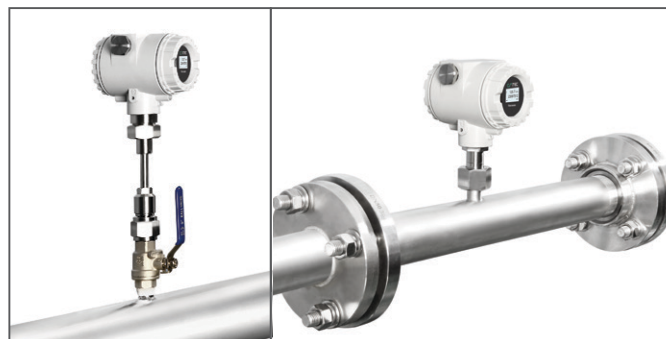
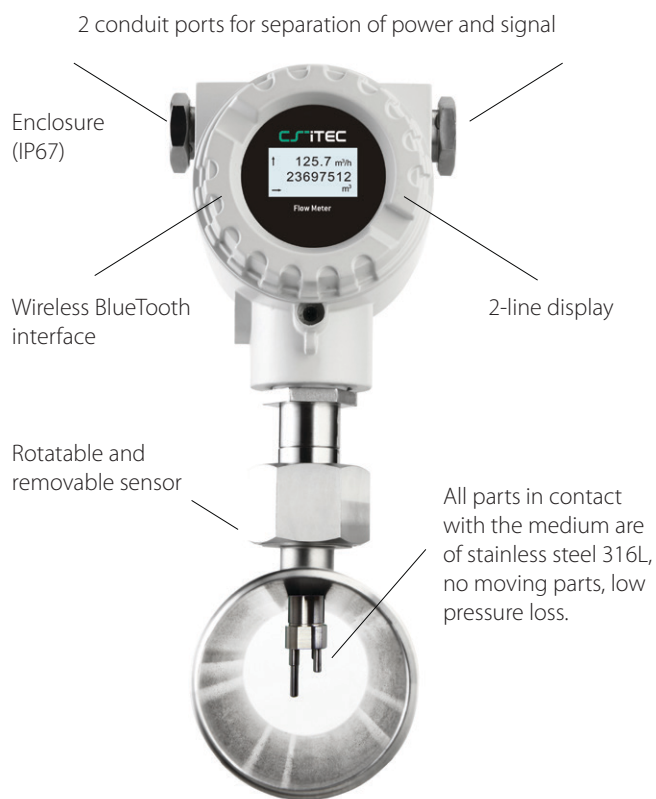
- Direct measurement of mass flow and standard flow without the need of pressure compensation
- Wide range of tube sizes are supported with insertion type for big pipe diameters and in line types for small pipe diameters
- No moving parts, non clogging
- All parts which come into contact with the measurement medium are made of stainless steel 316L
- Robust metal enclosure suitable for out-door applications in harsh environment
- Wireless BlueTooth interface for sensor settings on site
- Display showing flow rates, consumption, medium temperature and diagnostic results
- 2 analogue outputs (4-20 mA) and 1 pulse output
- Available options:
 - Fieldbus interface: HART, MODBUS
 - Hazardous approval ATEX: II 2 G Ex d IIC T4
IECEx approval
GB Ex approval
 - 2-directional measurement
 - Flow conditioning

The CS-ITEC flow sensor S 450 is based on the thermal mass flow principle. It measure volumetric standard flow over a wide measuring range. The result is pressure and temperature independent.

S 450 is designed specifically for harsh environments. The enclosure with IP67 allows all-weather applications, all parts which come into contact with the measurement medium are made of stainless steel 316L. This allows applications in pharmaceutical and food industry, but also the measurement of corrosive and contaminated gas. Installations in explosive environment can be done through the optional ATEX approval. Various gases can be measured such as air, oxygen, argon, carbondioxyde, natural gas, hydrogen, methane, etc.. Basically any gas mixture can be measured as long the mixing ratio and its components are known and constant.

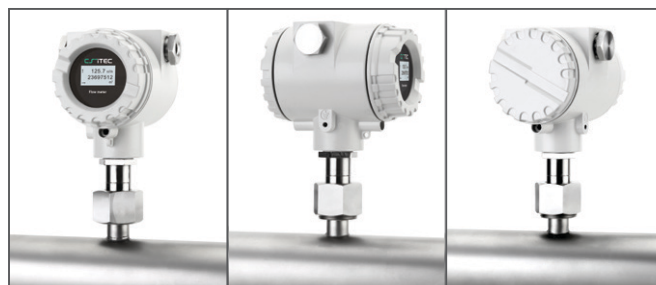


S 450/452 HEAVY DUTY INDUSTRY FLOW/CONSUMPTION SENSOR



Insertion type installation through ball valve

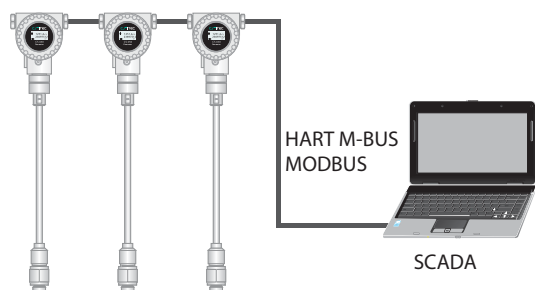
In line type installation through flanges or R thread



Sensor head can be rotated in 90° steps through the screw nut



Sensor configuration through wireless Blue Tooth connection



Industrial communication through MODBUS, M-BUS, HART

Volumetric flow ranges S 450/452

Inch	DN	S-Range (m3/h)	M-Range (m3/h)	HS-Range (m3/h)
1/2"	DN15	0.2 ... 45.6	0.4 ... 91.0	0.48 ... 110.16
3/4"	DN20	0.4 ... 89.1	0.9 ... 177.8	1.09 ... 215.3
1"	DN25	0.6 ... 147.7	1.2 ... 294.7	1.82 ... 356.85
1"	DN25	0.6 ... 147.7	1.2 ... 294.7	1.82 ... 356.85
1 1/2"	DN40	1.5 ... 366.7	2.9 ... 731.9	4.36 ... 886.18
2"	DN50	2.4 ... 600	4.8 ... 1198	7.26 ... 1450.04
2 1/2"	DN65	4.1 ... 1027	8.2 ... 2049	12.1 ... 2480.44
3"	DN80	5.7 ... 1424	11.4 ... 2841	16.94 ... 3441.91
4"	DN100	8.7 ... 2183	17.4 ... 4357	24.2 ... 5275.71
5"	DN125	20 ... 3419.6	38 ... 6824.4	45.9 ... 8263.09
6"	DN150	20 ... 4930	39 ... 9839	70.18 ... 11913.10
8"	DN200	35 ... 8786	70 ... 17533	106.48 ... 21229.51
10"	DN250	55 ... 13744	110 ... 27429	165.77 ... 33210.69
12"	DN300	79 ... 19815	158 ... 39544	239.58 ... 47880.39

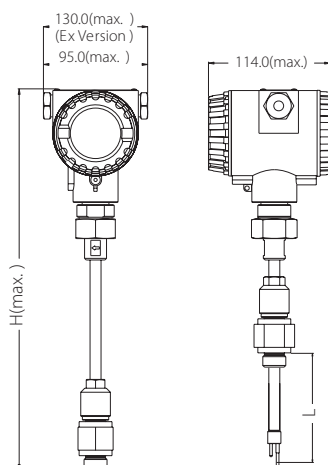
Stated flow values are at standard conditions of $P_s = 0.1 \text{ MPa(a)}$ and $T_s = 20^\circ \text{C}$ with medium air.

At other standard conditions and in other gases flow ranges are different and data are available on request.

In larger pipe diameters flow can also be measured.

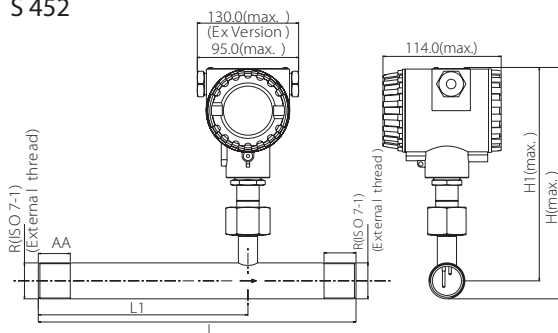
S 450/452 HEAVY DUTY INDUSTRY FLOW/CONSUMPTION SENSOR

S 450

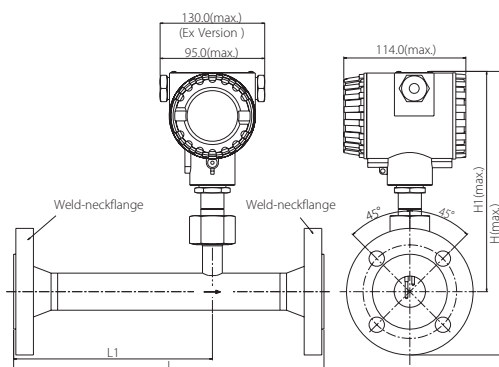


Shaft option	L(mm)	H(mm)
A	220	469
B	160	409
C	300	549

S 452



Pipe nominal size inch / (DN)	L total length (mm)	L1 inlet length (mm)	H total height (mm)	H1 from pipe center to casing top (mm)	R External Thread	A Thread Length (mm)
1/2" (DN15)	300	210	210.8	200.15	R1/2"	20
3/4" (DN20)	475	275	213.6	200.15	R3/4"	20
1" (DN25)	475	275	217.0	200.15	R1"	25
1 1/4" (DN32)	475	275	221.35	200.15	R1 1/4"	25
1 1/2" (DN40)	475	275	224.3	200.15	R1 1/2"	25
2" (DN50)	475	275	230.3	200.15	R2"	30



Pipe nominal size inch/(DN)	L total length (mm)	L1 inlet length (mm)	H total height (mm)	H1 from pipe center to casing top (mm)
1/2" (DN15)	300	210	247.65	200.15
3/4" (DN20)	475	275	252.65	200.15
1" (DN25)	475	275	257.65	200.15
1 1/4" (DN32)	475	275	270.15	200.15
1 1/2" (DN40)	475	275	275.15	200.15
2" (DN50)	475	275	282.65	200.15
2 1/2" (DN65)	475	275	300.55	208.05
3" (DN80)	475	275	314.45	214.45

Technical data S 450/452

Measuring range: 0.4 ... 92.7 sm/s (standard range calibration)
0.8 ... 185 sm/s (max range calibration)
(refer to table for flow measurement ranges in different tube diameters)
* sm/s: standard meter per second

Accuracy: $\pm$ (1.5% of reading + 0.3% full scale)

Stated accuracy at: Ambient/process temperature 23 °C $\pm$ 3 °C
Ambient/process humidity < 90%, no condensation
Process pressure at 0.6 MPa

Repeatability: 0.25% of reading

Response time t95: < 5 seconds

Sampling rate: Display and outputs are refreshed every 200 msec

Tube diameter: Insertion type: DN25 ... DN1500
In line type: DN15 ... DN80

Process connection: Insertion type: 1/2" G type thread(ISO 228-1)
In line type: R thread(ISO 7-1),
Flange EN 1092-1,
ANSI / B16.5, JIS B2220

Measuring medium: Any gases where the components and the mixing ratio are constant and known. See order information for a list of standard gases.

Operating temperature: -40 °C ... +150 °C (medium temp. insertion type)
-40 °C ... +100 °C (medium temp. in line type)
-40 °C ... +65 °C (ambient temperature)

Operating pressure: 1.6 MPa (insertion type)
4.0 MPa (in line type)

Analogue output: 2 x 4 ... 20 mA, up to 400 R load, active/passive selectable, measurement channel selectable, scaling programmable

Pulse/Alarm output: Either alarm or pulse output. 1 pulse per 1, 10 or 100 consumption units, Alarm programmable

Power supply: 16-30 VDC, 5 W

Enclosure: IP 67

Sensor material: Stainless steel 1.4404 (SUS 316L)

Approvals: CE, RoHS
ATEX: II 2 G Ex d IIC T4 / GB3836 / IECEx(Optional)

Fieldbus: MODBUS
(Optional) HART

Configuration interface: CS-iTEC Service kit
Bluetooth

Order numbers for measuring sections (inline types)

Line size	Code	R thread (ISO 7-1)	Flange EN 1092-1, PN40	Flange ANSI 16.5
DN8	1/4"	Z	A1300	
DN15	1/2"	A	A1301	A1341
DN20	3/4"	B	A1302	A1342
DN25	1"	C	A1303	A1343
DN32	1.25"	D	A1304	A1344
DN40	1.5"	E	A1305	A1345
DN50	2"	F	A1306	A1346
DN65	2.5"	G	A1327	A1347
DN80	3"	H	A1328	A1348

Order form

* R thread only up to DN 50

S 450/ S452	Shaft/ line size	Process connection	Gas medium	Calibration	Hazardous area approval	Fieldbus	Display	Description
S695 0450								S 450, flow sensor insertion type
S695 0452								S 452, flow sensor, in line type
								S695 0450 S695 0452
	A							A1200 220mm DN15 <i>Standard</i>
	B							A1201 160mm DN20
	C							A1202 300mm DN25
	D							DN32
	E							DN40
	F							DN50
	G							DN65
	H							DN80
		A						G ½" R thread (ISO 7-1)* <i>Standard</i>
		B						PT ½" adaptor EN-1092-1, PN40
		C						NPT ½" adaptor Flange ANSI 16.5
		D						Flange JIS B2220
A1007			A					Medium Air <i>Standard</i>
A1008			B					Medium CO ₂
A1009			C					Medium O ₂ (oil & grease free cleaned)
A1010			D					Medium N ₂
A1011			E					Medium N ₂ O
A1012			F					Medium Ar
A1013			G					Medium Natural gas (exact gas mix required)
A1014			H					Medium H ₂ (real gas calibration)
A1015			I					Others (please specify the gas or gas mix)
A1016			J					Medium He (real gas calibration)
A1017			K					Medium Propane C ₃ H ₈
				A				Standard range calibration <i>Standard</i>
A1271				B				Max range calibration
A1272				C				Bi-directional standard range calibration
A1273				D				Bi-directional max. range calibration
A1274				E				High speed calibration
A1279					A			None <i>Standard</i>
A1280					B			ATEX / GB3836 / IECEx
A1284						A		2x 4 ... 20 mA + pulse
A1285						B		HART
A1286						C		MODBUS
A1294							A	Without display <i>Standard</i>
A1295							B	With display

Order No.	Description
R200 0005	Oil & grease free cleaned option for flow sensors (for Oxygen it is already included in A 1009)
R200 0020	Real gas calibration in selected gas to ensure best accuracy
A553 0121	Sensor cable, 6 pole, AWG22, 7.5 mm outer diameter, w/shielding, black (per meter)
A553 0123	RS-485 cable, 2 pole, AWG (per meter)