

S 420 ECONOMIC FLOW/CONSUMPTION SENSORS



At the touch of a button:
- reset of counter reading
- selection of units

Features

- Easy and affordable installation
- Units freely selectable via keypad m^3/h , m^3/min , l/min , l/s , g/min , kg/s , cfm
- Compressed air counter up to 1,999,999,999 m^3
- Analogue output 4...20 mA, pulse output (galvanically separated)
- High measuring accuracy also in the lower measuring range (ideal for leakage measurement)
- Negligible small loss of pressure
- Thermal mass flow principle, no additional pressure and temperature measurement necessary
- Gas types adjustable via software (N_2 , O_2 , CO_2 , N_2O , Ar)
- Modbus interface (Optional)

Volumetric flow ranges S 420

Connection thread	DN	Inner pipe diam. mm	Measuring range from to
1/4"	DN8	8.8	0.5 ... 90.1 l/min
1/2"	DN15	16.1	0.5 ... 90 m^3/h
3/4"	DN20	21.7	0.9 ... 170 m^3/h
* 1"	DN25	27.3	1.5 ... 290 m^3/h

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.

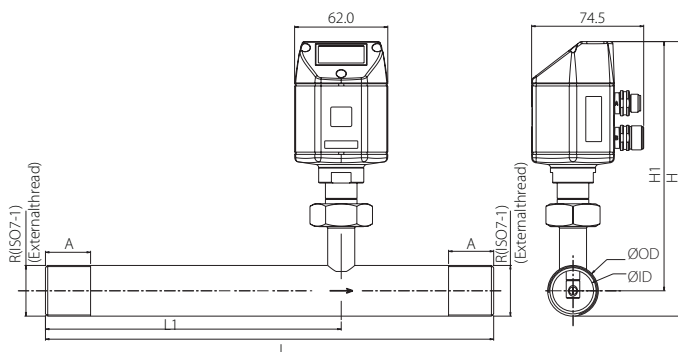
* Attention:

Shortened inlet section! Please observe the recommended minimum inlet section (length = 15 x inner diameter) on site.

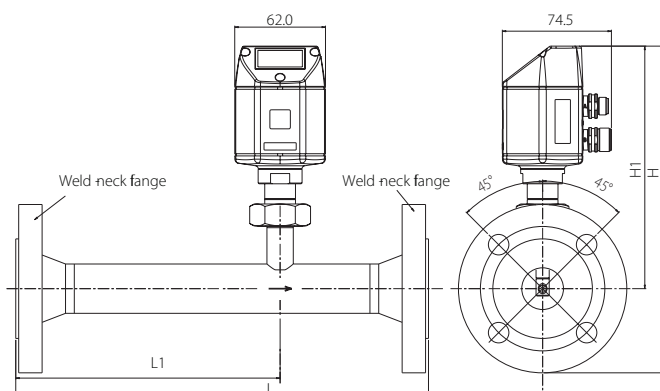
Application range of S 420:

- Compressed air balancing, compressed air consumption measurement
- Leakage air / leak rate determination
- Mobile compressed air measurement in front of single machines/plants
- Flow measurement of process gases like e. g. N_2 , CO_2 , O_2 , Ar, N_2O
- Flow measurement at nitrogen generators

Dimensional drawings



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)
1/4"(DN8)	194	137	176.0	165.7	R1/4"	15
1/2"(DN15)	300	210	176.4	165.7	R1/2"	20
3/4"(DN20)	475	275	179.2	165.7	R3/4"	20
1"(DN25)	475	275	182.6	165.7	R1"	25



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	213.2	165.7
3/4"(DN20)	475	275	218.2	165.7
1"(DN25)	475	275	223.2	165.7

Technical data S 420

Measuring units: m^3/h , m^3/min , l/min , cfm , m/s , kg/min , kg/h , kg/s
(Reference standard can be programmed)

Default values:

*Air: $P_s = 1000 \text{ hPa(a)}$, $T_s = 20 \text{ }^\circ\text{C}$

all other gases: $P_s = 1013 \text{ hPa(a)}$, $T_s = 0 \text{ }^\circ\text{C}$

Accuracy: $\pm (2\% \text{ of measured value} + 0.3\% \text{ full scale})$

Temperature drift: $0.05\% / \text{K}$

Pressure drift: $0.5\% / \text{MPa}$

Repeatability $\pm 0.5\% \text{ of measured value}$

Stated accuracy at: Ambient/process temperature $23 \text{ }^\circ\text{C} \pm 3 \text{ }^\circ\text{C}$

Ambient/process humidity $< 90\%$, no condensation

Process pressure at 0.6 MPa

Process connection: R thread (ISO 7-1),

Flange EN 1092-1, ANSI / B16.5, JIS B2220

Principle of measurement: Thermal mass flow

Sensor: Glass coated resistive sensor

Measuring medium: Air, N_2 , O_2 , Ar, N_2O , CO_2

Operating temperature: $-30 \text{ }^\circ\text{C}$ to $+50 \text{ }^\circ\text{C}$
 $-10 \text{ }^\circ\text{C}$ to $+50 \text{ }^\circ\text{C}$ with local display

Operating pressure: up to 1.6 MPa
up to 4.0 MPa (Optional)

Analogue output: Signal: 4 to 20 mA
Scaling: 0 to maximum volume flow
Accuracy: 0.06 mA

Modbus output (default setting): Mode: RTU
Baud rate: 19200
Device address: 1
Framing/parity/stop bit: $8, N, 1$

Pulse output: 1 pulse per consumption unit, insulated switch output, max. 30 VDC , 20 mA

Power supply: $12-30 \text{ VDC}$, 100 mA

Display: 128×64 pixel, with backlight

Material: Measuring section:
Stainless steel 1.4404 (SUS 316L)

* P_s : Standard pressure T_s : Standard temperature

Order form

S 420	Process connection	Gas medium	Display	Description
S695 4200				S 420, inline type flow sensor
S695 4201				S 420, inline flow sensor, 4 MPa version
A1300	Z			DN8, R thread (ISO 7-1)
A1301	A			DN15, R thread (ISO 7-1)
A1302	B			DN20, R thread (ISO 7-1)
A1303	C			DN25, R thread (ISO 7-1)
A1321	D			DN15 Flange+EN-1092-1, PN40
A1322	E			DN20 Flange+EN-1092-1, PN40
A1323	F			DN25 Flange+EN-1092-1, PN40
A1341	G			DN15 Flange ANSI 16.5
A1342	H			DN20 Flange ANSI 16.5
A1343	I			DN25 Flange ANSI 16.5
A1007		A		Medium Air <i>Standard</i>
A1008		B		Medium CO ₂
A1009		C		Medium O ₂ (oil & grease free cleansed)
A1010		D		Medium N ₂
A1011		E		Medium N ₂ O
A1012		F		Medium Ar
A1013		G		Medium Natural gas (exact gas mix required)
A1015		H		Others (please specify the gas or gas mix)
A1016		I		Medium He (Real gas calibration)
A1017		J		Medium Propane C ₃ H ₈
			A	Without display <i>Standard</i>
A1022			B	With display
A1027			C	Option S 420, Modbus with display
A1028			D	Option S 420, Modbus

for a complete order code the pipe diameter has to be defined (DN8 ... DN25)

Order No.	Description
A553 0104	Sensor cable 5 m, with M12 connector, open wires, AWG24 (0.2 mm ²)
A553 0105	Sensor cable 10 m, with M12 connector, open wires, AWG24 (0.2 mm ²)
A554 2005	Service kit for sensor configuration including software
A554 0007	Power supply wall mountable, input: 85 ... 264 VAC, output: 24 VDC, 15W, without cable
A554 0107	Mains unit 100-240 VAC/24 VDC, 0.5 A for S 401/S 201 Series, 2 m cable
R200 0001	Re-Calibration of flow sensor with certificate
R200 0005	Oil & grease free cleaned option for flow sensors (for Oxygen it is already included in A1009)
R200 0020	Real gas calibration in selected gas to ensure best accuracy
A553 0122	Sensor cable, 5 pole, AWG24, 5.0 mm outer diameter, black (per meter)