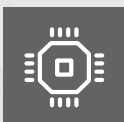
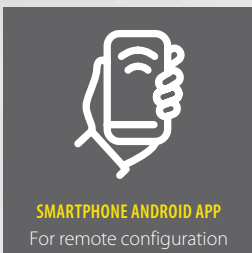


THERMAL MASS FLOW SENSORS S401 / S421



Measure consumption and flow — optimize process efficiency



S421 inline type

S401 insertion type

S401 / S421 FEATURES



**SMARTPHONE
ANDROID APP**
For remote
configuration



**ACCURATE
RESULTS**
Very fast
response time



**EASY PROCESS
MONITORING**
Effective and
inexpensive
measurements



TOTAL FLOW
High accuracy
and reliable
measurements

Optional color display for online values,
consumption counter and sensor settings.
10-digit counter (1 999 999 999)



S401 / S421 FEATURES AT A GLANCE

- Measures standard flow, mass flow and consumption
- Thermal mass flow, independent of pressure and temperature changes
- IP65 casing provides robust protection in rough industrial environment
- Very fast response time
- High accuracy and wide measuring range
- Isolated mA and pulse output signals or Modbus/RTU interface
- Selectable gas type (Some gases require real gas calibration!)
- Sensor can be calibrated in 2 different gases

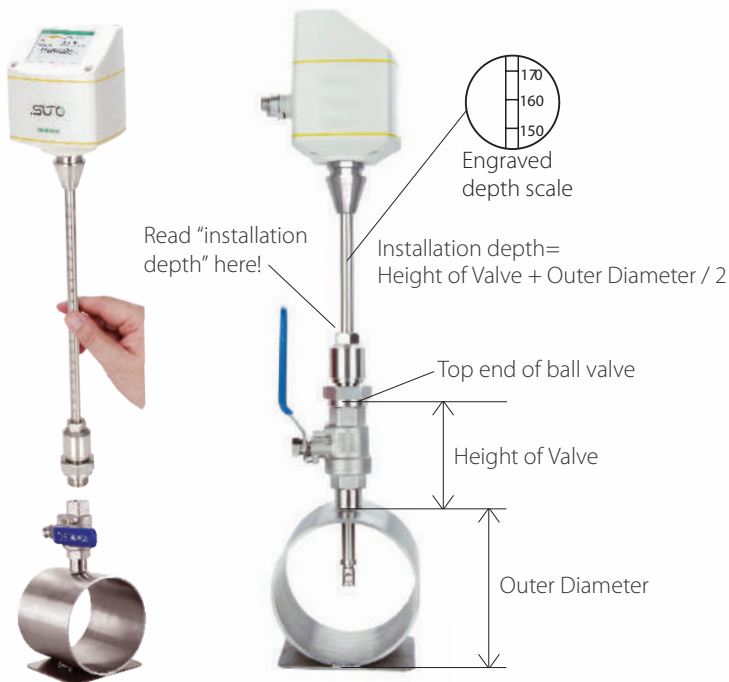
S401 BENEFITS

- Tube diameters of DN25 to DN500.
- 2 installation types: center installation and 100 mm insertion depth installation for bigger pipes (> DN250)
- Installation under pressure through 1/2" ball valve

S421 BENEFITS

- Pipes sizes available: DN15, DN20, DN32, DN40, DN50, DN65, DN80
- Fits your needs: various process connections available (R-thread, EN 1092-1 flange or ANSI flange)
- Exchangeable sensor unit (easy sensor swap)
- Optional flow conditioner, no need for a straight inlet anymore

S401 / S421 INSTALLATION AND SENSOR REMOVAL



S401 can be installed under pressure through a 1/2" ball valve. The sensor tip must be in the pipes center.



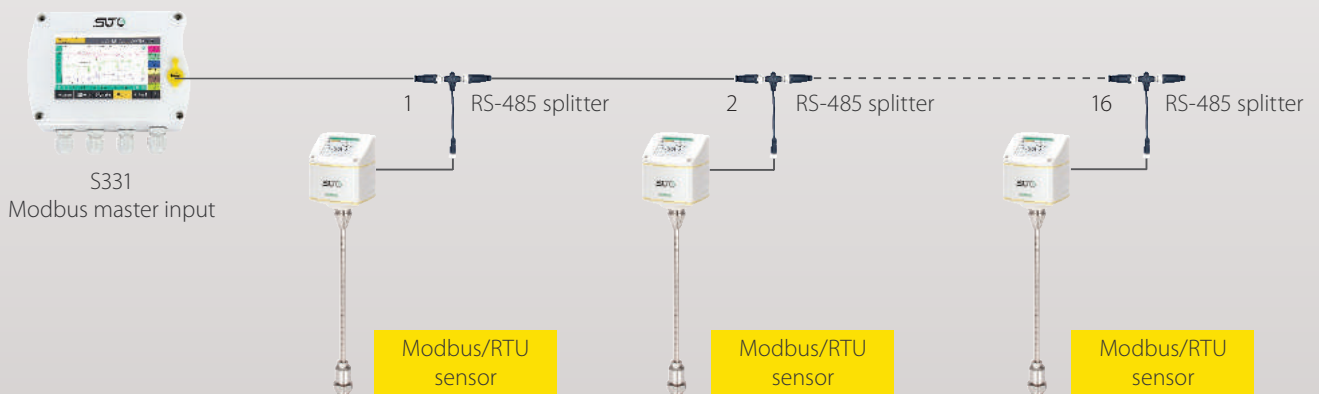
The S421 sensor unit can be easily removed for calibration. (Closing cap separately available)



Optional flow conditioner eliminates the straight pipe inlet requirement



Wireless connection allows the user to read the measurement values and change the configuration



Sensors can be easily integrated into a Modbus/RTU network (daisy chain)

S401 / S421 TECHNICAL DATA

General Specifications						
Accuracy	1.5% of reading + 0.3% full scale (Optional 1% of reading)					
Repeatability	0.25% of reading					
Sampling rate	> 10 samples / sec					
Reference conditions	Can be set by user. Standard conditions are Ps = 0.1 MPa and Ts = 20°C					
Medium conditions:	-30 ... +140°C / relative humidity < 90% no condensation					
Transport Temperature:	-30 ... +70°C					
Material:	Metal parts 1.4404 (SUS 316L) Casing PC + ABS Sensor: Ceramic with glass coating					
Classification:	IP65					
Electrical connection:	2 x M12, 5 poles (2 x M12 plug with screw terminals included)					
Approvals:	CE, RoHS, FCC					
Operating temperature	-30 ... +140°C fluid temperature -30 ... +70°C casing -10 ... +50°C casing with display					
Operating pressure	S401: 0 ... 5.0 MPa (>1.6 MPa need installation device) S421: 0 ... 1.6 MPa (Optional: 4.0 MPa)					
Analogue output	Signal: 4 ... 20 mA, isolated Scaling: 0 ... max flow Max load: 250R					
Pulse output	Signal: Isolated switch output, normally open, Max 30 VDC, 20 mA Scaling: 1 pulse per consumption unit					
Modbus output	Isolated RS-485 with Modbus/RTU protocol					
Power supply	15 ... 30 VDC / 200 mA					
Volumetric flow ranges		S401				S421
Inch	DN	Di (mm)	S 401-S (m ³ /h)	S 401-M (m ³ /h)	S 401-H (m ³ /h)	Measuring range from to
½"	DN15		-	-	-	0.5 ... 90 m ³ /h
¾"	DN20		-	-	-	0.9 ... 170 m ³ /h
1"	DN25	27.3	0.5 ... 147.7	0.6 ... 294.7	0.6 ... 356.9	1.5 ... 290 m ³ /h
1¼"	DN32	36.0	0.9 ... 266.3	1.2 ... 531.5	1.2 ... 643.5	2 ... 500 m ³ /h
1½"	DN40	41.9	1.2 ... 366.7	1.5 ... 731.9	1.5 ... 886.2	3 ... 700 m ³ /h
2"	DN50	53.1	2.0 ... 600.1	2.5 ... 1197.6	3.0 ... 1450.0	4 ... 1000 m ³ /h
2½"	DN65	68.9	3.5 ... 1026.5	5.0 ... 2048.6	5.0 ... 2480.4	6 ... 1500 m ³ /h
3"	DN80	80.9	5.0 ... 1424.4	7.0 ... 2842.7	7.0 ... 3441.9	8 ... 2500 m ³ /h
4"	DN100	100.0	10 ... 2183.3	12 ... 4357.2	12.0 ... 5275.7	
5"	DN125	125.0	13 ... 3419.6	18 ... 6824.4	18.0 ... 8263.1	
6"	DN150	150.0	18 ... 4930.1	25 ... 9838.9	25.0 ... 11913.1	
8"	DN200	200.0	26 ... 8785.6	33 ... 17533.3	42.0 ... 21229.5	
10"	DN250	250.0	40 ... 13743.9	52 ... 27428.5	60.0 ... 33210.7	
12"	DN300	300.0	60 ... 19814.8	80 ... 39544.1	100.0 ... 47880.4	

Stated measuring ranges under following conditions:

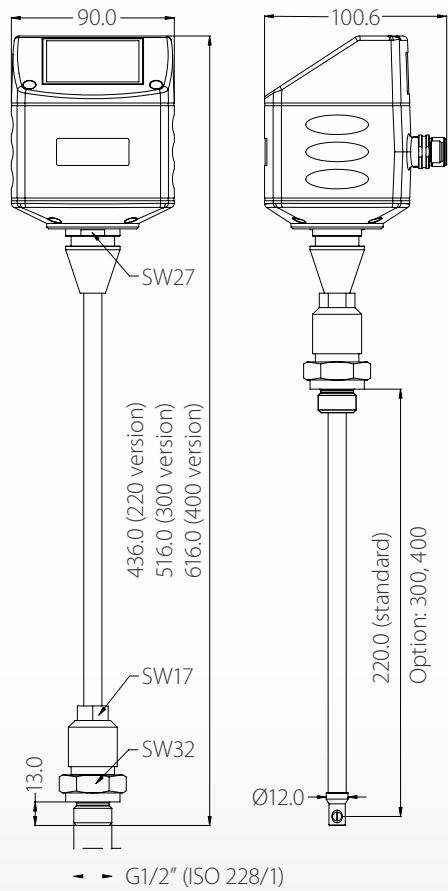
- Standard flow in air
- Reference pressure: 1000 hPa
- Reference Temperature: +20°C

The table above shows the air flow ranges for pipe sizes up to DN300 at standard conditions. At other reference conditions and gas types the flow range may vary, please contact your local sales support.

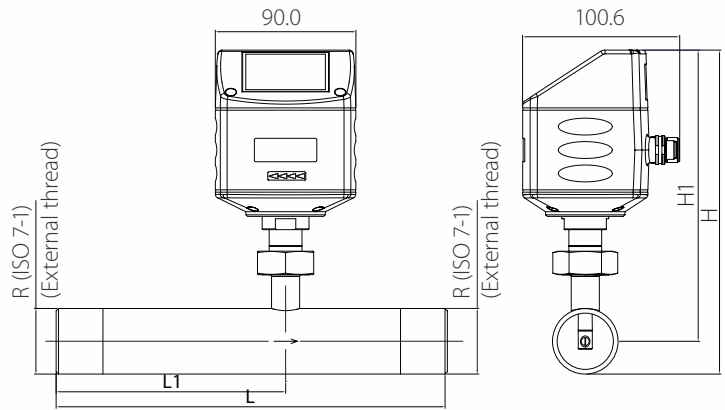
Furthermore it is possible to measure the air flow in bigger pipes (> DN300), for this please contact your local sales support.

S401 / S421 DIMENSIONS

S401

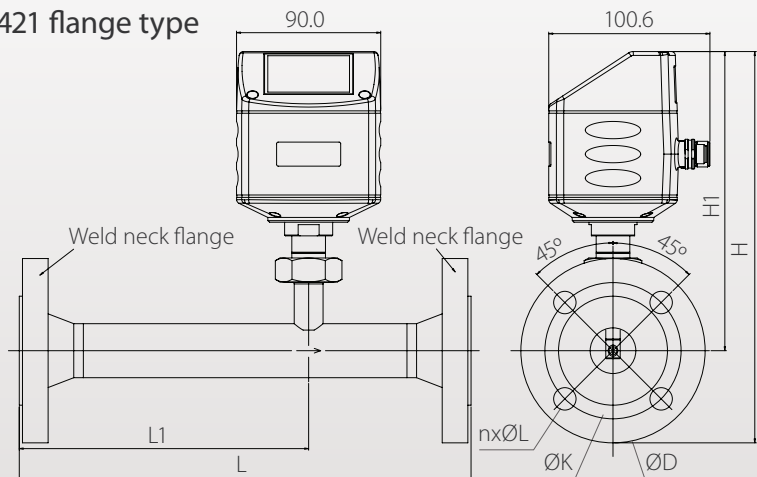


S421 thread type



Pipe nominal size inch / (DN)	L total length (mm)	L1 total length (mm)	H total height (mm)	H1 from pipecenter to casing top (mm)	R External Thread
1/2" (DN15)	300	210	197.4	186.7	R 1/2"
3/4" (DN20)	475	275	200.2	186.7	R 3/4"
1" (DN25)	475	275	203.6	186.7	R 1"
1 1/4" (DN32)	475	275	207.9	186.7	R 1 1/4"
1 1/2" (DN40)	475	275	210.9	186.7	R 1 1/2"
2" (DN50)	475	275	216.9	186.7	R 2"
2 1/2" (DN65)	475	275	232.7	194.6	R 2 1/2"
3" (DN80)	475	275	245.5	201.0	R 3"

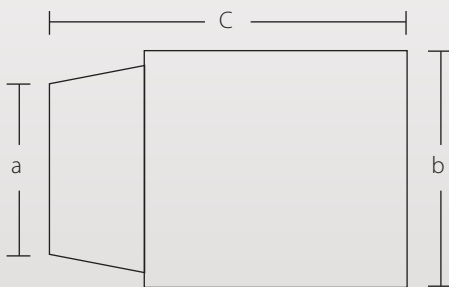
S421 flange type



Pipe nominal size inch / (DN)	L total length (mm)	L1 total length (mm)	H total height (mm)	H1 from pipecenter to casing top (mm)
1/2" (DN15)	300	210	234.2	186.7
3/4" (DN20)	475	275	239.2	186.7
1" (DN25)	475	275	244.2	186.7
1 1/4" (DN32)	475	275	256.7	186.7
1 1/2" (DN40)	475	275	261.7	186.7
2" (DN50)	475	275	269.2	186.7
2 1/2" (DN65)	475	275	287.1	194.6
3" (DN80)	475	275	301.0	201.0

Optional flow conditioner

No more straight inlet requirements



Order No.	Dimensions	a	b in mm	c in mm
A 1070	DN15	R 1/2"	24	64
A 1071	DN20	R 3/4"	32	69
A 1072	DN25	R 1"	37	75
A 1073	DN32	R 1.25"	45	92
A 1074	DN40	R 1.5"	54	92
A 1075	DN50	R 2"	68	105
A 1076	DN65	R 2.5"	80	128
A 1077	DN80	R 3"	95	142

S401 / S421 ORDERING



Visit our website or e-mail us:
www.suto-itec.com
sales@suto-itec.com

Please use the following tables to assist in placing your order with our sales staff.

S401 Thermal Mass Flow Meter (Insertion type)		
Order No.	Code	Description
S695 4100	S4010	S401 Flow sensor, 220mm shaft
S695 4101	S4011	S401 Flow sensor, 300mm shaft
S695 4102	S4012	S401 Flow sensor, 400mm shaft
S695 4103	S4013	S401 Flow sensor, 160mm shaft
Connection thread		
	A	G1/2" Standard
A1006	B	PT 1/2" Adapter
A1005	C	NPT 1/2" Adapter
Gas type 1		
A1007	A	Air
A1008	B	CO ₂
A1009	C	O ₂ (Oil- & grease-free cleaned)
A1010	D	N ₂
A1011	E	N ₂ O
A1012	F	Argon
A1013	G	Natural Gas
A1014	H	H ₂ (real gas calibration)
A1015	I	Other gas (Please specify)
A1016	J	He (real gas calibration)
A1017	K	C ₃ H ₈
	Z	No Second Gas
Gas type 2 (same selections as above)		
Range		
	A	Standard range version (92,7 m/s)
A1401	B	Max range version (185 m/s)
A1402	C	High speed range version (220 m/s)
A1403	D	Low range version (1/3 or standard range)
Calibration		
	A	Standard calibration
A1405	C	Bi-directional calibration
A1404	E	High accuracy calibration (1% ± 0.3%F.S.)
Output		
A1410	A	Analog 4 ... 20 mA, Pulse output
A1411	B	Modbus/RTU output
A1413	C	Analog 4 ... 20 mA, Pulse output compatible to S400
Display		
	A	Without display
A1420	B	With display

Example: S4010AAZBAAB

S401, 220 mm shaft, G1/2", Air, no second gas, max range, standard calibration, analog output, display

Attention:

- Measuring section connection and size must be combined to get the order number. Example: A1306 = R-thread DN50

S421 Thermal Mass Flow Meter (Inline type)		
Order No.	Code	Description
S695 4120	S4210	S421 Flow sensor, in-line type, 1.6 MPa version
S695 4121	S4211	S421 Flow sensor, in-line type, 4.0 MPa version
Measuring section connection *		
A130X	A	R-thread (IOS-7-1)
A132X	B	Flange, EN 1092-1, PN40
A134X	C	Flange ANSI 16.5
Measuring section size *		
1	A	DN15 (1/2")
2	B	DN20 (3/4")
3	C	DN25 (1")
4	D	DN32 (1.25")
5	E	DN40 (1.5")
6	F	DN50 (2")
7	G	DN65 (2.5")
8	H	DN80 (3")
Gas type 1		
A1007	A	Air
A1008	B	CO ₂
A1009	C	O ₂ (Oil- & grease-free cleaned)
A1010	D	N ₂
A1011	E	N ₂ O
A1012	F	Argon
A1013	G	Natural Gas
A1014	H	H ₂ (real gas calibration)
A1015	I	Other gas (Please specify)
A1016	J	He (real gas calibration)
A1017	K	C ₃ H ₈
	Z	No Second Gas
Gas type 2 (same selections as above)		
Range & Calibration		
	A	Standard range version / calibration
A1403	D	Low range version (1/3 of standard range)
A1404	E	High accuracy calibration (1% ± 0.3%F.S.)
Output		
A1410	A	Analog 4 ... 20 mA, Pulse output
A1411	B	Modbus/RTU output
A1413	C	Analog 4 ... 20 mA, Pulse output compatible to S400
Display		
	A	Without display
A1420	B	With display
Flow conditioner		
A107X	A	R-thread flow conditioner

Example: S4210AFBDAEBBB

S421, R-thread, DN50, CO₂, N₂, standard range, high accuracy calibration, Modbus output, display