FLOW SENSORS
SERIES FS

Sizes: 17, 30, 35

News

The Series FS is available for flows ranging from 0.5 to 2000 L/min, offered in three different sizes, also available with the pressure sensor version included.
The display is designed to be rotatable, thus allowing for easy reading of the monitored values.
The cumulative flow rate is immediately visible on the display.

Main features:
- Real-time monitoring: Allows for constant flow control at all times.
- Wide range of applications: Suitable for multiple uses, from small workshops to large industries.
- Painting robots: Ideal for managing the airflow in painting processes, contributing to the economization of technical gases.

Wide range of flow rates	• Available for flows ranging from 0.5 to 2000 l/min.
Multiple sizes	• Choose from three different sizes to suit specific needs.
Easy Installation	• The design ensures a hassle-free installation process.
Easy reading of Display Data	• The display view can be oriented for easy reading of monitored values to suit the application.
Instant Visibility	• The accumulated flow rate is immediately visible on the display.

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FLOW SENSORS
SERIES FS - GENERAL DATA

GENERAL DATA

Mod.	**FS** (Flow sensors)	**FSP** (Flow sensor + Pressure sensor)
Sizes	01 (17mm) 02 (30mm) 03 (35mm)	
Medium	Dry air, N_2, Non-corrosive / Non-flammable gas	
Measured flow range	**FS01 - FSP01** (0 ÷ 1 to 0 ÷ 200 L/min) **FS02 - FSP02** (2 ÷ 500 to 10 ÷ 1000 L/min) **FS03 - FSP03** (10 ÷ 2000 L/min)	
Flow direction	Unidirectional	
Rated pressure range	Not applicable	-0,90 ÷ 10 Bar
Display	4 digits * 4 digits, 7 segment screen (red/green/orange)	
Flow istante range	**FS01 - FSP01** (0 ÷1,050 to 0 ÷ 210 L/min) **FS02 - FSP02** (0 ÷ 525 to 0 ÷ 1050 L/min) **FS03 - FSP03** (0 ÷ 2100 L/min)	
Minimum setting scale LPM	**FS01 - FSP01** (1 ml/min to 1 L/min) **FS02 - FSP02, FS03 - FSP03** (1 L/min)	
Minimum setting scale CFM	**FS01 - FSP01** (0.01 ft^3/min to 1 ft^3/min) **FS02 - FSP02, FS03 - FSP03** (1 ft^3/min)	
Accumulated flow	**FS01 - FSP01** (99999999 ml to 9999999.9 L) **FS02 - FSP02, FS03 - FSP03** (99999999 L)	
Resolution	**FS01 - FSP01** (1ml to 1 L) **FS02 - FSP02, FS03 - FSP03** (1 L)	
Display range	Not applicable	-1 ÷ 10 bar
Minimum setting scale kPA	Not applicable	1
Minimum setting scale kfg/cm^2	Not applicable	0.01
Minimum setting scale bar	Not applicable	0.01
Minimum setting scale psi	Not applicable	0.1
Guaranteed range of flow display	2 ÷ 100 % F.S.	
Accuracy of flow display indicators	**FS01 - FSP01** (± 3% F.S. ± 1 digit *1) **FS02 - FSP02, FS03 - FSP03** (± 3% F.S. ± 1 digit *5)	
Analog output accuracy of the flow display	**FS01, FSP01** (± 5% F.S. *1) **FS02 - FSP02, FS03 - FSP03** (± 5% F.S. *5)	
Repeatability of flow visualization	**FS01 - FSP01** (±1% F.S. ±1 digit *2) **FS02 - FSP02, FS03 - FSP03** (±1% F.S. ±1 digit *2), (± 2% F.S. when the response time is set to 50ms) *2	
Linearity of flow visualization	± 3% F.S. *2	
Variation with temperature of the flow display	**FS01 - FSP01** ± 2% F.S. (15÷35°C); ± 5% F.S. (0÷15°, 35÷50°C), (compared with *2) **FS02 - FSP02, FS03 - FSP03** ± 5% F.S. (compared with *2)	
Variation with pressure	**FS01 - FSP01** (± 5% F.S. ± 1 digit *3) **FS02 - FSP02, FS03 - FSP03** (± 5% F.S. ± 1 digit *6)	
Guaranteed range pressure accuracy	Not applicable	0 ÷ 100 % F.S.
Indicators accuracy	Not applicable	± 2% F.S. ± 1 digit *7
Analog output accuracy	Not applicable	± 2.5% F.S. *7
Repeatability pressure accuracy	Not applicable	± 0.2% F.S. ± 1 digit *7
Linearity pressure accuracy	Not applicable	± 1% F.S. *7
Variation with temperature precision pressure	Not applicable	± 2% F.S. (compared with *7)
General digital output	2	1
Digital output flow response time	800 ms (available 50, 80, 120, 200, 400, 1500ms)	
Response time to digital output pressure	Not applicable	2.5 ms (available 25, 100, 250, 500, 1000, 1500 ms)
Digital flow output mod	Hysteresis Mode, Window Comparator Mode, Accumulated Output, Accumulated Pulse Output	
Digital pressure output	Not applicable	
Hysteresis	Adjustable	
Short circuit protection	Yes	
Accumulated pulse output	**FS01 - FSP01** (10 ml/impulse to 2 L/impulse) **FS02 - FSP02** (5 L/impulse to 10 L/impulse) **FS03 - FSP03** (10 L/impulse)	
Analog voltage output	1 ÷ 5 V – Output Impedance : 1 kΩ	1 ÷ 5 V; *8 – Output Impedance: 1 kΩ
Analog current output	4 ÷ 20 mA – Load Impedance: ≤ 300Ω	4 ÷ 20 mA; *8 – Load Impedance: ≤ 300Ω
Response time	≤ 100 ms	Pressure: ≤ 50 ms; Flow: ≤ 100 ms
External input	Input Open collector, ≤ 0.4V, ≥ 30ms	
Communication interface	RS-485 *	
Power supply voltage	12 ÷ 24V DC ± 10 % - Ripple (P-P) ≤ 10 %	
Power Consumption	≤ 50 mA	
Operating pressure range	Not applicable	**FSP01** (-0,9 ÷ 8 bar) **FSP02, FSP03** (0÷10 bar)
Withstand pressure	Not applicable	**FSP01** (10 bar) **FSP02, FSP03** (15 bar)
Protection class	IP40	
Working fluid temperature	0÷50 °C (no condensation or freezing)	
Ambient temperature range	Operation : 0÷50 °C ; Storage : -10÷60 °C (no condensation or freezing)	
Ambient humidity range	Operation / Storage : 35÷85 % R.H. (no condensation)	
Insulation resistance	≥ 50 MΩ (500 V DC, between case and lead wire)	**FSP01** (≥ 2 MΩ - 50 VDC, between case and lead wire) **FSP02, FSP03** (≥ 50 MΩ - 500 VDC, between case and lead wire)
Maximum Voltage	1000 VAC for 1 minut, between case and lead wire	**FSP01** (250 VAC for 1 minut, between case and lead wire) **FSP02, FSP03** (1000 VAC for 1 minut, between case and lead wire)
Vibration	Total amplitude 1.5 mm or 10 G, 10 Hz÷55 Hz÷10 Hz scan for 1 minute, 2 hours each direction of X, Y and Z	

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Shock	100 m/s² (10 G), 3 times each in direction of X, Y and Z
EMC	IEC 61000-6-2; IEC 61000-6-4
Cable	Ø4 Oil-resistance cable (PVC) - 26 AWG (0.15 mm²) - 6 cores
Port sizes	**FS01 - FSP01** (ø6 to ø8) **FS02 - FSP02** (Rc1/2, G1/2) **FS03 - FSP03** (Rc3/2, G3/4)
Weight (with 2 meter lead wire)	**FS01 - FSP01** (109.3 g to 112.7 g approx.) **FS02 - FSP02** (250 g to 325 g) **FS03 - FSP03** (325 g)

TABLE NOTES:
*1: CONDITIONS: inlet pressure: 3 bar, outlet pressure: atmospheric pressure, 25 °C
*2: CONDITIONS: outlet pressure: atmospheric pressure, 25 °C
*3: -0.9 ÷ 8 bar, outlet pressure: atmospheric pressure, 25 °C
*4: Function available only for options -02 and -04
*5: CONDITIONS: inlet pressure: 6 bar, outlet pressure: atmospheric pressure, 25 °C
*6: 0÷10 bar, outlet pressure: atmospheric pressure, 25 °C
*7: Outlet flow = 0 L/min, 25 °C
*8: PWM output, corresponding to the pressure 0 ÷ 10 bar

CODING EXAMPLE

FS	01	-	201	-	031	-	R8

FS	**SERIES** FS = Flow sensor FSP = Flow sensor + Pressure sensor
01	**SIZE** 01 = 17 mm 02 = 30 mm 03 = 35 mm
201	**FLOW RATE RANGE** 005 = 500 mL/mil (only size 01) - *Available on request* 010 = 1000 mL/min (only size 01) 050 = 5 L/min (only size 01) - *Available on request* 100 = 10 L/min (only size 01) - *Available on request* 500 = 50 L/min (only size 01) 101 = 100 L/min (only size 01) - *Available on request* 201 = 200 L/min (only size 01) 501 = 500 L/min (only size 02) 102 = 1000 L/min (only size 02) 202 = 2000 L/min (only size 03)
031	**OUTPUT SPECIFICATIONS** 010 = 2 NPN output + Analog output 1 - 5 V 011 = 2 NPN output + Analog output 4 - 20 mA 020 = 2 NPN output + RS485 - *Available on request* 030 = 2 PNP output + Analog output 1 - 5 V 031 = 2 PNP output + Analog output 4 - 20 mA 040 = 2 PNP output + RS485 - *Available on request*
R8	**PORT SIZE** R6 = Ø6 mm for Flow Rate type 005, 010, 050, 100, 500 R8 = Ø8 mm for Flow Rate type 101, 201 F9C = G1/2 for Flow Rate Range 501/102 F12C = G3/4 for Flow Rate Range 202

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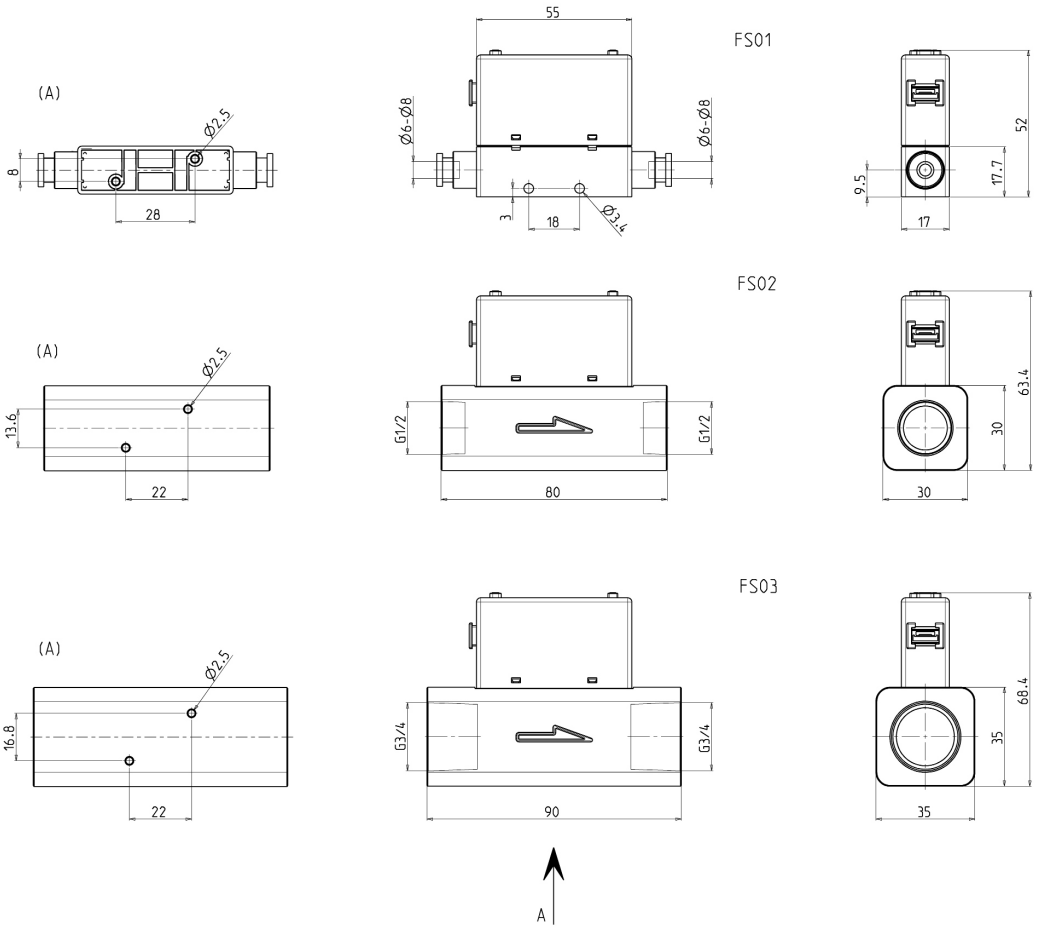
FLOW SENSORS
SERIES FS - DIMENSIONAL CHARACTERISTICS

FS sensor - Dimensions

News

The sensor is supplied WITHOUT cable.



Mod.	Flow rate (L/min)	Output	Ports	Dimensions
FS01-500-031-R6	50 L/min	2 PNP ANALOG 4-20mA	Ø 6	17
FS01-500-030-R6	50 L/min	2 PNP ANALOG 1-5 V DC	Ø 6	17
FS01-201-031-R8	200 L/min	2 PNP ANALOG 4-20mA	Ø 8	17
FS01-201-030-R8	200 L/min	2 PNP ANALOG 1-5 V DC	Ø 8	17
FS02-501-031-F9C	500 L/min	2 PNP ANALOG 4-20mA	1/2G	20
FS02-501-030-F9C	500 L/min	2 PNP ANALOG 1-5 V DC	1/2G	20
FS02-102-030-F9C	1000 L/min	2 PNP ANALOG 1-5 V DC	1/2G	20
FS02-102-031-F9C	1000 L/min	2 PNP ANALOG 4-20mA	1/2G	20
FS03-202-031-F12C	2000 L/min	2 PNP ANALOG 4-20mA	3/4G	30
FS03-202-030-F12C	2000 L/min	2 PNP ANALOG 1-5 V DC	3/4G	30

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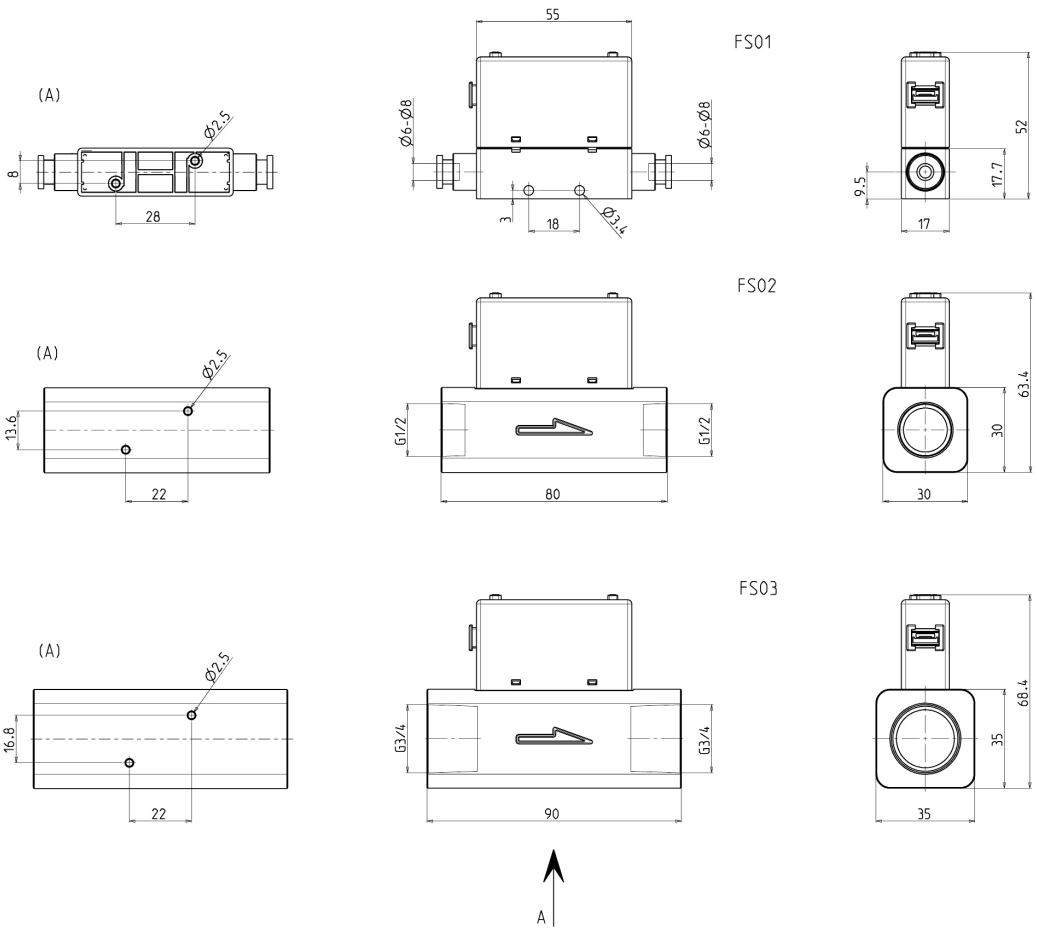
FSP sensor - Dimensions

News

The sensor is supplied WITHOUT cable.



Mod.	Flow rate (L/min)	Output	Ports	Dimensions
FSP01-010-031-R6	1 L/min	2 PNP ANALOG 4-20mA	Ø 6	17
FSP01-500-031-R6	50 L/min	2 PNP ANALOG 4-20mA	Ø 6	17
FSP01-500-030-R6	50 L/min	2 PNP ANALOG 1-5 V DC	Ø 8	17
FSP01-201-031-R8	200 L/min	2 PNP ANALOG 4-20mA	Ø 8	17
FSP01-201-030-R8	200 L/min	2 PNP ANALOG 1-5 V DC	1/2G	17
FSP02-501-031-F9C	500 L/min	2 PNP ANALOG 4-20mA	1/2G	20
FSP02-501-030-F9C	500 L/min	2 PNP ANALOG 1-5 V DC	1/2G	20
FSP02-102-030-F9C	1000 L/min	2 PNP ANALOG 1-5 V DC	1/2G	20
FSP02-102-031-F9C	1000 L/min	2 PNP ANALOG 4-20mA	1/2G	20
FSP03-202-031-F12C	2000 L/min	2 PNP ANALOG 4-20mA	3/4G	30
FSP03-202-030-F12C	2000 L/min	2 PNP ANALOG 1-5 V DC	3/4G	30

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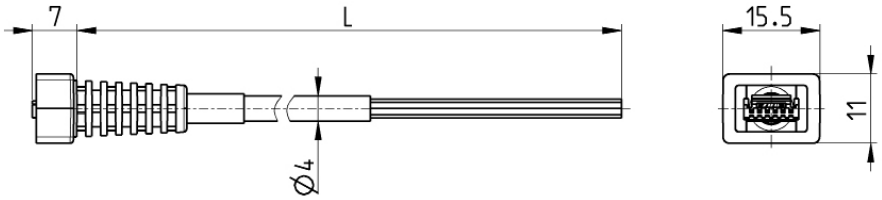
FLOW SENSORS
SERIES FS - ACCESSORIES

Cables for FS

News

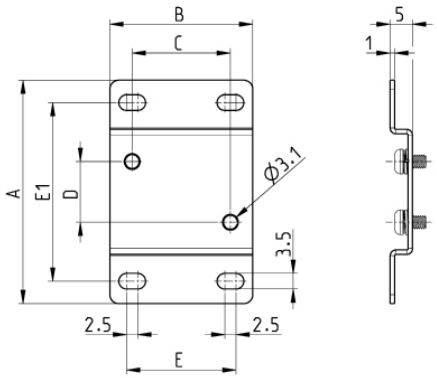
Material: PVC
The cable is not included in the sensor package.



Mod.	L = length cable
GM6X-2	2 m
GM6X-5	5 m

Mounting brackets for FS and FSP

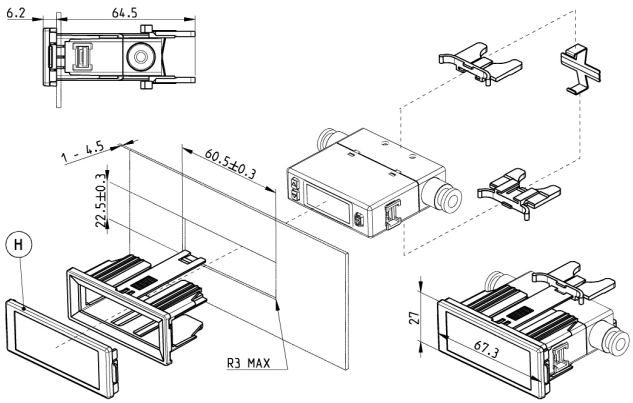
News



Mod.	A	B	C	D	E	E1
FS-BT-26	33,6	40	28	8	32,2	26
FS-BT-27	50	32	22	13,6	24,5	40
FS-BT-28	58	42	22	16,8	24,5	48

Kit panel adapter for FS and FSP

News



Mod.	H
FS-PA-H	Yes
FS-PA-G	No

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