Description

The miniature Flow Meter FC04 is designed to operate with air, compressed air, oxygen, nitrogen and biogas. Sensor head integral with electronic circuitry.
When used in a compressed-air system, the FC04 has to be installed behind the air dryer to prevent moisture condensation of the sensors. Damage of the ceramic sensors through particles in the pipe system must be prevented by suitable filtering measures.

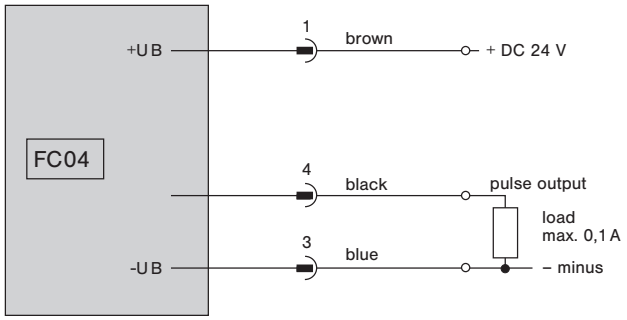


FC04-..
pressure resistant, p_N = 16 bar/232 psi

Features

- Pressure resistant to 16 bar/232 psi
- Easy fitting by sensor adapter TP-... or ball valve BV-...
- Electrical Connection by means of M8 connectors following IEC 60947-5-2
- Measuring range factory preset
- No moving parts in the flow stream
- Response time < 1 s
- Quantity scaled pulse

Connection diagram FC04



Ordering information FC04

Flow Meter/calorimetric

FC04 Miniature Flow Meter with 3-pole connector

Process connection

11 Insertion-type (standard)

Material of the area exposed to fluid

M1 Stainless steel 1.4571/AISI 316 Ti, polyamide/ceramics/ glass-passivated sealing

Schaftlänge

L11 29,5 mm/1.16 in. (standard)

Electrical connection

E12 M12x1, 3-pole

Output

P1 1 pulse = 1 Nl (only MB0)
P2 1 pulse = 10 Nl
P3 1 pulse = 100 Nl
P4 1 pulse = 1000 Nl (not MB0)

Measuring range

MB0
MB1
MB2

Sensor adapter or ball valve

TP01
TP02
TP03
TP04
TP05
TP06
BV03
BV04
BV05
BV06

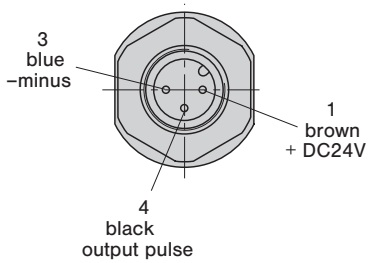
Gas

air, compressed air, oxygen, nitrogen
BIO biogas

FC04	11	M1	L11	E12	P3	MB2	TP03	ordering example

Electrical Connection FC04

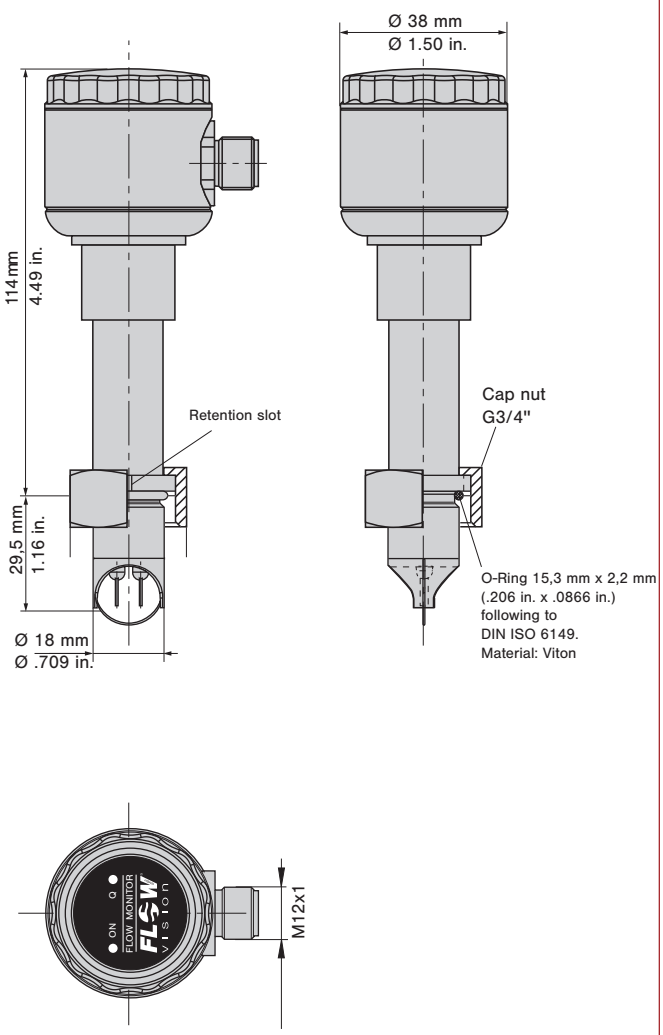
Connector DIN EN 50044 / IEC 947, M12x1 3-pole



TECHNICAL DATA			
Flow Meter FC04		**FC04-....P1/P2/P3/P4**	
General data			
Gas		air, compressed air, oxygen, nitrogen and biogas (please enquire for other gases)	
Measuring functions		standard volume flow/mass flow	
Display		LED (green = busy), LED (yellow = pulse)	
Temperature range (gas, ambience and storage)		0 ... +60 °C/+32 ... +140 °F	
Electrical data			
Input voltage		DC 24 V (18 ... 32 V)	
Power consumption (1)		30 ... 130 mA	
Quantity of the output pulse		1 pulse = 1l/10l/100l/1000l (pulse width: 50 ms) (max. 100 mA)	
Flow rate measurement			
Measuring range/ calibration range (dependent on use of sensor adapter TP01...TP06 or ball valve BV03...BV06) (2)	Mesuring range, sensor adapter/ball valve	air, compressed air, oxygen, nitrogen	biogas
	MB0 in TP01	0 - 6 Nm³/h	
	MB1 in TP01	0 - 20 Nm³/h	0 - 15 Nm³/h
	MB1 in TP02	0 - 30 Nm³/h	0 - 26 Nm³/h
	MB1 in TP03/BV03	0 - 50 Nm³/h	0 - 40 Nm³/h
	MB1 in TP04/BV04	0 - 80 Nm³/h	0 - 65 Nm³/h
	MB1 in TP05/BV05	0 - 125 Nm³/h	0 - 105 Nm³/h
	MB1 in TP06/BV06	0 - 200 Nm³/h	0 - 170 Nm³/h
	MB2 in TP01	0 - 50 Nm³/h	0 - 37 Nm³/h
	MB2 in TP02	0 - 75 Nm³/h	0 - 62 Nm³/h
	MB2 in TP03/BV03	0 - 125 Nm³/h	0 - 95 Nm³/h
	MB2 in TP04/BV04	0 - 200 Nm³/h	0 - 161 Nm³/h
	MB2 in TP05/BV05	0 - 310 Nm³/h	0 - 260 Nm³/h
	MB2 in TP06/BV06	0 - 500 Nm³/h	0 - 425 Nm³/h
Accuracy (6)		±3% of measured value ±1% of final value	
Repeatability (3)		±1 % of measured value ±0,5 % of final value	
Temperature drift		typ. ±0,25 %/°C / ±0,45 %/°F of measured value	
Delay on switch on		typically 30 s	
Response time (step function) (5)		< 1 s	
Adjustment time t_{90} (4)		typically 10 s	
Mechanical data (electronic circuitry)			
Degree of protection		IP64 between medium and electronic circuitry	
		IP67 electronic circuitry (when plugged in)	
Materials	Housing	stainless steel 1.4571	
	Cap PA	6-3-T, transparent	
	M12-Connector	nickel-plated brass	
	O-Rings	Viton®	
	sensor assembly: cap	polyamide	
	sensor	ceramics glass-passivated	
	protective bracket	stainless steel 1.4571	
Weight		305 g/.672 lb	
Max. cable length		depending on cable resistance and input voltage	

(1) Depending on input voltage and volume flow, including load current.
(2) Standard volume flow related to 0 °C/32 °F and 1013 mbar/14.7 psi.
(3) At constant temperature and flow conditions, and stable thermal conductivity.
(4) Upon flow rate changes and for reaching 90 % of the final value.
(5) Delay with the limit value set at 10 m/s / 32.8 fps and the flow at 20 m/s 65.6 fps, after a sudden complete stop.
(6) Accuracy specification for biogas valid up to: 18,1 Nm³/h (TP01), 28,3 Nm³/h (TP02), 44,2 Nm³/h (TP03/BV03), 72,4 Nm³/h (TP04/BV04), 113,1 Nm³/h (TP05/BV05), 176,7 Nm³/h (TP06/BV06)

Dimensions


Ø 38 mm
Ø 1.50 in.
114 mm
4.49 in.
Retention slot
Cap nut
G3/4"
29,5 mm
1.16 in.
O-Ring 15,3 mm x 2,2 mm
(.206 in. x .0866 in.)
following to
DIN ISO 6149.
Material: Viton
Ø 18 mm
Ø .709 in.
ON
Q
FLOW MONITOR
FLOW VISION
M12x1

Sensor adapter TP-.../Ball valve BV-...



TP-... BV-...

Description

Sensor adapters TP and ball valves BV facilitate correct positioning and exchange of CSP monitoring heads, FC03, FC04 or FS10-U1...11 (plug-in type connection) in pipes with process connection DN 15...DN 50.
Ball valve BV enables pressure-free installation or removal of CSP monitoring heads, Flow Meter FC03, FC04 and Flow Monitor FS10-U1...11 (plug-in type connection) simply by closing the input and output pipe. The measuring points are suited to temporary measurements; after completion of the measuring cycle they can be closed by means of blanking plugs.

Features

- Correct positioning of sensor
- Ease of sensor replacement
- Measuring point can be closed if not used
- Sensor adapter available as screw-in or welding type
- Ball valve also serves as a shutoff valve (both input and output)

Ordering information

Type					
TP	Sensor adapter with internal thread				
	Process connection/Nominal size				
	01	DN 15	G1/2	internal thread	length: 50 mm/1.97 in.
	02	DN 20	G3/4	internal thread	length: 64 mm/2.52 in.
	03	DN 25	G1	internal thread	length: 78 mm/3.07 in.
	04	DN 32	G1 1/4	internal thread	length: 94 mm/3.70 in.
	05	DN 40	G1 1/2	internal thread	length: 110 mm/4.33 in.
	06	DN 50	G2	internal thread	length: 138 mm/5.43 in.
			Material of the area exposed to medium		
			M1	stainless steel 1.4571/AISI 316Ti	PN 315 bar/4569 psi
			M3	brass (not TP-03..)	PN 25 bar/363 psi
			M5	red brass (only TP-03..)	PN 16 bar/232 psi
TP -	**01**		**M3**	ordering example	

Accessories

Description	Ref. No.
Blanking plug, brass, with O ring	0Z121Z000186
Union nut, brass	Y 306 901 01
Blanking plug, stainless steel 1.4571/AISI 316 Ti, with viton O ring	0Z121Z000187
Union nut, stainless steel	Y 306 901 03

Ordering information

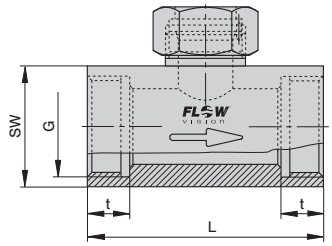
Type					
TP	Sensor adapter with welding nipples				
	Process connection/Nominal size				
	01	DN 15	dia.d: 16 mm/.630 in.		length: 50 mm/1.97 in.
	02	DN 20	dia.d: 20 mm/.787 in.		length: 70 mm/2.76 in.
	03	DN 25	dia.d: 25 mm/.984 in.		length: 80 mm/3.15 in.
	04	DN 32	dia.d: 32 mm/1.26 in.		length: 100 mm/3.94 in.
	05	DN 40	dia.d: 40 mm/1.57 in.		length: 110 mm/4.33 in.
	06	DN 50	dia.d: 50 mm/1.97 in.		length: 140 mm/5.51 in.
			Material of the area exposed to medium		
			M1	stainless steel 1.4571/AISI 316Ti	
				Process connection	
				SA	welded connection
TP -	**01**		**M1 -**	**SA**	ordering example

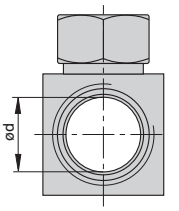
Ordering information

Type					
BV	ball valve with internal thread				
	Process connection/Nominal size				
	03	DN 25	G1	internal thread	length: 88 mm/3.46 in.
	04	DN 32	G1 1/4	internal thread	length: 100 mm/3.94 in.
	05	DN 40	G1 1/2	internal thread	length: 110 mm/4.33 in.
	06	DN 50	G2	internal thread	length: 131 mm/5.16 in.
			Material of the area exposed to medium		
			M3	nickel plated brass, Delrin seal	
BV -	**03**		**M3**	ordering example	

Dimensions

TP-... sensor adapter with internal thread



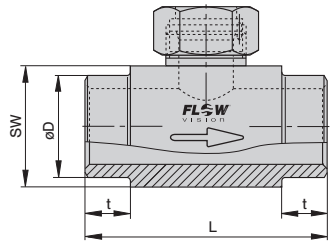


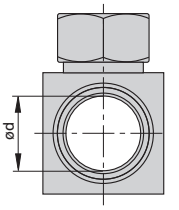
SW = switch across flats

Material stainless steel (-M1): PN 315 bar / 4569 psi
Material brass (-M3): PN 25 bar / 363 psi
Material red brass (-M5): PN 16 bar / 232 psi

Type	DN		dia. d		G	t		L		SW	
	mm	in.	mm	in.	in.	mm	in.	mm	in.	mm	in.
TP-01 ...	15	.591	16	.630	1/2"	11	.433	50	1.97	27	1.06
TP-02 ...	20	.787	20	.787	3/4"	12	.472	64	2.52	32	1.26
TP-03 ...	25	.984	25	.984	1"	14	.551	78	3.07	40	1.57
TP-04 ...	32	1.26	32	1.26	1.1/4"	15	.591	94	3.70	50	1.97
TP-05 ...	40	1.57	40	1.57	1.1/2"	15	.591	110	4.33	55	2.16
TP-06 ...	50	1.97	50	1.97	2"	19	.748	138	5.43	70	2.76

TP-... M1-SA sensor adapter with welding nipples

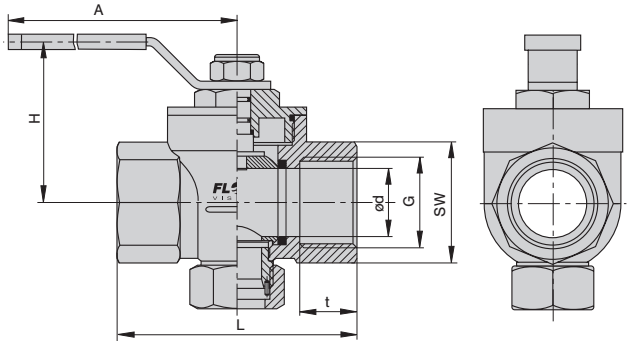




PN 315 bar / 4569 psi

Type	DN		dia. d		dia. D		t		L		SW	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
TP-01M1-SA	15	.591	16	.630	21.3	.839	15	.591	50	1.97	27	1.06
TP-02M1-SA	20	.787	20	.787	26.9	1.06	15	.591	70	2.76	32	1.26
TP-03M1-SA	25	.984	25	.984	33.7	1.33	15	.591	80	3.15	40	1.57
TP-04M1-SA	32	1.26	32	1.26	42.4	1.67	15	.591	100	3.94	50	1.97
TP-05M1-SA	40	1.57	40	1.57	48.3	1.90	15	.591	110	4.33	55	2.16
TP-06M1-SA	50	1.97	50	1.97	60.3	2.37	15	.591	140	5.51	70	2.76

BV-... M3 Ball valve with internal thread



PN 25 bar / 363 psi

Type	DN		dia. d		G	t		L		SW		H		A	
	mm	in.	mm	in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
BV-03M3	25	.984	25	.984	1"	21	.827	88	3.46	41	1.61	59	2.32	115	4.53
BV-04M3	32	1.26	32	1.26	1.1/4"	24	.945	100	3.94	50	1.97	65	2.56	115	4.53
BV-05M3	40	1.57	40	1.57	1.1/2"	24	.945	110	4.33	54	2.13	77	3.03	150	5.91
BV-06M3	50	1.97	50	1.97	2"	28	1.10	131	5.16	70	2.76	85	3.35	150	5.91

This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

Cable type 24 with connectors



Description

Connection cable M12 for flow meter FC04 for connection of supply voltage and output signal.

Technical data

Cabel type 24

Features:	Protection degree IP67 (only with connector fitted) Resistant to chemicals and oils
Temperature range:	-25 ... +80 °C/-13 ... +176 °F
Contact resistance:	≤ 5 mΩ
Current carrying capacity:	4 A
Insulation resistance:	> 10^9 Ω
Withstand voltage:	2,0 kV_{eff} / 60 s

Ordering information

cable and cable connector

Do + Ka type 24 - 5 m

with connector to IEC 60947-5-2, 3-pole
M12 and PUR insulated cable 3x0,34 mm², halogen-free, 5 m/16.4 ft

Do + Ka type 24 - 5 m	ordering example