

Description

The miniature Flow Meter FC04 is designed to operate with air, compressed air, oxygen and nitrogen. 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.

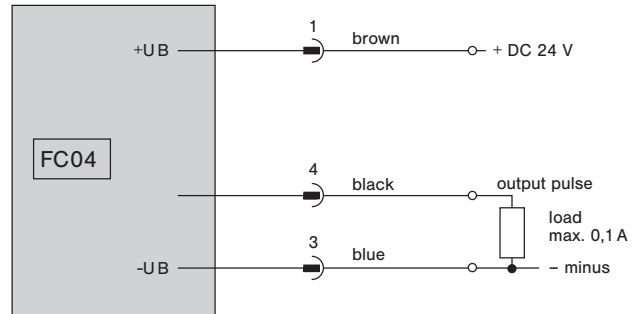


FC04-..
pressure resistant, $p_N = 16 \text{ bar}/232 \text{ psi}$

Features

- Pressure resistant to 16 bar/232 psi
- Easy fitting by sensor adapter TP... or ball valve BV... (see page 51)
- Electrical Connection by means of M8 connectors following IEC 60947-5-2
- Measuring range factory preset to standard flow
- No moving parts in the flow stream
- Response time < 1 s
- Quantity scaled pulse

Connection diagram FC04

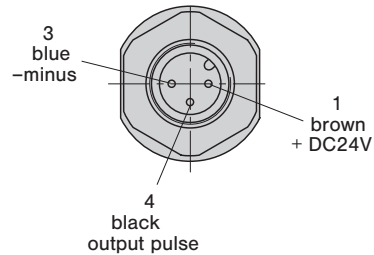


Ordering information FC04

Flow Meter/calorimetric						
FC04	Miniature Flow Meter with 3-pole connector					
Process connection						
11	Insertion-type (standard)					
Material of the area exposed to medium						
M1	stainless steel 1.4571/AISI 316 Ti, polyamide/ceramics/ glass-passivated sealing					
L11	19 mm/.75 in. (standard)					
Electrical connection						
E12	M12x1, 3-pole					
Output						
P1	1 pulse = 1l (only MB0)					
P2	1 pulse = 10l					
P3	1 pulse = 100l					
P4	1 pulse = 1000l (not MB0)					
Measuring range						
MB0						
MB1						
MB2						
Sensor adapter or ball valve						
TP01						
TP02						
TP03						
TP04						
TP05						
TP06						
BV03						
BV04						
BV05						
BV06						
FC04 - 11 M1 L11 E12 P3 MB2 - TP03	ordering example					

Electrical Connection FC04

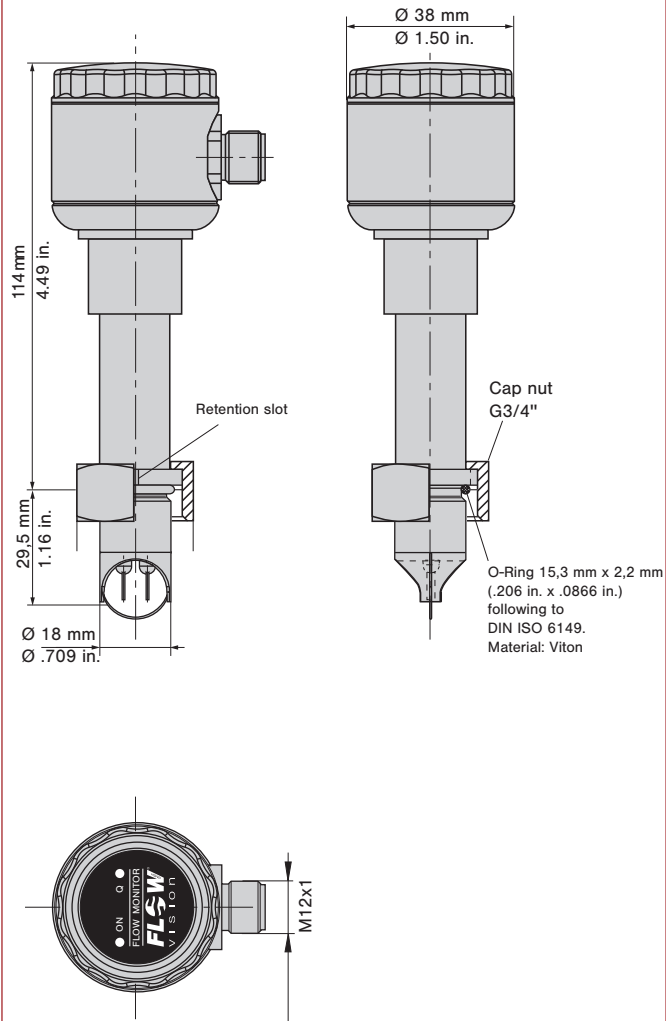
Connector DIN EN 50044 / IEC 947, M12x1 3-pole



Technical data		
Flow Meter FCO4		FCO4....P1/P2/P3/P4
General data		
Media	air, compressed air, oxygen and nitrogen (please enquire for other gases)	
Measuring functions	standard volume flow/mass flow	
Display	LED (green = busy), LED (yellow = pulse)	
Temperature range (medium, ambient and storage)	0 °C...60 °C	
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)	MB0 in TP01	0 - 6 Nm ³ /h ⁽²⁾
	MB1 in TP01	0 - 20 Nm ³ /h
	MB1 in TP02	0 - 30 Nm ³ /h
	MB1 in TP03/BV03	0 - 50 Nm ³ /h
	MB1 in TP04/BV04	0 - 80 Nm ³ /h
	MB1 in TP05/BV05	0 - 125 Nm ³ /h
	MB1 in TP06/BV06	0 - 200 Nm ³ /h
	MB2 in TP01	0 - 50 Nm ³ /h
	MB2 in TP02	0 - 75 Nm ³ /h
	MB2 in TP03/BV03	0 - 125 Nm ³ /h
	MB2 in TP04/BV04	0 - 200 Nm ³ /h
	MB2 in TP05/BV05	0 - 310 Nm ³ /h
	MB2 in TP06/BV06	0 - 500 Nm ³ /h
Accuracy	±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 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	
Max. cable length	depending on cable resistance and input voltage	
<p>(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 and the flow at 20 m/s, after a sudden complete stop.</p>		

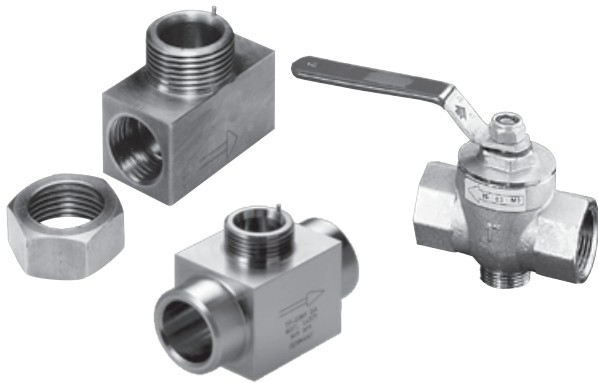
Dimensions

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All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

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



TP-...

BV-...

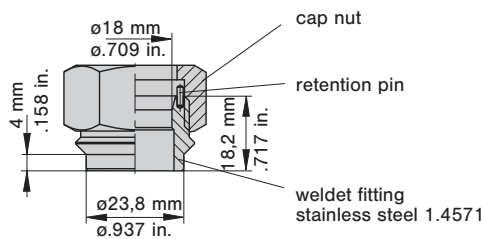
Features

- 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)

Accessories

Description	Ref. No.
Blanking plug, brass, with O ring	OZ121Z000186
Union nut, brass	Y 306 901 01
Blanking plug, stainless steel 1.4571/AISI 316 Ti, with viton O ring	OZ121Z000187
Union nut, stainless steel	Y 306 901 03

**Welding set 05
OZ122Z000202**



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.

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

Ordering information

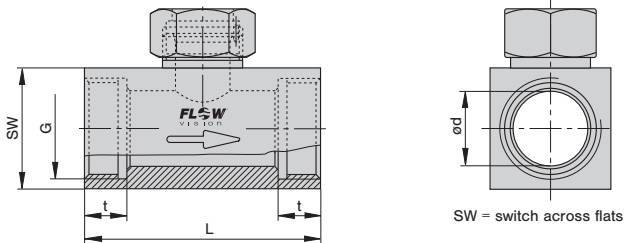
Type	
TP	Sensor adapter with welding nipples
Process connection/Nominal size	
01	DN 15 dia.d: 16 mm/.630 in. length: 50 mm/1.97 in.
02	DN 20 dia.d: 20 mm/.787 in. length: 70 mm/2.76 in.
03	DN 25 dia.d: 25 mm/.984 in. length: 80 mm/3.15 in.
04	DN 32 dia.d: 32 mm/1.26 in. length: 100 mm/3.94 in.
05	DN 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

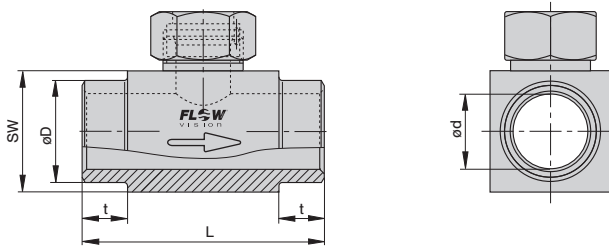
TP... sensor adapter with internal thread



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.	mm	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	

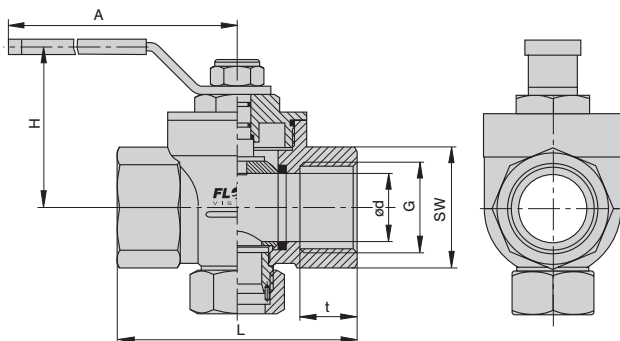
TP...M1-SA sensor adapter with welding nipples



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.	mm	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 ($\frac{mm}{inch}$)

Cabel type 24 with connectors



Technical data

Cabel type 24

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

Description

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

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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

Do + Ka type 24 - 5 m ordering example