

A

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Description

Compact single point flow monitor, MIN or MAX monitoring options, suitable for water, oil, air or media with similar thermal conductivities. With screw-in or plug-in type monitoring head for ease of installation and correct positioning.

If the flow rate falls below (MIN-function) or exceeds (MAX-function) the value adjusted by means of potentiometer, the signal output switches to 0 V-level and the yellow LED (Q) lights.

Features

- wear-resistant compact design, with stainless steel 1.4571 monitoring head and housing
- switch point steplessly adjustable by means of potentiometer
- status indication by green LED
- media temperature range -25 ... +100 °C/-13 ... +212 °F
- M12 plug-in electrical connection
- fault indication by yellow LED
- signal output with HighSide-FET output, protected against short circuits and overloads

Ordering information

Flow monitor (calorimetric)

FS10 flow monitor and integral compact housing

Power supply

U1 DC 24 V

Flow switch point

MIN

MAX

Process connection

01 G1/2A (to DIN 3852-A), length 36 mm

02 NPT1/2"-14, length 36 mm

11 plug-in type (following DIN ISO 6149), length 18.2 mm for TP or BV adaptes

Media

A air, gases

W water, oil, liquids

Fitting material

M1 stainless steel 1.4571

Electrical connection

E12 M12x1, 3-pole

Certification

T0 without certificate *)

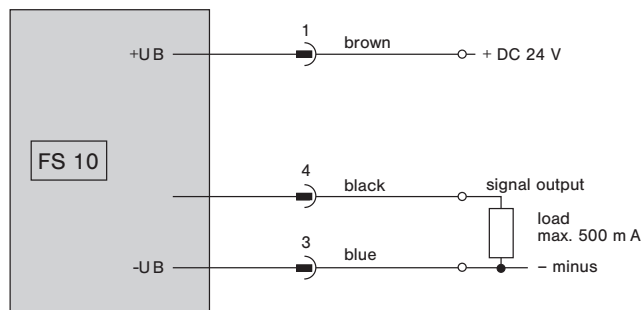
FS10 - U1 MAX 01 W - M1 E12 T0 ordering example

*) for detailed information please see section 0.

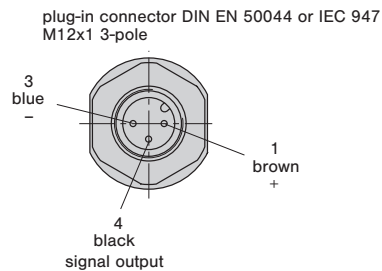


FS10-..

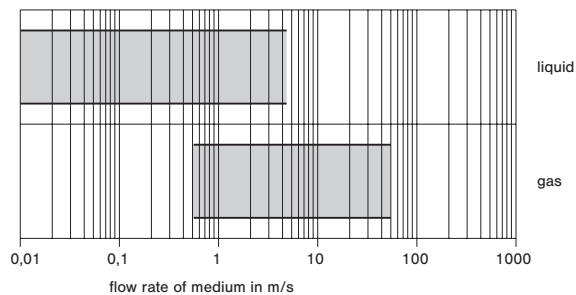
Connection diagram FS10



Electrical connection



Flow rate ranges

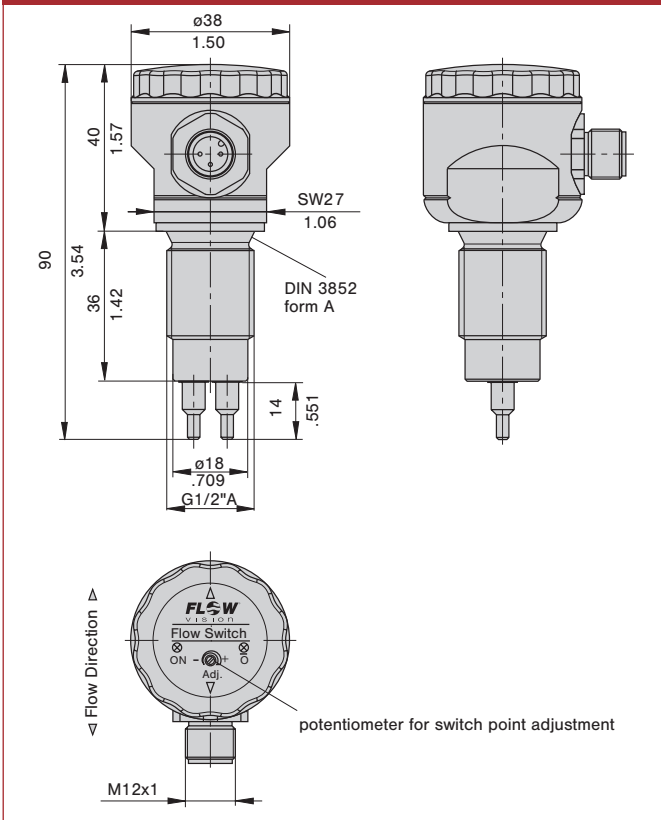


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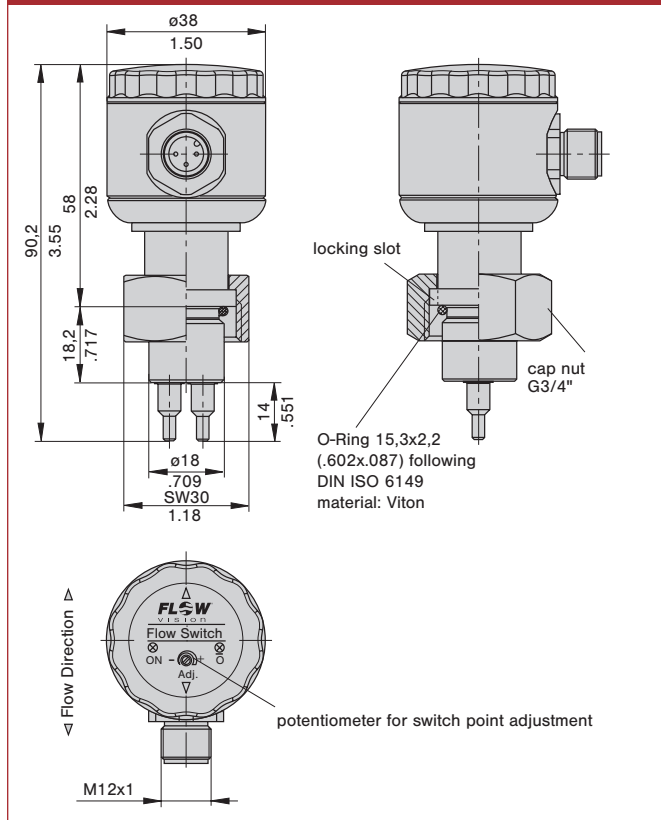
TECHNICAL DATA (ambient temperature $T_u = 25\text{ °C}$, operating voltage $U_B = \text{DC } 24\text{ V}$)

General data		FS10
Media		liquids, gases
Monitoring function	flow speed	switch point (min/max)
	fault indication	LED (yellow)
	signal output	Power FET, high side switch, short circuit proof relay output with coupling relay module REAW (see separate page)
	max. load	500 mA, inductive load max. 100 mA
Temperature range	liquid/gas	-25 ... +100 °C/-13 ... +212 °F
	ambient	-25 ... + 80 °C/-13 ... +176 °F
Electrical data		
Operating voltage U_B		DC 24 V (18 ... 32 V)
Power consumption (without load)	gases	28 mA \pm 5%
	liquids	57 mA \pm 3 %
Status indication		LED (green)
Connection to DIN 50044		M 12 plug-in connection, 3-pole
Flow monitoring		
Flow response level adjustment	air	0,5 ... 50 m/s / 1.64 ... 164 fps (with atmospheric pressure)
	water, oil	0,01 ... 4,5 m/s / 0.0328 ... 14.8 fps
Repeatability ⁽¹⁾		$\leq \pm 3\%$ of the set value
Response delay	water	typ. 2 sec ⁽²⁾
	air	typ. 8 sec ⁽³⁾
	oil	typ. 5 sec ⁽²⁾
Switch point drift through temperature change of the medium		approx. $\pm 1.0\%$ of the set value/°C / 1.8 % of the set value/°F
Mechanical data		
Type and size of monitoring head	plug-in	following DIN ISO 6149
	screw-in	G 1/2 A, NPT 1/2"
Pressure resistance of monitoring head	plug-in	100 bar
	screw-in	100 bar
Degree of protection		IP67 (when plugged in)
Materials (standard)	fitting (wetted)	stainless steel 1.4571
	sensor (wetted)	stainless steel 1.4571
	connection sensor/fitting	laser welded
	housing	stainless steel 1.4571
	M12 connector	CuZn, nickel-plated
	cap	PA
	O-ring	Viton (FPM)
Mass		approx. 240 g/0.529 lb
⁽¹⁾ of the set value, at constant temperature and flow conditions, and stable thermal conductivity ⁽²⁾ delay with the switch point set to 1 m/s / 3.28 fps and the flow at 2 m/s / 6.56 fps, after a sudden complete stop ⁽³⁾ delay with the switch point set to 10 m/s / 32.8 fps and the flow at 20 m/s / 65.6 fps, after a sudden complete stop		

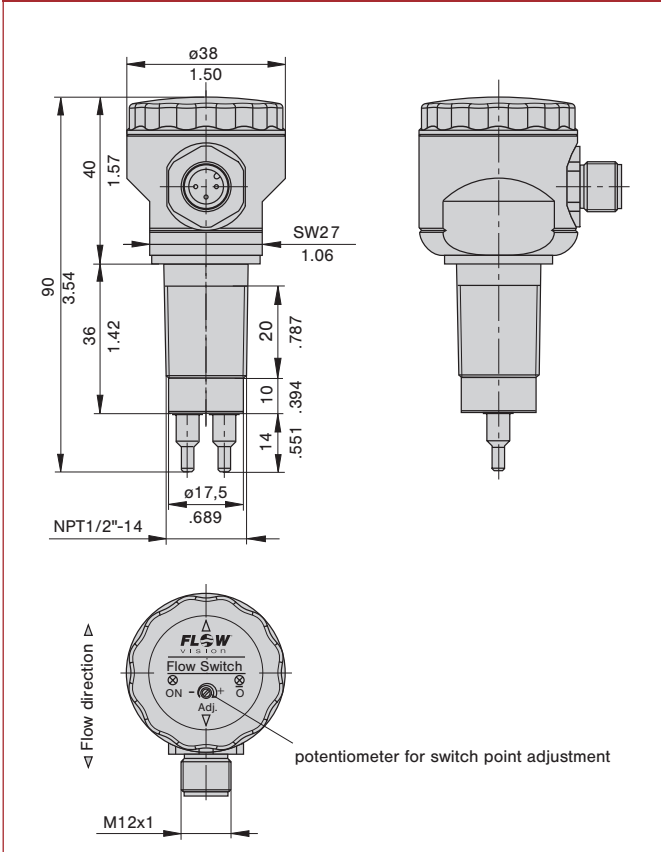
Dimensions of screw-in type process connection (FS10-U1...01)



Dimensions of plug-in type process connection (FS10-U1...11)



Dimensions NPT thread (FS10-U1...02)



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.

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



TP...

BV...

Description

Sensor adapters TP and 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 and Flow Meter FC03, FC04 and 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	
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

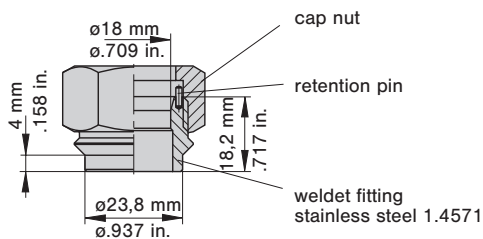
Features

- 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 out 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



Ordering information

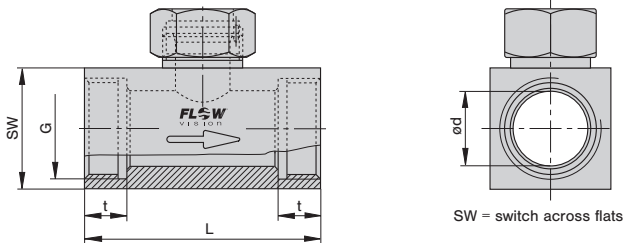
Type	
TP	Sensor adapter with internal thread
Process connection/Nominal size	
01	DN 15 G1/2 internal thread length: 50 mm/1.97 in.
02	DN 20 G3/4 internal thread length: 64 mm/2.52 in.
03	DN 25 G1 internal thread length: 78 mm/3.07 in.
04	DN 32 G1 1/4 internal thread length: 94 mm/3.70 in.
05	DN 40 G1 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/4570 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: 80 mm/3.15 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

Dimensions

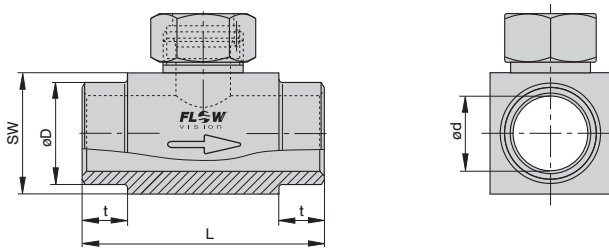
TP... sensor adapter with internal thread



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	

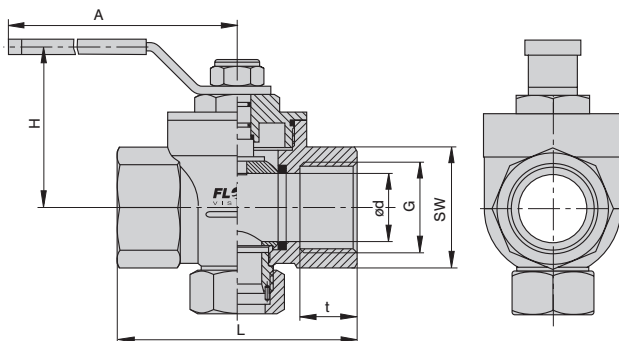
TP... M1-SA sensor adapter with welding nipples



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	80	3.15	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	3.47	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 ($\frac{mm}{inch}$)

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Cable type 24 with connectors



Description

M12 plug-in electrical connection for connection of supply voltage and switching output.

Technical data

Cable 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: > 10⁹ Ω

Withstand voltage: 2.0 kV_{eff.} / 60 s

Ordering information

Cable and cable connector

Do + Ka type 24 - 5 m	with connector to IEC60947-5-2, 3-pole M12 and PUR insulated cable 3x0.34 mm ² (AWG 22), halogen-free
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Do + Ka type 24 - 5 m	ordering example
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Description

Coupling relay module for Flow Monitor FS10/FS20/FS30 with connectors to FS10/FS20/FS30 and to I&C. Provides a relay output for FS10/FS20/FS30.

Features

- Connections with included Harting connectors
- Wire break detection possible with resistor at relay

Ordering information

Flow Monitor

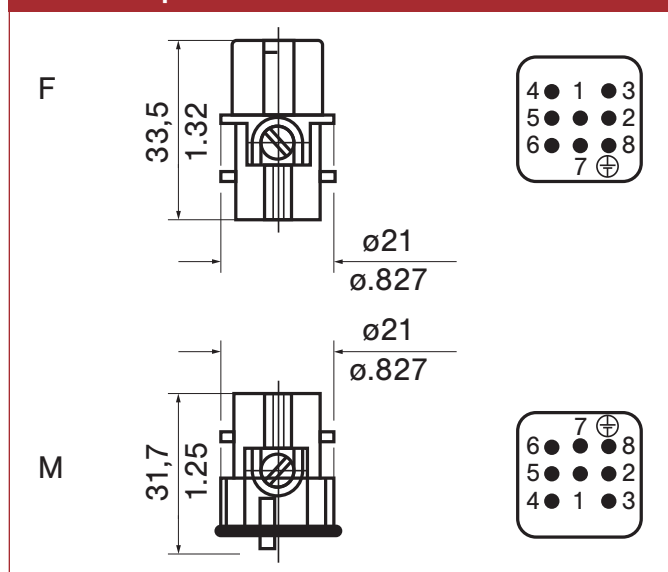
REAW-FS-U1 Coupling relay module to FS10/FS20/FS30

REAW-FS-U1 ordering example

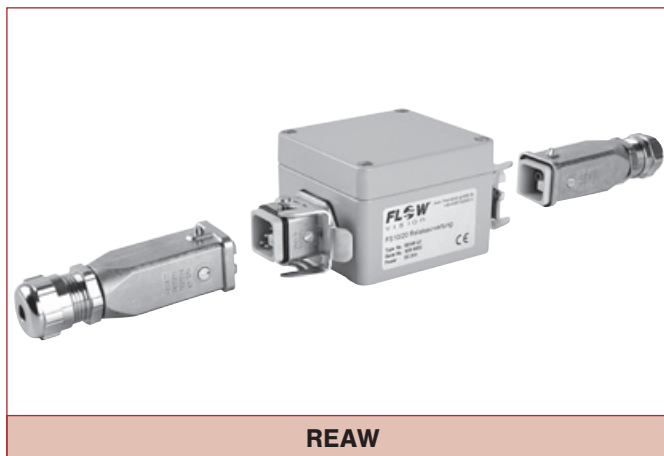
TECHNICAL DATA

General data		REAW-FS-U1
Temperature range (ambience)		-25 ... +60°C/-13 ... +140°F
Electrical data		
Operating voltage U_B		DC24V (18 ... 32V)
Power consumption		approx. 17mA (relay energized)
Input resistance		ca. 1400 Ohm
Relay outputs		1 SPDT contact, gilded, AC/DC 30V, 5A
Mechanical data		
Degree of protection		IP 65 (when plugged in)
Materials	housing	aluminium
	cover	aluminium
	connector	die cast, zinc alloy
	gland	brass, nickel plated

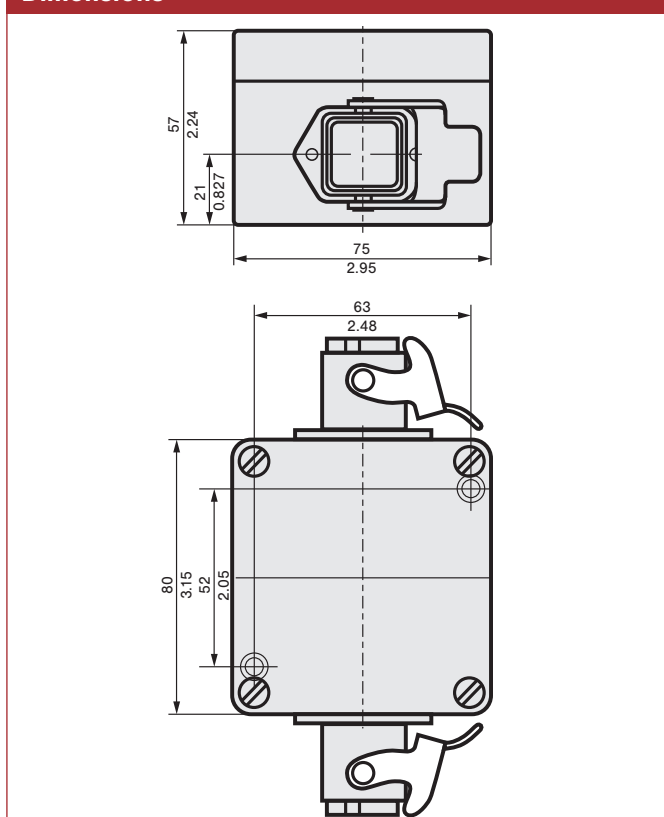
Connector pins



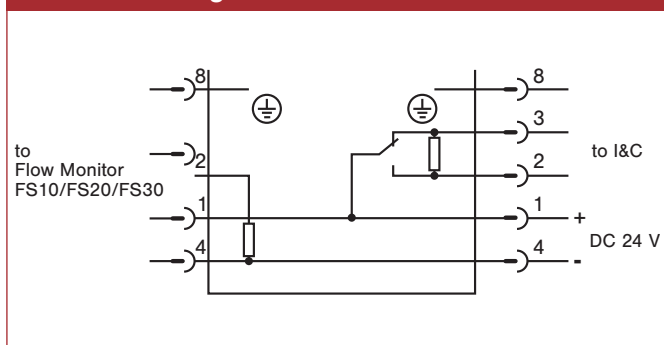
This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)



Dimensions



Connection diagram



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