

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)

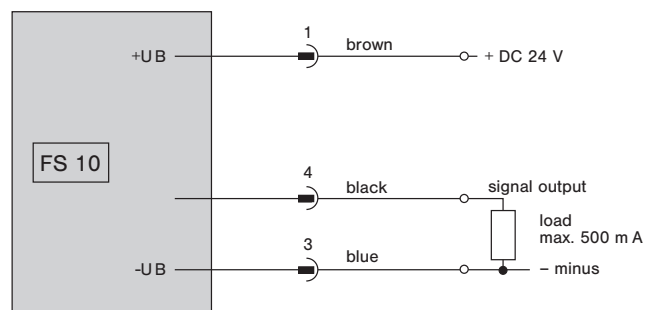
FS10	flow monitor and integral compact housing
Power supply	
U1	DC 24 V
Flow switch point	
MIN	
MAX	
Process connection	
01	G1/2A (to DIN 3852-A), length 36 mm
02	NPT1/2"-14, length 36 mm
11	plug-in type (following DIN ISO 6149), length 18.2 mm for TP or BV adaptes
Media	
A	air, gases
W	water, oil, liquids
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.

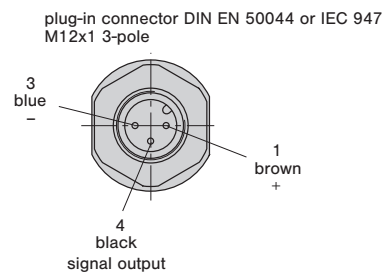


FS10-..

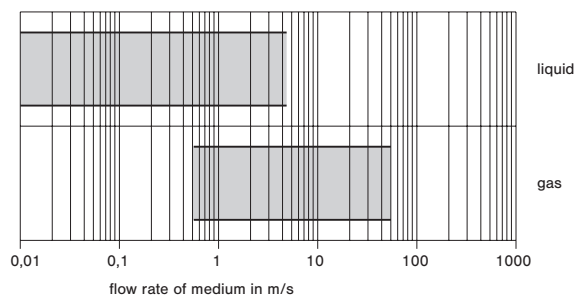
Connection diagram FS10



Electrical connection



Flow rate ranges

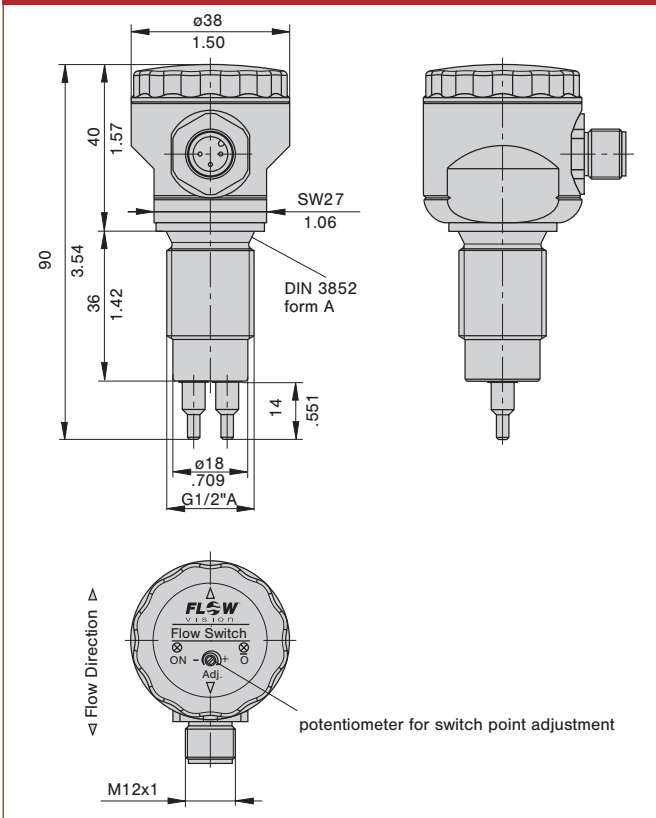


A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
B

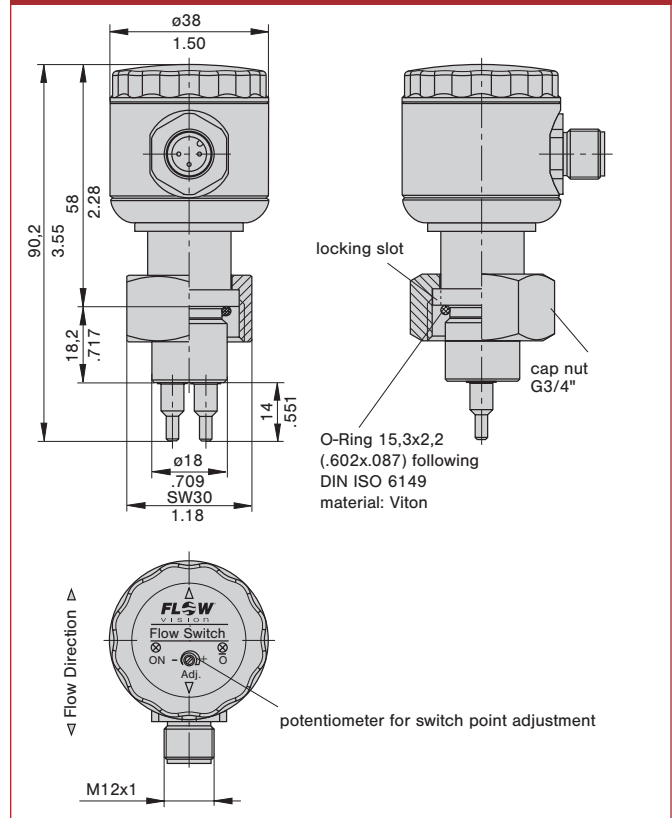
TECHNICAL DATA (ambient temperature $T_U = 25\text{ °C}$, operating voltage $U_B = \text{DC } 24\text{ V}$)

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
MTTF (SN 29500)		519 years
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. 1 sec ⁽²⁾
	air	typ. 2 sec ⁽³⁾
	oil	typ. 1,5 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 1,8 m/s and the flow at 2 m/s, after a sudden complete stop ⁽³⁾ delay with the switch point set to 18 m/s and the flow at 20 m/s, after a sudden complete stop		

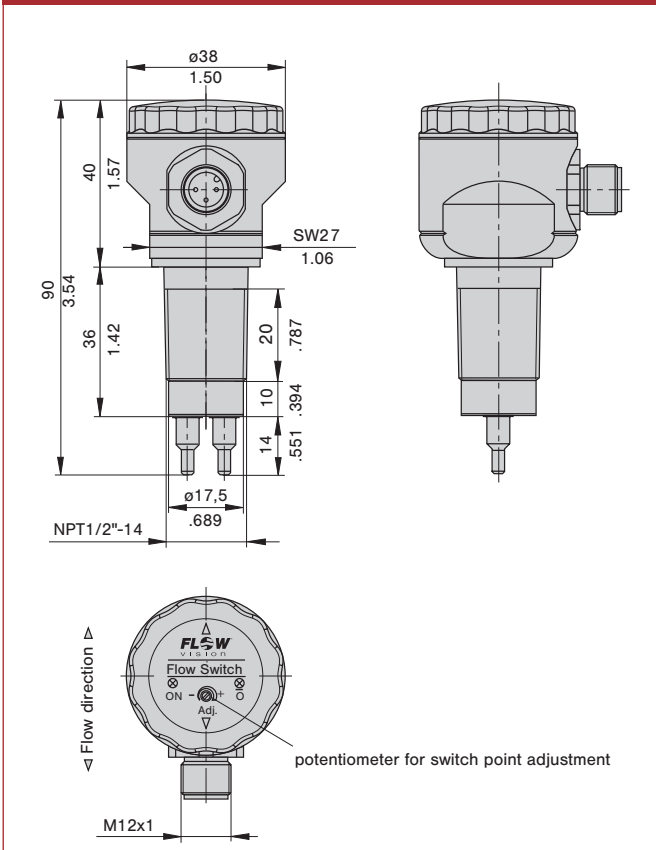
Dimensions of screw-in type process connection (FS10-U1...01)



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.

A

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

B

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 8...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)

Ordering information

Type			
TP	Sensor adapter with internal thread		
Process connection/Nominal size			
00	DN 8	G1/4	internal thread length: 50 mm/1.97 in. *
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	

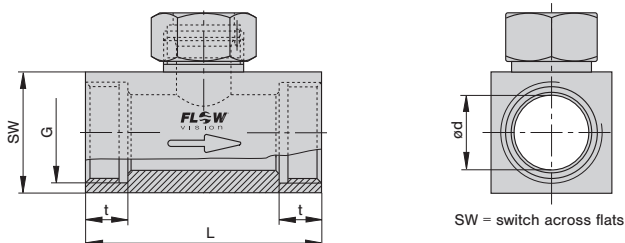
Ordering information

Type			
TP	Sensor adapter with welding nipples		
Process connection/Nominal size			
00	DN 8	dia.d: 8 mm/.315 in.	length: 80 mm/3.15 in. *
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

* tube/pipe inside diameter min. 8 mm

Dimensions

TP-... sensor adapter with internal thread

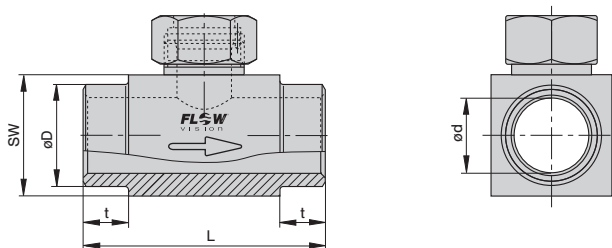


SW = switch across flats

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-00 ...	8	.315	8	.315	1/4"	10	.394	50	1.97	27	1.06
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

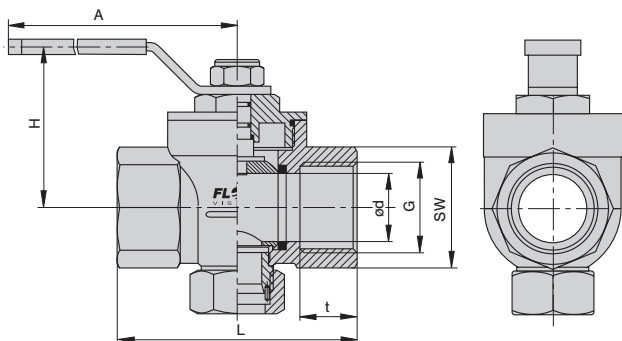
TP-... M1-SA sensor adapter with welding nipples



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-00M1-SA	8	.315	8	.315	13.5	.532	15	.591	80	3.15	27	1.06
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

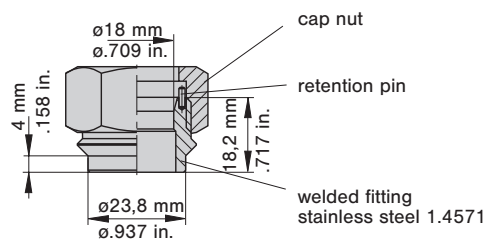
Type	DN		dia. d		G	t		L		SW		H		A	
	mm	in.	mm	in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
BV-03M3	25	.984	25	.984	1"	21	.827	88	3.47	41	1.61	59	2.32	115	4.53
BV-04M3	32	1.26	32	1.26	1.1/4"	24	.945	100	3.94	50	1.97	65	2.56	115	4.53
BV-05M3	40	1.57	40	1.57	1.1/2"	24	.945	110	4.33	54	2.13	77	3.03	150	5.91
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 (mm/inch)

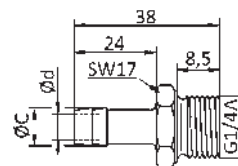
Accessories

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**



Barbed tube fitting for TP-00... (DN 8) *
brass nickel-plated, seal face for seal ring DIN 7603, PN 25 bar



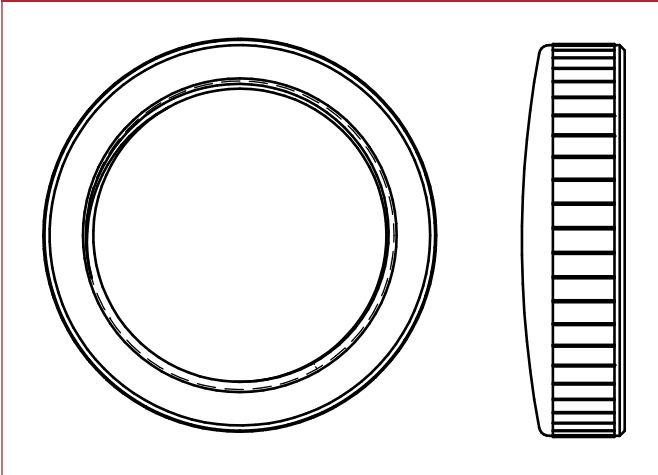
ordering number	for tube inside diameter	øC	ød
Y50040002	8 mm	9 mm	6 mm
Y50040003	10 mm	11 mm	8 mm
Y50040004	12 mm	13 mm	8 mm

- A
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- B

Stainless steel cap

Description

Protective cap, material stainless steel 1.4571
Ordering no.: Z00025



A

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

B

Cable type 24 with connectors



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

Current carrying capacity: 4 A

Insulation resistance: > 10⁹ Ω

Withstand voltage: 1,5 kV/60 s

Description

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

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
------------------------------	--

Do + Ka type 24 - 5 m	ordering example
------------------------------	------------------

A

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

B

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

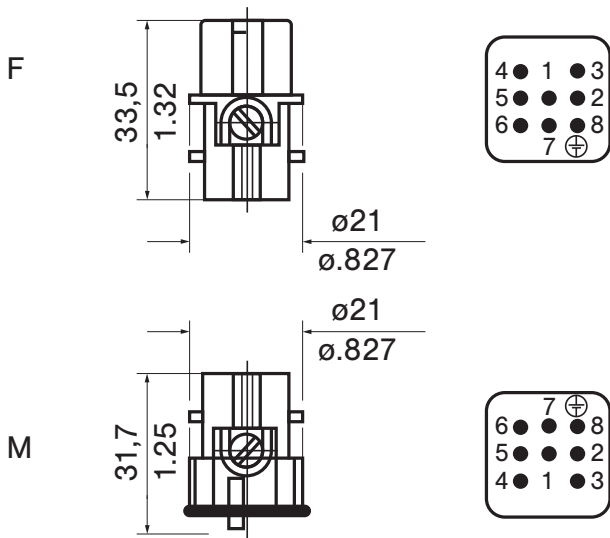
REAW-FS-U1 Coupling relay module to FS10/FS20/FS30

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 _s		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

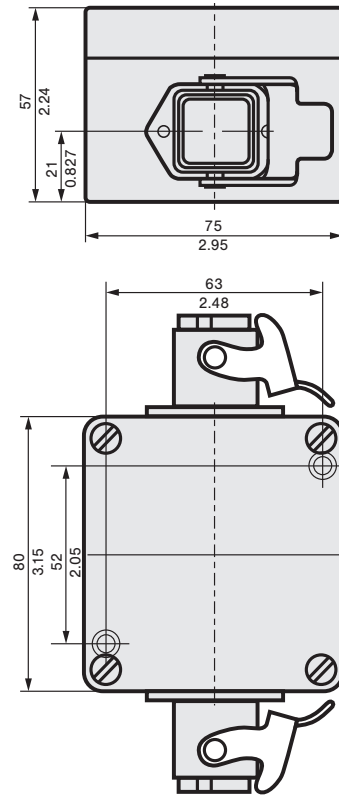


This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)



REAW

Dimensions



Connection diagram

