FLOWMETER SERIES FLUX 1 - 2

FLUX 1 and FLUX 2 flowmeters are devices used to measure the flow rate of compressed air in various areas of a pneumatic system.

The FLUX 1 comes with an anodized aluminium body and ½" threaded inlets and outlets for flow rates of up to 2,000 Nl/min, while the FLUX 2 has an anodized aluminium body and 1" threaded inlets and oulets for flow rates of up to 4,000 Nl/min. They are both available in the versions with or without display, with an M12 connector for power supply and signal control. The versions with display also feature a pressure and temperature transducer that minimises measurement error within the operating temperature range thanks to the algorithm implemented in the device software.

Flow rate, pressure and temperature values as well as graphs of instantaneous and cumulative values are displayed.

The electrical power used to produce the measured flow is also calculated and displayed.

A digital output (configurable for flow rate, pressure or total consumption) and an analogue output (configurable for voltage or current) are available for both sizes. Versions with IO-Link interface with similar characteristics are also available.

The Wireless versions are able to communicate with Ethernet networks (MQTT communication) and mobile devices, such as smartphones and tablets with Bluetooth® connection through a dedicated APP.

Through the APP, in addition to viewing the measured quantities, it is possible to change all the settings of the flowmeters and view the measured values in real time.

All FLUX flowmeters can be supplied with voltage ranging from 12VDC and 24VDC and perform the functions of a flowmeter and flow switch; all versions with a display can also be used as a pressure gauge or pressure switch.

The inner air ducts of the flowmeters are designed to ensure precise flow readings at all times without creating pressure drops between instrument inlet and outlet.

TECHNICAL DATA		FLUX 1	FLUX 2
Measured flow range	Nl/min	0 to 2000	0 to 4000
Fluid		Compressed air free of any lubricants and inert gases	
Fluid temperature	°C	0 to 50	
Direction of flow		Unidirectional	
Measuring method		Thermal	
Working pressure range	bar	0 to 10	
	MPa	0 to 1	
	psi	0 to 145	
Pressure drop		None	
Temperature range	°C	0 to 50	
Threaded ports		1/2"	1"
Degree of protection		IP65	
Weight	g	585	705
IO-Link supply voltage range	VDC	15 - 27 (with IO-Link Master)	
Current consumption	mA	80 mA (at 24VDC)	
Power supply voltage range in the analogue version	VDC	12 -10% 24 +30%	
Maximum admissible voltage	VDC	32 ▲	
Current absorption	mA	min 50 - max 120	
DISPLAY			
Instant flow rate	Nl/min	0 to 2200	0 to 4400
Cumulative flow rate	Nl	999.999.999	
	Nm³	999.999	
	Nft³	35.320.000	
Pressure ■	bar	0 to 10	
Resolution	bar	0.01	

▲ IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.

■ In versions with pressure transducer.

METAL WORK PNEUMATIC®

TECHNICAL DATA		FLUX 1	FLUX 2
PRECISION ●			
Flow rate			
Measuring range		0 to 100% of the full scale	
Single unit display accuracy		from 0 to 20% of the FS - better than ±1% of the FS	
		from 20% to 100% of the FS - better than ±3% of the FS	
Display accuracy of unit installed in an SY unit ▲		from 0 to 20% of the FS - better than ±2% of the FS	
		from 20% to 100% of the FS - better than ±6% of the FS	
Repeatability		±1% of the FS	
Temperature characteristic			
Version with pressure transducer		Automatic compensation of fluid temperature from 0 to 50°	
		Between 0 and 15°C and between 35 and 50°C ±0.6% of the FS every °C	
Version without pressure transducer		Without compensation, between 0 and 15°C and between 35 and 50°C ±1.2 % of the FS every °C	
Pressure			
Measuring range	bar	0 to 10	
Display accuracy		±2% of the FS	
Analogue output			
Output signal			
Analogue output powered		0 to 10 VDC or 0 to 5 VDC (I max 20 mA)	
		Output impedance about 1 kΩ	
Analogue output current		4 to 20 mA	
		Max. load impedance 500 Ω	
Analogue output accuracy		±0.1% of the value read	
DIGITAL OUTPUT		n° 1 open collector output NC / NO - PNP / NPN	
Maximum current	mA	100 mA	
Residual voltage	VDC	20 mV (with load)	
Operating mode, if set on flow rate		Level switch, Band switch, Value switch, Cyclic pulse	
Min. accumulated volume by pulse (pulse width 100 msec)	Nl	10	20
	Nm³	1	
	Nft³	1	
Response mode, with pressure mode setting		Level switch, Band switch	
Hysteresis		Adjustable	
Short-circuit protection at output		Yes	
DIGITAL INPUT ◆		n° 1 input for the reset of the consumption counters NO – PNP/NPN	
Type of input		Voltage12 -10% 24 +30%	
Activation time		min 1 sec	

● Accuracy referred to compressed air gas, at a pressure of 5 bar and a fluid temperature of 25°C ±10°C.

▲ In order to guarantee the stated measurement accuracy and to prevent lubricant residues from damaging the measurement sensor, **a filter has to be mounted at the FLUX inlet.**
If the device is fitted with a Syntesi® filter, the SYN filter parameter must be enabled in the system menu to guarantee the stated accuracy (function available only for the version with display).

◆ Version without display: the digital input selects the type of analogue output from 0 to 10 V and 4 to 20 mA.
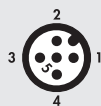
COMPONENTS

① BODY: anodized aluminium
② INLET BUSHING: anodized aluminium
③ FLOW RECTIFIER DISC: passivated aluminium
④ CONNECTOR M12: technopolymer
⑤ ELECTRONIC BOARD
⑥ FLOW SENSOR
⑦ COVER: technopolymer
⑧ GASKETS: NBR
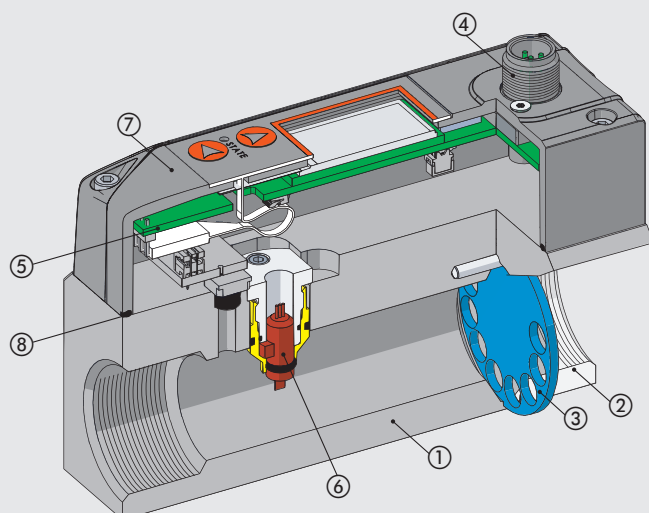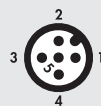
WIRING DIAGRAMS

Wiring diagram, analogue version

M12 male connector, A encoding

Pin	Function description	Lead colour
1	+24VDC power supply	Brown
2	Digital output	White
3	0VDC power supply	Blue
4	Digital input	Black
5	Analogue output	Gray

Wiring diagram, IO-Link version

M12 male connector, A encoding
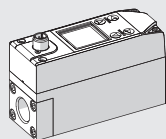
Port Class A
1 = L+
2 = NC
3 = L-
4 = C/Q
5 = NC

Pin	Signal	Description of Port Class A	Lead colour
1	L+	+24VDC power supply	Brown
2	NC	/	White
3	L -	0VDC power supply	Blue
4	C/Q	IO-Link communication	Black
5	NC	/	Gray

WIRELESS CONNECTION

With the Wireless versions of FLUX 1 and 2, you can establish a connection to at Wi-Fi® network via an access point or gateway to monitor and collect all the measured gas values.

Connection to a MQTT broker via an access point

MQTT

Broker MQTT

Flow [Nl/min]
17

Power [kw]
0.10

MassFlow [kg/min]
0.02

Pressure [bar]
2.05

Temperature [°C]
26.3

The Metal Work FluxUp App can be used for connection via Bluetooth® to Metal Work flow meters in the FLUX 1 and 2 series with a wireless interface, from Android® smartphone and iOS®.
With the Metal Work FluxUp App, you can view all data recorded by the FLUX and set all operating parameters in real time.

PNEUMATIC CONNECTION

To connect the inlet side, use a straight pipe* at least
150 mm-long for FLUX 1 and at least 200 mm-long for FLUX 2.
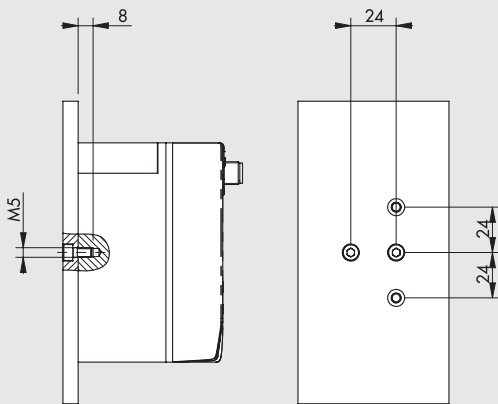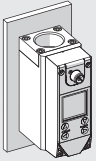If straight piping is not installed, the accuracy may vary from what is stated.

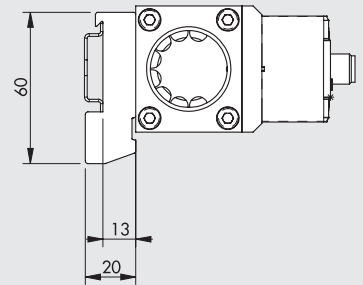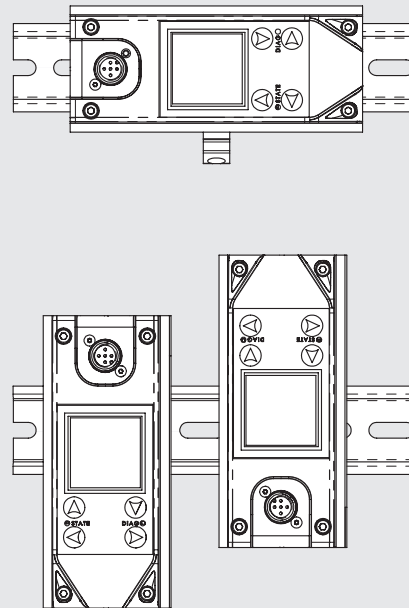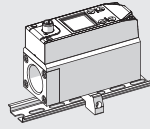*** Straight pipe**: the pipe must be straight with a constant cross-section.
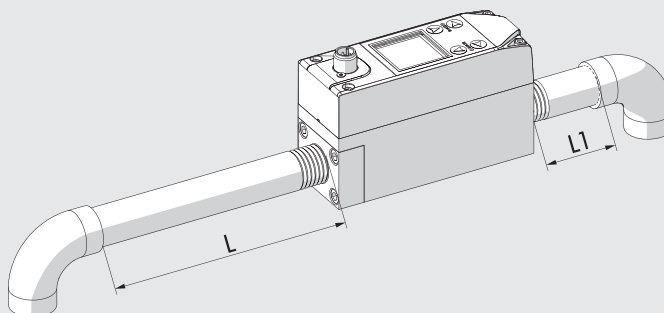
FLUX 1	L ≥150 mm	L1≥50 mm
FLUX 2	L ≥200 mm	L1≥50 mm

FIXING OPTIONS

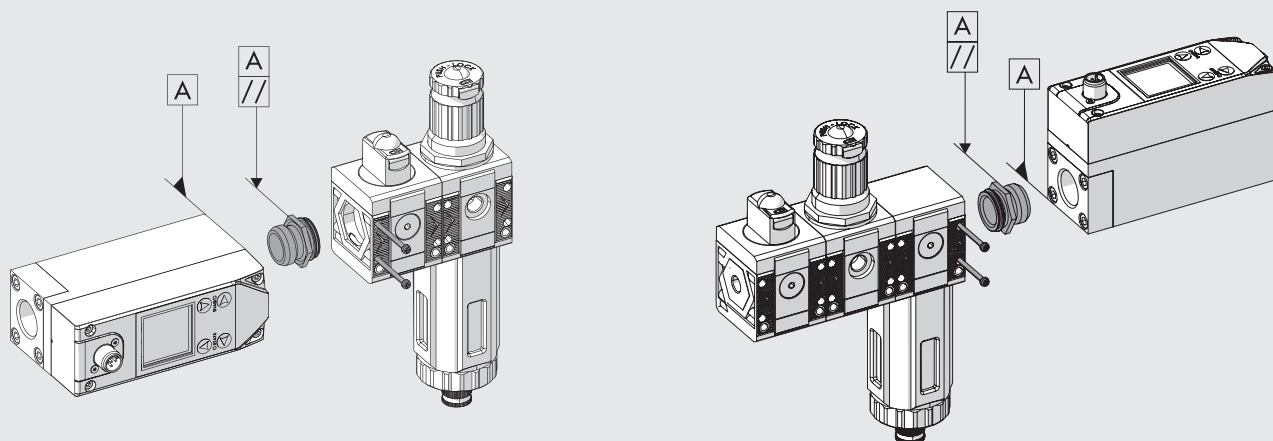Wall mounting by means M5 screws.

DIN rail mounting with bracket code 900099A001, using the M5x14 screws provided.


NOTES

ASSEMBLY DIAGRAM WITH SYNTESI®

1) Tighten the connection bushing on the flowmeter until it is flush (it is advisable to use sealant on the male thread of the bushing to ensure a perfect seal).
2) Unscrew the bushing slightly until two surfaces of the hexagon are parallel to the body of FLUX.
3) Insert the bushing into the Syntesi® unit.
4) Tighten the two self-tapping screws in the Syntesi® unit to a torque of 0.4 Nm for size 1 and torque 2.5 Nm for size 2.
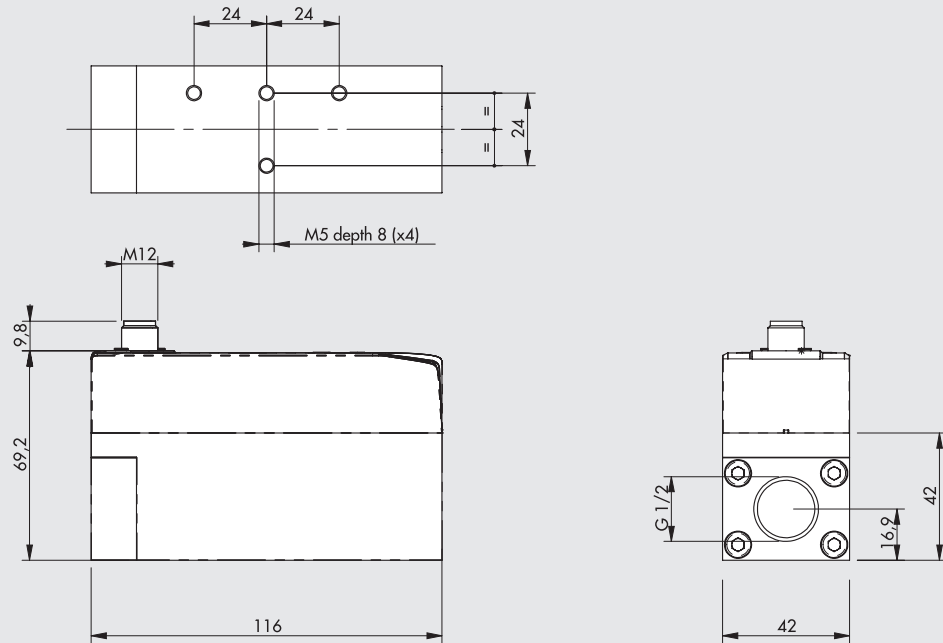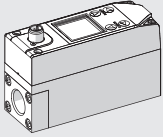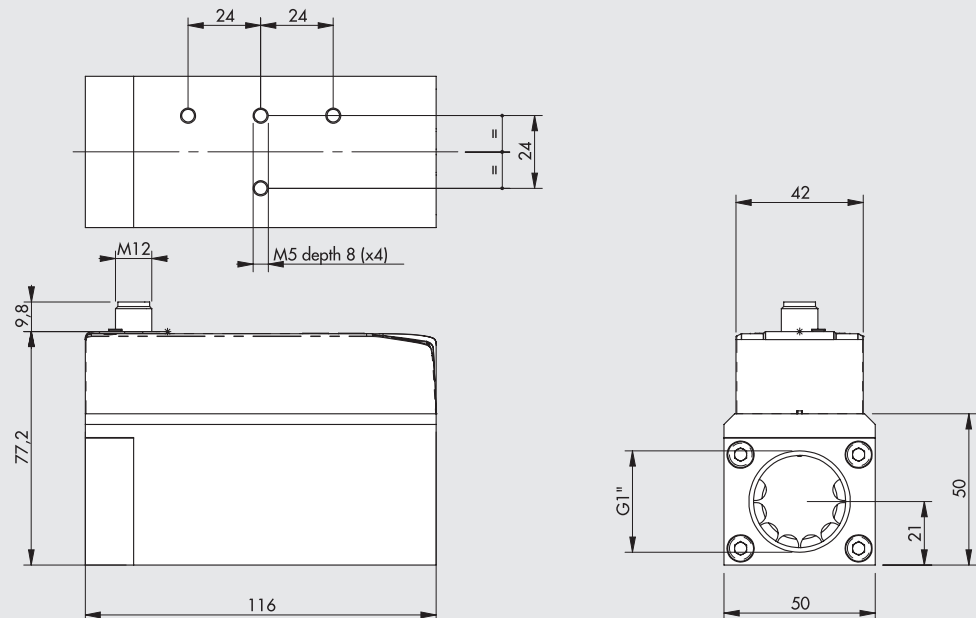
FLUX 1 + SYNTESI® 1
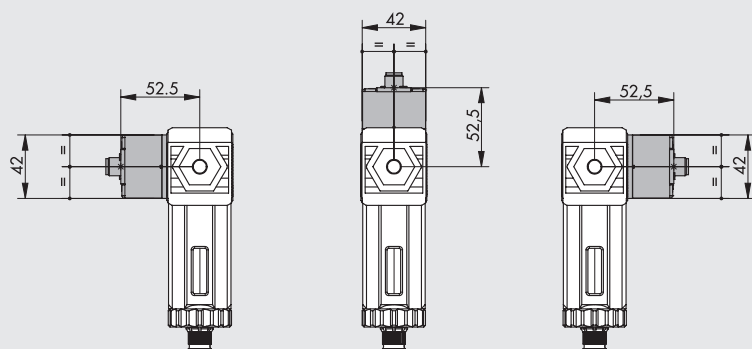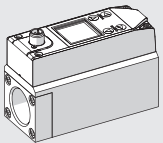

FLUX 2 + SYNTESI® 2
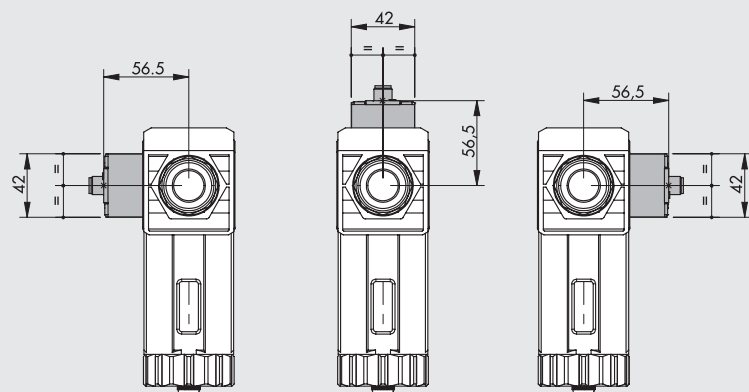
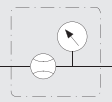**N.B.:** If the FLUX is used downstream a Syntesi® filter, fit it in one of the three positions shown in the figure.

DIMENSIONS AND ORDERING CODES

FLUX 1

FLUX 2

Symbol	Code	Description
	9000991000	Flowmeter FLUX 1, coupling 1/2", digital output PNP, analog output 0-10V 4-20 mA
	9000991200	Flowmeter FLUX 1, coupling 1/2", IO-Link
	9000992000	Flowmeter FLUX 2, coupling 1", digital output PNP, analog output 0-10V 4-20 mA
	9000992200	Flowmeter FLUX 2, coupling 1", IO-Link
	9000991510	Flowmeter FLUX 1, coupling 1/2", digital output PNP 0-10V 4-20 mA, with display and pressure sensor
	9000991511	Flowmeter FLUX 1, coupling 1/2", digital output PNP 0-10V 4-20 mA, with display, pressure sensor and Wi-Fi®
	9000991610	Flowmeter FLUX 1, coupling 1/2", IO-Link with display and pressure sensor
	9000991611	Flowmeter FLUX 1, coupling 1/2", IO-Link with display, pressure sensor and Wi-Fi®
	9000992510	Flowmeter FLUX 2, coupling 1", digital output PNP 0-10V 4-20 mA, with display and pressure sensor
	9000992511	Flowmeter FLUX 2, coupling 1", digital output PNP 0-10V 4-20 mA, with display, pressure sensor and Wi-Fi®
	9000992610	Flowmeter FLUX 2, coupling 1", IO-Link with display and pressure sensor
	9000992611	Flowmeter FLUX 2, coupling 1", IO-Link with display, pressure sensor and Wi-Fi®

ACCESSORIES

STRAIGHT CONNECTOR

Code	Description
W0970513001	5-PIN M12x1 straight connector

STRAIGHT CONNECTOR WITH WIRE

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey

Code	Description
W0970513002	5-PIN M12x1 straight connector with wire L = 5 m

90° CONNECTOR

Code	Description
W0970513003	M12x1 5-PIN 90° connector

90° CONNECTOR WITH WIRE

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey

Code	Description
W0970513004	M12x1 5-PIN 90° connector with wire L = 5 m

CONNECTION BRACKETS ON THE BAR (DIN EN50022)

Code	Description
900099A001	Connection brackets on DIN bar, FLUX 1 - 2

Note: complete with 2 M5x14 screws and 1 M6 grub screw

SY1 - SY2 KIT FOR CONNECTION

Code	Description
900099A002	Adapter FLUX 1 - SY1
900099A003	Adapter FLUX 2 - SY2

Max torque for screw, 0.4 Nm for SY1
Max torque for screw, 2.5 Nm for SY2

NOTES