流量传感器系列 FLUX 1 - 2

FLUX 1 和 FLUX 2 流量传感器是测量气动系统各个区域中压缩空气流量的设备。 FLUX 1 主体采用阳极氧化铝材质，输入和输出口的螺纹尺寸均为 ½″，流量可以达到 2,000 Nl/min。FLUX 2 主体同样采用阳极氧化铝材质，输入和输出口的螺纹尺寸均为 1″ 流量可以达到 4,000 Nl/min。该系列产品提供带或不带显示屏两种款型，且都配有 M12 电源和信号控制接口。带显示屏的版本还配备了压力和温度传感器，借助设备软件中的算法，可最大限度地减少工作温度范围内的测量误差。
显示屏可显示流量、压力和温度值以及瞬时值和累积值的图表。
用于产生测量流量的电功率也会被计算和显示。
两款新品均提供数字输出（可配置流量、压力或总消耗）和模拟输出（可配置电压或电流）。还提供具有类似特性的 IO-Link 接口的版本。
所有 FLUX 流量传感器均可提供 12VDC 和 24VDC 的电压，并实现流量传感器和流量开关的功能；所有带显示屏的版本也可以用作压力表或压力开关。流量传感器的内部空气管道旨在确保流量读数的精确度，并且不会在仪器入口和出口之间产生压降。

技术参数		FLUX 1	FLUX 2
流量测量范围	Nl/min	0 至 2000	0 至 4000
介质		压缩空气和惰性气体，不含任何润滑剂	
介质温度	°C	0 至 50	
气流方向		单向	
测量方法		热量	
工作压力范围	bar	0 至 10	
	MPa	0 至 1	
	psi	0 至 145	
压降		无	
温度范围	°C	0 至 50	
螺纹口		1/2"	1"
防护等级		IP65	
重量	g	585	705
IO-Link 电源电压范围	VDC	15 - 27 (带 IO-Link 主控器)	
电流消耗	mA	80 mA (24VDC时)	
模拟量款的电源电压范围	VDC	12 -10% 24 +30%	
最高许用电压	VDC	32 ▲	
电流吸收	mA	min 50 - max 120	
显示屏			
瞬时流量	Nl/min	0 至 2200	0 至 4400
累计流量	Nl	999.999.999	
	Nm^3	999.999	
	Nft^3	35.320.000	
压力 ■	bar	0 至 10	
分辨率	bar	0.01	

▲ 重要！ 大于 32VDC 的电压将对系统造成不可修复的损坏。
■ 带有压力传感器的版本。

METAL WORK PNEUMATIC

技术参数		FLUX 1	FLUX 2
精度 ●			
流量			
测量范围		满量程的0到100%	
单独使用时的显示精度		满量程的 0 到 20% - 好于满量程的 ±1%	
		满量程的 20% 到 100% - 好于满量程的 ±3%	
安装在SY中的显示精度 ▲		满量程的 0 到 20% - 好于满量程的 ±2%	
		满量程的20% 到 100% - 好于满量程的 ±6%	
重复精度		满量程的±1%	
温度特征			
	带压力传感器款	从 0 到 50° 自动补偿流体温度	
		0 至 15°C 和 35 至 50°C 之间满量程的±0.6% 每 °C	
	不带压力传感器款	不带补偿,0 至 15°C 和 35 至 50°C 之间满量程的 ±1.2 % 每 °C	
压力			
测量范围	bar	0 到 10	
显示精度		±2%	
模拟量输出			
输出信号			
	模拟量输出，电源	0 到 10 VDC 或 0 到 5 VDC (I max 20 mA)	
		输出阻抗 1 kΩ	
	模拟量输出，电流	4 至 20 mA	
		最大负载阻抗500 Ω	
模拟量输出精度		读出值的±0.1%	
		n° 1 集电极开路输出 NC / NO - PNP / NPN	
最大 电流	mA	100 mA	
剩余电压	VDC	20 mV (带负载)	
设置成流量时的工作模式		电平开关、波段开关、数值开关、循环脉冲	
按脉冲的最小累计流量 (脉冲宽度 100 msec)	Nl	10	20
	Nm^3	1	
	Nft^3	1	
响应模式，设定为压力模式时		电平开关、波段开关	
迟滞		可调节	
输出端的短路保护		是	
数字 输入 ◆		n° 1 输入，用于复位消耗计数器 NO – PNP/NPN	
输入类型		电压12 -10% 24 +30%	
激活时间		最小 1 sec	

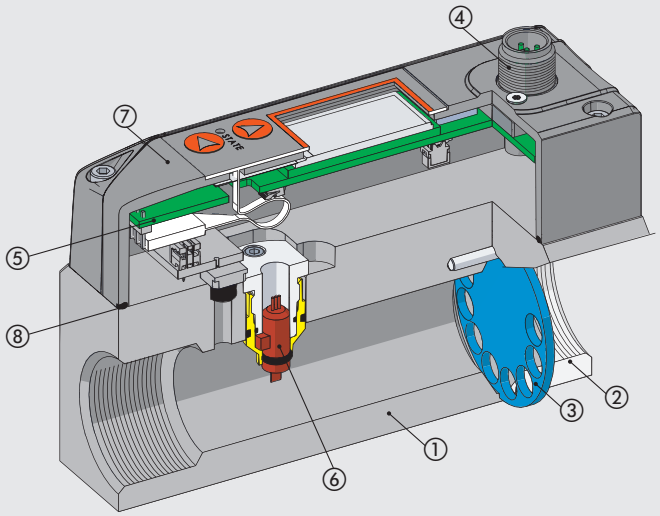
● 在 5 bar 的压力和 25°C ±10°C 的流体温度下。 25°C ±10°C.

▲ 为了保证规定的测量精度并防止润滑剂残留物损坏测量传感器，必须在 FLUX 入口处安装一个过滤器。
如果设备配备了 Syntesi® 过滤器，则必须在系统菜单中启用 SYN 过滤器参数以保证规定的精度（该功能仅适用于带显示器版本）。

◆ 数字输入选择模拟输出类型 0 到 10 V 以及 4 到 20 mA

部件

① 主体: 阳极氧化铝
② 输入口衬套: 阳极氧化铝
③ 整流盘: 钝化铝
④ 接头 M12: 聚合物材料
⑤ 电路板
⑥ 流量传感器
⑦ 盖: 聚合物材料
⑧ 密封圈: NBR



针脚分配图

接线图，模拟量版本

M12外螺纹插头, A 型

针	功能 说明	导线 颜色
1	+24VDC 电源	棕色
2	数字输出	白色
3	0VDC 电源	蓝色
4	模拟量输出	黑色
5	输入	灰色

接线图 , IO-Link 版本

M12外螺纹插头, A 型

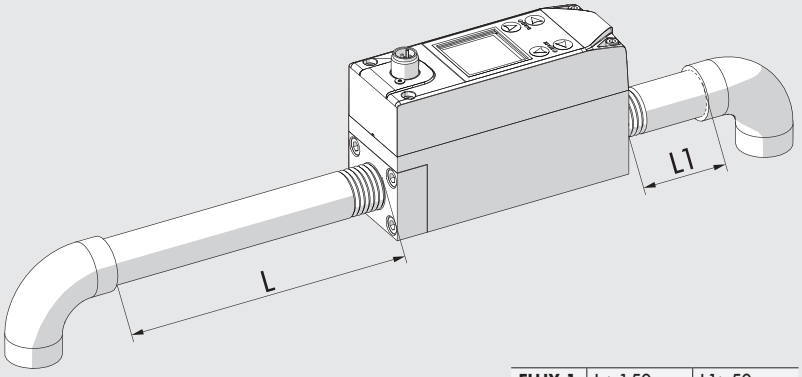
端口等级 A
1 = L+
2 = NC
3 = L-
4 = C/Q
5 = NC

针	信号	A级端口说明	导线 颜色
1	L+	+24VDC 电源	棕色
2	NC	/	白色
3	L -	0VDC 电源	蓝色
4	C/Q	IO-Link 通讯	黑色
5	NC	/	灰色

气路连接

要连接入口侧，请使用直管* 至少 150 mm 长（对于 FLUX 1）
和至少 200 mm 长（对于 FLUX 2）。
如果未安装直管，则精度可能与说明的有所不同。

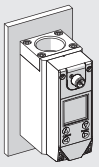
*** 直管**: 管道必须直，截面恒定。

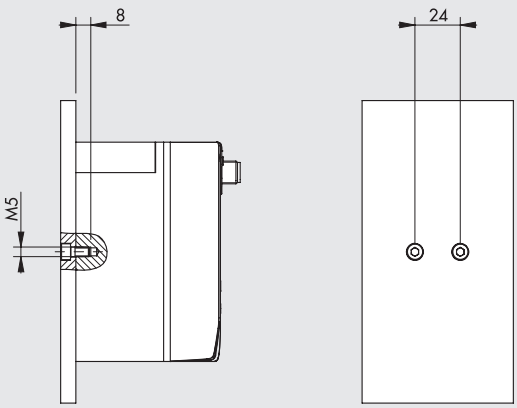


FLUX 1	L ≥150 mm	L1≥50 mm
FLUX 2	L ≥200 mm	L1≥50 mm

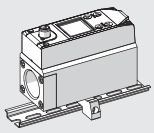
固定选项

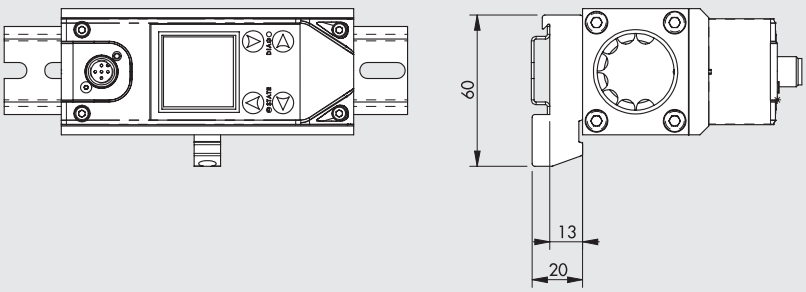
通过两个 M5 螺丝，进行墙面安装。



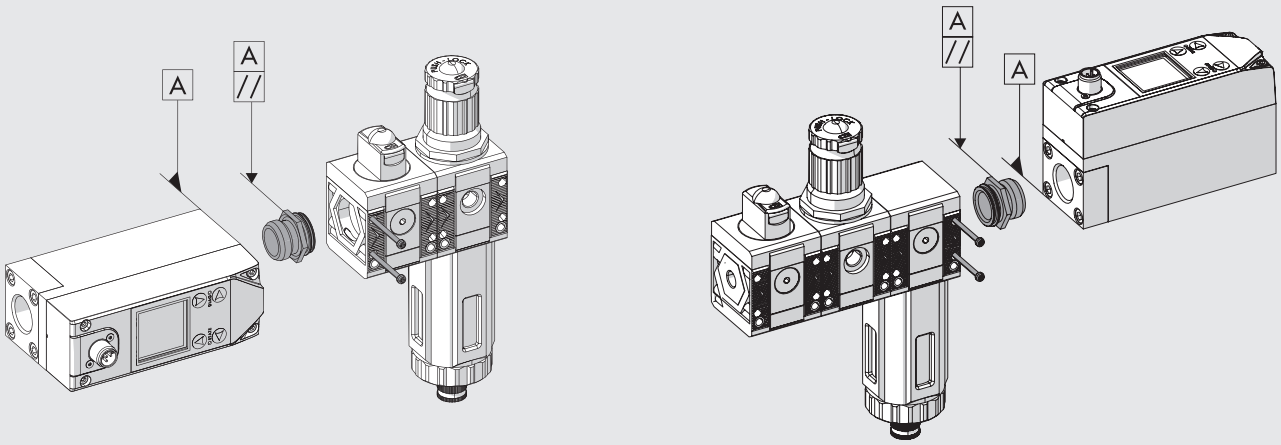


DIN 导轨安装，支架代码 900099A001, 使用提供的两个 M5x14 螺丝。



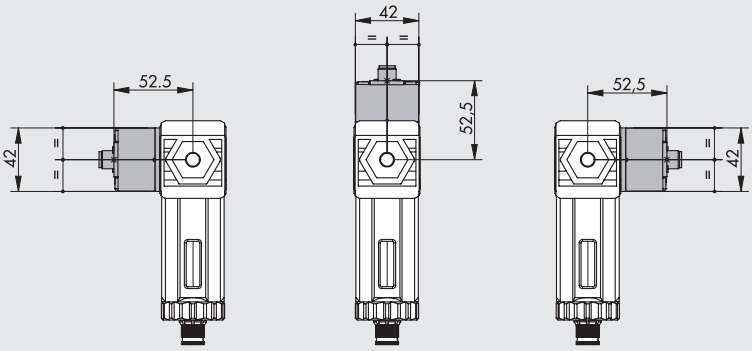


组合到SYNTESI®

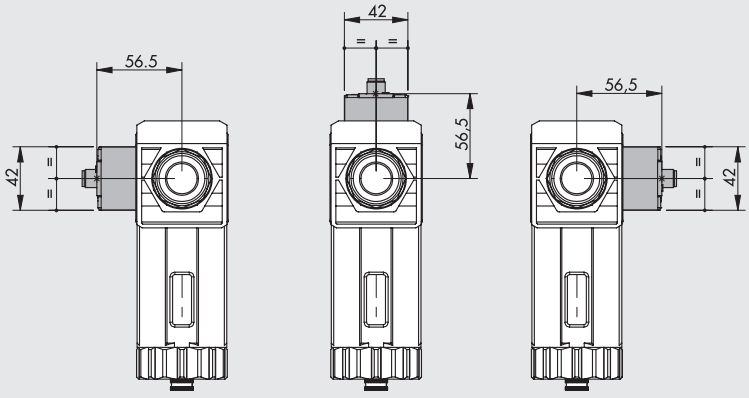


1) 将传感器上的连接衬套拧紧至齐平（最好在套管的外螺纹上涂上密封胶，以确保完美密封）。
2) 轻轻拧下衬套，直到六角的两个表面平行于 FLUX 主体。
3) 将衬套插入 Syntesi® 气源处理装置。
4) 将 Syntesi® 中的两个自攻螺钉拧紧，紧固扭矩规格1：0.4 Nm，规格2：2.5 Nm。

FLUX 1 + SYNTESI® 1



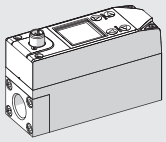
FLUX 2 + SYNTESI® 2

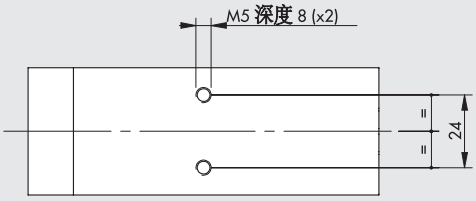


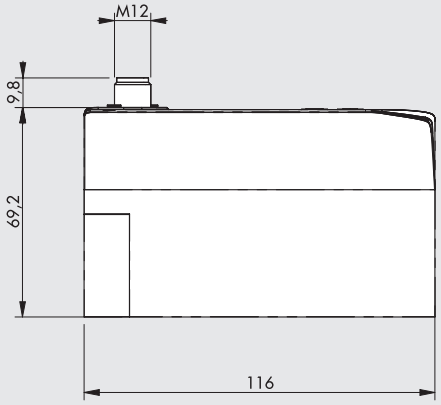
注意：如果 FLUX 用于 Syntesi® 过滤器的下游，请将其安装在图中所示的三个位置之一。.

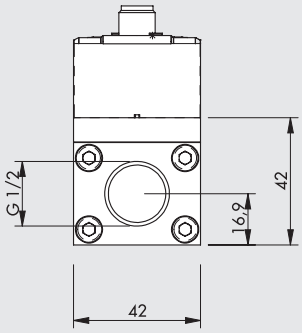
尺寸和订货代码

FLUX 1

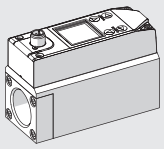


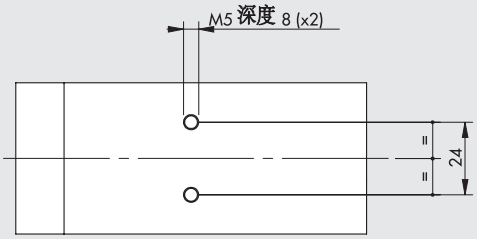


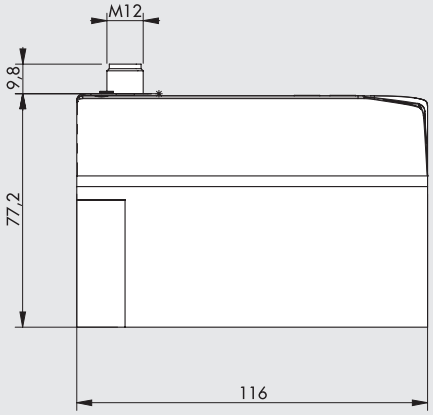


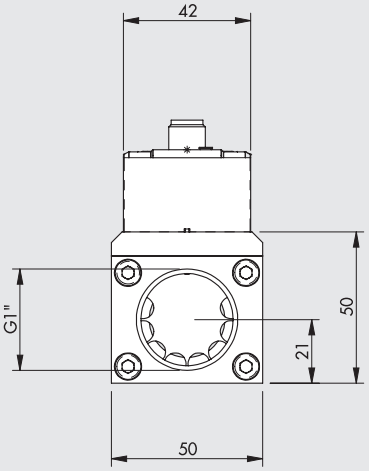


FLUX 2



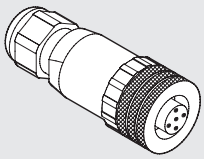






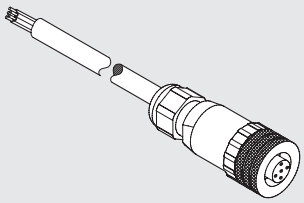
符号	代码	说明
	9000991000	流量传感器 FLUX 1, 接口 1/2", 数字输出 PNP, 模拟量输出 0-10V 4-20 mA
	9000991200	流量传感器 FLUX 1, 接口 1/2", IO-Link
	9000992000	流量传感器 FLUX 2, 接口 1", 数字输出 PNP, 模拟量输出 0-10V 4-20 mA
	9000992200	流量传感器 FLUX 2, 接口 1", IO-Link
	9000991510	流量传感器 FLUX 1, 接口 1/2", 数字输出 PNP 0-10V 4-20 mA, 带显示和压力传感器
	9000991610	流量传感器 FLUX 1, 接口 1/2", IO-Link 带显示和压力传感器
	9000992510	流量传感器 FLUX 2, 接口 1", 数字输出 PNP 0-10V 4-20 mA, 带显示和压力传感器
	9000992610	流量传感器 FLUX 2, 接口 1", IO-Link 带显示和压力传感器

直列式插头



代码	说明
W0970513001	5-针 M12x1 直列式插头

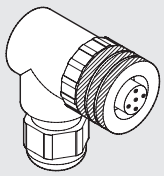
直列式插头，带电缆



针	缆线颜色
1	棕色
2	白色
3	蓝色
4	黑色
5	灰色

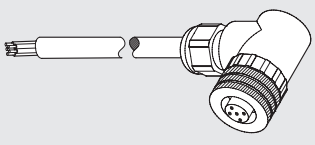
代码	说明
W0970513002	5-针 M12x1 直列式插头，带电缆　　L = 5 m

90° 插头



代码	说明
W0970513003	M12x1 5-针 90° 插头

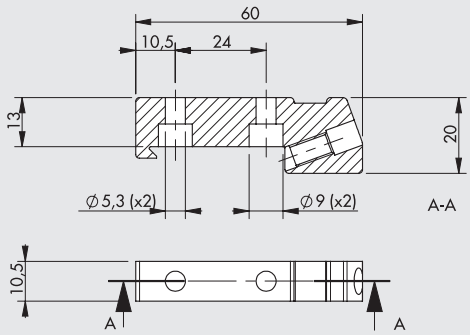
90° 插头，带电缆



针	缆线颜色
1	棕色
2	白色
3	蓝色
4	黑色
5	灰色

代码	说明
W0970513004	M12x1 5-针 90° 插头，带电缆 L = 5 m

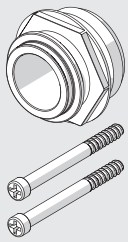
连接支架，用于 DIN EN50022 导轨



代码	说明
900099A001	连接支架，用于 DIN 导轨, FLUX 1 - 2

注意：配有 2 个 M5x14 螺钉和 1 个 M6 平头螺钉

SY1 - SY2 连接组件



代码	说明
900099A002	转接件 FLUX 1 - SY1
900099A003	转接件 FLUX 2 - SY2

螺丝最大紧固扭矩, 0.4 Nm 针对 SY1
螺丝最大紧固扭矩, 2.5 Nm 针对 SY2

备注

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.
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
Fluido		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	
	Nm^3	999.999	
	Nft^3	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
	Nm^3	1	
	Nft^3	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	

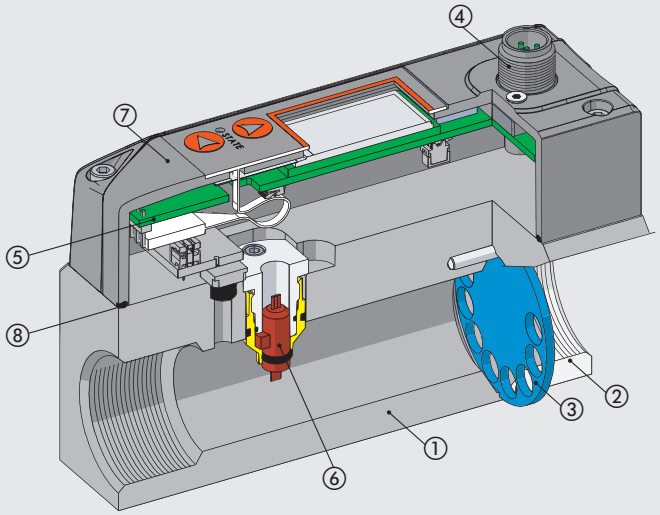
● At a pressure of 5 bar and a fluid temperature of 25°C ±10°C.

▲ 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

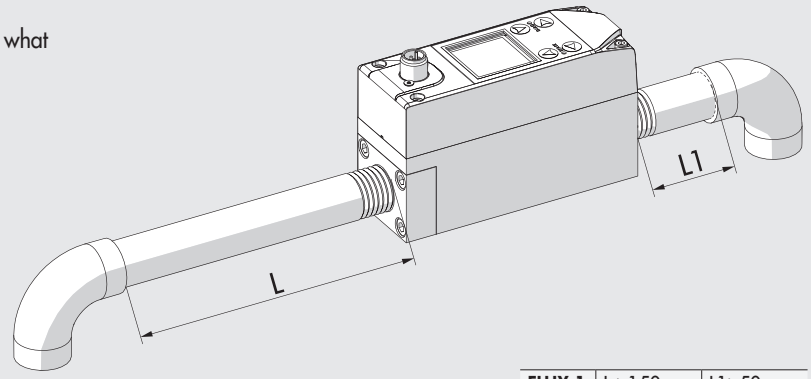
Port Class A
1 = L+
2 = NC
3 = L-
4 = C/Q
5 = NC

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

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.

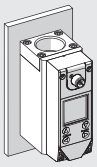
* **Straight pipe**: the pipe must be straight with a constant cross-section.

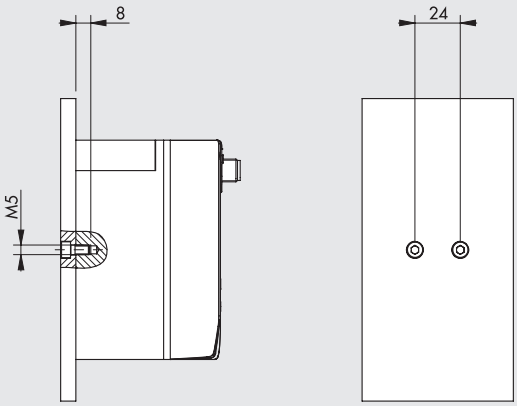


FLUX 1	L ≥150 mm	L1≥50 mm
FLUX 2	L ≥200 mm	L1≥50 mm

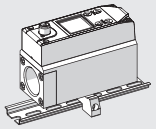
FIXING OPTIONS

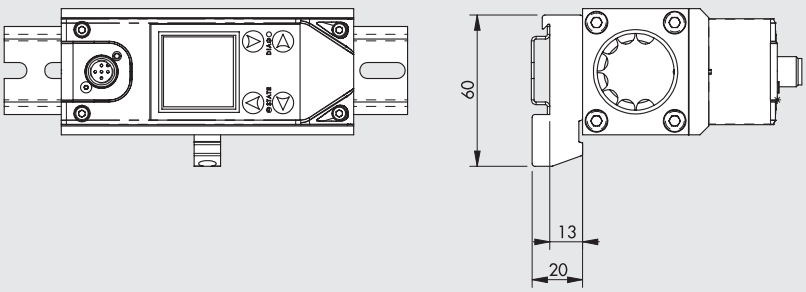
Wall mounting by means of two M5 screws.



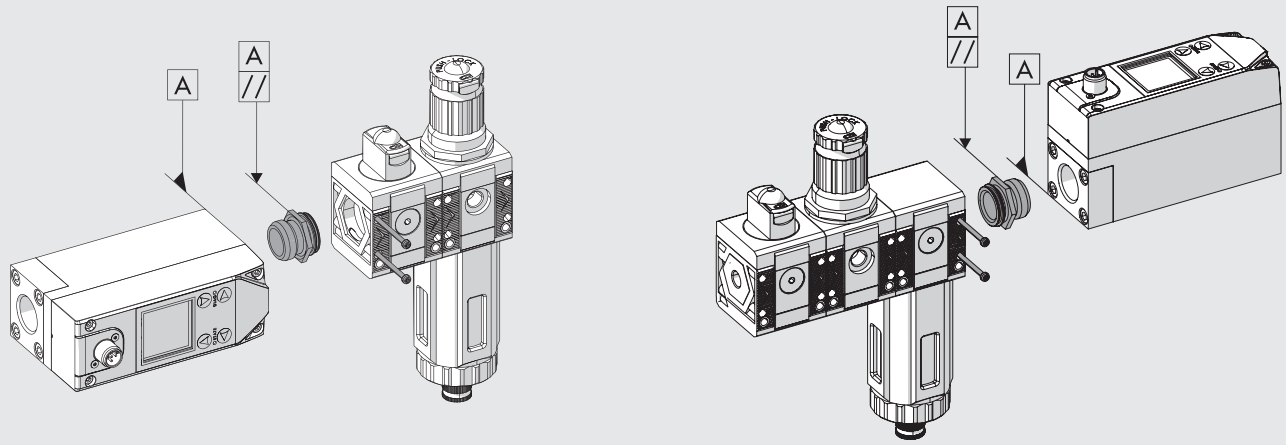


DIN rail mounting with bracket code 900099A001, using the M5x14 screws provided.



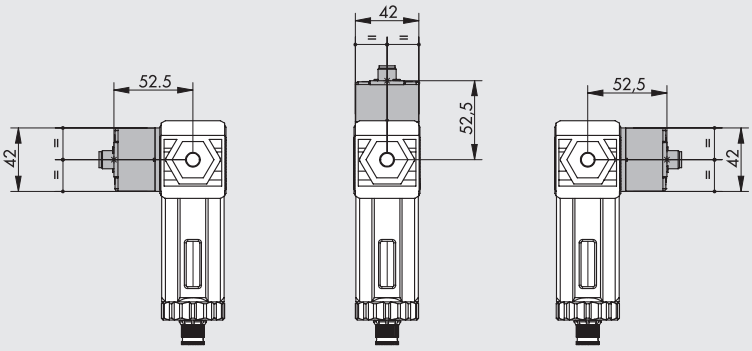


ASSEMBLY DIAGRAM WITH SYNTESI®

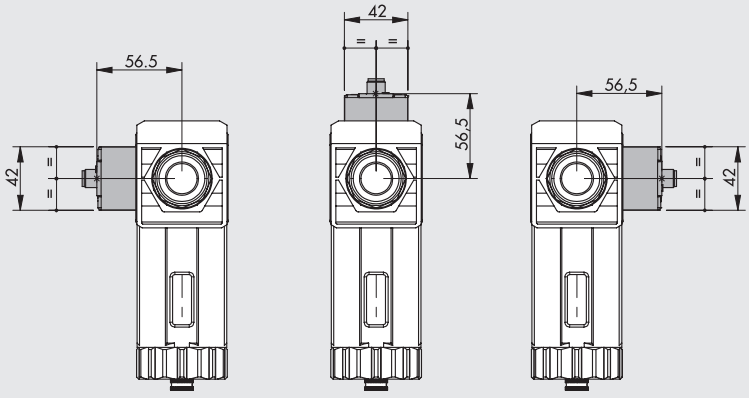


1) Tighten the connection bushing on the flowmeter until it is flush (it is advisable to use sealant on the male thread of the bushing to ensure a perfect seal).
2) Unscrew the bushing slightly until two surfaces of the hexagon are parallel to the body of FLUX.
3) Insert the bushing into the Syntesi® 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



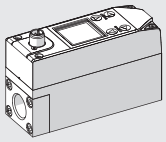
FLUX 2 + SYNTESI® 2

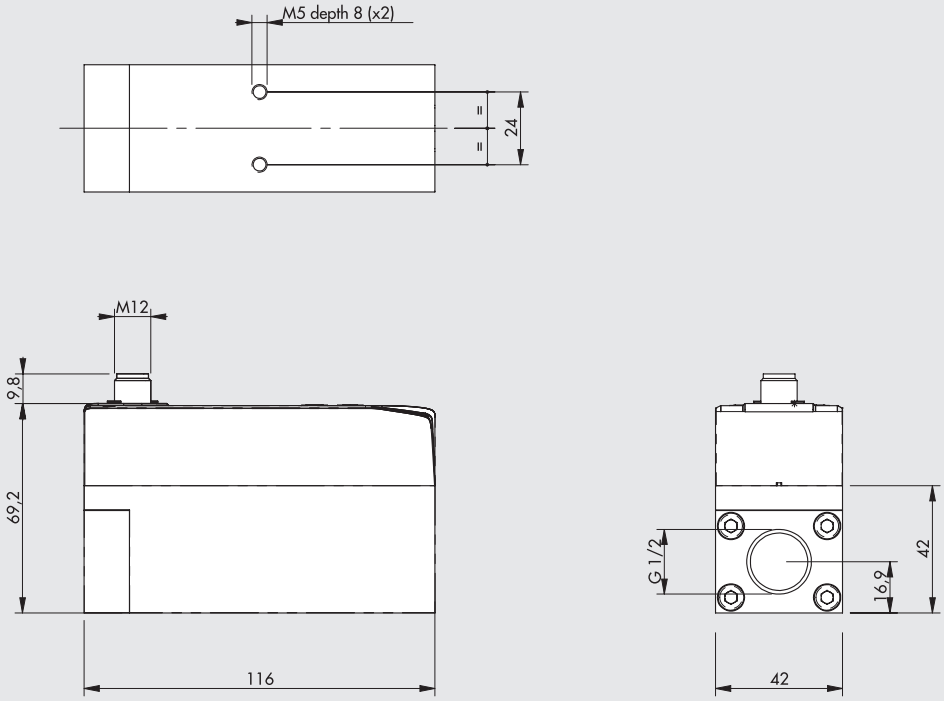


N.B.: If the FLUX is used downstream a Syntesi® filter, fit it in one of the three positions shown in the figure.

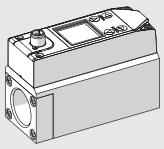
DIMENSIONS AND ORDERING CODES

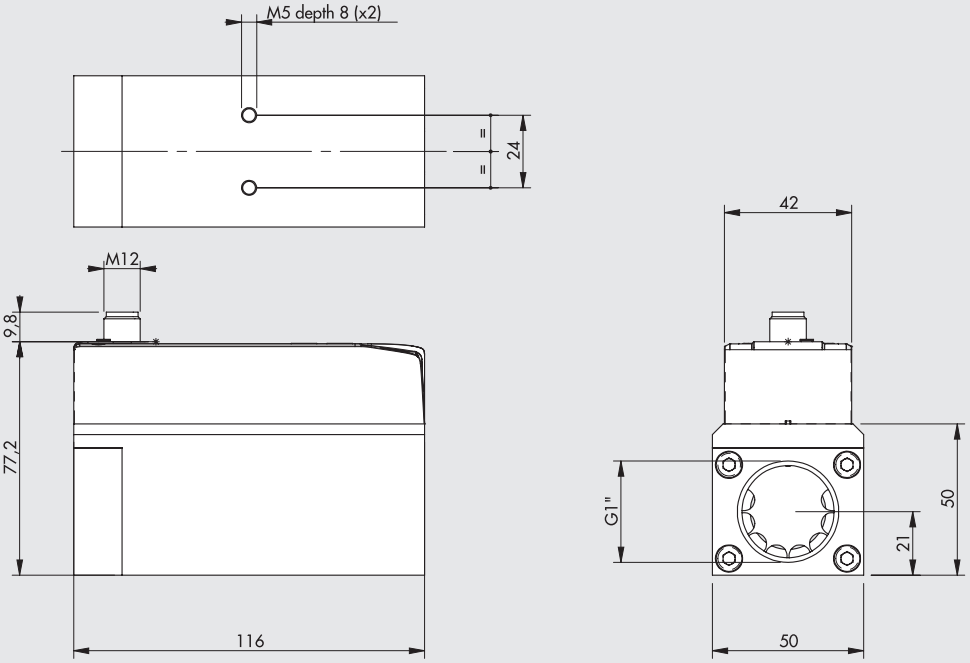
FLUX 1





FLUX 2

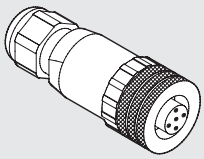




Symbol	Code	Description
	9000991000	Flowmeter FLUX 1, coupling 1/2", digital output PNP, analog output 0-10V 4-20 mA
	9000991200	Flowmeter FLUX 1, coupling 1/2", IO-Link
	9000992000	Flowmeter FLUX 2, coupling 1", digital output PNP, analog output 0-10V 4-20 mA
	9000992200	Flowmeter FLUX 2, coupling 1",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

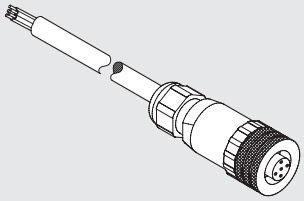
ACCESSORIES

STRAIGHT CONNECTOR



Code	Description
W0970513001	5-PIN M12x1 straight connector

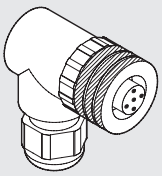
STRAIGHT CONNECTOR WITH WIRE



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

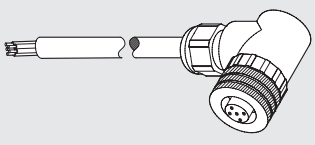
Code	Description
W0970513002	5-PIN M12x1 straight connector with wire L = 5 m

90° CONNECTOR



Code	Description
W0970513003	M12x1 5-PIN 90° connector

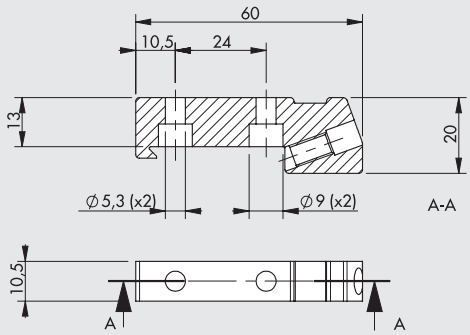
90° CONNECTOR WITH WIRE



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

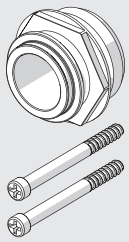
CONNECTION BRACKETS ON THE BAR (DIN EN50022)



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