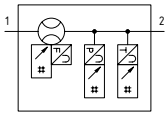
PNEUMAX

AIRPLUS DIGITAL FLOW SENSOR

CONTINUOUS AND PRECISE MONITORING

Digital Flow Sensor (FS)

- Instant consumption monitoring
- Accumulated consumption monitoring
- Fluid temperature and pressure monitoring
- Measuring range from 20 ... 3000 l/min and 50 ... 5000 l/min
- Pressure switch functionality is incorporated
- 2 digital outputs and 1 analog output
- Stand-alone or integrable in AIRPLUS air treatment groups
- Fully configurable
- Management by EtherCAT® or PROFINET IO RT protocols



EtherCAT®

PROFINET®

The AIRPLUS Digital Flow Sensor is a multifunctional tool that constantly monitors the operatiing parameters of a fluid, such as flow rate (instant flow), volume (accumulated consumption), pressure, and temperature.
These values are always displayed on the device's digital display to facilitate user data reading and process information retrieval. Not only flow rate but all operating parameters of a pneumatic system or part of it are constantly monitored and managed through the integrated digital and analog outputs.
Management is possible through industrial protocols based on Ethernet, but analog version usage is also supported.
Additionally, the AIRPLUS Digital Flow Sensor integrates an internal pressure switch function.
The two independent digital outputs, fully configurable by the user, can be set for either flow rate or pressure, with various intervention modes, making the product multifunctional and usable both stand-alone or integrated into AIRPLUS air treatment groups. The analog output is always dedicated to instant flow and is available in both voltage and current formats.
The measurement system uses the thermal principle, and the internal bypass construction reduces data contamination caused by impurities and humidity.
The product design allows integration into AIRPLUS air treatment groups or, with specific accessories, single use.
The functionalities of the outputs, both digital and analog, in various intervention and connection modes, are fully configurable by the user via the keypad or network depending on the usage mode.

Technical characteristics			
Model		P173FSA ...	P173FSB ...
Body type		Aluminium body version	
IN / OUT connections		G1/2" (only for stand-alone version)	
Assembly configuration		Stand-alone With bracket	
Assembly positions		Vertical	
Fluid		Compressed air Nitrogen	
Flow direction		Unidirectional	
Working fluid quality		7:4:4 according to DIN ISO 8573-1	
Measurement method		Thermal principle	
Flow range		from 20 to 3000 l/min	from 50 to 5000 l/min
Settable range	Instant flow	from 0 to 3000 l/min	from 0 to 5000 l/min
	Comulative consumption	from 0 to 99.999.999 l	
	Cyclic pulse		
Minimum settable increment	Instant flow	0,1 l/min	
	Comulative consumption	1 l	
	Cyclic pulse	1 l	
Pressure range		0 bar...10 bar	
Test pressure		6 bar	
Characteristic pressure		±2,5% F.S. (from 0 to 10 bar, 5 bar standard)	
Pressure drop		See "Pressure drop curves"	
Settable pressure range		0 bar...10 bar	
Minimum settable pressure increase		0,01 bar	
Display Features		Graphic LCD, positive, black on white, backlit	
Settable unit of measurement	Instant flow	l/min, m^3/min, ft^3/min	
	Comulative consumption	l, m^3, ft^3	
	Cyclic pulse	bar, MPa, psi	
Display precision		±3% F.S.	
Digital and analog output precision			
Repeatability		±1% F.S.	
Temperature characteristic		±5% F.S. (from 0 to 50°C, 25°C standard)	
Protection degree		IP65 (with connectors fitted)	
Electromagnetic compatibility		EN 61326-2-3 (for heavy industrial environments)	

Electrical characteristics		
Model	P173FSA ...	P173FSB ...
Rated voltage	+ 24 V DC	
Working voltage	15 ... 30 V DC	
Maximum current consumption	350 mA	
Power supply connector	M12, male, 5P, type A	
Power supply cable length	< 30 m	
Network connector	M12, female, 4P, type D	
Network connector cable length	< 100 m	
Number of independent digital outputs	2	
Settable digital output type	NPN - PNP	
Settable contact type	N.C. - N.O.	
Switching functions	Threshold value Window Storage Storage with impulse	
Hysteresis	Settable (see use and maintenance manual)	
Maximum current for each digital output	100 mA	
Digital output protection (NPN mode)	Overcurrent (self-resetting fuse), short circuit (electronics)	
Digital output protection (PNP mode)	Overcurrent (electronic, automatic reset)	
Digital output load	Resistive, inductive	
Digital output voltage drop	< 0.4V to pin 1 (@100mA)	
Settable analog output type	Current (4-20mA, 0-20mA) Voltage (0-10V, 0-5V)	
Maximum load analog output (current)	500 Ω	
Minimum load analog output (voltage)	10 Ω	

Operational characteristics		
Model	P173FSA ...	P173FSB ...
Max. working pressure	10 bar	
Working temperature	0°C ... +50°C	
Ambient humidity	35% ... 85% UR (non-condensing)	

Weights		
Model	P173FSA ...	P173FSB ...
Aluminum body version	700 g	

CODING: P173FS(F)(T)(D)

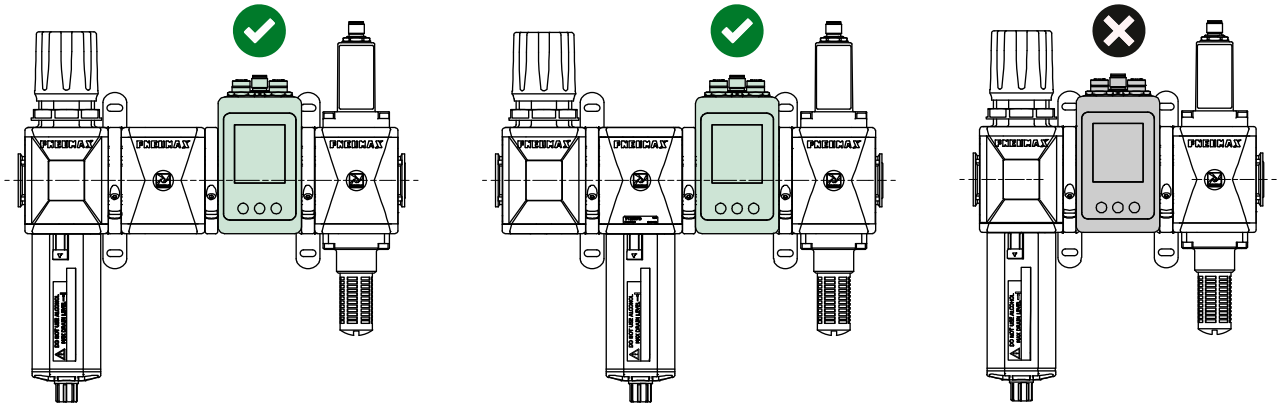
(F)	MEASURAMENT RANGE
	A = 20-3000 l/min
	B = 50-5000 l/min
(T)	MANAGEMENT PROTOCOL
	EC = EtherCat®
	PN = Profinet IO RT
(D)	FLOW DIRECTION
	= From left to right
	W = From right to left

Example : P173FSAEC : AIR PLUS Digital flow sensor, 20-3000 l/min, EtherCAT® management protocol, from left to right flow direction version.

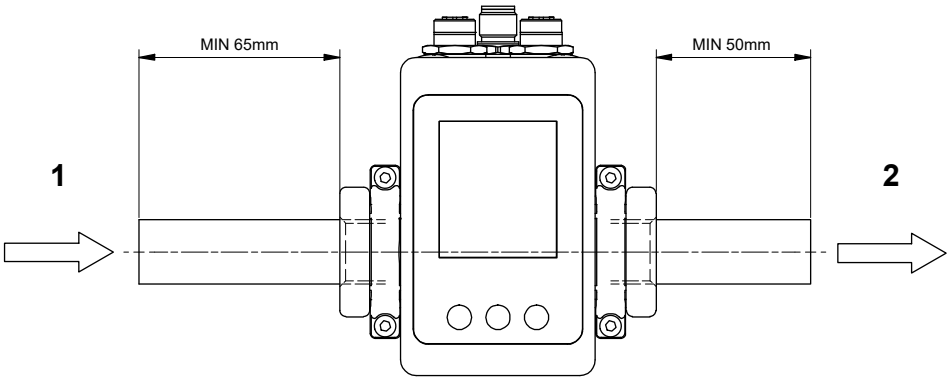
We recommend a reading range of up to 3000 l/min for use in AIRPLUS groups and a reading range of up to 5000 l/min for stand-alone.

Instructions for installation and use

Install the device as close as possible to the point of use. Pay attention to the flow direction indicated on the main body by numbers 1 (IN) and 2 (OUT). Integration into existing or new AIRPLUS groups is possible.
Avoid direct atmospheric discharge; ensure the flow is channeled into a pipeline.
It is not reccommended to integrate the device within an AIR PLUS air treatment unit immediately down stream of a pressure or filter regulator, to maintain the required accuracy.



For single use, ensure linear pipe lengths:
- **Inlet**: Minimum 65mm
- **Outlet**: Minimum 50mm



Warning!
Pay particular attention to external factors such as the nearness of live wires, magnetic fields, metallic objects providing magnetic conduction very close to the device, which may influence and disturb the diagnostic system.

Warning!
The electrical connection must be made exclusively by specialized personnel, using components that have no voltage present. Only use power supplies which can guarantee a safe electrical isolation of the working voltage in accordance to IEC/EN 60204-1. Additionally, observe the requirements anticipated by the PELV circuits in accordance to IEC/EN 60204-1.

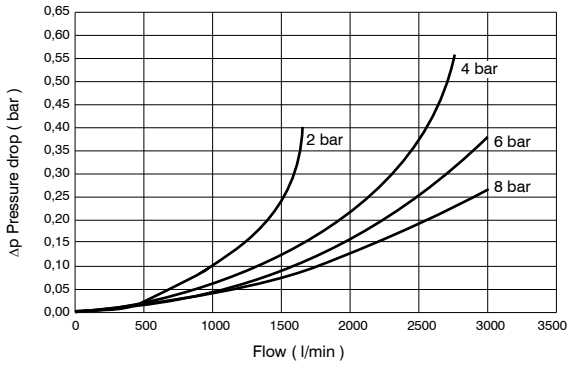
Warning!
Do not open and/or disassemble any components of the device while it's energised.

Warning!
Before carrying out any operation, it is essential to remove the pneumatic and power supply to the device and wait for the residual
pressure to be completely discharged. Periodically remove any dust deposits from the valve using a damp cloth. Use soapy water
to clean the device. Do not use corrosive or alcohol-based products.

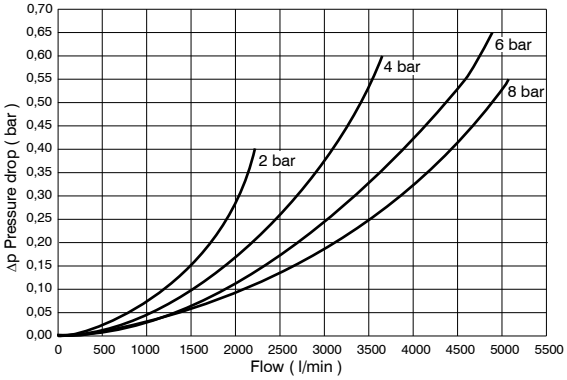
For maintenance operations on internal components, please consult with Pneumax S.p.A.

Pressure drop curves

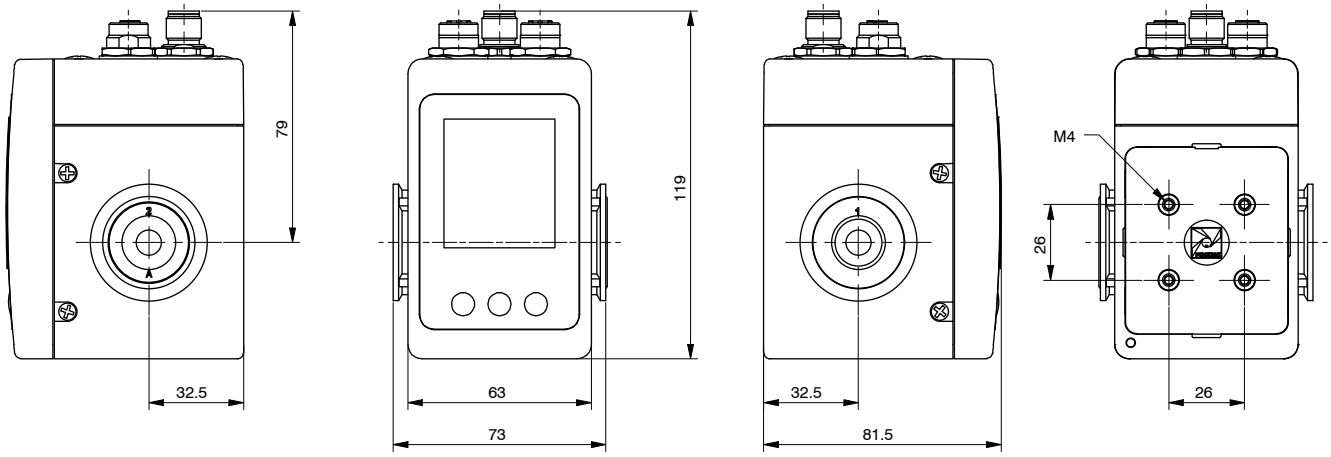
Model: P173FSA ...



Model: P173FSB ...

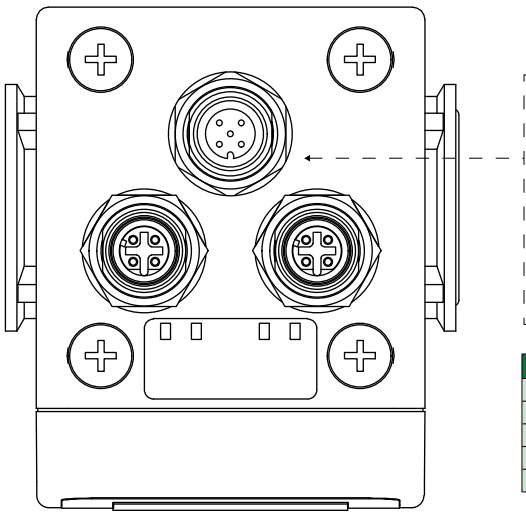


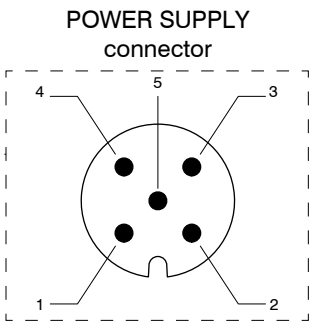
Dimensions and design



Electrical connection

The electrical connection is entrusted to a M12 5-pole male type A connector. The network connection is made via two M12 4-pole female type D connectors (IN and OUT).

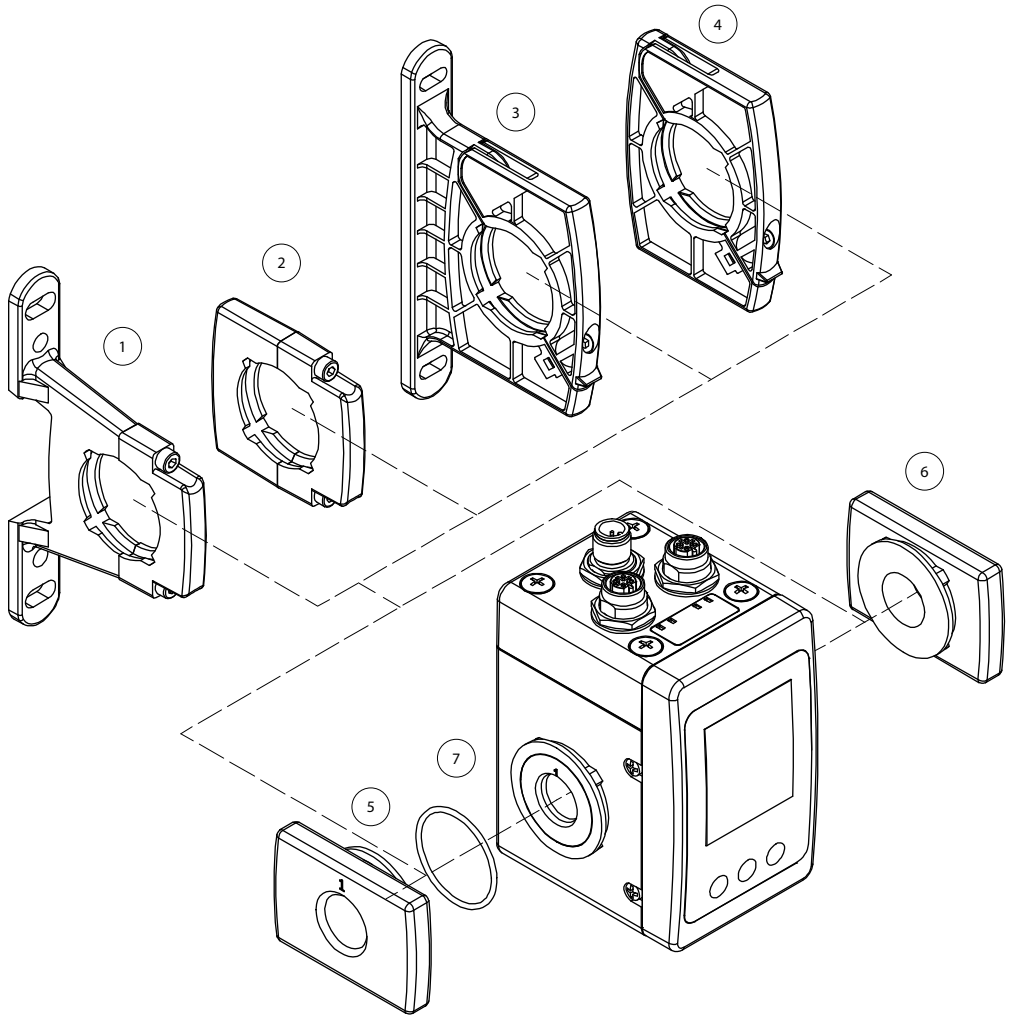




PIN	DESCRIPTION
1	+ 24V DC
2	DIGITAL OUT 2
3	0V DC
4	DIGITAL OUT 1
5	ANALOG OUT

Accessories

Threaded connections assembly kit



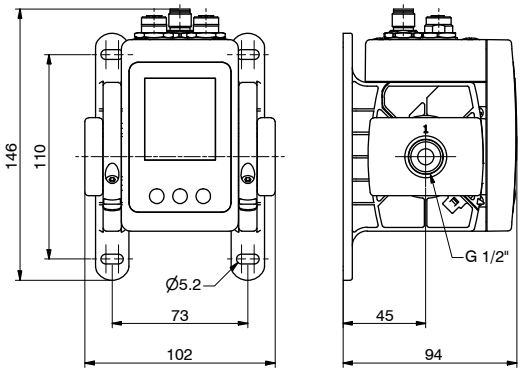
CODING: ⓥ1737ⓒⓣ

ⓥ	VERSION
	P = Aluminium
	T = Technopolymer
ⓒ	THREADED CONNECTIONS
	0 = Threaded connections IN - OUT G1/2"
	1 = Threaded connection IN G 1/2"
	2 = Threaded connection OUT G 1/2"
ⓣ	FLANGE TYPE
	X = Flange type X
	Y = Flange with fixing type Y

Example : T17370Y : Threaded connections IN - OUT G1/2" with technopolymer flange type Y

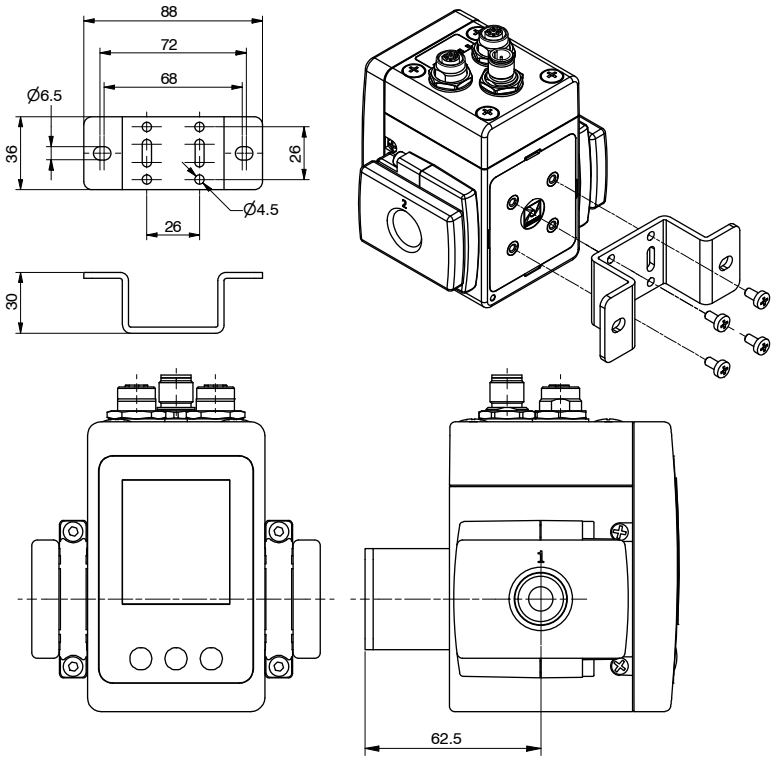
Connection type	Description	Materials
1	Flange type Y	Painted aluminum
2	Flange type X	Painted aluminum
3	Flange type Y	Technopolymer
4	Flange type X	Technopolymer
5	Threaded connection IN	Painted aluminum
6	Threaded connection OUT	Painted aluminum
7	OR Seals	NBR

Flange with fixing type Y dimensions



Fixing bracket

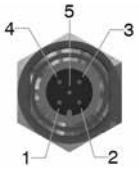
CODING: P17350



Power supply connector

Straight connector M12A 5P female

CODING: 5312A.F05.00



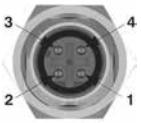
Upper view slave connector

PIN	DESCRIPTION
1	+24V DC
2	DIGITAL OUT 2
3	0V DC
4	DIGITAL OUT 1
5	ANALOG OUT

Network connector

Straight connector M12D 4P male

CODING: 5312D.M04.00



Upper view slave connector

PIN	SIGNAL	DESCRIPTION
1	TX+	EtherNet Transmit High
2	RX+	EtherNet Receive High
3	TX-	EtherNet Transmit Low
4	RX-	EtherNet Receive Low

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D.NW.112-EN-06/2025