



SM-00

Impeller Flowmeter for Small Volumes of Fluid



Description:

The SM-00 is a universally applicable flowmeter for small to medium volumes of thin fluid. A rotor mounted on one side on a bearing pin is made to rotate by a flow obliquely directed through a nozzle where the rotor's blades are equipped with magnets. A Hall effect sensor mounted externally on the flow housing emits a small voltage impulse every time when one of the magnets passes by its front side. The electronics of the SM-00 are capable of receiving these impulses and translating them into an NPN Open-Collector rectangular signal that will be made available to the plug output.

Features

/ Arnite, Larton® G/40 or PVDF

/ Up to 100°C

/ Up to 20 bar

/ Wide choice of operating range

/ Excellent media resistance

Application:

The SM-00 is the ideal device especially for tapping small volumes of flow of chemically hostile fluids. The available material combinations are Arnite, Larton® G/40 and PVDF which can be deployed in many areas of the chemical industry. With its range of up to 100°C and 20 bar, for a plastic device the limits in regard to pressure and temperature are very outstretched and the Open-Collector signal in NPN form can be evaluated by any common control device. The available connection threads are G1/4" female thread as well as G1/2" male thread where the user has the option to place both the inlet and the outlet of flow on a single side of the SM-00 or, to have, preferably, one connection on the right side and another on the left side of the flowmeter.

The unique impeller bearing of the SM-00 ensures a long life for the SM-00. As against many other devices available in the market, the rotor is not mounted on both sides but it practically „floats“ during operation over a one-sided bearing pin. Thus, the design of the device ensures durability and, consequently, maximum possible rotational speed of the impeller.



Technical Specifications:

Material /	
SM-00.1:	Housing made of PBT 35%GF (Arnite) bearing pin made of stainless steel 1.4305 (1.4571 optional) O-Ring made of silicon (Viton or EPDM optional) rotor made of PVDF magnets made of ceramic Sr Fe O
SM-00.2:	Housing made of PPS 40%GF (Larton® G/40) bearing pin made of stainless steel 1.4305 (1.4571 optional) O-Ring made of silicon (Viton or EPDM optional) rotor made of PVDF magnets made of ceramic Sr Fe O
SM-00.3.1:	Housing made of PVDF Bearing pin made of st. steel 1.4305 (1.4571 or PCTFE (nozzle PTFE) optional) O-Ring made of Viton (EPDM optional) Rotor made of PVDF Magnets made of ceramic Sr Fe O
SM-00.3.(2. . .3):	Housing made of PVDF Bearing pin made of PCTFE O-Ring made of Viton (EPDM optional) Rotor made of PVDF magnets made of ceramic Sr Fe O (not wetted)
Flow volume /	depends on the version and nozzle, see Tables 1 and 2
Accuracy /	± 2% of MV
Reproducibility /	< ± 0.25%
Temperature range /	
SM-00.1:	-10. . .+65°C
SM-00.2:	-10. . .+100°C
SM-00.3:	-10. . .+100°C
Pressure /	max. 20 bar at 20°C
Mounting position /	horizontal pos. recommended
Nozzle sizes /	see Tables 1 and 2
Process connection /	G1/4" female on one side or G1/4"male on both sides (left/right), or G1/2"male on both sides (for large operating ranges only)

Electrical Specifications:

Supply voltage /	4,5. . .24 VDC
Power consumption /	5. . .13 mA
Output /	rectangular impulse NPN open collector
Signal load /	20 mA max.
Current leakage /	10 µA max.
El. connection /	3Pin -AMP 2.8 x 0.8 mm (counter-plug available as accessory)
Duty Cycle /	50% ± 5%

Ordering Codes:

Order number	SM-00.	1.	1.	1.	0
SM-00 Impeller Flowmeter for Small Volumes					
Material version /					
1 = Arnite with bearing pin in stainless steel 1.4305, O-Ring in silicon and turbine in PVDF					
2 = Larton® G/40 with bearing pin in stainless steel 1.4305, O-Ring in silicon and turbine in PVDF					
3 = PVDF with bearing pin in stainless steel 1.4305 (PCTFE for thread on both sides), O-Ring in Viton and turbine in PVDF					
Connections /					
1 = 2 x G1/4" female on one side (not nozzle sizes 10 mm and 3 - 4 - 5.6 mm for PVDF)					
2 = 2 x G1/4"male on both sides (not nozzle sizes 3.3 and 10 mm)					
3 = 2 x G1/2"male on both sides (nozzle size 10 only)					
Nozzle size /					
1 = 1.0 mm					
2 = 1.2 mm					
3 = 1.5 mm					
4 = 2.0 mm					
5 = 2.5 mm					
6 = 3.0 mm (both sides in G1/4" male thread only)					
7 = 3.3 mm (both sides in G1/4" female thread only)					
8 = 4.0 mm (both sides in G1/4" male thread only)					
9 = 5.6 mm (both sides in G1/4" male thread only)					
10= 10 mm (in G1/2" male thread only)					
Optionen /					
0 = none					
1 = O-Ring in Viton instead of silicon for versions in Arnite and Larton® G/40					
2 = O-Ring in EPDM instead of silicon for versions in Arnite and Larton® G/40					
3 = O-Ring in EPDM instead of Viton for versions in PVDF					
4 = Bearing pin in st. steel 1.4571 instead of 1.4305 for versions in Arnite and Larton® G/40					
5 = Bearing pin in st. steel 1.4571 instead of 1.4305 for versions in PVDF with one-sided thread					
6 = Bearing pin in PCTFE instead of st. steel 1.4305 for versions in PVDF with one-sided thread					



Versions:

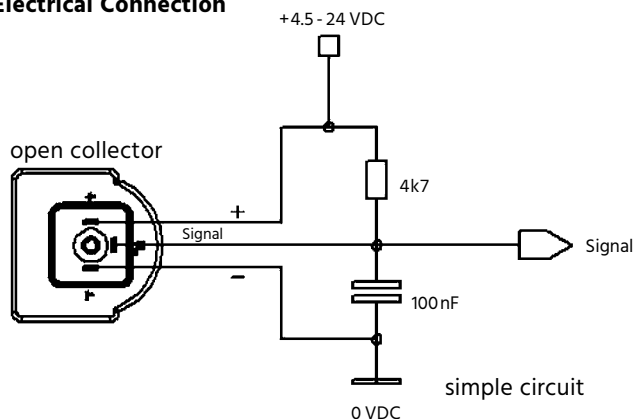
Material version: The basic body of the SM-00 can be made of materials such as Arnite, Larton® G/40 or PVDF where the Arnite and Larton versions are intended for standard applications while the PVDF version has been developed for applications in the chemical industry.

Connections: The available thread connections are G1/4" female thread and G1/2" male thread which allow the user to decide placing both the flow inlet and outlet on the same side of the SM-00 or, preferably, one connection on the right side and another on the left side of the flowmeter. The possible operating ranges vary with different versions as detailed in the Tables 1 and 2.

Nozzle size: The nozzle at the inlet of the SM-00 enables an oblique direction flow within the body of the SM-00 and is largely responsible for the dynamic functioning of the flowmeter and, therefore, for the length and position of the linear operating range. The relationship between the nozzle size and operating range is detailed in the Tables 1 and 2. The operating ranges given in these tables indicate the linear range of the relevant version. The specified pressure drop occurs when the full scale value of the measuring range is reached.

Options: The bearing pin in the Arnite and Larton® G/40 versions of the SM-00 is made of stainless steel 1.4305 as a standard and the sealing ring is made of silicon. If the medium in question has special requirements in regard to the material, the bearing pin can be also supplied in stainless steel 1.4571 and the O-Ring in Viton or EPDM. The PDVF version of the SM-00 is used, especially when the requirements of strength on the flowmeter are very high. In the case of the variant with thread connection, the bearing pin is made of stainless steel 1.4305 on the one side and, in those with thread connections on both sides it is made of PCTFE. Optionally, the stainless steel pin in the one-sided version can also be replaced by a PCTFE pin. In this „chemical“ version, the impeller magnets are fully infused and hence not wetted.

Electrical Connection





All given values are average and have been measured for water at room-temperature and horizontal position. The actual values differ, depending on the application, by an accuracy of ± 2% of MV.

Table of operating ranges SM-00.1/2

Nozzle size [mm]	Version Arnite or Larton® G/40, connections G 1/4"-female one-sided			Version Arnite or Larton® G/40, connections G 1/4"-male both-sided			Version Arnite or Larton® G/40, connections G 1/2"-male both-sided		
	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]
1.0	0.0274..0.5867	2223	1.0	0.0410..0.5670	2063	1.0			
1.2	0.0315..0.7777	1787	1.0	0.0505..0.8225	1700	1.0			
1.5	0.0417..1.3434	1386	1.0	0.0427..1.2504	1314	1.0			
2.0	0.1109..2.3268	1013	1.0	0.0911..2.4055	988	1.0			
2.5	0.0673..2.7421	754	0.6	0.1503..3.7478	760	1.0			
3.0	0.137..4.88	572	1.0	0.1022..5.6310	565	1.0			
3.3	0.1396..5.3606	509	1.0						
4.0	0.111..7.26	382	1.0	0.1235..8.3893	381	0.8			
5.6	0.180..8.30	256	0.9	0.3088..9.2647	236	0.45			
10.0							3.00..26.69	65	0.32

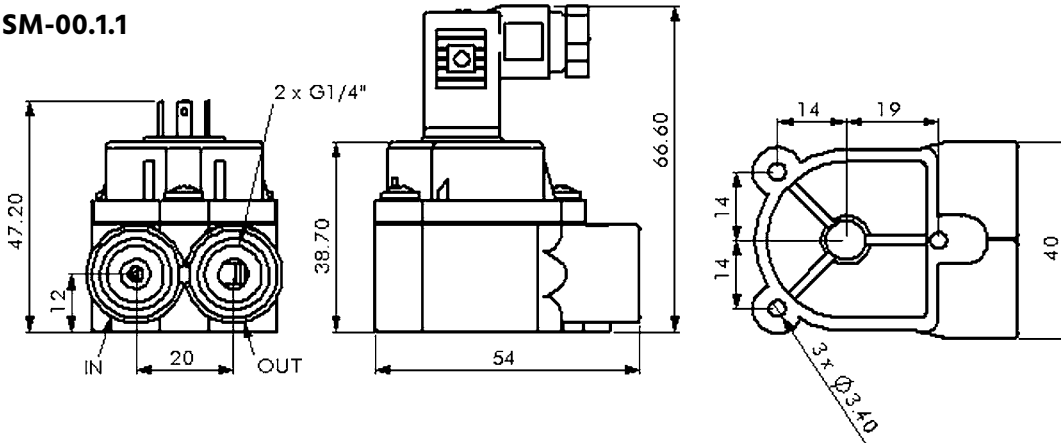
Table of operating ranges SM-00.3

Nozzle size [mm]	Version PVDF with bearing pin in 1.4305, connections G 1/4"-female one-sided			Version PVDF with bearing pin in PCTFE, connections G 1/4"-female one-sided			Version PVDF, connections G 1/4"-male both-sided		
	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]
1.0	0.0419..0.5899	2277	1.0	0.0551..0.4789	4962	1.0	0.0440..0.5498	4366	1.0
1.2	0.0343..0.8014	1834	1.0	0.0480..0.8273	3752	1.0	0.0532..0.8447	3485	1.0
1.5	0.0523..1.2731	1447	1.0	0.0784..1.1325	3020	1.0	0.0668..0.9314	2827	0.55
2.0	0.0692..2.3482	1010	1.0	0.1087..2.2155	2078	1.0	0.1170..2.2198	2049	1.0
2.5	0.0664..3.7142	739	1.0	0.0741..2.7640	1443	0.66	0.1147..2.7205	1544	0.64
3.0							0.1048..2.8494	1109	0.41
3.3	0.7173..6.0997	555	1.0	0.2571..5.0044	1033	1.0			
4.0							0.2098..9.2712	793	1.0
5.6							1.7820..10.7990	511	0.49

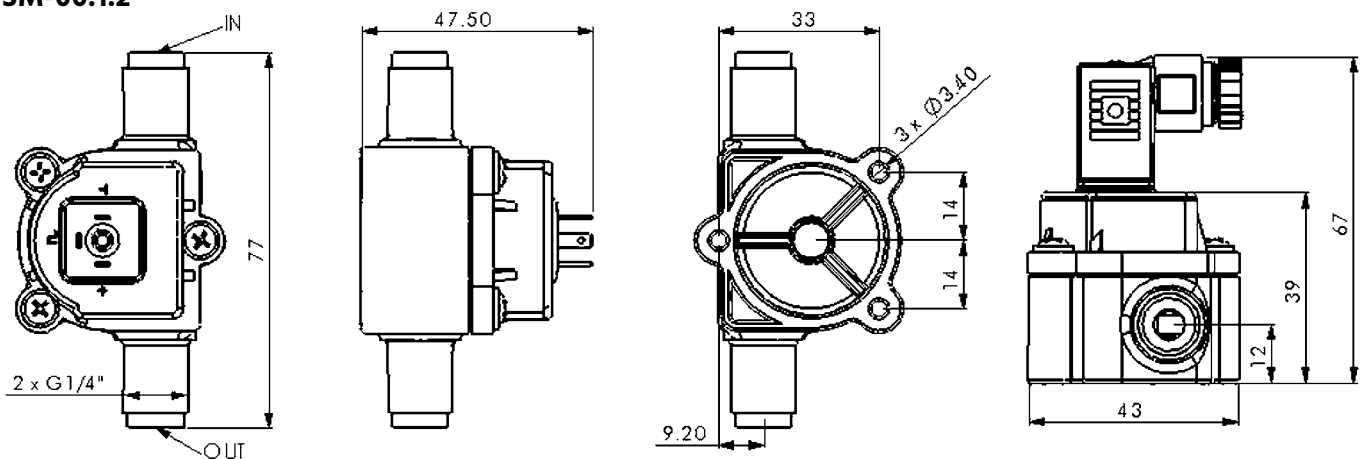
Nozzle size [mm]	Version PVDF, connections G 1/2"-male both-sided	Flow [l/min]	Impulse rate [Imp./l]	Pressure drop for FSV [bar]
10.0		3..26.69	130	0.32

Dimensions in mm:

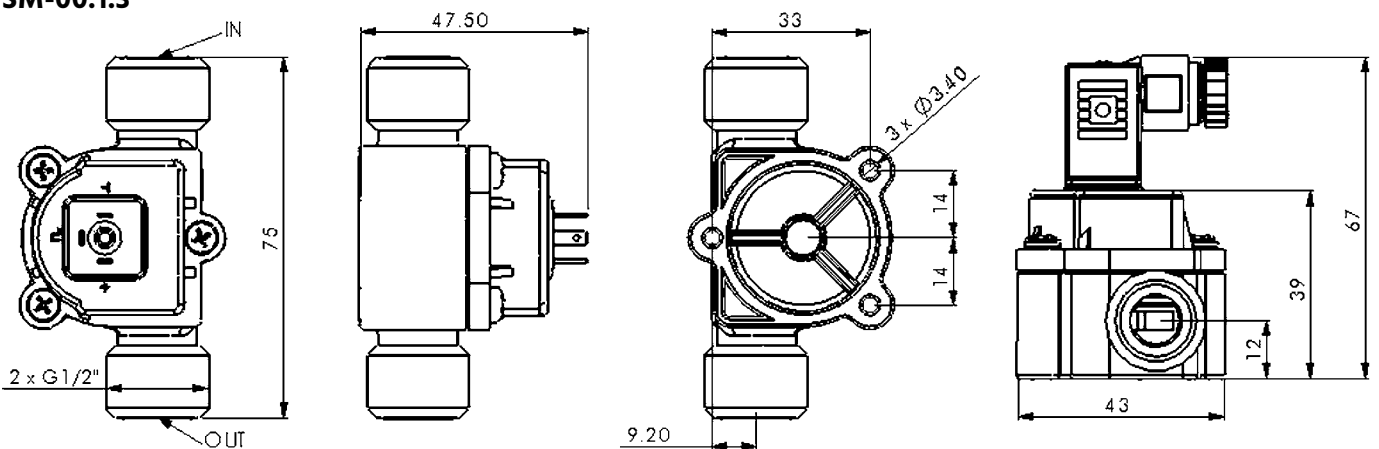
SM-00.1.1



SM-00.1.2

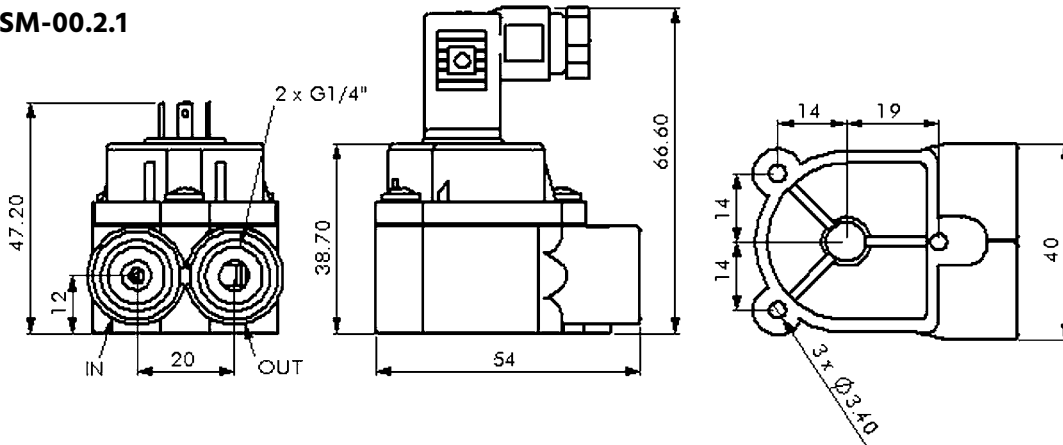


SM-00.1.3

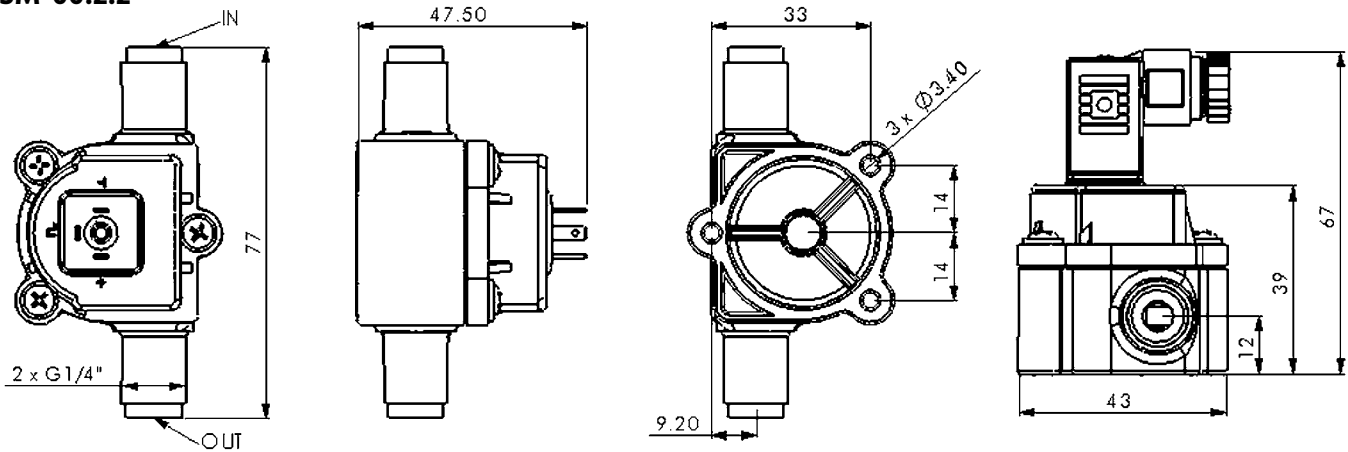




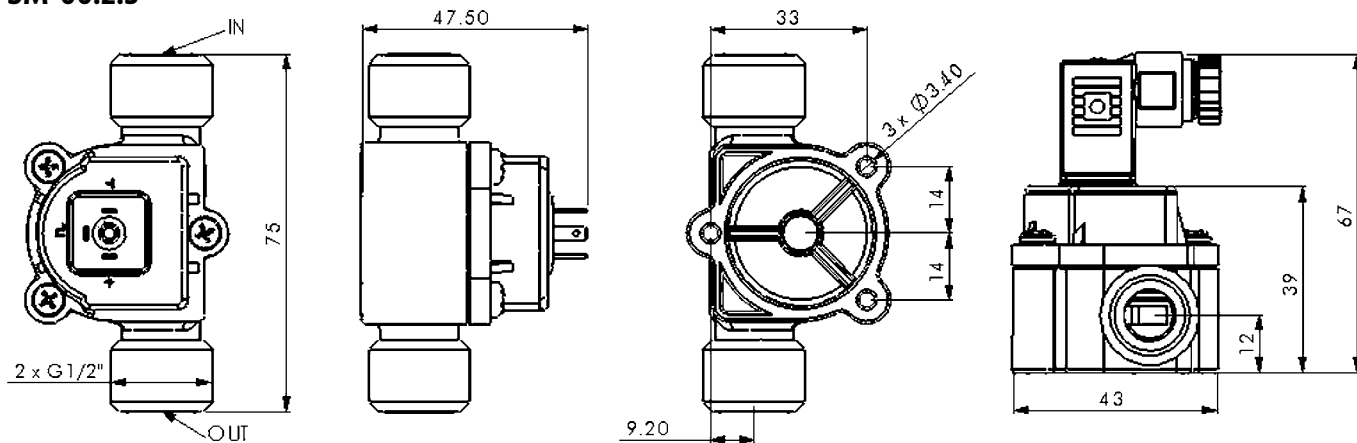
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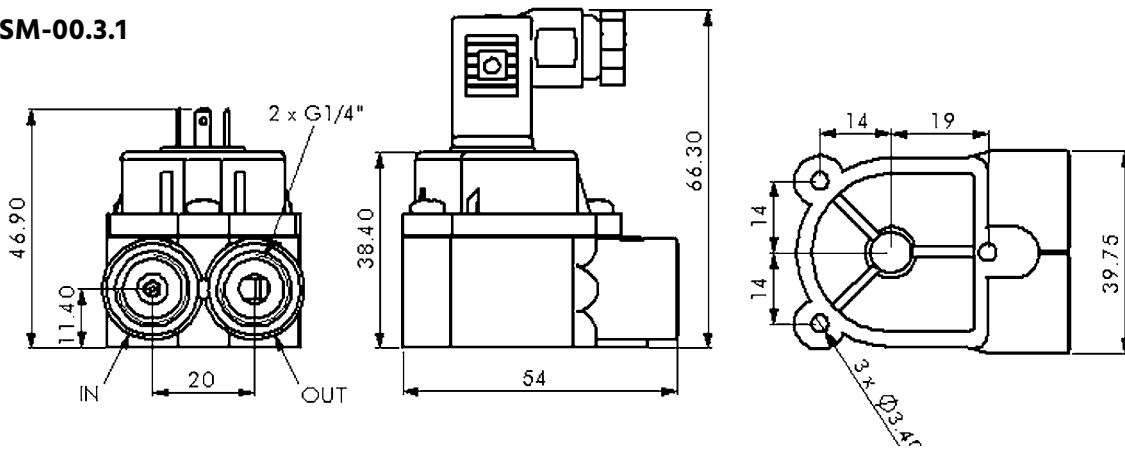
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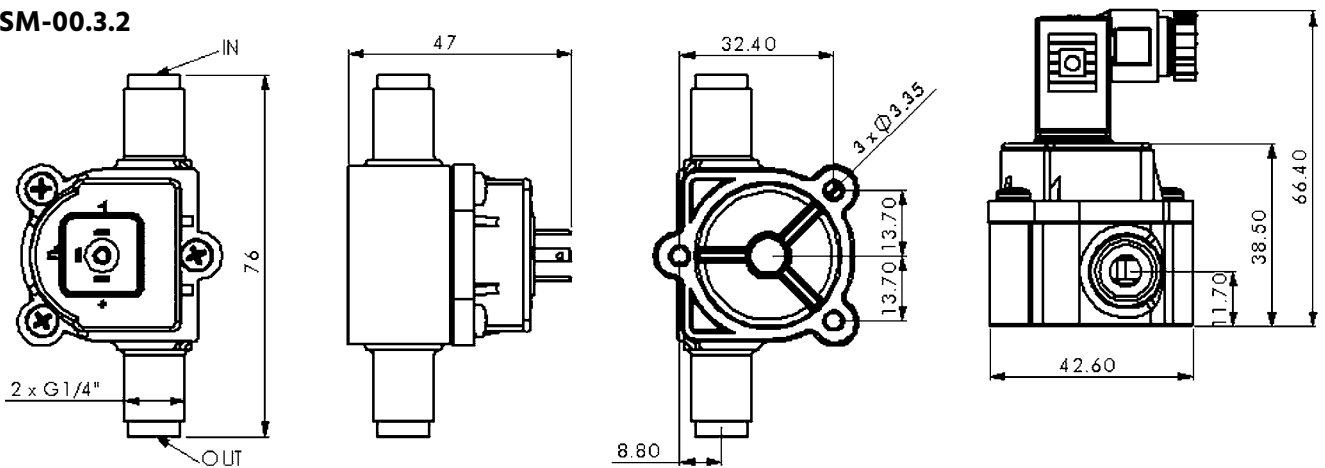
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SM-00.3.1



SM-00.3.2



SM-00.3.3

