P220 Series

Glass Tube Variable Area Flow Meter

The P220 Series flow meters are designed for low flow rates of both liquids and gases.

The P220 Series covers a broad range of applications, from purging to monitoring of industrial processes.

The P220 offers 316 Stainless Steel construction for all wetted parts.

For challenging corrosive applications, the P220 offers PTFE seals as an option.

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Product Features:

- Ideal for general purpose use, as well as use for field test equipment
- Suitable for both liquids and gases
- 316 Stainless Steel construction for challenging corrosive applications
- Front panel mounting hardware
- Easy-to-read scale
- Scale tube length of 100mm
- Optional alarm output

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Specifications

Materials of Construction

Wetted	
Body	Standard: 316 Stainless Steel
Tapered Tube	Heat-resistant Glass
Float	316 Stainless Steel, Glass, PTFE or Ruby
Packing	Standard: NBR (Nitrile Rubber) Optional: • FPM (Fluorinated Propylene Monomer) • CR (Neoprene) • PTFE (Polytetrafluoroethylene)
Fitting	Standard: 316 Stainless Steel
Valve	Standard: 316 Stainless Steel

Non-wetted	
Cover	Polycarbonate
Support	Aluminum
Connection Size and Type	Standard: NPT or RC 1/4" with locknuts for front panel mounting

Performance

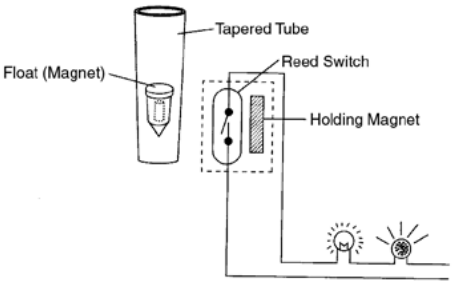
Flow Rate Scale Ranges		
Water[1]	Minimum Maximum	0.1 - 0.8 Gal/h (0.3 - 3 L/h) 6.3 - 32 Gal/h (24 - 120 L/h)
Air[2]	Minimum Maximum	0.01 - 0.1 ft^3/h (0.3 - 3 L/h) (nor) 13 - 127 ft^3/h (360 - 3600 L/h) (nor)
Turndown		10:1
Accuracy		±3% F.S.
Approx. Weight		1.3 lbs. (0.6 kg)
Flow Direction		Bottom Rear to Top Rear
Alarm Type		Self-holding Reed Switch

Operating Conditions	
Max. Operating Pressure	116 psig (8 barg)
Max. Operating Temperature • NBR (Nitrile Rubber) • CR (Neoprene) • FPM (Fluorinated Propylene Monomer)	 176°F (80°C) 176°F (80°C) 248°F (120°C)

[1]Liquid equivalent to water density 1.0g/cm^3, viscosity 1.0cp
[2]Gases equivalent to Air @ 0°C 1 atm

Reed Switch Specification

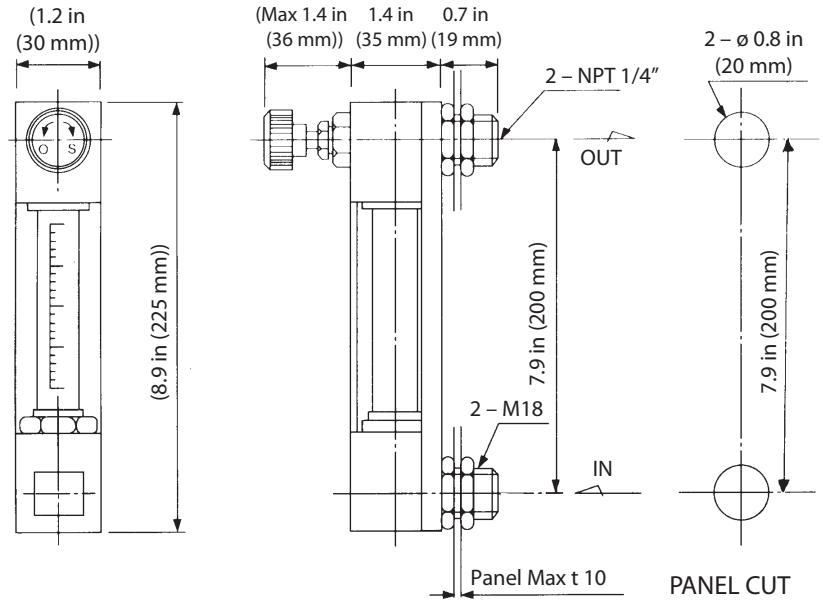
Number of Point	1 point (high or low) 2 point alarm also available as an option Consult factory for details
Alarm Setting Range	Standard 20% to 80% of full scale (H: 50% to 80%, L: 20% to 50%)
Contact	Reed switch (Self-holding type) Max. contact capacity: AC10VA, DC10W Max. voltage: AC125V, DC100V Max. current: 0.5A
Connection	Lead wire connection of 50cm (2m is also available)
Reset-Span	25% Full Scale
Ambient Temperature	-10°C to 60°C



Caution must be taken when mounting multiple alarmed meters. Close proximity may cause interference with alarm signal.

Dimensional Drawing

Standard valve provided at outlet, with locknuts for front panel mounting



Use non-magnetized material for panel with Reed Switch alarm output

Panel Cut Dimensions		
Connection Size	Hole Diameter	
	in	mm
1/4" NPT or RC	ø 0.8	ø 20.0
1/8" NPT or RC	ø 0.6	ø 16.0

Application Information

Fluid Name:
Operating Density or Specific Gravity:
Viscosity:
Flow Rate
Maximum:
Operating or Normal:
Scale Range:
Pressure
Maximum:
Operating or Normal:
Temperature
Maximum:
Operating or Normal:
Alarm Settings
Alarm 1:
Alarm 2:
Other Options

Use this Application Information form in conjunction with the Ordering Information on the following page.

Flow Range Alarm Settings

Air[1] Flow Rate Table

If LO, LC, HO, or HC Alarm Output			
Air		Alarm Setting Range	
ft³/h	L/h (nor)	ft³/h	L/h (nor)
0.1 - 1.1	3 - 30	0.2 - 0.8	6 - 24
0.2 - 2.1	6 - 60	0.4 - 1.7	12 - 48
0.4 - 4.2	12 - 120	0.8 - 3.4	24 - 96
0.6 - 6.4	18 - 180	1.3 - 5.1	36 - 144
1.1 - 11	30 - 300	2.1 –8.5	60 - 240
2.1 - 21	60 - 600	4.2 - 17	120 - 480
4.2 - 42	120 - 1200	8.5 - 34	240 - 960
6.4 - 64	180 - 900	13 - 51	360 - 1440
8.5 - 85*	240 - 2400*	17 - 68	480 - 1920
21 - 106	600 - 3000	21 - 85	600 - 2400

[1] Air measured at 0 psig and 32°F (0°C)
* 10:2 if range is more than 85 ft³/h (600 L/h) (nor)

Water[2] Flow Rate Table

If LO, LC, HO, or HC Alarm Output			
Water		Alarm Setting Range	
Gal/h	L/h	Gal/h	L/h
0.1 - 0.8	0.3 - 3	0.2 - 0.6	0.6 - 2.4
0.2 - 1.6	0.6 - 6	0.3 - 1.3	1.2 - 4.8
0.3 - 3.2	1.2 - 12	0.6 - 2.5	2.4 - 9.6
0.5 - 4.8	1.8 - 18	1 - 3.8	3.6 - 14
0.8 - 8.9	3 - 30	1.6 - 6.3	6 - 24
1.6 - 16	6 - 60	3.2 - 13	12 - 48

[2] Water measured with viscosity of 1 mPas

Ordering Information

Use the following guide to determine the specific product number you require.

The following example describes a P220 bottom rear to top rear flow meter with air equivalent flow rates >44 nL/hr[1] up to 3600 nL/hr[1], water equivalent flow rates from 3 L/hr[2] to 120 L/hr[2], no valve or alarm, wetted parts of SUS 316 SS, FPM/FKM packing material, and 1/8" NPT thread connection with standard front panel mounting.

Example: P221A1A1A1A

Model Number, Example and Options									Description
P22	**1**	**A**	**1**	**A**	**1**	**A**	**1**	**A**	
Flow / Direction	1								Bottom rear to top rear Air equivalent flow rates >44 nL/hr[1] up to 3600 nL/hr[1] Water equivalent flow rates from 3 L/hr[2] to 120 L/hr[2]
	2								Bottom rear to top rear Air equivalent flow rates < 43 nL/hr[1]
	Z								Special
Valve		A							None
		B							Bottom: For gas flows less than 43 nL/hr[1] Air Equivalent
		C							Top: For gas flows less than 43 nL/hr[1] Air Equivalent
		D							Bottom: Gas flow not less than 43 nL/hr[1] Air Equivalent
		E							Top: Gas flow not less than 43 nL/hr[1] Air Equivalent
		F							Bottom: For gas flow 3600 nL/hr[1], liquid flow up to 2 L/min[2]
		G							Top: For gas flow 3600 nL/hr[1], liquid flow up to 2 L/min[2]
		Z							Special
Alarm Output			1						None
			2						Reed Switch - Contact closes (becomes ON) when value is more than set point
			3						Reed Switch - Contact opens (becomes OFF) when value is more than set point
			4						Reed Switch - Contact closes (becomes ON) when value is less than set point
			5						Reed Switch - Contact opens (becomes OFF) when value is less than set point
			Z						Special
Wetted Parts				A					SUS 316 SS (Standard)
				Z					Special
Packing Material					1				Fluorinated Propylene Monomer (FPM/FKM)
					2				Nitrile Rubber (NBR)
					3				Chloroprene Rubber (CR)
					Z				Special
Connection Type						A			NPT thread (standard)
						B			RC thread (typical for non-USA market)
						Z			Special
Connection Size							1		1/8"
							2		1/4"
							Z		Special
Mounting Options								A	None (Standard with locknuts for front panel mounting)
								Z	Special

[1]Gases equivalent to Air @ 21.1°C 1 atmos (Standard)
[2]Liquid equivalent to water density 1.0 g/cm^3, viscosity 1.0cp

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