

# P210 Series

## Glass Tube Variable Area Flow Meter



The P210 Series flow meters are designed for low flow rates of both liquids and gases.

They cover a broad range of applications, from purging to monitoring of industrial processes.

The P210 Series offers 316 Stainless Steel construction for all wetted parts.

For challenging corrosive applications, the P210 offers PTFE seals as an option.



### Contact Information:

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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 all wetted parts
- PTFE seals are available as an option
- Front panel mounting hardware
- Easy-to-read scale
- Scale tube length of 45mm
- Optional alarm output



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# Specifications

## Materials of Construction

Wetted	
<b>Body</b>	Standard: 316 Stainless Steel
<b>Tapered Tube</b>	Heat-resistant Glass
<b>Float</b>	316 Stainless Steel, Glass, PTFE or Ruby
<b>Packing</b>	Standard: NBR (Nitrile Rubber) Optional: <ul style="list-style-type: none"> <li>FPM (Fluorinated Propylene Monomer)</li> <li>CR (Neoprene)</li> <li>PTFE (Polytetrafluoroethylene)</li> </ul>
<b>Fitting</b>	Standard: <ul style="list-style-type: none"> <li>316 Stainless Steel</li> </ul>
<b>Valve</b>	Standard: 316 Stainless Steel
Non-wetted	
<b>Cover</b>	Polycarbonate
<b>Support</b>	Aluminum
<b>Connection Size and Type</b>	Standard: NPT or RC 1/4" with locknuts for front panel mounting

## Performance

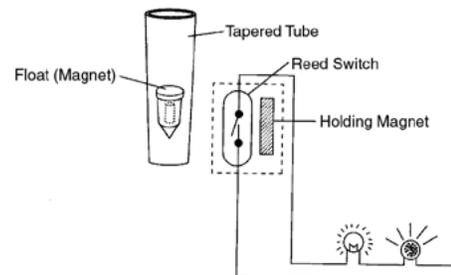
Flow Rate Scale Ranges		
<b>Water<sup>1</sup></b>	Minimum	0.1 - 0.8 Gal/h (0.3 - 3 L/h)
	Maximum	6.3 - 32 Gal/h (24-120 L/h)
<b>Air<sup>2</sup></b>	Minimum	0.01 - 0.04 ft <sup>3</sup> /h (0.2 - 1.2 L/h) (nor)
	Maximum	11 - 106 ft <sup>3</sup> /h (300 - 3000 L/h) (nor)
<b>Turndown</b>		10:1
<b>Accuracy</b>		±5% F.S.
<b>Approx. Weight</b>		1.1 lbs. (0.5 kg)
<b>Flow Direction</b>		Bottom rear to top rear
<b>Alarm Type</b>		Self-holding Reed Switch
Operating Conditions		
<b>Max. Operating Pressure</b>		116 psig (8 barg) (72.5 psig) (5 barg) when PTFE packing material is used
<b>Max. Operating Temperature</b>		<ul style="list-style-type: none"> <li>NBR (Nitrile Rubber) 176°F (80°C)</li> <li>CR (Neoprene) 176°F (80°C)</li> <li>PTFE (Polytetrafluoroethylene) 248°F (120°C)</li> <li>FPM (Fluorinated Propylene Monomer) 248°F (120°C)</li> </ul>

<sup>1</sup>Liquid equivalent to water density 1.0g/cm<sup>3</sup>, viscosity 1.0cp

<sup>2</sup>Gases equivalent to Air @ 0°C 1 atm

## Reed Switch Specification

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



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

### ⚠ WARNING – USER RESPONSIBILITY

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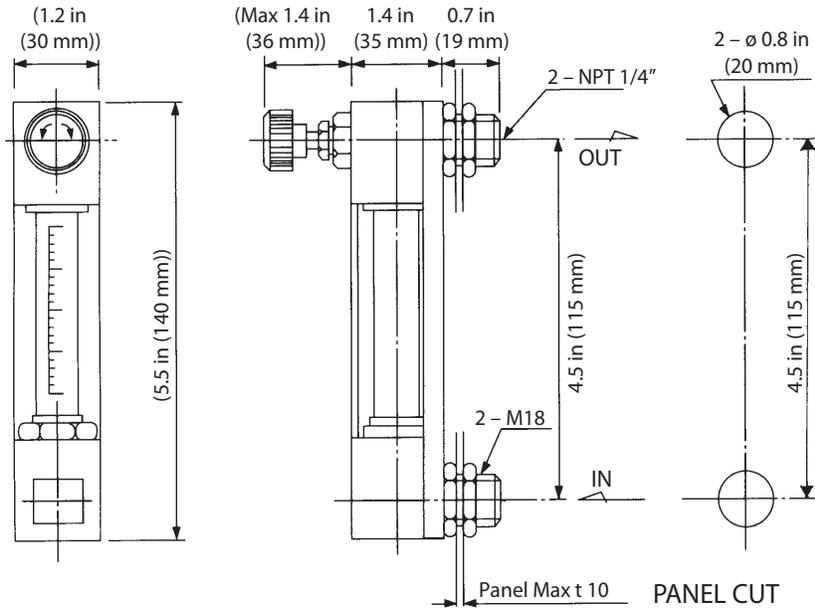
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# Dimensional Drawing

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:
<b>Flow Rate</b>
Maximum:
Operating or Normal:
Scale Range:
<b>Pressure</b>
Maximum:
Operating or Normal:
<b>Temperature</b>
Maximum:
Operating or Normal:
<b>Alarm Settings</b>
Alarm 1:
Alarm 2:
<b>Other Options</b>

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

# Flow Range Alarm Settings

## Air<sup>1</sup> Flow Rate Table

If LO, LC, HO, or HC Alarm Output			
Air		Alarm Setting Range	
ft <sup>3</sup> /h	L/h (nor)	ft <sup>3</sup> /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
1.3 - 13	36 - 360	2.1 - 11	60 - 300
2.1 - 21**	60 - 600**	4.2 - 17	120 - 480
6.4 - 32	180 - 900	6.4 - 25	180 - 720
13 - 64	360 - 1800	13 - 51	360 - 1440
17 - 85	480 - 2400	17 - 68	480 - 1920

<sup>1</sup> Air measured at 0 psig and 32°F (0°C)  
 When PTFE is used, a flow meter with a valve cannot be manufactured for a flow rate less than 2.1 ft<sup>3</sup>/h (60 L/h) (nor).  
 \* 10:2 if range is less than 0.2 ft<sup>3</sup>/h (6 L/h) (nor)  
 \*\* 10:2 if range is more than 21 ft<sup>3</sup>/h (600 L/h) (nor)

## Water<sup>2</sup> 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
0.8 - 3.2	3 - 12	1.3 - 2.5	4.8 - 9.6
0.5 - 4.8	1.8 - 18	1 - 3.8	3.6 - 14
0.8 - 7.9	3 - 30	1.6 - 6.3	6 - 24
1.6 - 16*	6 - 60	3.2 - 13	12 - 48

<sup>2</sup> Water measured with viscosity of 1 mPas  
 \* 10:2 if range is more than 16 Gal/h (60 L/h)

# Ordering Information

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

The following example describes a P210 bottom rear to top rear with air equivalent flow rates >27 nL/hr<sup>1</sup> up to 1200 nL/hr<sup>1</sup>, water equivalent flow rates from 0.3 L/hr<sup>2</sup> to 24-120 L/hr<sup>2</sup>, 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:** P211A1A1A1A

Model Number, Example and Options								Description	
<b>P21</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>	
Flow / Direction	1								Bottom rear to top rear Air equivalent flow rates >27 nL/hr <sup>1</sup> up to 1200 nL/hr <sup>1</sup> Water equivalent flow rates from 0.3 L/hr <sup>2</sup> to 24-120 L/hr <sup>2</sup>
	2								Bottom rear to top rear Air equivalent flow rates < 27 nL/hr <sup>1</sup>
	3								Bottom rear to top rear Air equivalent flow rates >1200 nL/hr <sup>1</sup> up to 3000 nL/hr <sup>1</sup>
	Z								Special
Valve	A								None
	B								Bottom: For gas flows less than 60 nL/hr <sup>1</sup> Air Equivalent
	C								Top: For gas flows less than 60 nL/hr <sup>1</sup> Air Equivalent
	D								Bottom: Gas flow not less than 60 nL/hr <sup>1</sup> to 2340 nL/hr <sup>1</sup> Air Equivalent
	E								Top: Gas flow not less than 60 nL/hr <sup>1</sup> to 2340 nL/hr <sup>1</sup> Air Equivalent
	F								Bottom: For gas flow 2340 nL/hr <sup>1</sup> to 3180 nL/hr <sup>1</sup> , liquid flow up to 2 L/min <sup>2</sup>
	G								Top: For gas flow 2340 nL/hr <sup>1</sup> to 3180 nL/hr <sup>1</sup> , liquid flow up to 2 L/min <sup>2</sup>
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)
	4								Polytetrafluoroethylene (PTFE)
	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

<sup>1</sup>Gases equivalent to Air @ 21.1°C 1 atmos (Standard)

<sup>2</sup>Liquid equivalent to water density 1.0 g/cm<sup>3</sup>, viscosity 1.0cp