PF2A Series Digital Flow Switch for Air

Ordering Code

PF2A Series Digital Flow Switch for Air

PF2A 7 10 - □ 01 - 27 □ - M

- 7: Integrated display type
- 10: Flow rate range
  - 10: 1 to 10L/min
  - 50: 5 to 50L/min
  - 11: 10 to 100L/min
  - 21: 20 to 200L/min
  - 51: 50 to 500L/min
- □: Thread type
  - Nil: Rc
  - N: NPT
  - F: G
- 01: Port size

Symbol	Port size	Flow rate (L/min) 10	50	100	200	500	Applicable model
01	1/8	●	●	–	–	–	PF2A710/750
02	1/4	●	●	–	–	–	
03	3/8	–	–	●	●	–	PF2A711/721
04	1/2	–	–	–	–	●	PF2A751

- 27: Output specifications
  - 27: NPN open collector 2outputs
  - 67: PNP open collector 2outputs
- □: Lead wire
  - Nil: Lead wire with M12 connector (3m)
  - N: Without lead wire
- M: Unit specifications
  - Nil: With unit switching function
  - M: Fixed SI unit
  - * Fixed units: Instantaneous flow rate: L/min, Accumulated flow: L

* Please contact us if you need remote sensor and display separated type.

Analogue Output

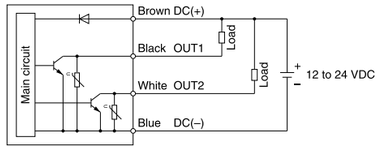
Part no.	Min. rated flow rate value	Max. rated flow rate value
PF2A710	1NL/min	10NL/min
	3.5CFM×10^{-2}	35.0CFM×10^{-2}
PF2A750	5NL/min	50NL/min
	18.0CFM×10^{-2}	176.0CFM×10^{-2}
PF2A711	10NL/min	100NL/min
	3.5CFM×10^{-1}	35.5CFM×10^{-1}
PF2A721	20NL/min	200NL/min
	7.0CFM×10^{-1}	71.0CFM×10^{-1}
PF2A751	50NL/min	500NL/min
	18.0CFM×10^{-1}	176.0CFM×10^{-1}

* When using the analog output of the standard state, please convert according to the following formula.
Base state flow rate value ÷ 0.927 = Standard state flow rate value.

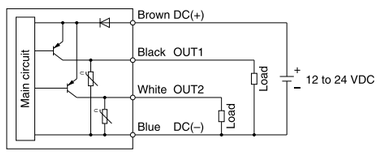
Internal Circuits and Wiring Examples

PF2A7□□

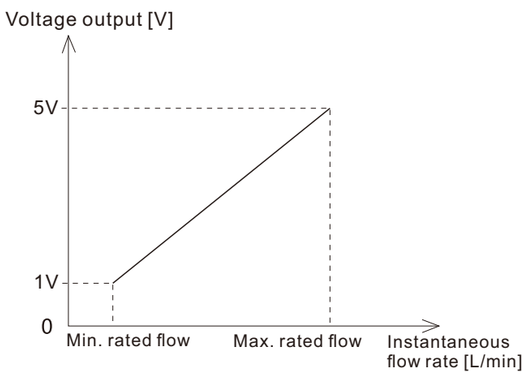
-27
NPN (2 outputs)



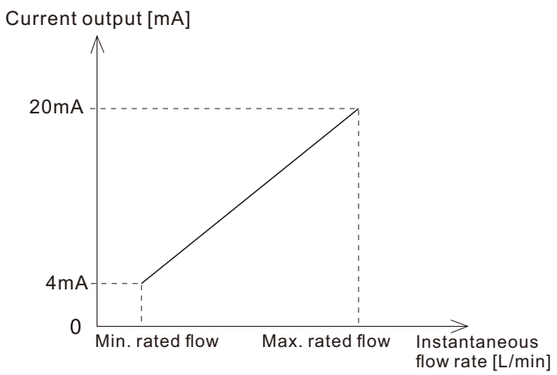
-67
PNP (2 outputs)



Voltage output [V]



Current output [mA]



PF2A Series Digital Flow Switch for Air

Specifications

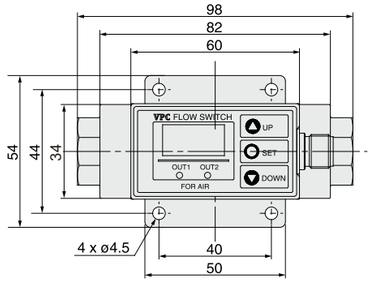
Model		PF2A710	PF2A750	PF2A711	PF2A721	PF2A751
Working medium		Dry Air, Nitrogen				
Rated flow range		1 to 10L/min	5 to 50L/min	10 to 100L/min	20 to 200L/min	50 to 500L/min
Minimum set unit		0.1L/min	0.5L/min	1L/min	2L/min	5L/min
Accumulated pulse flow rate exchange value(Pluse width: 50ms)		0.1L/pulse	0.5L/pulse	1L/pulse	2L/pulse	5L/pulse
Display units *1,2)	Instantaneous flow rate	L/min, CFM×10^{-2}		L/min, CFM×10^{-1}		
	Accumulated flow	L, ft^3×10^{-1}				
Working temperature		0 to 50℃				
Accuracy *3)		±5%F.S.				
Repeatability		±1%F.S.		±2%F.S.		
Temperature characteristics		±3%F.S. (15 to 35℃, 25℃ reference), ±5%F.S. (0 to 50℃, 25℃ reference)				
Current consumption		150mA or less		160mA or less		170mA or less
Port size (Rc, NPT, G)		1/8, 1/4		3/8		1/2
Detection type		Heater type				
Operating pressure		-50kPa to 0.5MPa		-50kPa to 0.75MPa		
Proof pressure		1.0MPa				
Accumulated flow range *4)		0 to 999999L				
Output *5) specifications	Switch output	NPN open collector	Max. load current: 80mA; Internal voltage drop: 1V or less Max. applied voltage: 30V; 2outputs			
		PNP open collector	Max. load current: 80mA; Internal voltage drop: 1.5V or less; 2outputs			
	Accumulated pulse output	NPN or PNP open collector (same as switch output)				
Status LED's		Lights up when output is turned ON OUT1: Green; OUT2: Red				
Response time		1 sec. or less				
Hysteresis		Hysteresis mode: Variable (can be set from 0), Window comparator mode *6) : 3-digit fixed				
Power supply voltage		DC12 to 24 V±10%				
Environment	Enclosure	IP65				
	Working temperature	Operating: 0 to 50℃, Stored: -25 to 85℃ (with no freezing and condensation)				
	Withstand voltage	AC 1000V for 1 minute between terminals and housing				
	Insulation resistance	50MΩ or more (DC 500V measured via megohmmeter) between terminals and housing				
	Noise resistance	1000V P-P pulse width1μs lasts 1ns				

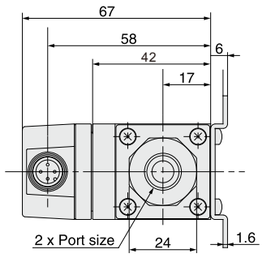
*1) For digital flow switch with unit switching function. (Fixed SI unit [(L/min, or L, m^3 or m^3×10^3)] will be set for switch type without the unit switching function.)
*2) Flow rate display can be switched between the basic condition of 0℃, 101.3 kPa and the standard condition (ANR) of 20℃, 101.3 kPa, and 65% RH.
*3) The piping on the IN side must have a straight section of piping whose length is 8 times the piping diameter or more. If a straight section of piping is not installed, the accuracy may vary by±5% F.S. or more.
*4) Accumulated flow rate is reset when the power supply turns OFF.
*5) Switch output and accumulated pulse output can be selected during initial setting.
*6) Window comparator mode — Since hysteresis will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more. (In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
*7) For details about wiring and thread type, please contact VPC.
*8) Any products with tiny scratches, smears, or display color variation or brightness which does not affect the performance are verified as conforming products.

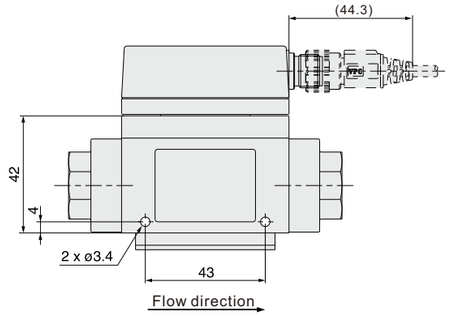
PF2A Series Digital Flow Switch for Air

Main Dimensions

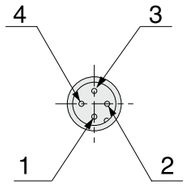
PF2A710,750





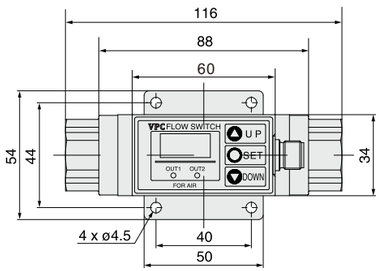


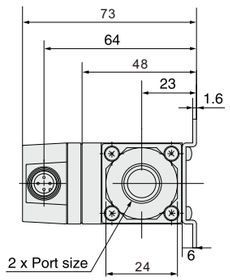
Connector pin numbers

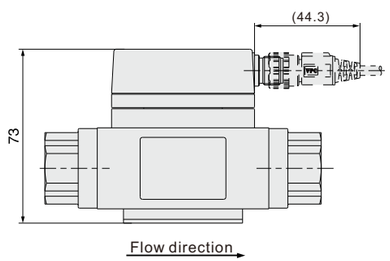


Pin No.	Pin description
1	DC(+)
2	OUT2
3	DC(-)
4	OUT1

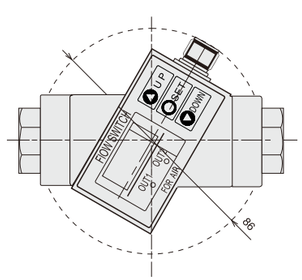
PF2A711,721,751







Rotation display diameter



* Be sure to allow straight pipe length that is minimum 8 times the port size upstream and downstream of the switch piping.

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PF2A Series High Flow Rate Type Digital Flow Switch for Air

Product Feature

- High flow rate range: 150 to 12000L/min(ANR).
- Flow rate can be set and detected.
- Digital displays of instantaneous flow rate and accumulated flow rate can be selected.
- Real-time switch output, accumulated switch output, or accumulated pulse output can be selected as an output type.

Ordering Code

PF2A Series High Flow Rate Type Digital Flow Switch for Air

PF2A7 □ H - □ □ - □ □ - M □

- Integrated display type
- Flow rate range: 03: 150 to 3000L/min; 06: 300 to 6000L/min; 12: 600 to 12000L/min
- High flow rate type
- Thread type: Nil: Rc; N: NPT; F: G
- Port size

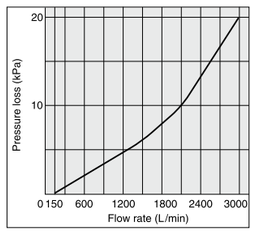
Symbol	Port size	Flow rate (L/min) 3000	6000	12000	Applicable model
10	1	●	–	–	PF2A703H
14	1½	–	●	–	PF2A706H
20	2	–	–	●	PF2A712H

- Output specifications
  - 28: NPN open collector 1output+ Analog output (1 to 5V)
  - 29: NPN open collector 1output+ Analog output (4 to 20mA)
  - 68: PNP open collector 1output+ Analog output (1 to 5V)
  - 69: PNP open collector 1 output+ Analog output (4 to 20mA)

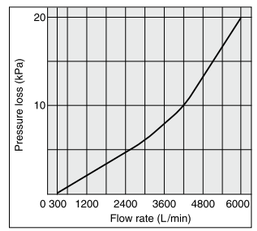
  * Switching of switch output and accumulated pulse output is possible with NPN or PNP open collector outputs.
- Lead wire: Nil: Lead wire with M12 connector (3m); N: Without lead wire
- Unit specifications: Nil: With unit switching function; M: Fixed SI unit
  * Fixed units: Instantaneous flow rate: L/min; Accumulated flow: L, m³, m³×10³
- Made to order: X795: Wide range

Flow Rate Characteristics (Pressure Loss)

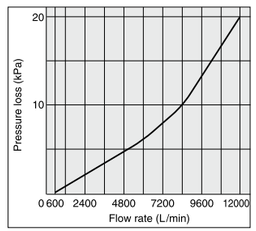
PF2A703H



PF2A706H

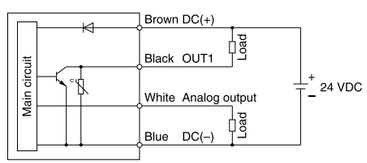


PF2A712H

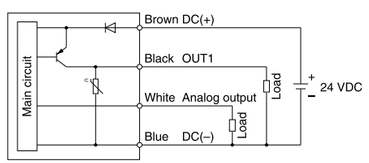


Internal Circuits and Wiring Examples

-28/29
28: NPN (1 output)+Analog voltage output
29: NPN (1 output)+Analog current output



-68/69
68: PNP (1 output)+Analog voltage output
69: PNP (1 output)+Analog current output



PF2A Series High Flow Rate Type Digital Flow Switch for Air

Specifications

Model		PF2A703H	PF2A706H	PF2A712H
Working medium		Dry Air, Nitrogen		
Detection type		Heater type		
Rated flow range *1)		150 to 3000L/min	300 to 6000L/min	600 to 12000L/min
Minimum set unit *1)		5L/min	10L/min	
Display units *2)	Instantaneous flow rate	L/min, CFM		
	Accumulated flow	L, m^3, $m^3\times10^3$, ft^3, $ft^3\times10^3$, $ft^3\times10^6$		
Operating pressure		0.1 to 1.5MPa		
Proof pressure		2.25MPa		
Pressure loss		20kPa (at maximum flow rate)		
Accumulated flow range *3)		0 to 9,999,999,999L		
Accuracy *5)		±1.5%F.S. (0.7MPa, at 20℃)		
Repeatability		±1.0%F.S. (0. 7MPa, at 20℃), ±3.0% F.S. in case of analog output		
Pressure characteristics		±1.5% F.S. (0.1 to 1.5 MPa, 0.7 MPa reference)		
Temperature characteristics		±2.0%F.S. (0 to 50℃, 25℃ reference)		
Output specifications	Switch output *5)	NPN open collector: Max. load current: 80 mA; Max. applied voltage: 30 V; Internal voltage drop: 1 V or less (with load current of 80 mA)		
		PNP open collector: Max. load current: 80 mA; Internal voltage drop: 1.5 V or less (with load current of 80 mA)		
	Accumulated pulse output *5)	NPN or PNP open collector: Flow rate per pulse: 100 L/pulse, 10.0 ft^3/pulse; ON time per pulse width: 50 msec/pulse		
	Analog output *6)	Output voltage: 1 to 5 V; Min. load impedance: 100 kΩ (Output impedance: 1 kΩ)		
		Output current: 4 to 20 mA; Max. load impedance: 250 Ω		
Response time		1 sec. or less		
Hysteresis		Hysteresis mode: Variable (can be set from 0); Window comparator mode: Fixed (set from 0 to 3% F.S.)		
Power supply voltage		DC24 V±10%		
Current consumption		450mA or less		
Environment	Enclosure	IP65		
	Working temperature	0 to 50℃ (with no freezing and condensation)		
	Withstand voltage	AC 1000V for 1 minute between terminals and housing		
	Insulation resistance	50MΩ or more (DC 500V measured via megohmmeter) between terminals and housing		
	Noise resistance	1000V P-P pulse width1μs lasts 1ns		
Standards and regulations		CE, RoHS		
Weight		1.1kg (without lead wire)	1.0kg (without lead wire)	2.0kg (without lead wire)
Port size (Rc, NPT, G)		1	1½	2

*1) Flow rate display can be switched between the basic condition of 0°C, 101.3 kPa and the standard condition (ANR) of 20°C, 101.3 kPa, and 65% RH.
*2) For digital flow switch with unit switching function. (Fixed SI unit [(L/min, or L, m^3 or $m^3\times10^3$)] will be set for switch type without the unit switching function.)
*3) Accumulated flow rate is reset when the power supply turns OFF. It is possible to select a function that holds the accumulated value so it is not reset. In such cases, data is written on EEPROM (electrically erasable programmable read-only memory) at approximately four-minute intervals. When using, please take into consideration that the EEPROM writing is guaranteed up to 1 million times (four minutes × 1 million = 4 million ≈ 7.9 years)
*4) The high flow rate type is CE marking compatible; however, the linearity with applied noise is ±5% F.S. or less.
*5) Switch output and accumulated pulse output selections are made using the button controls.
*6) The analog output operates only for instantaneous flow rate, and does not operate for accumulated flow.

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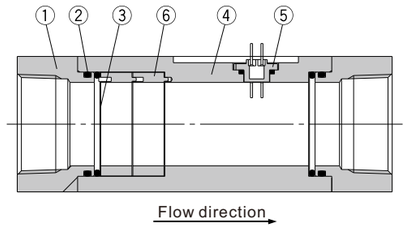
PF2A Series High Flow Rate Type Digital Flow Switch for Air

Wetted Parts Construction

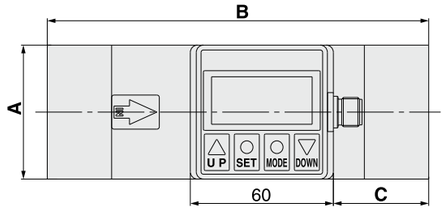


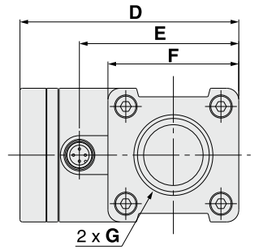
Parts list

NO.	Description	Material	Note
1	Attachment	Aluminum alloy	Anodized
2	Seal	HNBR	–
3	Mesh	Stainless steel	–
4	Body	Aluminum alloy	Anodized
5	Sensor	PPS	–
6	Spacer	PBT	–

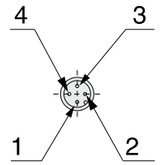
Main Dimensions

PF2A703H,706H,712H

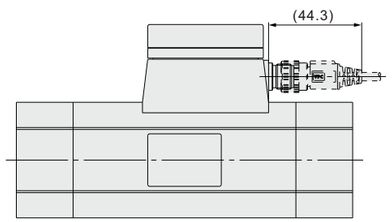


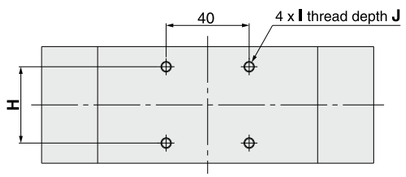


Connector pin numbers



Pin NO.	Pin description
1	DC(+)
2	Analog output
3	DC(-)
4	OUT1





* Be sure to allow straight pipe length that is minimum 8 times the port size upstream and downstream of the switch piping.

(mm)

Model	A	B	C	D	E	F	G	H	I	J
PF2A703H	55	160	40	92	67	55	Rc1, NPT1, G1	36	M5×0.8	8
PF2A706H	65	180	45	104	79	65	Rc1½, NPT½, G1½	46	M6×1	9
PF2A712H	75	220	55	114	89	75	Rc2, NPT2, G2	56	M6×1	9

PF2A Series Digital Flow Switch Brackets

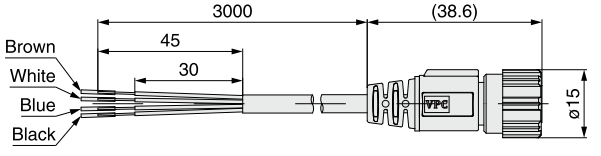
Option/Accessory Type

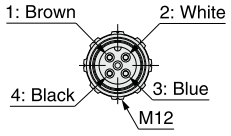
Type	Description	Note	Weight
ZS-37-A	Lead wire with plug (straight type)	Length: 3m	100g
ZS-37-B	Lead wire with plug (L type)	Length: 3m	100g
ZS-39-T	Bracket	With 4 mounting screws (3×12 threaded)	40g

Main Dimensions

Lead wire and M12 connector

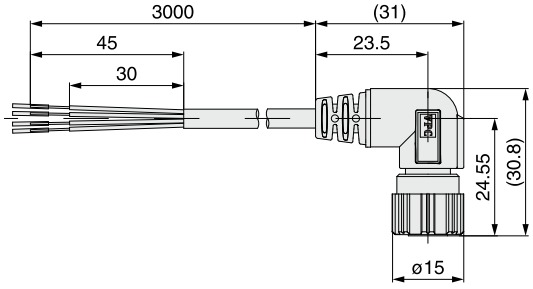
ZS-37-A

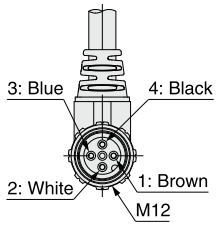




Pin NO.	Description	Lead wire color
1	DC(+)	Brown
2	OUT2	White
3	DC(-)	Blue
4	OUT1	Black

ZS-37-B





Part NO.	Description
ZS-37-A	Straight type 3m
ZS-37-B	Right angle type 3m

Mount bracket: ZS-39-T