

Flow Sensors



Flow Sensor Product Variations

Fluid

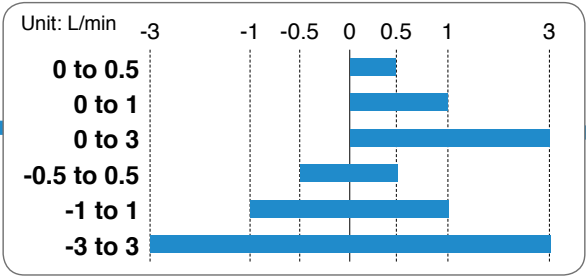
Flow Rate Range

For Air

Thermal type (MEMS)

Dry air, Nitrogen, Argon, CO₂

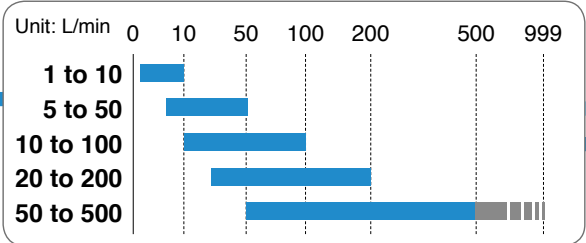
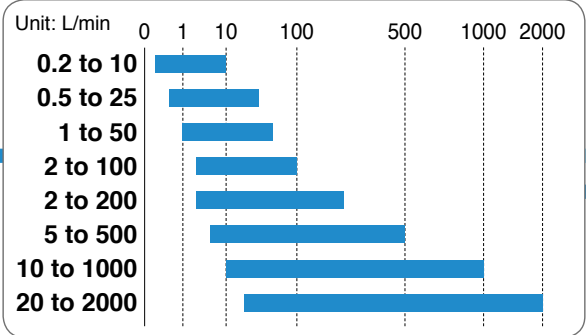
(Air quality grade is JIS B 8392.1-1. 1.2 to 1.6.2, ISO 8573.1-1. 1.2 to 1.6.2.)



For Air

Thermal type (Thermistor)

Air, Nitrogen

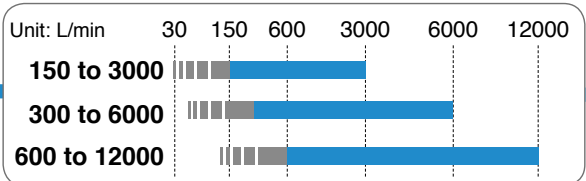


For Water

Karman vortex

Water

Mixture of water 50% + Ethylene glycol 50%

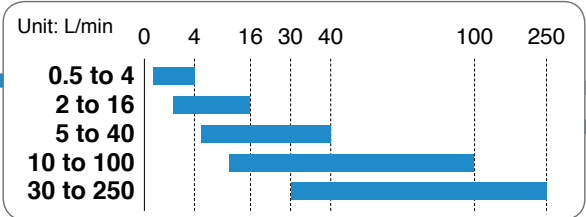


For Water and Water-soluble Coolant

Electromagnetic type

Water

Water-soluble coolant

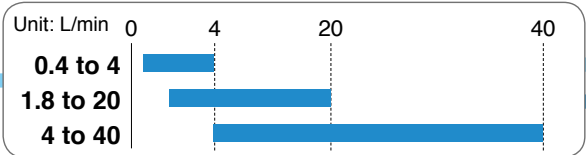
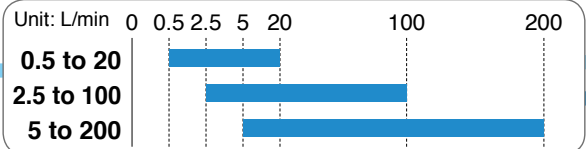


For Deionized Water and Chemical Liquids

Karman vortex

Deionized water

Fluids that does not corrode or osmose the wetted parts (with viscosity 3 mPa·s [3 cP] or less)



Product Type

Integrated Display

Output type

- Switch output
- Analog output
- Digital display

- Sensor/Display integrated type
- Numerically displays the setting and measurement values.

Remote Sensor

Output type

- Analog output

- Sensor only product
- Can be connected to a separate monitor

Remote Monitor

Output type

- Switch output
- Analog output
- Digital display

- Sensor type display
- Numerical control can be placed in a distant location.

Applicable Model

For air	For water	For water and water-soluble coolant	For deionized water and chemical liquids
<ul style="list-style-type: none"> · PF2M7 series · PFM7 series · PFMB7 series · PFMC7 series · PF2A7 series · PF3A7□H series 	<ul style="list-style-type: none"> · PF3W7-Z series · PF3W7 series 	<ul style="list-style-type: none"> · LFE□ series 	<ul style="list-style-type: none"> · PF3W7 series

* The PF2A7 series and PF2A7□□H series are compatible with made-to-order specifications.






<ul style="list-style-type: none"> · PFM5 series · PFMV5 series · PF2A5 series 	<ul style="list-style-type: none"> · PF3W5-Z series · PF3W5 series 	<ul style="list-style-type: none"> · LFE□ series 	<ul style="list-style-type: none"> · PF2D5 series · PF3W5 series
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[For 1 ch] <ul style="list-style-type: none"> · PFG300 series · PFM3 series · PFMV3 series · PF2A3 series 	[For 1 ch] <ul style="list-style-type: none"> · PF3W3 series 	[For 1 ch] <ul style="list-style-type: none"> · LFE0 series 	[For 1 ch] <ul style="list-style-type: none"> · PF2D3 series
[For 4 ch] <ul style="list-style-type: none"> · PF2A2 series 			[For 4 ch] <ul style="list-style-type: none"> · PF2D2 series

Basic Performance Table

Model Selection Table					
Sensors with Displays					
Model	PF2M7	PFM7	PF2A7	PF3A7□H	PFMB7
Fluid	Dry air, N ₂ , Ar, CO ₂		Air, N ₂	Air, N ₂	Dry air, N ₂
Calibration method	Push-button calibration				
Rated flow range	0.1 to 10 L/min 0.3 to 25 L/min 0.5 to 50 L/min 1 to 100 L/min	0.2 to 10 L/min 0.5 to 25 L/min 1 to 50 L/min 2 to 100 L/min	1 to 10 L/min 5 to 50 L/min 10 to 100 L/min 20 to 200 L/min 50 to 500 L/min	30 to 3000 L/min 60 to 6000 L/min 120 to 12000 L/min	2 to 200 L/min 5 to 500 L/min 10 to 1000 L/min 20 to 2000 L/min
Power supply voltage	24 VDC ±10%		12 to 24 VDC ±10%	24 VDC ±10%	12 to 24 VDC ±10%
Temperature characteristics (based on 25°C)	±3% F.S. ±1digit (15 to 35°C) ±5% F.S. ±1digit (0 to 50°C)	±2% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C)	±3% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C) ±2% F.S. (PF2A7□□0, PF2A7□□H: 0 to 50°C)	±5% F.S. (0 to 50°C) [Monitor unit ±0.5% F.S. (0 to 50°C)]	±2% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C)
Repeatability	±1% F.S. ±1digit (Fluid: Dry air) Analog output: ±3% F.S.	±1% F.S. (Fluid: Dry air) Analog output: ±3% F.S.	±1% F.S. (PF2A7□□0, PF2A7□□H) ±2% F.S. (PF2A7□□1)	±1% F.S. [Monitor unit ±0.1% F.S.]	±1% F.S. (Fluid: Dry air)
Hysteresis	Hysteresis mode: Variable Window comparator mode: Variable		Hysteresis mode: Variable Window comparator mode: Fixed (3 digits*1) *1 Digit is min. calibration unit.	Hysteresis mode: Variable Window comparator mode: Variable	
Output	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output		NPN/PNP open collector Accumulated pulse output	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output	
Display	2-color LCD display	2-color display	1-color display	3-color LCD display	2-color LED display 2-color LCD display
Enclosure	IP40		IP65	IP65 [Monitor unit IP40]	IP40
Note	Analog free span function Reversible display mode Delay time setting Flow adjustment valve integrable Selectable flow rate display unit Secret code setting function Display OFF mode Accumulated value hold function	Flow adjustment valve integrable Panel mounting possible DIN rail mountable Selectable flow rate display unit Responses time setting function → All renewed Secret code setting function Power saving mode Accumulated flow display function	Selectable flow rate display unit Accumulated flow display function	2-screen display Display rotates 90° and can be reversed Reference condition Accumulated value hold function	Flow adjustment valve integrable (200 L) Panel mounting possible (200 L) DIN rail mountable (200 L) Selectable flow rate display unit Responses time setting function → All renewed Secret code setting function Power saving mode Accumulated flow display function

Basic Performance Table

Model Selection Table				
Sensors with Displays				
PFMC7 	PF3W-Z 	PF3W-L 	PF3W7 	LFE□  PVC piping type
Dry air, N ₂	Water, ethylene glycol aqueous solution		Water, deionized water, chemicals	Water, water-soluble coolant
5 to 500 L/min 10 to 1000 L/min 20 to 2000 L/min	0.5 to 4 L/min 2 to 16 L/min 5 to 40 L/min 10 to 100 L/min	0.5 to 4 L/min 2 to 16 L/min 5 to 40 L/min 10 to 100 L/min 50 to 250 L/min		10 to 100 L/min 30 to 250 L/min
12 to 24 VDC ±10%		12 to 24 VDC ±10% 18 to 30 VDC ±10%*1 *1 When used as an IO-Link device	12 to 24 VDC ±10%	
±2% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C)	±5% F.S. (0 to 50°C)			±5% F.S.
±1% F.S. (Fluid: Dry air)	±2% F.S.			±2% F.S. (Displayed values) Analog output: ±1.5% F.S.
Hysteresis mode: Variable Window comparator mode: Variable	Variable			
NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output	Analog voltage output Analog current output	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output		NPN/PNP open collector Analog voltage output Analog current output
3-color LCD display	3-color display			
IP65				
Flow adjustment valve integrable Responses time setting function → All renewed Secret code setting function Power saving mode Accumulated flow display function	3-color/2-screen display Selection of display on sub screen Switching of flow direction Responses time setting function Secret code setting function Power saving mode Accumulated flow display function	IO-Link compatible 3-color/2-screen display Selection of display on sub screen Switching of flow direction Responses time setting function Secret code setting function Power saving mode Accumulated flow display function	3-color/2-screen display Selection of display on sub screen Switching of flow direction Responses time setting function Secret code setting function Power saving mode Accumulated flow display function	

Basic Performance Table

Model Selection Table

Remote Sensors and Monitors

Model	Sensor unit	Monitor unit	Sensor unit	Monitor unit	Sensor unit	Monitor unit	
	PFM5	PFM3	PFMV5	PFMV3	PF2A5	PF2A3	PF2A2
Fluid	Dry air, N ₂ , Ar, CO ₂		Dry air, N ₂		Air, N ₂		
Sensor input amount			1 input		1 input		4 inputs
Calibration method	Push-button calibration		Push-button calibration		Push-button calibration		
Rated flow range	0.2 to 10 L/min 0.5 to 25 L/min 1 to 50 L/min 2 to 100 L/min		0 to 0.5 L/min 0 to 1 L/min 0 to 3 L/min		-0.5 to 0.5 L/min -1 to 1 L/min -3 to 3 L/min		1 to 10 L/min 5 to 50 L/min 10 to 100 L/min 20 to 200 L/min 50 to 500 L/min
Power supply voltage	24 VDC ±10%		24 VDC ±10%		12 to 24 VDC ±10%		
Temperature characteristics (25°C reference)	±2% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C)		±2% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C)		±2% F.S. (15 to 35°C) ±3% F.S. (0 to 50°C)		±1% F.S. (15 to 35°C) ±2% F.S. (0 to 50°C) ±2% F.S. (0 to 50°C)
Repeatability	±1% F.S. (Fluid: Dry air) Analog output: ±5% F.S.		±0.1% F.S. (Fluid: Dry air) Analog output: ±0.5% F.S.		±1% F.S. (Fluid: Dry air) Analog output: ±5% F.S.		±0.1% F.S. (Fluid: Dry air) Analog output: ±0.5% F.S. ±1% F.S. (Connected with PF2A3□) ±2% F.S. (Connected with PF2A2□)
Hysteresis	Hysteresis mode: Variable Window comparator mode: Variable		Hysteresis mode: Variable Window comparator mode: Variable		Hysteresis mode: Variable Window comparator mode: Fixed (3 digits*1) *1 Digit is min. calibration unit.		
Output	Analog voltage output Analog current output		NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output		Analog voltage output Analog current output		NPN/PNP open collector Accumulated pulse output
Display	2-color display		2-color display		1-color display		1-color display
Enclosure	IP40		IP40		IP65	IP40	Front only: IP65 The rest: IP40
Note	Flow adjustment valve integrable Panel mounting possible Manifold mountable DIN rail mountable		Panel mounting possible Selectable flow rate display unit Security code setting function Power saving mode Accumulated flow display function		Panel mounting possible Selectable flow rate display unit Security code setting function Power saving mode Auto shift function		Connectable with 4 ch monitor (Analog voltage output only) Selectable flow rate display unit Accumulated flow display function

Basic Performance Table

Model Selection Table

Remote Sensors and Monitors

Sensor unit		Monitor unit	Sensor unit	Sensor unit	Monitor unit	Sensor unit	Monitor unit		PFG300
PF3W5-Z	PF3W5	PF3W3	PF3W5	LFE□	LFE0	PF2D5	PF2D3	PF2D2	PFG300
Water, ethylene glycol aqueous solution			Water, deionized water, chemicals	Water, water-soluble coolant		Deionized water, fluids that dose not corrode or osmose Super PFA.			
		1 input			1 input		1 input	4 inputs	1 input
		Push-button calibration			Push-button calibration		Push-button calibration		Push-button calibration
0.5 to 4 L/min 2 to 16 L/min 5 to 40 L/min 10 to 100 L/min	0.5 to 4 L/min 2 to 16 L/min 5 to 40 L/min 10 to 100 L/min 50 to 250 L/min		10 to 100 L/min 30 to 250 L/min	0.5 to 20 L/min 2.5 to 100 L/min 5 to 200 L/min			0.4 to 4 L/min 1.8 to 20 L/min 4 to 40 L/min		2 to 200 L/min 5 to 500 L/min 10 to 1000 L/min 20 to 2000 L/min 30 to 3000 L/min 60 to 6000 L/min 120 to 12000 L/min
12 to 24 VDC ±10%				24 VDC ±10%		12 to 24 VDC ±10%			
±5% F.S. (0 to 50°C)	±0.5% F.S. (0 to 50°C)	±5% F.S. (0 to 50°C)		±5% F.S.		±5% F.S. (0 to 50°C)	±1% F.S. (15 to 35°C) ±2% F.S. (0 to 50°C)	±2% F.S. (0 to 50°C)	±2% F.S. (0 to 50°C)
±2% F.S.	±0.5% F.S.	±2% F.S.		±1.5% F.S.	±0.5% F.S.	±1% F.S.	±0.5% F.S.	±3% F.S.	±0.5% F.S.
	Variable			Variable			Hysteresis mode: Variable Window comparator mode: Fixed (3 digits*1) *1 Digit is min. calibration unit.		Variable
Analog voltage output Analog current output	NPN/PNP open collector Analog voltage output Analog current output	Analog voltage output Analog current output	Analog voltage output Analog current output	Analog voltage output Analog current output	NPN/PNP open collector Analog voltage output Analog current output	Analog voltage output Analog current output	NPN/PNP open collector Accumulated pulse output		NPN/PNP open collector Analog voltage output Analog current output
	3-color display			3-color display			1-color display	1-color display	2-color display
IP65	Front only: IP65 The rest: IP40	IP65	IP65	IP65	Front only: IP65 The rest: IP40	IP65	IP40	Front only: IP65 The rest: IP40	IP40
Temperature sensor and flow adjustment valve integrable Flow indicator	3-step setting Copy function 3-color/ 2-screen display	Flow indicator		3-color/ 2-screen display		Connectable with 4 ch monitor (Analog voltage output only)	Selectable flow rate display unit Accumulated flow display function		NPN/PNP switch function Input range selection Delay time setting Analog output Free range function Accumulated value hold function Copy function

Digital Flow Sensor Manifold for Water PF3WB/C/S/R Series

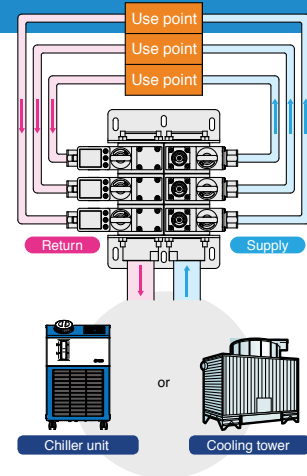
Highly Configurable Layouts

- Up to 10 stations
- Sensor, flow adjustmet valve, stop valves
- IO-Link compatible

Integrated Type

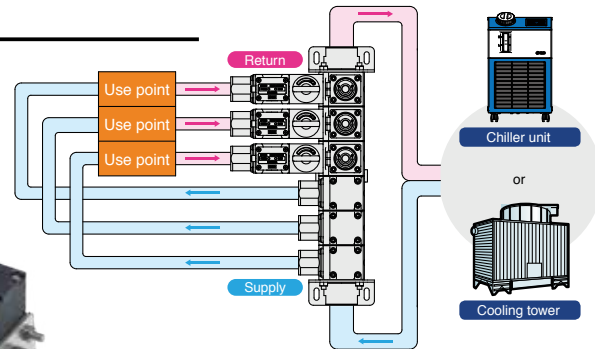
Basic type PF3WB

Space can be saved by integrating the supply and return in one unit.



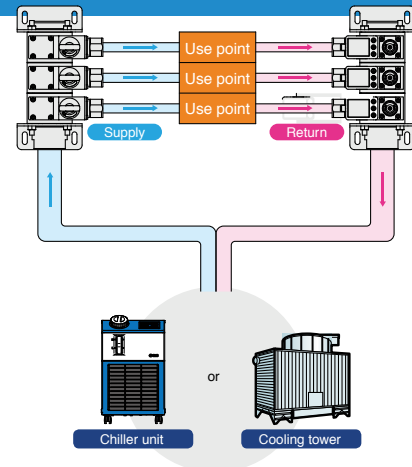
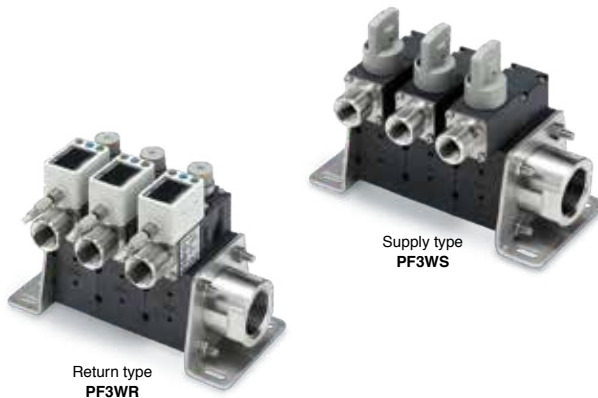
Straight type PF3WC

Space can be saved by integrating the supply and return in on unit. The piping for the supply and return can be arranged in the same direction.



Remote Type

Free layout is possible by separating the supply and return unit.



IO-Link Compatible

3-Color Display Digital Flow Sensor for Water

PF3W-L

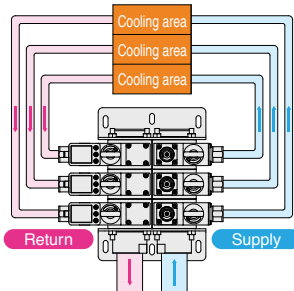
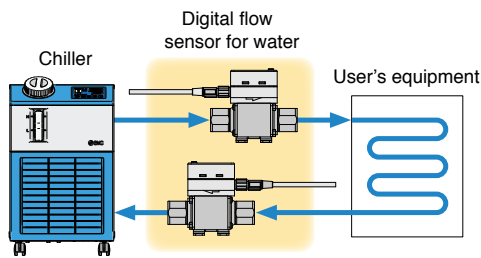


IO-Link Compatible

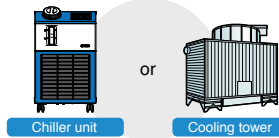
- IO-Link version V1.1
- Process data length 6-byte input
- Transmission speed COM2 (38.4 kbps)
- Minimum cycle time 3.5 ms
- IO-Link port type Class A

For the predictive maintenance of cooling water problems

- Monitors flow rate and temperature's "switch ON/OFF signals" and "analog values" to determine the cooling status
The process and cooling status can be compared.



Digital flow sensor for water/Manifold



Energy Saving Program

For details, refer to the SMC website.

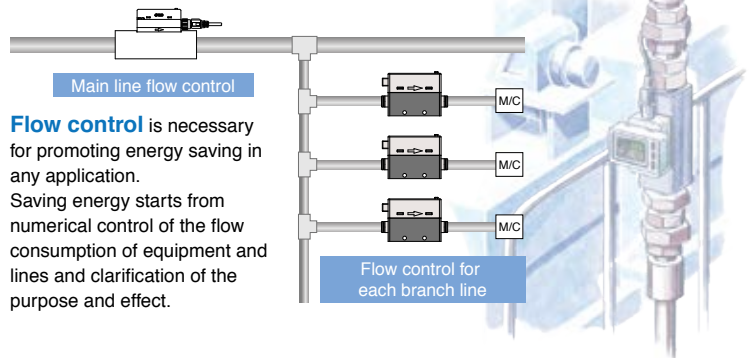


Digital flow sensor to save energy!

3-Color Display Digital Flow Sensor for Large Flow PF3A7□H



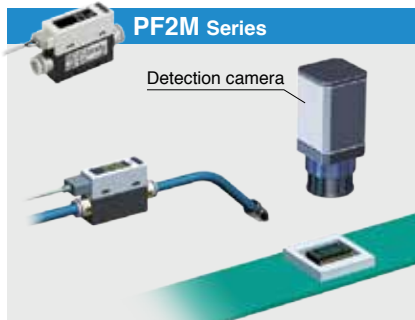
Videos can be viewed here



Flow control is necessary for promoting energy saving in any application. Saving energy starts from numerical control of the flow consumption of equipment and lines and clarification of the purpose and effect.

Applications

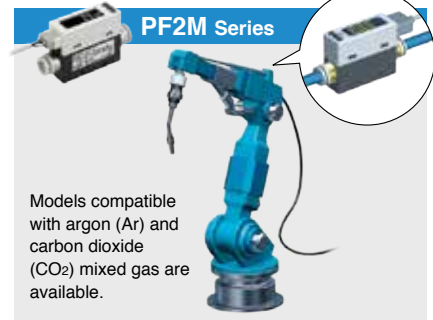
- Flow control of N₂ gas to prevent lead frame oxidation
- N₂ blow prevents distortion of camera image due to air turbulence.



- Accumulated indication shows the operating flow rate or residual amount (of N₂, etc.) in a gas cylinder.

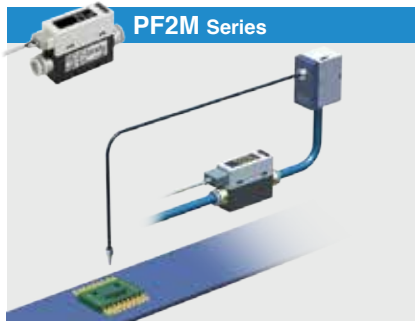


- Welding machine



Models compatible with argon (Ar) and carbon dioxide (CO₂) mixed gas are available.

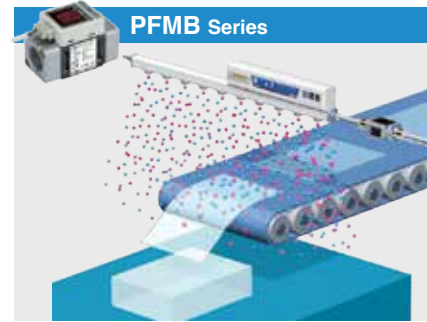
- Control of metal wire tension



- Flow control of the air for spray painting

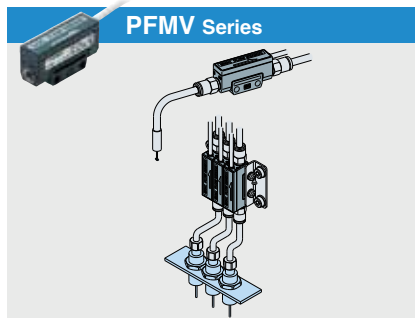


- Control of purge air flow of ionizer

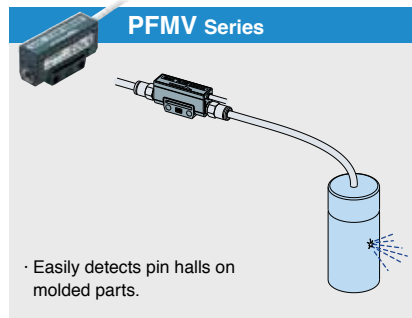


* The product is not designed to be explosion proof.

- Suction verification of very small workpieces

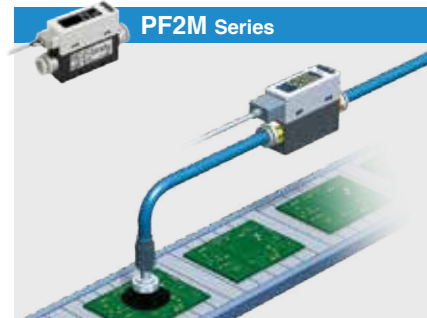


- Easy leak test

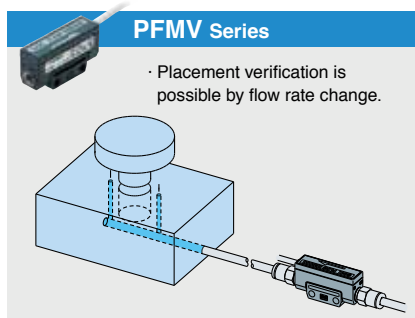


· Easily detects pin holes on molded parts.

- Suction verification

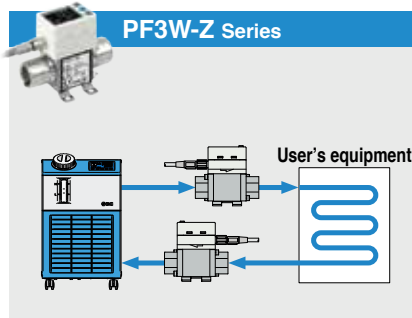


- Easy placement verification



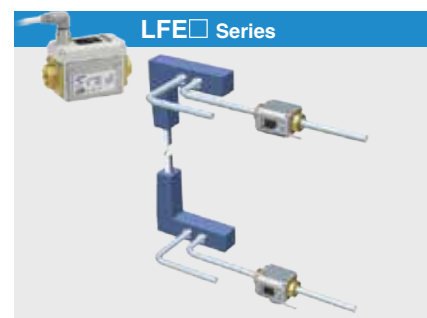
· Placement verification is possible by flow rate change.

- Flow control of the circulating fluid in a chiller



User's equipment

- Flow control for pressurized cooling water for welding guns



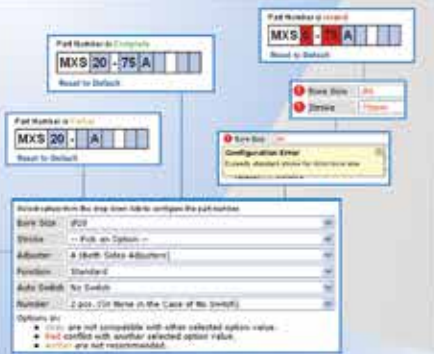


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SMC North American Headquarters, Manufacturing and Central Distribution Facility



Global Products / Local Support

The North American Manufacturing and Central Warehouse expansion has positioned SMC to support sales and growth in the U.S. and Canada.

- 2 million sq. ft. total manufacturing and warehouse space
- Additional investment in warehouse space to increase inventory levels
- Incorporating FTZ area within the expanded warehouse reducing overseas delivery time



Global Manufacturing, Distribution and Service Network

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RUSSIA
SMC Pneumatik LLC.

SLOVAKIA
SMC Priemyselná Automatizácia, Spol s.r.o.

SLOVENIA
SMC Industrijska Avtomatika d.o.o.

SPAIN / PORTUGAL
SMC España, S.A.

SWEDEN
SMC Pneumatics Sweden AB

SWITZERLAND
SMC Pneumatik AG

TURKEY
SMC Pnömatik Sanayi Ticaret ve Servis A.Ş.

UK
SMC Pneumatics (U.K.) Ltd.

ASIA / OCEANIA

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CHINA
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SMC Pneumatics (Guangzhou) Ltd.

HONG KONG
SMC Pneumatics (Hong kong) Ltd.

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JAPAN
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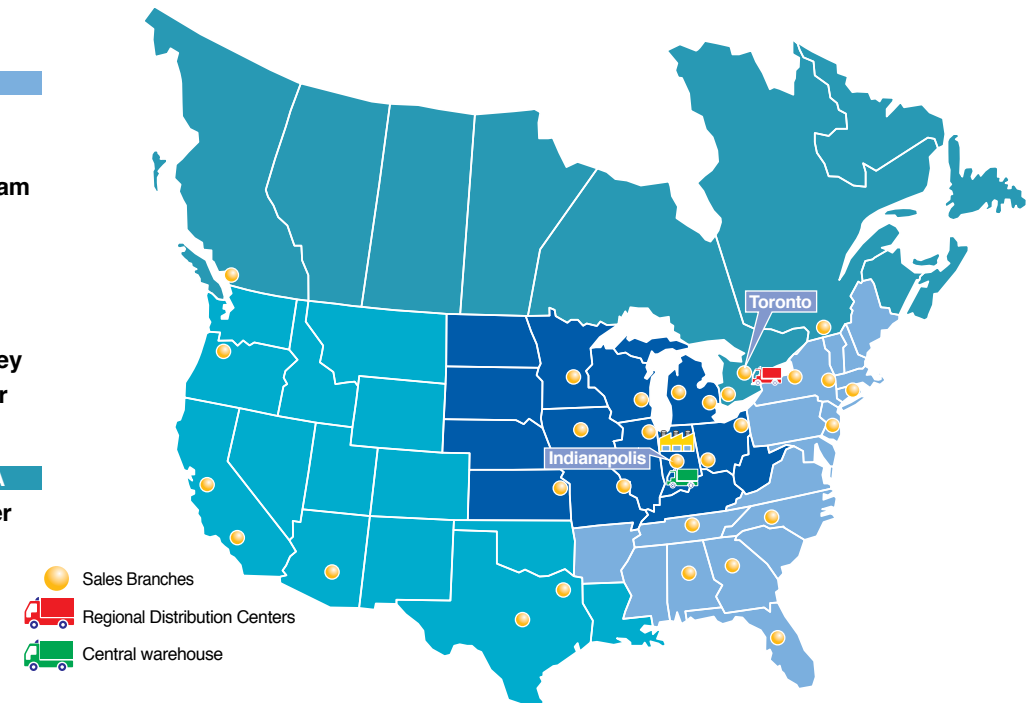
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