



Expertise – Passion – Automation



Moving reliably
Process pumps

[Quick overview](#)

Process pumps

Whatever the application, SMC offers the perfect pump solution for your needs

With a strong heritage in air operated diaphragm pumps, SMC has developed a range of process pumps that are specifically designed to address the key challenges that our customers face.

Our single and double acting process pumps provide a range of benefits including increased efficiency, reliability and performance, thanks to the materials used in construction.

Thanks to our global footprint and network of dedicated support engineers in over 83 countries, we have the products and solutions to meet your requirements.

Specifically designed to meet key industry demands, our comprehensive range of process pumps are designed with our customers' needs in mind. Our range delivers simple operating principles and high levels of reliability. For applications where space is a premium, we offer compact and lightweight designs.

Safety in mind

With the highest safety standards, our range includes pumps for use in atmospheres that may become explosive, due to local and operational conditions, which satisfy ATEX Directive 2014/34/EU.

Compatibility

Constructed to be used among other fluids with chemicals, the range offers a high performance fluororesin pump with non-metallic body parts guaranteeing total compatibility when using with high purity chemicals.

Our solutions are ideal for a range of industry sectors, including water treatment, pulp and paper, chemical, semi-conductor, machine tool and print, paint and varnish applications.

SMC has the solution to reliably move a wide variety of fluids in your industrial processes.

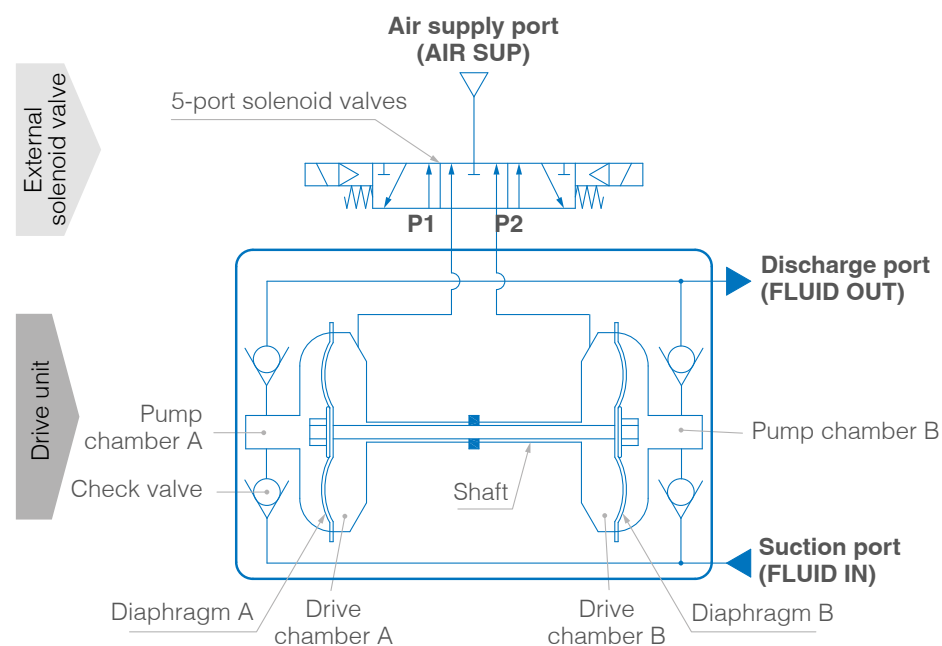


Process pumps	p. 2
Working principle	p. 3
Where to use SMC pumps	p. 4
General specifications	p. 6
Selected part numbers	p. 7
Related products	p. 14
SMC Business Continuity Plan	p. 16

How SMC pumps work

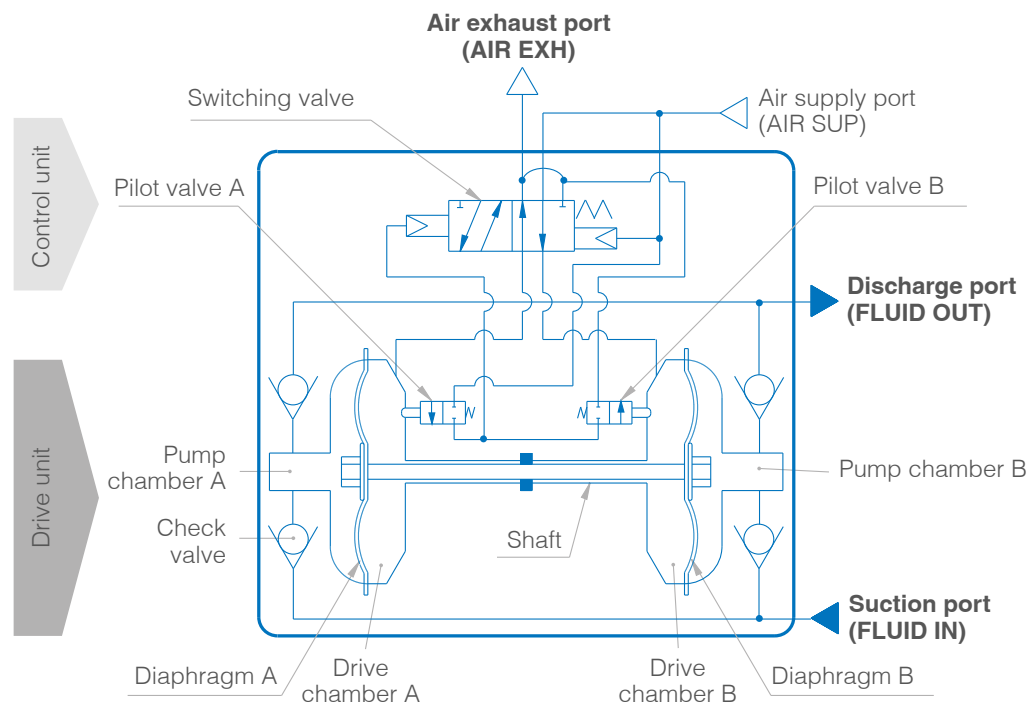
SMC diaphragm pumps are driven by compressed air. The two diaphragms are connected by a shaft, in the **air operated type** when air is supplied to P1 port, it enters drive chamber A moving diaphragm A to the left, and at the same time diaphragm B also moves to the left. The fluid in pump chamber A is forced out to the discharge port, and the fluid is sucked into pump chamber B from the suction port.

If air is supplied to the P2 port, the opposite will occur. Continuous suction and discharge of fluid is performed by repeating this process with the control of an external 5-port solenoid valve.



Within the control unit of the **automatically operated type**, when air is supplied, it passes through an internal switching valve and enters drive chamber B. Diaphragm B moves to the right, and at the same time diaphragm A also moves to the right pushing pilot valve A. When pilot valve A is pushed, air acts upon the switching valve, drive chamber A switches to a supply state, and the air which was in drive chamber B is exhausted to the outside. When air enters drive chamber A, diaphragm B moves to the left pushing pilot valve B. When pilot valve B is pushed, the air which was acting upon the switching valve is exhausted, and drive chamber B once again switches to a supply state. A continuous reciprocal motion is generated by this repetition.

In the drive unit, when air enters drive chamber B, the fluid in pump chamber B is forced out, and at the same time fluid is sucked into pump chamber A. When the diaphragm moves in the opposite direction, the fluid in pump chamber A is forced out, and fluid is sucked into pump chamber B.



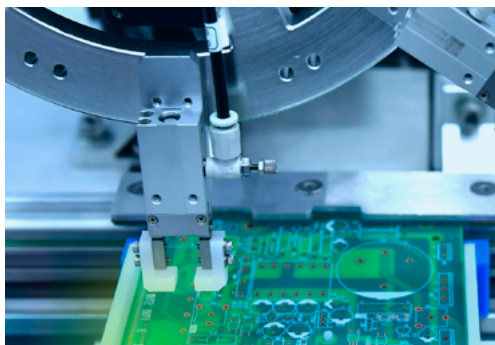
SMC pumps can be used for transferring and dosing liquids in a wide variety of installations in many applications thanks to their simple operating principle, with a compact and reliable system.

SMC diaphragm pumps meet the requirements of a most industry types.

Life Science



Semiconductor



Automotive



Chemical



Machine tools



Pulp & paper



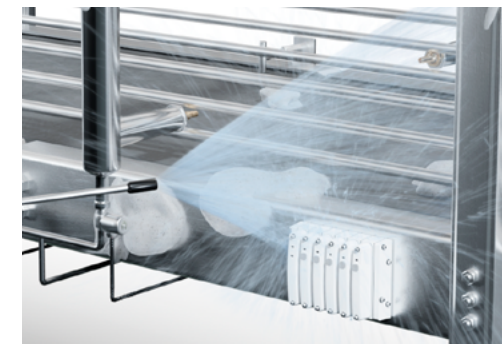
Print, paint & varnish



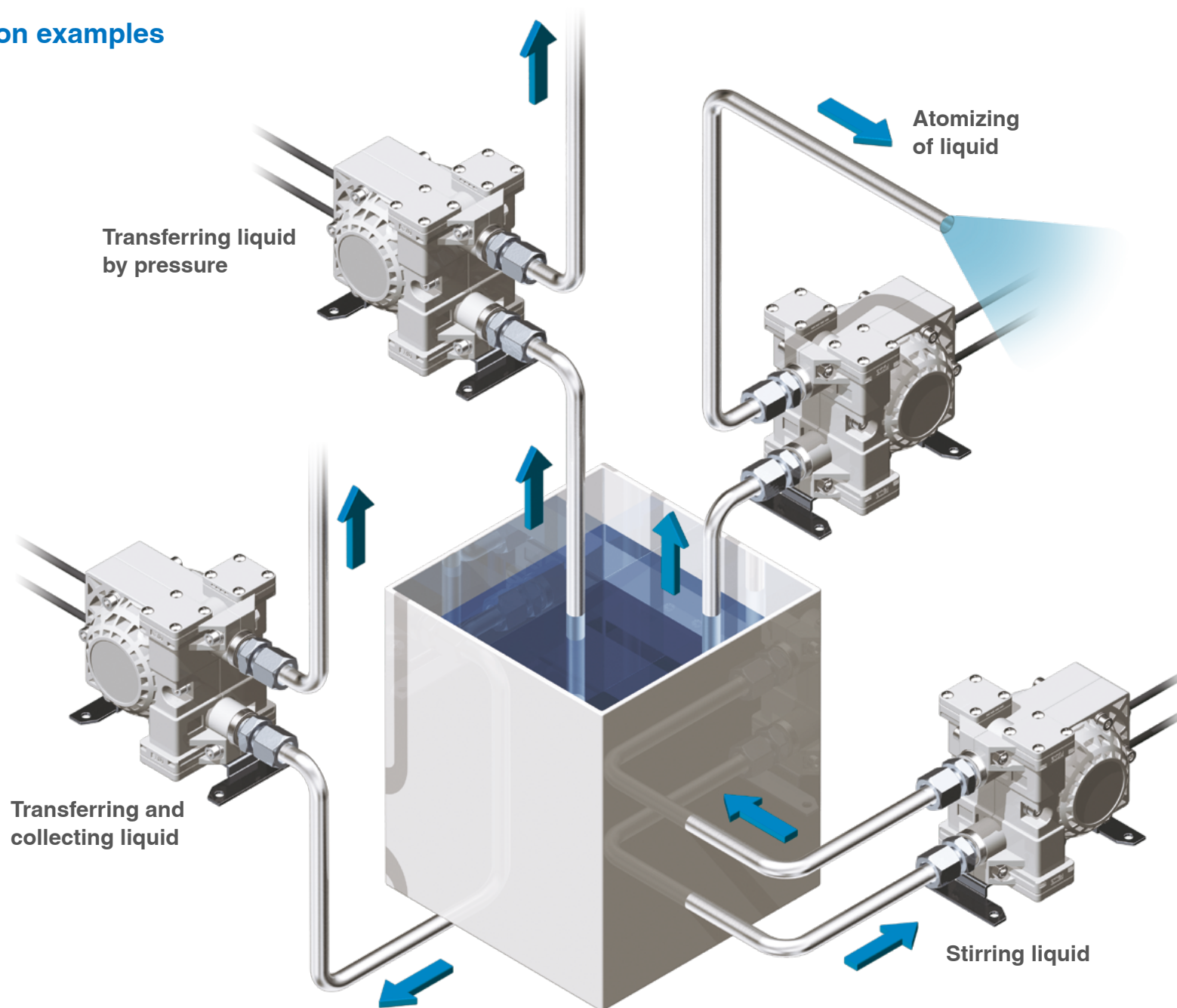
Water treatment



CIP system



Installation examples



Process pumps portfolio

	Discharge rate	Suction lift		Material		Diaphragm life	Operation method	Operating fluid temperature	ATEX compliant
		Dry	Wet	Body wetted areas	Diaphragm				
Single acting diaphragm pump									
PB	Up to 2000 ml/min	Up to 2.5 m	Up to 2.5 m	Polypropylene (PP) Stainless steel (SUS316) New PFA	PTFE	50 million cycles	Air operated type Built-in solenoid valve	0 to 50 °C (No freezing, heat cycle not applied)	No
Double acting diaphragm pump									
PA3000	Up to 20 l/min	Up to 1 m	Up to 6 m	ADC12 SCS14 PP	PTFE NBR	100 million cycles	Automatically operated type Air operated type	0 to 60 °C (with no freezing)	Yes
PA5000	Up to 63 l/min	Up to 2 m				50 million cycles			
PAX1000	Up to 10 l/min								
PA3300	Up to 13 l/min	Up to 0.5 m	Up to 4 m	New PFA	PTFE	—	Automatically operated type Air operated type	0 to 100 °C (with no freezing)	No
PAF3000	Up to 20 l/min	Up to 1 m				50 million cycles		0 to 90 °C (with no freezing)	
PAF5000	Up to 45 l/min								
Solenoid type pump									
LSP	Up to 200 µL per shot	—	—	PEEK PP	EPDM FKM	—	Direct operated	10 to 50 °C (with no freezing)	No

Compact, single acting diaphragm pump

PB Series



- Suitable for transferring and collecting a wide range of fluids
- Built-in solenoid valve or air operated (external switching type)
- Easy to adjust the flow rate by ON/OFF frequency control of the solenoid valve
- Discharge 8 to 2000 ml/min. (for air operated type up to 1000 ml/min)
- Weight 0.11 kg (PB1013A/Air-operated type without foot).

Part number	Operation method	Port size	Wetted parts	Discharge ¹⁾ [ml/min]	Average discharge pressure [MPa]	Pilot air pressure [MPa]
PB1011A-F01	Built-in solenoid valve	G1/8	Polypropylene (PP), stainless steel (SUS316), PTFE, FKM	8 to 2000	0 to 0.6	0.2 to 0.7
PB1013A-F01	Air operated type (external switching type)			8 to 1000 ²⁾		
PB1313A-F01			New PFA, PTFE	8 to 1000	0 to 0.4	0.2 to 0.5

1) The values given for discharge and suction head are for no piping. Values will depend on piping conditions.

2) Applicable up to 2000 ml/min by using a solenoid valve with a large Cv value (Cv value of 0.5 or more).

Compact, double acting diaphragm pump

PA3000 Series



PA5000 Series



- Compact, large capacity diaphragm type pump (PA3000: up to 20 l/min, PA5000: up to 63 l/min)
- Compatible with a wide variety of fluids
- Easy adjustment of discharge pressure and flow rate with control of the pilot air pressure
- Self-priming function makes priming unnecessary.

Part number	Operation method	Port size	Material		Discharge rate [l/min] ¹⁾	Average discharge pressure [MPa]	Pilot air pressure [MPa]		
			Body wetted areas	Diaphragm					
PA3120-F03	Automatically operated type (internal switching type)	G3/8	Aluminium	NBR	1 to 20	0 to 0.6	0.2 to 0.7		
PA3110-F03			Stainless steel	PTFE					
PA3210-F03				NBR					
PA3220-F03									
PA5120-F04		G1/2	Aluminium	PTFE	5 to 50				
PA5110-F04			Stainless steel	NBR					
PA5210-F04				PTFE					
PA5220-F04									
PA5120-F06		G3/4	Aluminium	PTFE	5 to 60				
PA5110-F06			Stainless steel	NBR					
PA5210-F06				PTFE					
PA5220-F06									
PA3113-F03	Air operated type (external switching type)	G3/8	Aluminium	PTFE	0.1 to 12	0 to 0.4	0.1 to 0.5		
PA3213-F03			Stainless steel		1 to 45				
PA5113-F04		G1/2	Aluminium						
PA5213-F04			Stainless steel						
PA5113-F06		G3/4	Aluminium		1 to 50				
PA5213-F06			Stainless steel						
PA5010-F04	Automatically operated type (internal switching type)	1/2	Polypropylene	PTFE	5 to 53	0 to 0.6	0.2 to 0.7		
PA5010-F06		3/4			5 to 63				
PA5013-F04	Air operated type (external switching type)	1/2			1 to 45	0 to 0.4	0.1 to 0.5		
PA5013-F06		3/4			1 to 50				

1) The values are for normal temperatures and when the transferred fluid is fresh water.

Compact, double acting diaphragm pump

PAX1000 Series



- Prevents spraying of discharge and foaming in tank
- Space-saving design eliminates separate piping with built-in pulsation attenuator
- Compatible with a wide variety of fluids.

Part number	Operation method	Port size	Material		Discharge rate [l/min] ¹⁾	Average discharge pressure [MPa]	Pilot air pressure [MPa]
			Body wetted areas	Diaphragm			
PAX1112-F02	Automatically operated type (internal switching type)	G1/4	Aluminium	PTFE	0.5 to 10	0 to 0.6	0.2 to 0.7
PAX1212-F02			Stainless steel				
PAX1112-F03		G3/8	Aluminium				
PAX1212-F03			Stainless steel				

1) The values are for normal temperatures and when the transferred fluid is fresh water.

Fluororesin diaphragm pump

PA3300 Series



- High corrosion resistance:
 - Side body, ports: new PFA
 - Diaphragm/O-rings: PTFE.
- Lightweight and compact
- Clean: you can order your process pump assembled in a clean room environment and double-packaged (PAP331). Side bodies and ports are moulded to achieve a greater reduction of particle generation.

Part number	Assembly environment	Operation method	Port size	Material		Discharge rate [l/min] ¹⁾	Average discharge pressure [MPa]	Pilot air pressure [MPa]	Option
				Body wetted areas	Diaphragm				
PA3310-F03-B	Standard	Automatically operated type (internal switching type)	G3/8	New PFA	PTFE	1 to 13	0 to 0.4	0.2 to 0.5	With foot
PA3313-F03-B		Air operated type (external switching type)				1 to 9			
PAP3313-P11F-B	Clean room	Automatically operated type (internal switching type)	3/8 tube extension			1 to 12			
PAP3310-P11F-B		Air operated type (external switching type)				1 to 9			
PAP3313-P13F-B		Automatically operated type (internal switching type)	1/2 tube extension			1 to 13			
PAP3310-P13F-B									

1) The values are for normal temperatures and when the transferred fluid is fresh water.

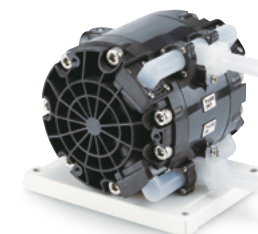


Fluororesin diaphragm pump

PAF3000 Series PAF5000 Series



- High corrosion resistance:
 - Body material: new PFA
 - Diaphragm/Seal material: PTFE
- Lightweight and compact
- No metallic parts are used (metal-free), pump made from fluororesin
- Max. flow rate: 45 l/min (automatically operated).



PAF3000-X68 Series

Part number	Operation method	Port size	Material		Discharge rate [l/min] ¹⁾	Average discharge pressure [MPa]	Pilot air pressure [MPa]	Option	Made to order
			Body wetted areas	Diaphragm					
PAF3410-F03-B	Automatically operated type (internal switching type)	G3/8 female thread	New PFA	PTFE	1 to 20	0 to 0.4	0.2 to 0.5	With foot	—
PAF5410-F06		G3/4 female thread			5 to 45			None	
PAF3413-F03-B	Air operated type (external switching type)	G3/8 female thread			1 to 15			With foot	
PAF5413-F06		G3/4 female thread			5 to 38			None	
PAF3410-P13F-B	Automatically operated type (internal switching type)	1/2 tube extension			1 to 20			With foot	
PAF5410-P19F		3/4 tube extension			5 to 45			None	
PAF3413-P13F-B	Air operated type (external switching type)	1/2 tube extension			1 to 15			With foot	
PAF5413-P19F		3/4 tube extension			5 to 38			None	
PAF3410S-1S13F-B	Automatically operated type (internal switching type)	With nut			1 to 20			With foot	
PAF5410S-1S19F					5 to 45			None	
PAF3413S-1S13F-B	Air operated type (external switching type)				1 to 15			With foot	
PAF5413S-1S19F					5 to 38			None	
PAF3410-F03-B-X68	Automatically operated type (internal switching type)	G3/8 female thread			1 to 20			With foot	X68 (Tightening bolt, air switching valve: Stainless steel)
PAF3410-P13F-B-X68		1/2 tube extension							
PAF3410S-1S13F-B-X68		With nut							

1) The values are for normal temperatures and when the transferred fluid is fresh water.

ATEX compliant pump Compact, double acting diaphragm pump

55/56-PA3000/5000 Series



- ATEX compliant: category 2 (55-PA3000/5000) and category 3 (56-PA3000/5000)
- Compact, large capacity diaphragm type pump (55/56-PA3000:Up to 20 l/min, 55/56-PA5000 up to 45 l/min)
- Compatible with a wide variety of fluids
- Easy adjustment of discharge pressure and flow rate with control of the pilot air pressure.

Part number ²⁾	Operation method	Port size	Material		Discharge rate ¹⁾ [l/min]	Average discharge pressure [MPa]	Pilot air pressure [MPa]	ATEX category
			Body wetted areas	Diaphragm				
56-PA3120-F03	Automatically operated type (internal switching type)	G3/8	Aluminium	NBR	1 to 20	0 to 0.6	0.2 to 0.7	ATEX category 3 - II 3 G
56-PA3110-F03			Stainless steel	PTFE				
56-PA3210-F03				NBR				
56-PA3220-F03			Aluminium					
56-PA5120-F04		Stainless steel	NBR					
56-PA5110-F04			PTFE	5 to 60				
56-PA5210-F04		NBR						
56-PA5220-F04			Aluminium		PTFE			
56-PA5120-F06		G3/4	Aluminium		NBR			
56-PA5110-F06			Stainless steel	PTFE				
56-PA5210-F06				NBR				
56-PA5220-F06			Aluminium		NBR			
56-PA3113-F03	Air operated type (external switching type)	G3/8	Aluminium	PTFE	0.1 to 12	0 to 0.4	0.1 to 0.5	
56-PA3213-F03			Stainless steel					
56-PA5113-F04		G1/2	Aluminium		1 to 45			
56-PA5213-F04			Stainless steel					
56-PA5113-F06		G3/4	Aluminium		1 to 50			
56-PA5213-F06			Stainless steel					

1) The values given for discharge and suction head are for no piping. Values will depend on piping conditions.

2) For ATEX category 2, add the prefix 55- instead of 56-.

Liquid dispense pump

LSP Series



- Dispense volume up to 200 μL
- Repeatability: $\pm 1\%$ ^{1) 2)}
- Adjustment of dispense volume is possible
- Shut-off function
- Self-contained system.

1) $\pm 2\%$ at 5 to 15 μL .

2) Under SMC's measurement conditions.

Part number	Connection	Dispense volume	Coil voltage	Fluid contact material			Port size	
				Body	Diaphragm	Check valve		
LSP132-5A	Base mounted	100 to 200 µl	24 VDC	PEEK	EPDM	EPDM	—	
LSP122-5A		50 to 100 µl						
LSP112-5A		5 to 50 µl			FKM	FKM		
LSP112-5B								
LSP112-5C				PP	EPDM	EPDM		
LSP112-5D					FKM	FKM		
LSP131-5A1	Body ported	100 to 200 µl		PEEK	EPDM	EPDM	M5 thread	
LSP121-5A1		50 to 100 µl						
LSP111-5A1		5 to 50 µl						
LSP131-5B1		100 to 200 µl						FKM
LSP121-5B1		50 to 100 µl						
LSP111-5B1		5 to 50 µl						
LSP131-5A3		100 to 200 µl			EPDM	EPDM	1/4-28UNF thread	
LSP121-5A3		50 to 100 µl						
LSP111-5A3		5 to 50 µl						

Sensors



Digital flow switch for water
PF3W-Z Series



Digital flow switch for deionized water and chemical fluids
PF2D Series



Electromagnetic type digital flow switch
LFE Series



3-screen display high-precision digital pressure switch
ISE7□/ISE7□G/ISE79S Series



3-screen display high-precision digital pressure switch
ISE20C Series



Pressure sensor for general fluids
PSE570 Series



Monitors



Sensor monitor
PSE300AC Series



Digital flow monitor
PFG300 Series



Pressure sensor monitor
PSE300A Series



Multi channel pressure sensor monitor
PSE200A Series



3-screen display, 4-channel flow monitor
PFG200 Series



Filters



Quick change filter
FQ1 Series



Water strainer
WF300 Series



Regulators



Water regulator
WR110 Series



Process valves



Direct operated 2-port solenoid valve

JSX Series



Compact direct operated 2-port solenoid valve

VDW Series



Air operated/External pilot solenoid valve

VNB Series



Zero differential pressure type pilot operated 2-port solenoid valve

JSXZ Series



2-port solenoid valve with built-in Y-strainer

VXK Series



High purity chemical valve

LVA Series



Pilot operated 2-port solenoid valve

JSXD Series



Angle seat valve

JSB Series



Compact type high purity

LVD Series



Fittings and tubing



Stainless steel 316 insert fittings

KFG2 Series



Metal one-touch fittings

KQB2 Series



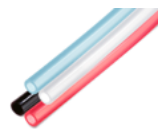
Stainless steel 316 one-touch fittings

KQG2 Series



Fluoropolymer fittings

LQ Series



FEP tubing

TH Series



2-layer fluoropolymer polyurethane tubing

TUL Series



High purity (Super PFA)

TL Series



Discover more on
SMC Business Continuity Plan

Sustainable growth also means ensuring uninterrupted operations

We are committed to ensuring that SMC is prepared for any emergency and that our business activities will not stop in the event of such circumstances. SMC aims to fulfil our product supply responsibilities and maintain our customers' trust by contributing to both sustainable growth and the expansion of technological innovations.

SMC, as a comprehensive manufacturer of automatic control equipment that supports automation, is able to promptly provide products that meet our customers' needs anywhere in the world.

Finance BCP

Safe & Solid financial base

In the event of an emergency, SMC can provide a safe and solid financial base (with cash, deposits, and equity capital) that will sufficiently cover the working capital and funds needed to rebuild buildings and the equipment required for business continuity. This is done to provide peace of mind to our customers and workers alike.

Information security BCP

Vital data kept safe

Strengthen information security for protection against computer viruses and cyberattacks, plus the installation of data centres to establish a disaster recovery system. Your information is safe with us.

Sales BCP

Consistent sales support

7,900 sales engineers worldwide ready to recommend the best solution for you.
Over 80 global locations to make sure that wherever you are, we are there too.

Production BCP

Ensure customer order fulfilment

Reliable delivery for you thanks to our 9 global logistic centres and production sites in 30 countries, 10 of which are located in Europe. Moreover, flexibility to rapidly respond to any sudden change in the manufacturing environment.

**Aiming to gain your trust
Sustainability through
reliability**

Engineering BCP

Consistent technical support

1,700 engineers at our 5 technical centres around the globe (2 in Europe – Germany and UK).



Expertise – Passion – Automation

www.smc.eu

PUMPS-LEAF-B-UK