Process Pump
Automatically Operated Type (Internal Switching Type)
Air Operated Type (External Switching Type)
Series PAF3000

How to Order

Female threaded

PAF341[0]-[ ][03]-[ ]

Actuation Note 1)

Symbol	Actuation
0	Automatically operated
3	Air operated

Thread type Note 2)

Symbol	Type
Nil	Rc
N	NPT
F	G

Port size

Symbol	Port size
03	3/8"

Option

Symbol	Option	Applicable actuation	
		Automatically operated	Air operated
Nil	None	●	●
B	With foot	●	●
N	With silencer	●	—

∗ When more than one option is required, indicate in alphabetical order.

Tube extension

PAF341[0]-P13[ ][ ]-[ ]

Actuation Note 1)

Symbol	Actuation
0	Automatically operated
3	Air operated

Tubing size

Symbol	Main fluid connection size
13	1/2"

Thread type Note 2)

Symbol	Type
Nil	Rc
N	NPT
F	G

Option

Symbol	Option	Applicable actuation	
		Automatically operated	Air operated
Nil	None	●	●
B	With foot	●	●
N	With silencer	●	—

∗ When more than one option is required, indicate in alphabetical order.

With nut

PAF341[0]S-[1]S[13][ ]-[ ]

Actuation Note 1)

Symbol	Actuation
0	Automatically operated
3	Air operated

Fitting type

Symbol	Fitting type
1	LQ1
3	LQ3

Fitting size

Symbol	IN side	OUT side	Fitting type	
			LQ1	LQ3
13	4		●	●
1319	4	5	●	—
1913	5	4	●	—
19	5		●	—

∗ Refer to page 3 for applicable fittings.

Option

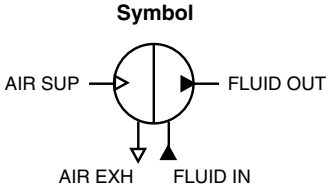
Symbol	Option	Applicable actuation	
		Automatically operated	Air operated
Nil	None	●	●
B	With foot	●	●
N	With silencer	●	—

∗ When more than one option is required, indicate in alphabetical order.

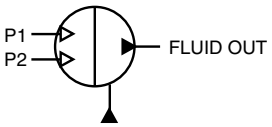
Thread type Note 2)

Symbol	Type
Nil	Rc
N	NPT
F	G

Symbol



Automatically operated type



Air operated type

Note 1) The pilot port size is as follows. Automatically operated type is 1/4"; Air operated type is 1/8".
Note 2) The thread type is applied to the pilot port and female threaded piping connection.
∗1 Refer to page 23 for "Maintenance Parts."
∗2 Refer to pages 21 and 22 for "Related Products."

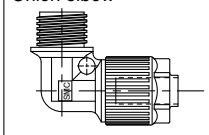
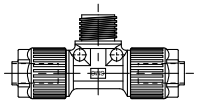
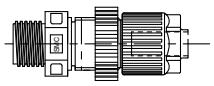
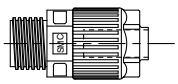
How to Order Fittings for Products with Nut (PAF341□S, PAF541□S Series)

Fittings compatible for the process pump with nut: PAF341□S, PAF541□S.
Product without nut (insert bushing), 1 piece nut removed, which is not necessary in cases when using the products with nut.

LQ1 fitting

LQ1 E 41 – S

- **Fitting type**
- **Applicable tubing size**
- **Nut (including insert bushing), 1 location removed**

E	T
Union elbow 	Union tee 
P	**U**
Panel mount union 	Union 

Metric Size

Class	No.	Applicable tubing size (mm)	∗ Reducing	Applicable process pump	
				PAF341□S	PAF541□S
4	1	12 x 10	○	■	—
4	2	10 x 8	●	■	—
5	1	19 x 16	○	■	■
5	2	12 x 10	●	■	■
6	1	25 x 22	○	—	■
6	2	19 x 16	●	—	■

∗ ○: Basic size ●: With reducer

Inch Size

Class	Symbol	Applicable tubing size (inch)	∗ Reducing	Applicable process pump	
				PAF341□S	PAF541□S
4	A	1/2" x 3/8"	○	■	—
4	B	3/8" x 1/4"	●	■	—
5	A	3/4" x 5/8"	○	■	■
5	B	1/2" x 3/8"	●	■	■
6	A	1" x 7/8"	○	—	■
6	B	3/4" x 5/8"	●	—	■

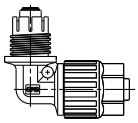
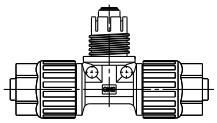
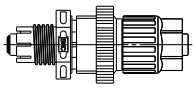
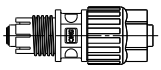
∗ ○: Basic size ●: With reducer

Note) Select the fitting after confirming the IN/OUT side fitting size and fitting type.

LQ3 fitting

LQ3 E 4A – S

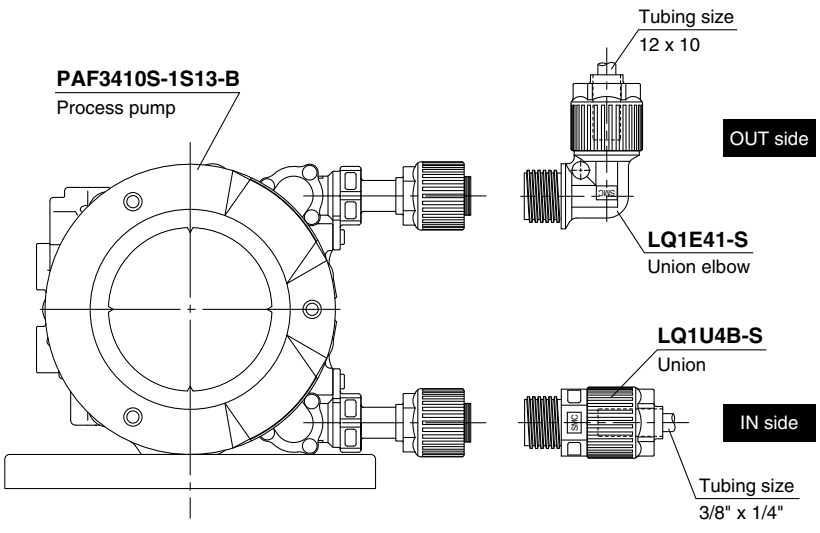
- **Fitting type**
- **Applicable tubing size**
- **Nut, 1 location removed**

E	T
Union elbow 	Union tee 
P	**U**
Panel mount union 	Union 

Class	Symbol	Applicable tubing size (inch)	Applicable process pump	
			PAF341□S	PAF541□S
4	A	1/2" x 3/8"	■	—
5	A	3/4" x 5/8"	—	■

Note) Select the fitting after confirming the IN/OUT side fitting size and fitting type.

Ordering Example

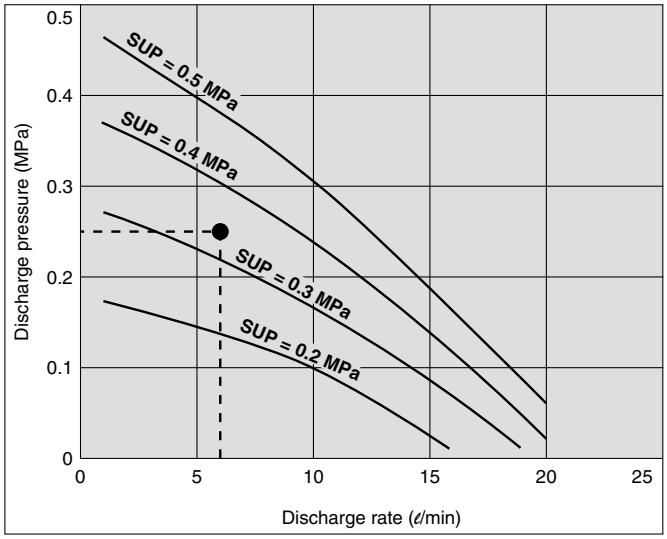


PAF3410S-1S13-B 1
LQ1E41-S (Union elbow) 1
LQ1U4B-S (Union) 1

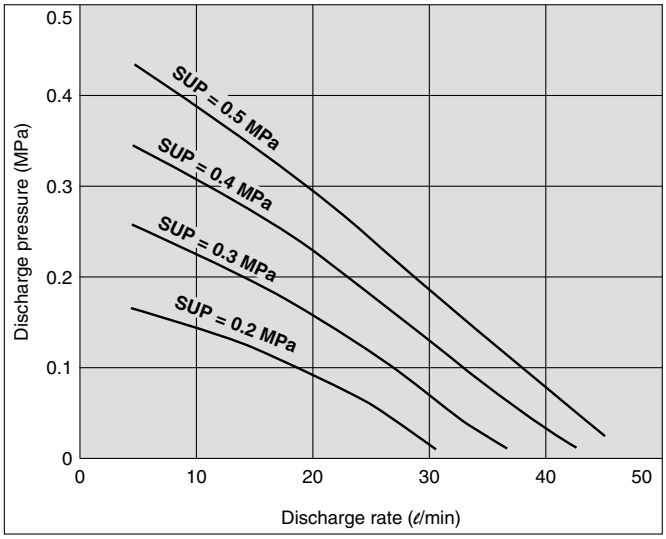
Note) Fittings which are ordered with the process pump at the same time will be shipped in a separate package.

Performance Curve: Automatically Operated Type

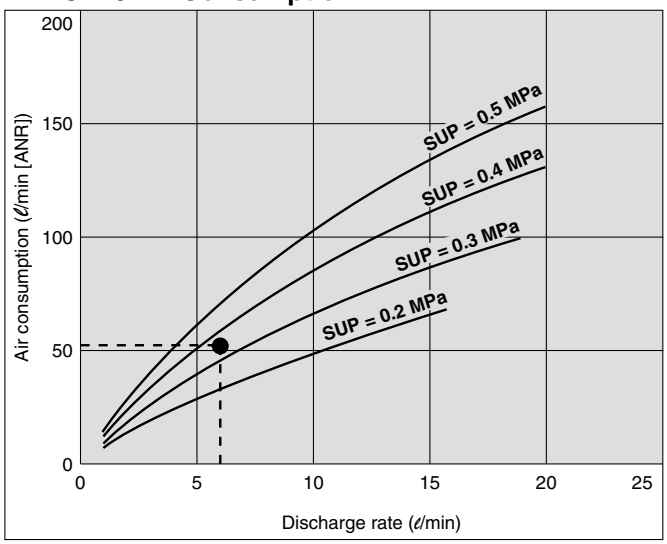
PAF3410 Flow Characteristics



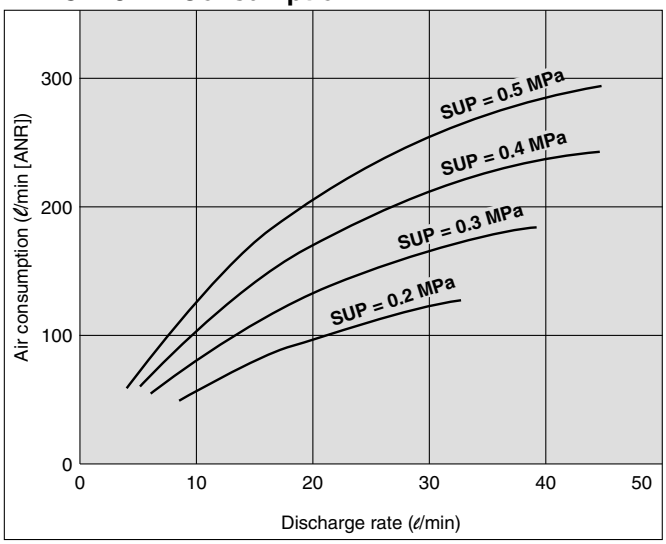
PAF5410 Flow Characteristics



PAF3410 Air Consumption



PAF5410 Air Consumption



Selection from Flow Characteristic Graph (PAF3410)

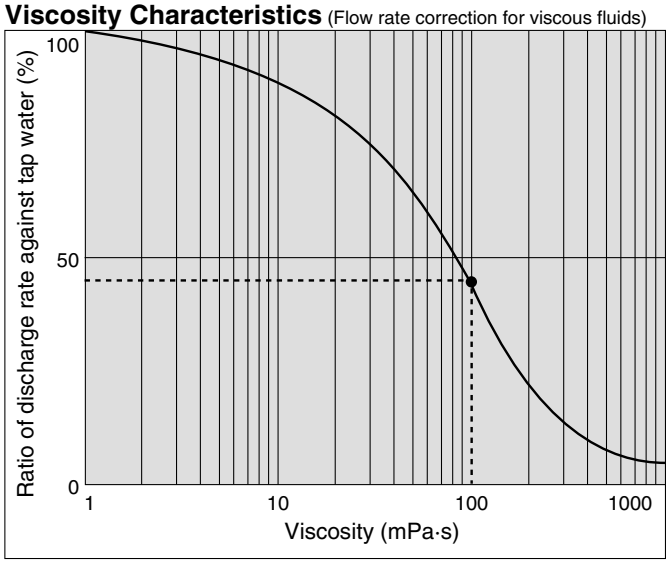
Required specifications example:
Find the pilot air pressure and pilot air consumption for a discharge rate of 6 ℓ/min and discharge pressure of 0.25 MPa. <The transfer fluid is tap water (viscosity 1 mPa·s, specific gravity 1.0).>
∗ If the total lifting height is required instead of the discharge pressure, discharge pressure of 0.1 MPa corresponds to a total lift of 10 m.

Selection procedures:
1. First mark the intersection point for a discharge rate of 6 ℓ/min and discharge pressure of 0.25 MPa.
2. Find the pilot air pressure for the marked point. In this case, the point is between the discharge curves for SUP = 0.3 MPa and SUP = 0.4 MPa, and based on the proportional relationship to these lines, the pilot air pressure for this point is approx. 0.35 MPa.
3. Next, find the air consumption rate. Trace the discharge rate, 6 ℓ/min, up to the point between the discharge curves for SUP = 0.35 MPa, then trace to the Y-axis, finding the air consumption to be around 55 ℓ/min (ANR).

⚠ Caution

① These flow characteristics are for tap water (viscosity 1 mPa·s, specific gravity 1.0).
② The discharge rate differs greatly depending on properties (viscosity, specific gravity) of the fluid being transferred and operating conditions (lifting range, transfer distance), etc.
③ Use 0.75 kW per 100 ℓ/min of air consumption as a guide for the relationship between the air consumption and the compressor.

Viscosity Characteristics (Flow rate correction for viscous fluids)



Selection from Viscosity Characteristic Graph

Required specifications example:
Find the pilot air pressure and pilot air consumption for a discharge rate of 2.7 ℓ/min, discharge pressure of 0.25 MPa, and a viscosity of 100 mPa·s.

Selection procedures:
1. First find the ratio of the discharge rate for tap water when viscosity is 100 mPa·s from the graph on the left. It is determined to be 45%.
2. Next, in the required specification example, the viscosity is 100 mPa·s and the discharge rate is 2.7 ℓ/min. Since this is equivalent to 45% of the discharge rate for tap water, 2.7 ℓ/min ÷ 0.45 = 6 ℓ/min, indicating that a discharge rate of 6 ℓ/min is required for tap water.
3. Finally, find the pilot air pressure and pilot air consumption based on selection from the flow characteristic graphs.

⚠ Caution

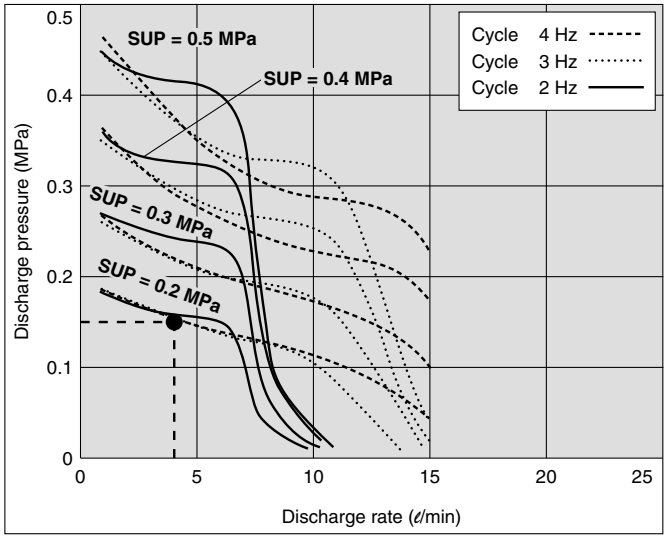
Viscosities up to 1000 mPa·s can be used.
Dynamic viscosity ν = Viscosity μ/Density ρ.

$$\nu = \frac{\mu}{\rho}$$

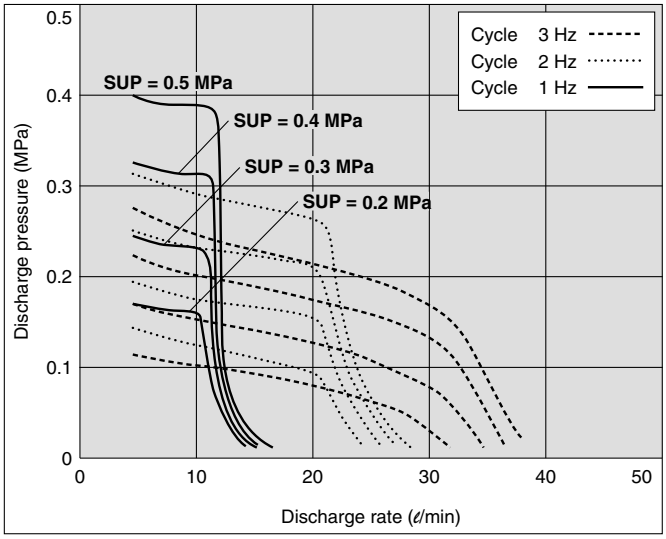
$\nu(10^{-3}\ m^2/s) = \mu(mPa{\cdot}s)/\rho(kg/m^3)$

Performance Curve: Air Operated Type

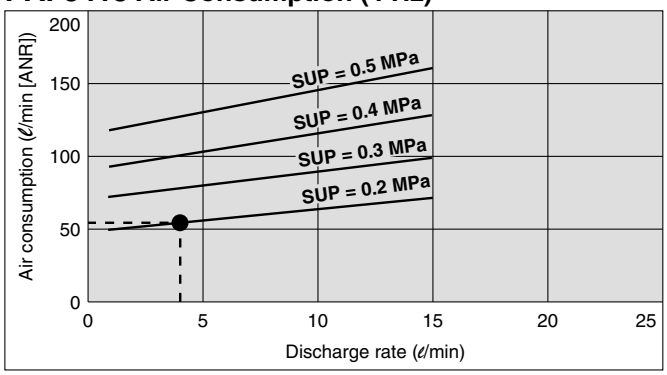
PAF3413 Flow Characteristics



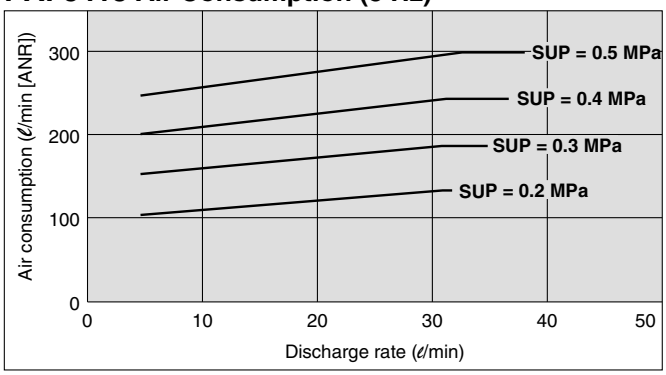
PAF5413 Flow Characteristics



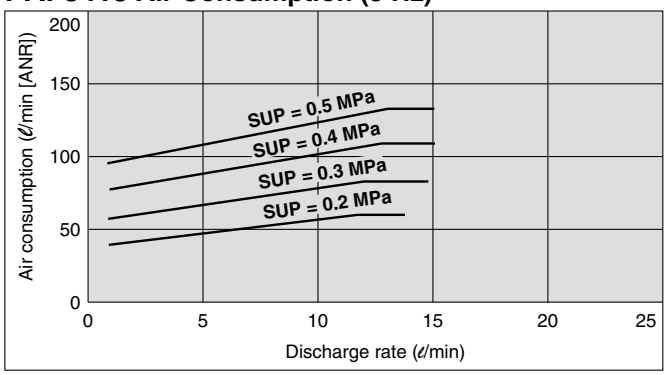
PAF3413 Air Consumption (4 Hz)



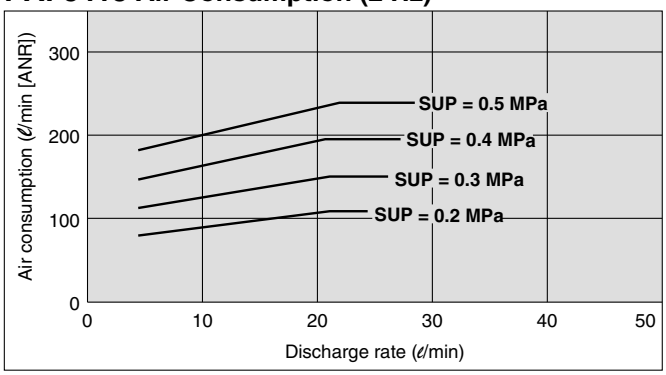
PAF5413 Air Consumption (3 Hz)



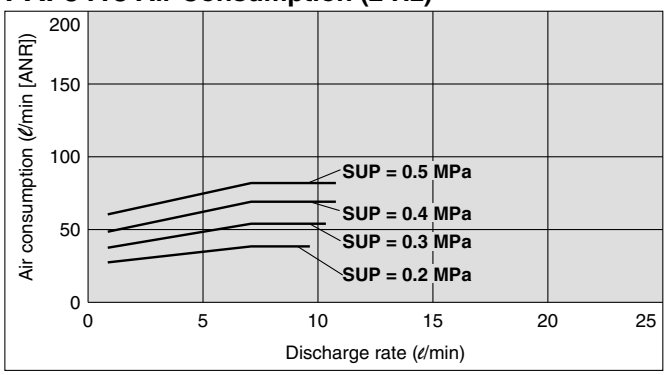
PAF3413 Air Consumption (3 Hz)



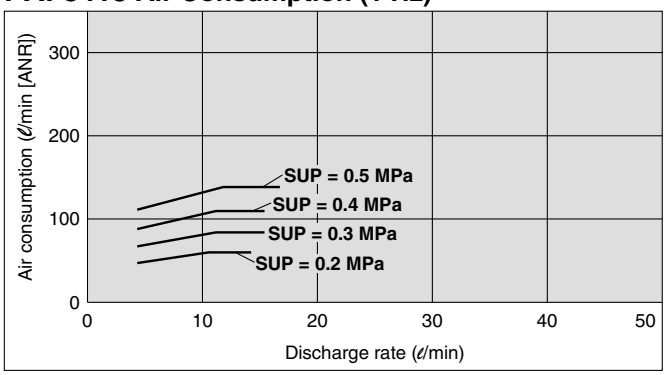
PAF5413 Air Consumption (2 Hz)



PAF3413 Air Consumption (2 Hz)



PAF5413 Air Consumption (1 Hz)



Selection from Flow Characteristic Graph (PAF3413)

Required specification example:
Find the pilot air pressure for a discharge rate of 4 ℓ/min and discharge pressure of 0.15 MPa. <The transfer fluid is tap water (viscosity 1 mPa·s, specific gravity 1.0).>

Note 1) If the total lifting height is required instead of the discharge pressure, discharge pressure of 0.1 MPa corresponds to a total lift of 10 m.
Note 2) Discharge per cycle: Approx. 50 mℓ

Selection procedures:
1. First mark the intersection point for a discharge rate of 4 ℓ/min and discharge pressure of 0.15 MPa.
2. Find the pilot air pressure for the marked point. In this case, the point is between the discharge curves (solid lines) for SUP = 0.2 MPa, and the pilot air pressure for this point is approx. 0.2 MPa.

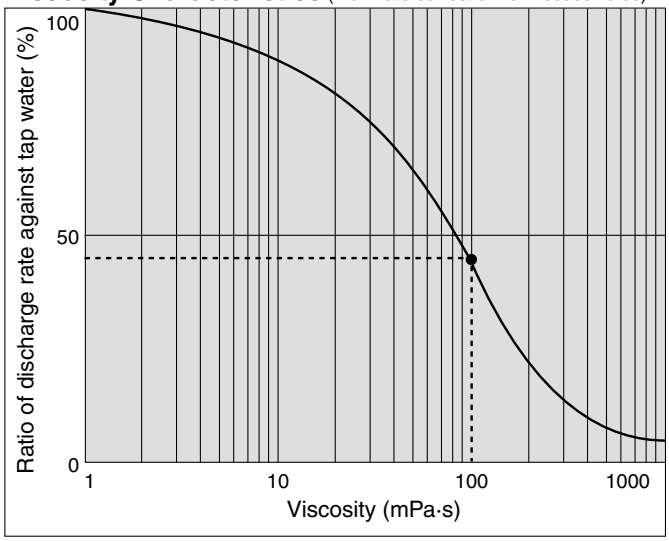
Calculating Air Consumption (PAF3413)

Find the air consumption for operation with a discharge rate of 4 ℓ/min, a 4 Hz switching cycle and pilot air pressure of 0.2 MPa from the air consumption graph.
Selection procedures:
1. Look up from the discharge rate of 4 ℓ/min to find the intersection with SUP = 0.2 MPa.
2. From the point just found, draw a line to the Y-axis to find the air consumption. The result is approx. 54 ℓ/min (ANR).

⚠Caution

① These flow characteristics are for tap water (viscosity 1 mPa·s, specific gravity 1.0).
② The discharge rate differs greatly depending on properties (viscosity, specific gravity) of the fluid being transferred and operating conditions (lifting range, transfer distance).

Viscosity Characteristics (Flow rate correction for viscous fluids)



Selection from Viscosity Characteristic Graph

Required specification example: Find the pilot air pressure for a discharge rate of 2.7 ℓ/min, discharge pressure of 0.25 MPa, and a viscosity of 100 mPa·s.

Selection procedures:
1. First find the ratio of the discharge rate for tap water when viscosity is 100 mPa·s from the graph on the left. It is determined to be 45%.
2. Next, in the required specification example, the viscosity is 100 mPa·s and the discharge rate is 2.7 ℓ/min. Since this is equivalent to 45% of the discharge rate for tap water, 2.7 ℓ/min ÷ 0.45 = 6 ℓ/min, indicating that a discharge rate of 6 ℓ/min is required for tap water.
3. Finally, find the pilot air pressure based on selection from the flow characteristic graphs.

⚠Caution

Viscosities up to 1000 mPa·s can be used.
Dynamic viscosity ν = Viscosity μ/Density ρ.

$$\nu = \frac{\mu}{\rho}$$

$\nu(10^{-3}\ m^2/s) = \mu(mPa{\cdot}s)/\rho(kg/m^3)$

Specifications

PAF3000 Series

Model		PAF3410	PAF3413
Actuation		Automatically operated	Air operated
Port size	**Main fluid: Suction/Discharge port**	Rc, NPT, G 3/8" female threaded, 1/2" tube extension, with nut (size 4, 5)	
	Pilot air: Supply/Exhaust port	Rc, NPT, G 1/4" female threaded	Rc, NPT, G 1/8" female threaded
Discharge flow rate		1 to 20 ℓ/min	1 to 15 ℓ/min
Average discharge pressure		0 to 0.4 MPa	
Pilot air pressure		0.2 to 0.5 MPa (for 0 to 60°C)	
Air consumption		230 ℓ/min (ANR) or less	
Suction lift	**Dry**	Up to 1 m (dry state inside the pump)	
	Wet	Up to 4 m (with fluid inside the pump)	
Noise		80 dB (A) or less (Option: with silencer, AN200)	80 dB (A) or less (not including the noise from the quick exhaust and solenoid valve)
Withstand pressure		0.75 MPa	
Service life		50 million cycles (for water)	
Fluid temperature		0 to 90°C (with no freezing)	
Ambient temperature		0 to 70°C (with no freezing)	
Recommended operation cycle		—	2 to 4 Hz
Mass (without foot bracket)		1.6 kg	1.3 kg
Mounting		Horizontal (bottom mounting)	
Packaging		Clean double packaging	

Note) Values in the table are measured at room temperature using tap water.

PAF5000 Series

Model		PAF5410	PAF5413
Actuation		Automatically operated	Air operated
Port size	**Main fluid: Suction/Discharge port**	Rc, NPT, G 3/4" female threaded, 3/4" tube extension, with nut (size 5, 6)	
	Pilot air: Supply/Exhaust port	Rc, NPT, G 1/4" female threaded	
Discharge flow rate		5 to 45 ℓ/min	5 to 38 ℓ/min
Average discharge pressure		0 to 0.4 MPa	
Pilot air pressure		0.2 to 0.5 MPa (for 0 to 60°C)	
Air consumption		300 ℓ/min (ANR) or less	
Suction lift	**Dry**	Up to 1 m (dry state inside the pump)	
	Wet	Up to 4 m (with fluid inside the pump)	
Noise		80 dB (A) or less (Option: with silencer, AN200)	80 dB (A) or less (not including the noise from the quick exhaust and solenoid valve)
Withstand pressure		0.75 MPa	
Service life		50 million cycles (for water)	
Fluid temperature		0 to 90°C (with no freezing)	
Ambient temperature		0 to 70°C (with no freezing)	
Recommended operation cycle		—	1 to 3 Hz
Mass		6 kg	
Mounting		Horizontal (bottom mounting)	
Packaging		Clean double packaging	

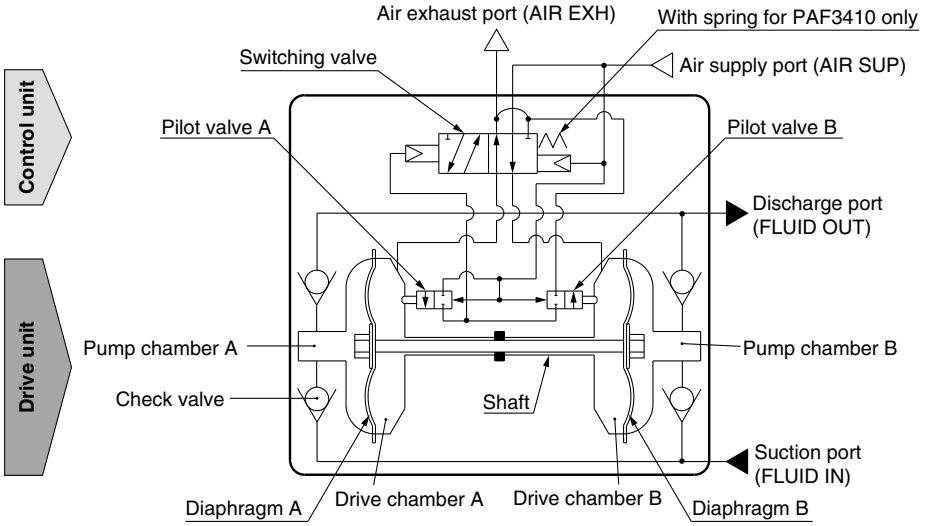
Note) Values in the table are measured at room temperature using tap water.

Tubing Size Applicable for Nut Size

(Tubing size can be altered, using a reducer even within the same nut size.)

Size	Applicable tubing size
4	10 x 8, 12 x 10, 3/8" x 1/4", 1/2" x 3/8"
5	12 x 10, 19 x 16, 1/2" x 3/8", 3/4" x 5/8"
6	19 x 16, 25 x 22, 3/4" x 5/8", 1" x 7/8"

Working Principle: Automatically Operated Type (PAF3410, 5410)



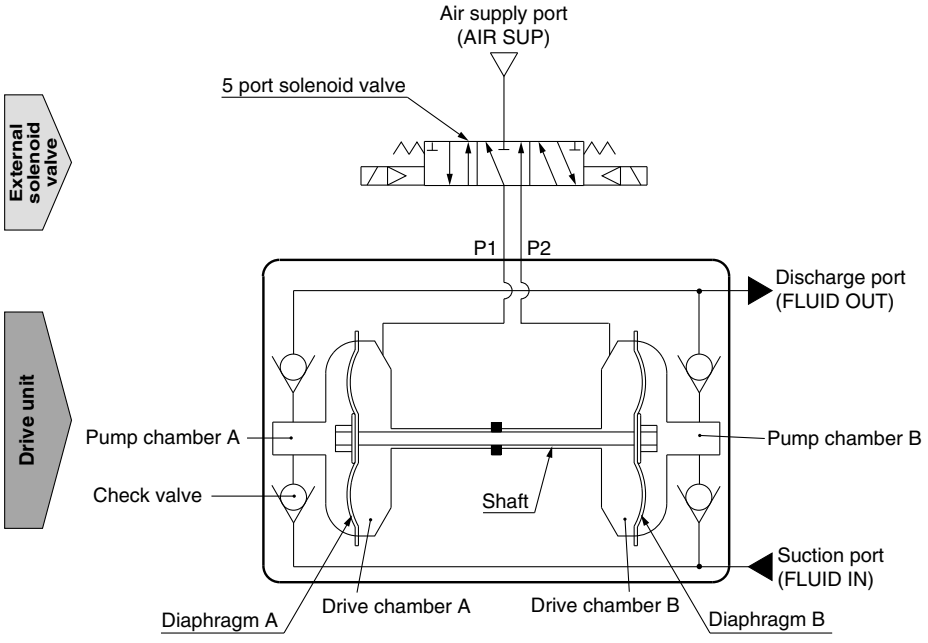
Control unit

① When air is supplied, it passes through the switching valve and enters the drive chamber B.
② The diaphragm B moves to the right, and the diaphragm A also moves to the right simultaneously to push the pilot valve A.
③ When the pilot valve A is pushed, air acts upon the switching valve, the drive chamber A switches to a supply state, and the air which was in the drive chamber B is exhausted to the outside.
④ When air enters the drive chamber A, the diaphragm B moves to the left to push the pilot valve B.
⑤ When the pilot valve B is pushed, the air which was acting upon the switching valve is exhausted, and the drive chamber B once again switches to a supply state. A continuous reciprocal motion is generated by this repetition.

Drive unit

① When air enters the drive chamber B, the fluid in the pump chamber B is forced out, and at the same time fluid is sucked into the pump chamber A.
② When the diaphragm moves in the opposite direction, the fluid in the pump chamber A is forced out, and fluid is sucked into the pump chamber B.
③ Continuous suction and discharge is performed by the reciprocal motion of the diaphragm.

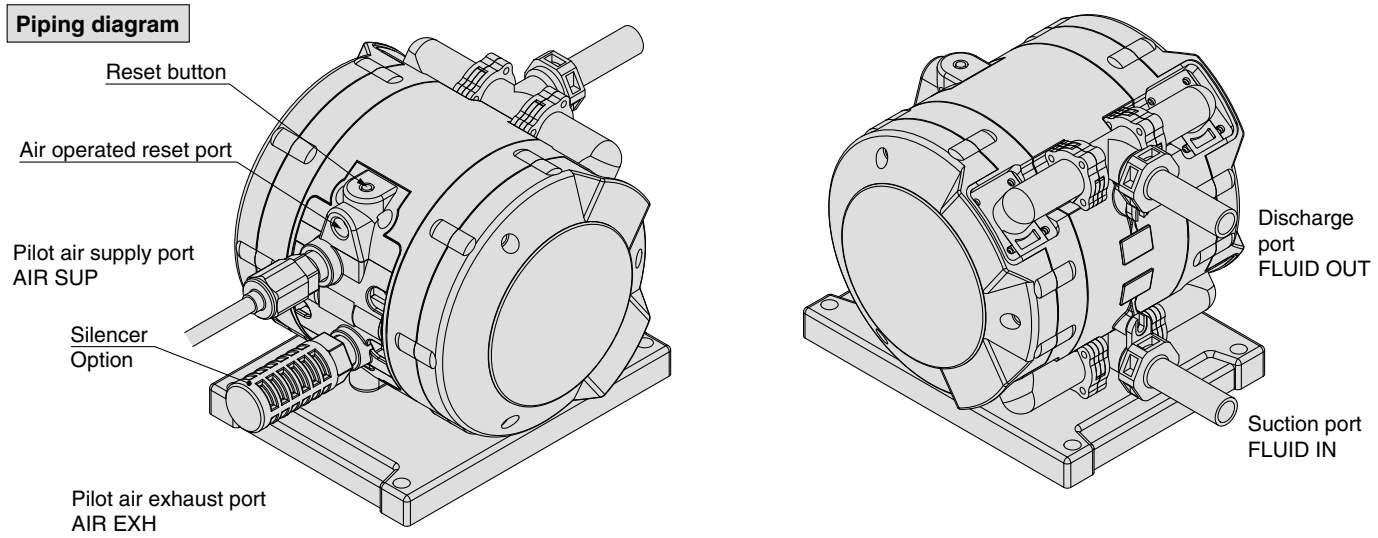
Working Principle: Air Operated Type (PAF3413, 5413)



① When air is supplied to P1 port, it enters the drive chamber A.
② The diaphragm A moves to the left, and the diaphragm B also moves to the left simultaneously.
③ The fluid in the pump chamber A is forced out to the discharge port, and the fluid is sucked into the pump chamber B from the suction port.
④ 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 solenoid valve (5 port valve).

Piping and Operation: Automatically Operated Type (PAF3410, 5410)

Piping diagram



⚠Caution

Mounting posture of the pump is set with the mounting bracket facing downward. Air to be supplied to the air supply port <AIR SUP> should be cleaned and filtered through a filter, or a mist separator etc. Air with foreign matter or drainage etc. will have negative effects on the built-in solenoid valve and will lead to malfunction. Maintain the proper tightening torque for fittings and mounting bolts, etc. Looseness can cause problems such as fluid and air leaks, while over tightening can cause damage to threads and parts, etc.

Operation

<Starting and Stopping> Refer to circuit example (1).

1. Connect air piping to the air supply port <AIR SUR> and connect piping for the fluid to be transferred to the suction port <FLUID IN> and the discharge port <FLUID OUT>.
2. Using a regulator, set the pilot air pressure within the range of 0.2 to 0.5 MPa. Then, the pump operates when power is applied to the 3 port solenoid valve of the air supply port <AIR SUP>, the exhaust noise begins from the air exhaust port <AIR EXH> and fluid flows from the suction port <FLUID IN> to the discharge port <FLUID OUT>.
   At this time, the ball valve on the discharge side is in an open state. The pump performs suction with its own power even without priming. (Dry state suction lifting range: Max. 1 m) To restrict the exhaust noise, attach a silencer (AN200-02: option) to the air exhaust port <AIR EXH>.
3. To stop the pump, exhaust the air pressure being supplied to the pump by the 3 port solenoid valve of the air supply port <AIR SUP>. The pump stops even when the ball valve on the discharge side is closed. But the pressure supply to the pump should be exhausted quickly.

<Discharge Flow Rate Adjustment>

1. Adjustment of the flow rate from the discharge port <FLUID OUT> is performed with the ball valve connected on the discharge side or the throttle connected on the air exhaust side. For adjustment from the air side, use of the needle valve restrictor connected to the air exhaust port <AIR EXH> is effective. Refer to circuit example (1).
2. When operating with a discharge flow rate below the specification range, provide a bypass circuit from the discharge side to the suction side to ensure the minimum flow rate inside the process pump. With a discharge flow rate below the minimum flow rate, the process pump may stop due to unstable operation. Refer to circuit example (2). (Minimum flow rates: PAF3000 1 ℓ/min, PAF5000 5 ℓ/min)

<Reset Button>

Press the reset button by 3 to 4 mm when the pump does not start even though air is supplied.

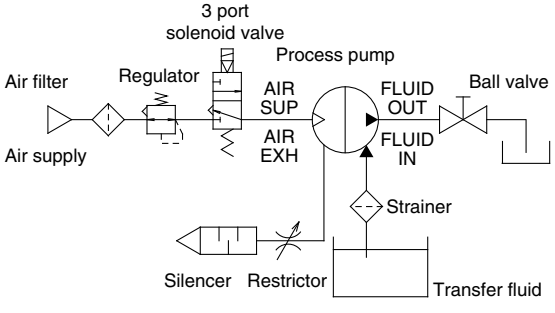
<Air-operated Reset Port>

It is possible to restart by supplying air to the air-operated reset port by remote control, without pressing the reset button directly. Reset air requires equal or greater pressure (less than 0.5 MPa, however) than pilot air. Refer to air-operated reset circuit examples (1) (2).

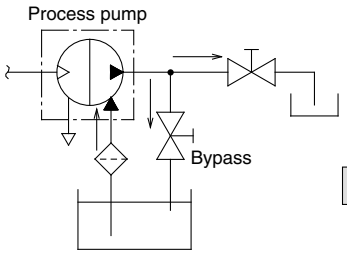
<Operation Count: PAF3000 only>

It is possible to keep track of the number of times the pump has been operated by connecting a pressure switch to the air-operated reset port. The distance between the pressure switch and the air-operated reset port should not exceed 50 mm. Refer to the air-operated reset circuit example (1).

Circuit example (1)

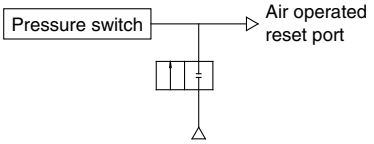


Circuit example (2)

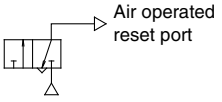


Air operated reset

Circuit example (1) [PAF3000]



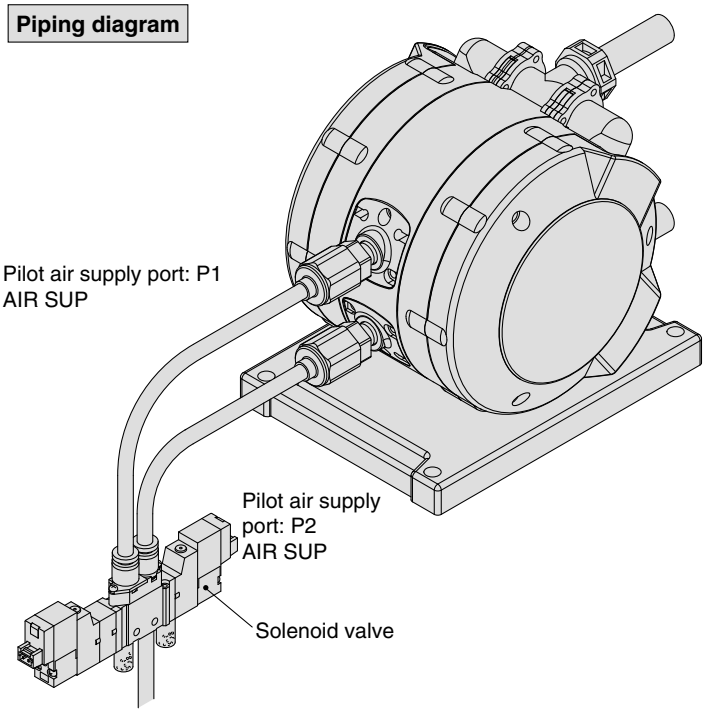
Circuit example (2) [PAF5000]

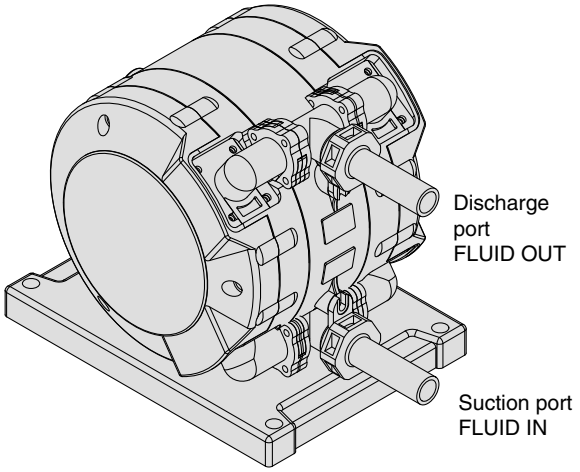


For the related products, refer to pages 21, 22.

Piping and Operation: Air Operated Type (PAF3413, 5413)

Piping diagram





Recommended Valve

PAF3413	VQZ14□0 (Exhaust center)
PAF5413	VQ44□0 (Exhaust center)

Refer to page 21 for further details.

⚠ Caution

Maintain the proper tightening torque for fittings and mounting bolts, etc. Looseness can cause problems such as fluid and air leaks, while over tightening can cause damage to threads and parts, etc.

Operation

<Starting and Stopping> Refer to circuit examples.

1. Connect air piping Note 1) to the pilot air supply port <P1>, <P2> and connect piping for the fluid to be transferred to the suction port <FLUID IN> and the discharge port <FLUID OUT>.
2. Using a regulator, set the pilot air pressure within the range of 0.2 to 0.5 MPa. Then, the pump operates when power is applied to the solenoid valve Note 2) of the pilot air supply port and fluid flows from the suction port <FLUID IN> to the discharge port <FLUID OUT>. At this time, the ball valve on the discharge side is in an open state. The pump performs suction with its own power even without priming. Note 3) (Dry state suction lifting range: Max. 1 m) To restrict the exhaust noise, attach a silencer to the solenoid valve air exhaust port.
3. To stop the pump, exhaust the air pressure being supplied to the pump with the solenoid valve of the air supply port.

Note 1) When used for highly permeable fluids, the solenoid valve may malfunction due to the gas contained in the exhaust. Implement measures to keep the exhaust from going to the solenoid valve side.

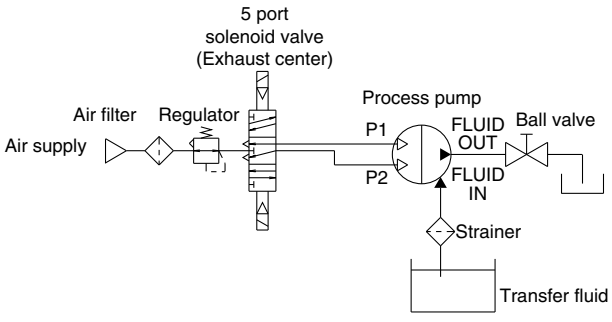
Note 2) For the solenoid valve, use an exhaust center 5 port valve, or a combination of residual exhaust 3 port valve and a pump drive 4 port valve. If air in the drive chamber is not released when the pump is stopped, the diaphragm will be subjected to pressure and its life will be shortened.

Note 3) When the pump is dry, operate the solenoid valve at a switching cycle of 2 to 4 Hz for the PAF3000, 1 to 3 Hz for the PAF5000. If operated outside of this range, the suction lifting height may not reach the prescribed value.

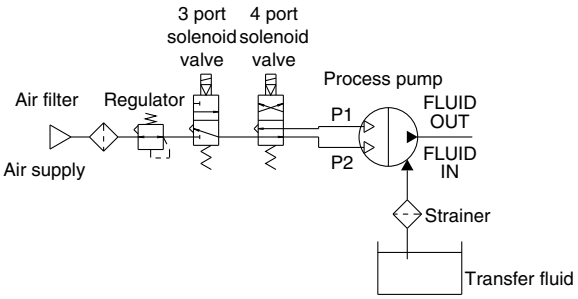
<Discharge Flow Rate Adjustment>

1. The flow rate from the discharge port <FLUID OUT> can be adjusted easily by changing the switching cycle of the solenoid valve on the air supply port.

Circuit example (1)



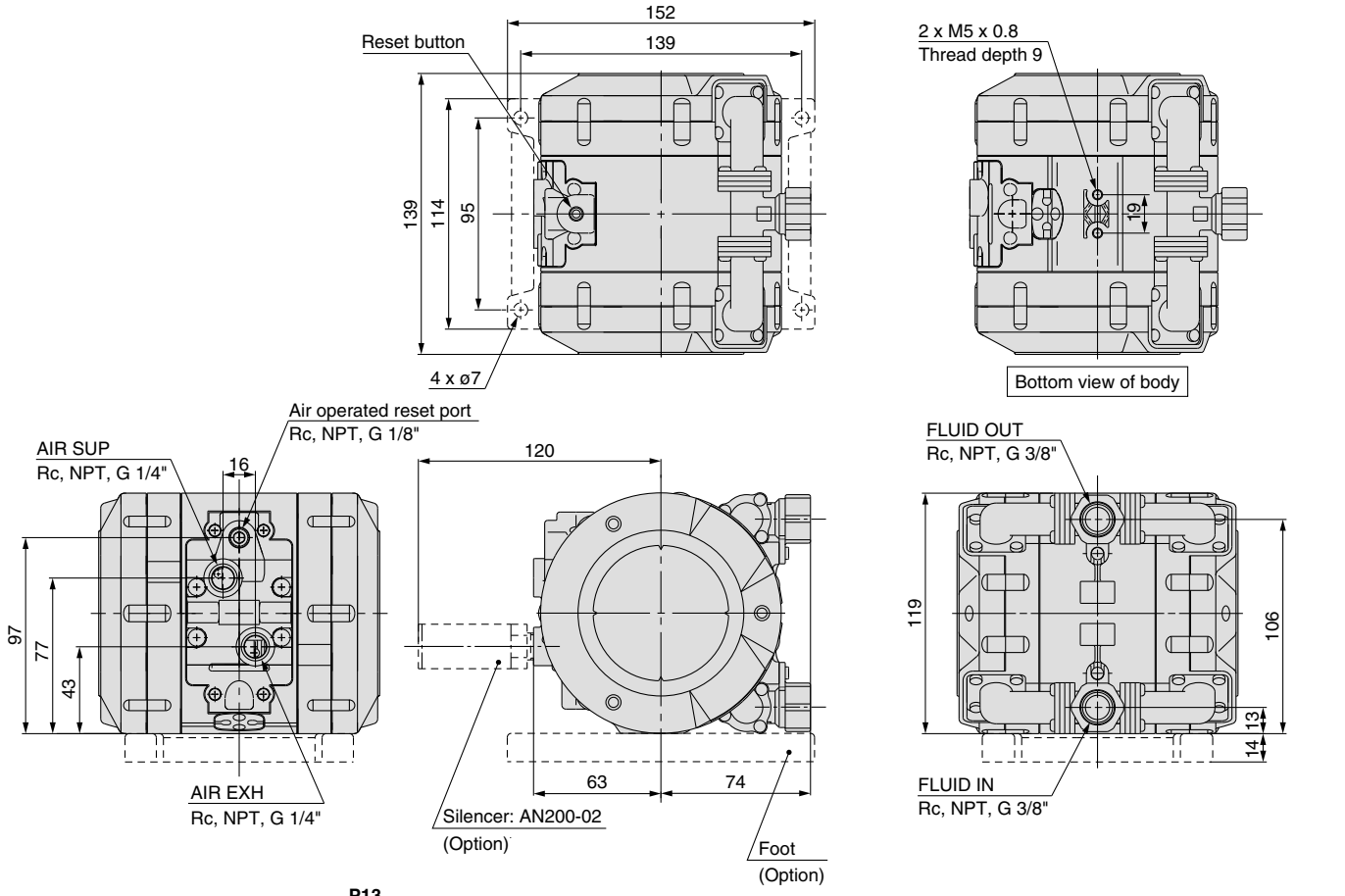
Circuit example (2)



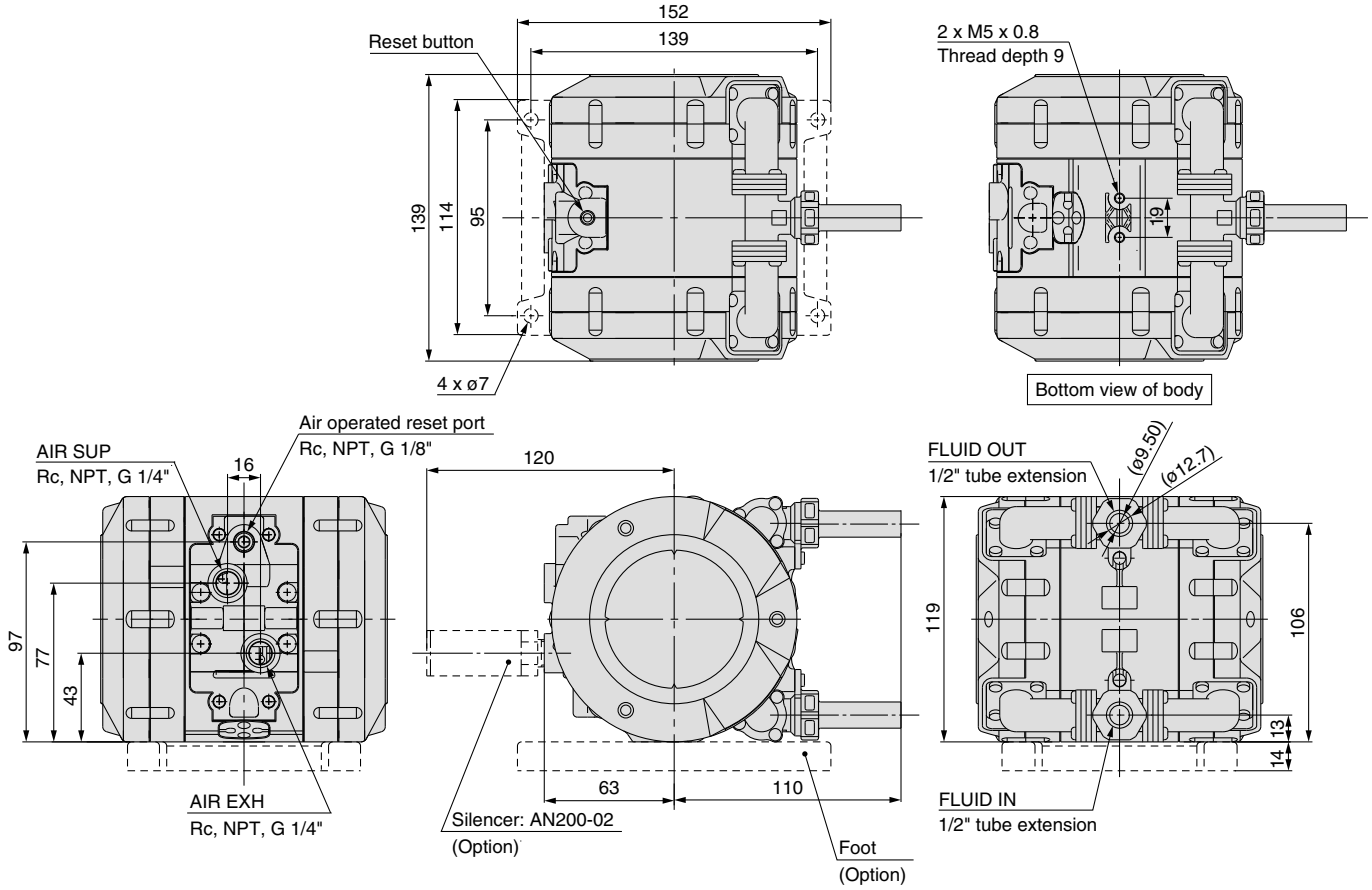
For the related products, refer to pages 21, 22.

Dimensions: Automatically Operated Type (PAF3000 Series)

Female threaded: PAF3410-$^{03}_{N03}_{F03}$

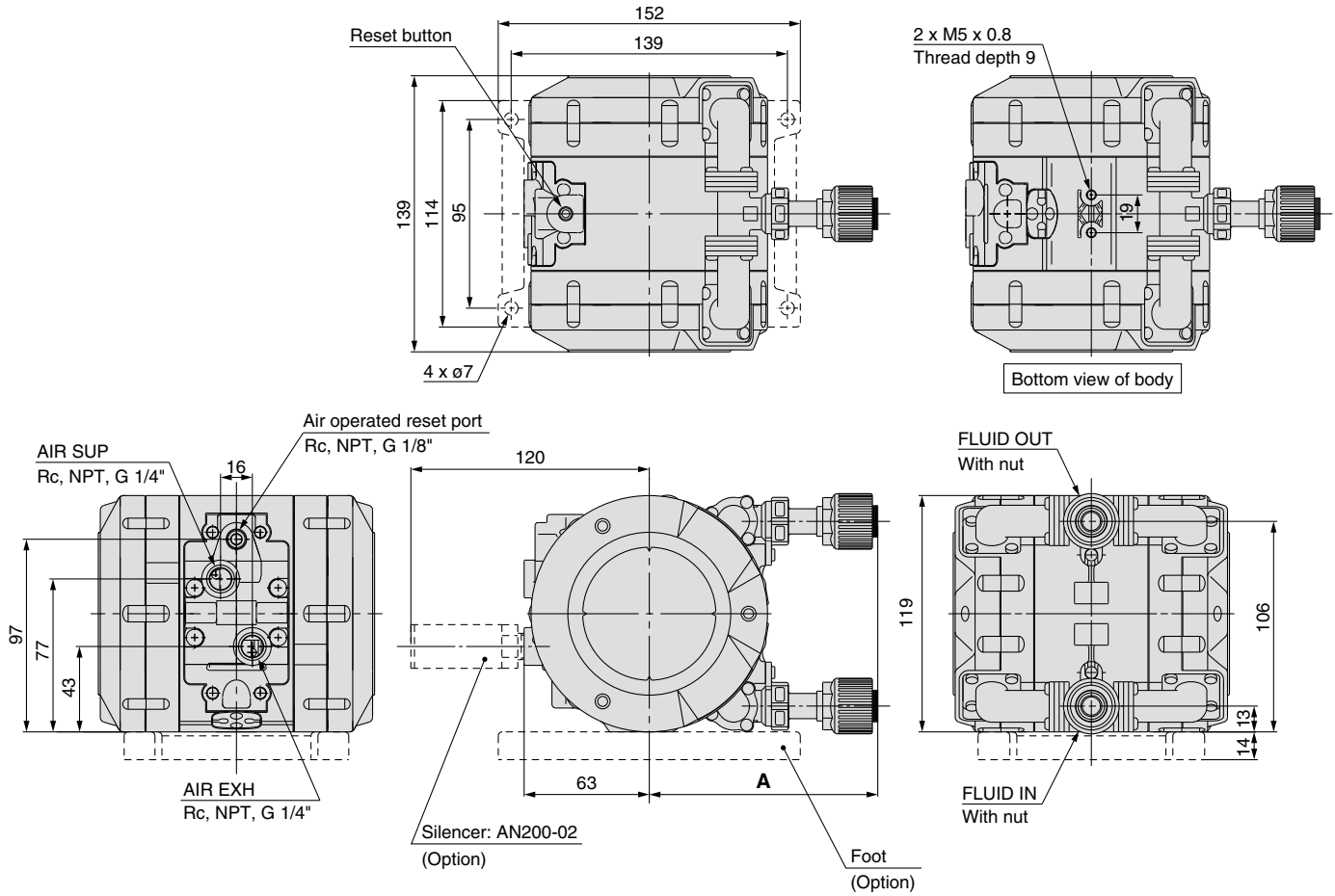


Tube extension: PAF3410-$^{P13}_{P13N}_{P13F}$



Dimensions: Automatically Operated Type (PAF3000 Series)

With nut (with LQ1 fitting): PAF3410S-$^{1S13\square}_{1S19\square}$



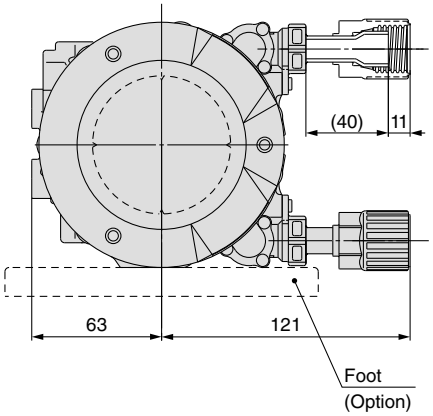
(mm)

Model	A
PAF3410S-1S13□	115
PAF3410S-1S19□	118

Tubing Size Applicable for Nut Size
(Tubing size can be altered, using a reducer even within the same nut size.)

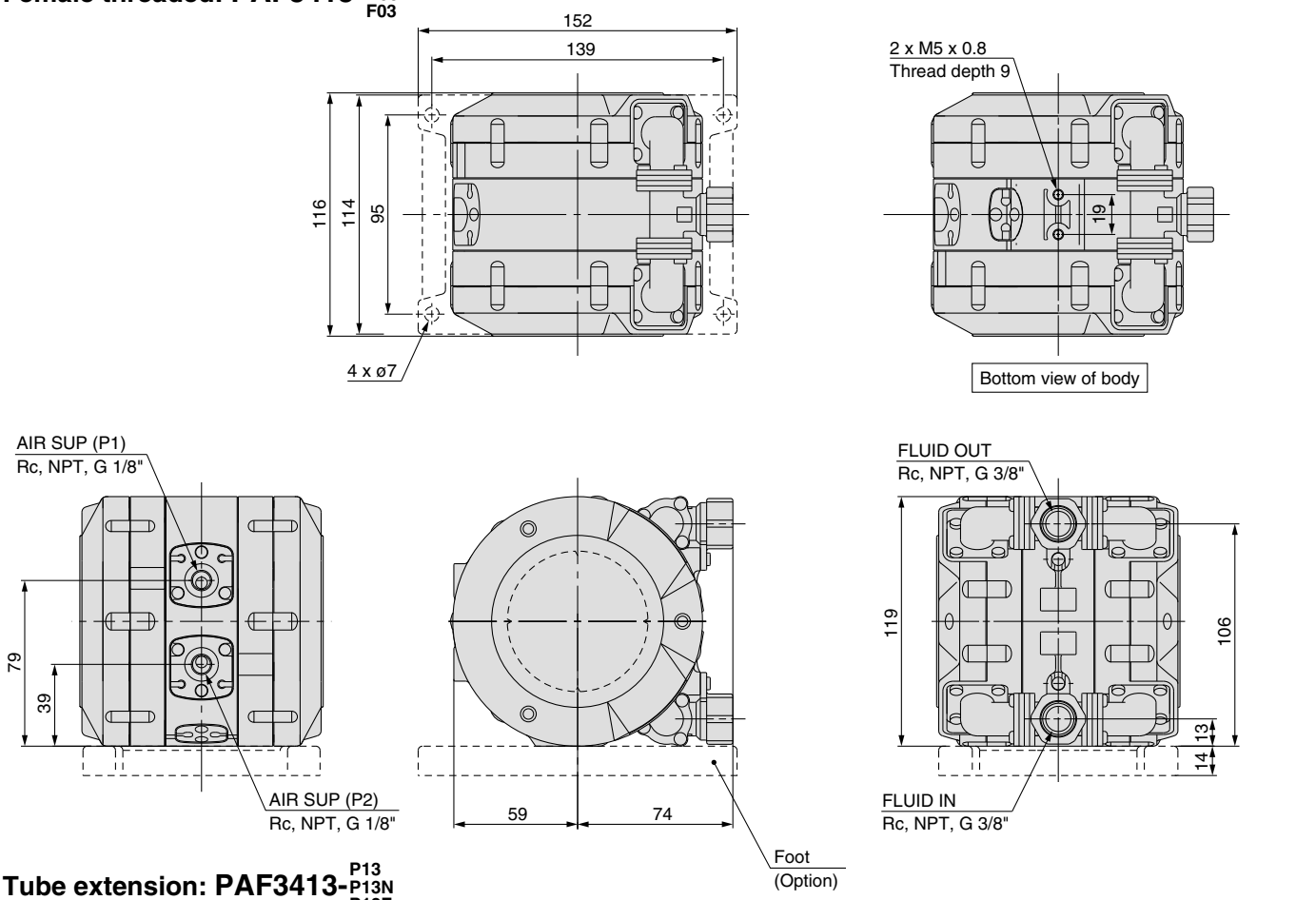
Size	Applicable tubing size
4	10 x 8, 12 x 10, 3/8" x 1/4", 1/2" x 3/8"
5	12 x 10, 19 x 16, 1/2" x 3/8", 3/4" x 5/8"

With nut (with LQ3 fitting): PAF3410S-3S13□

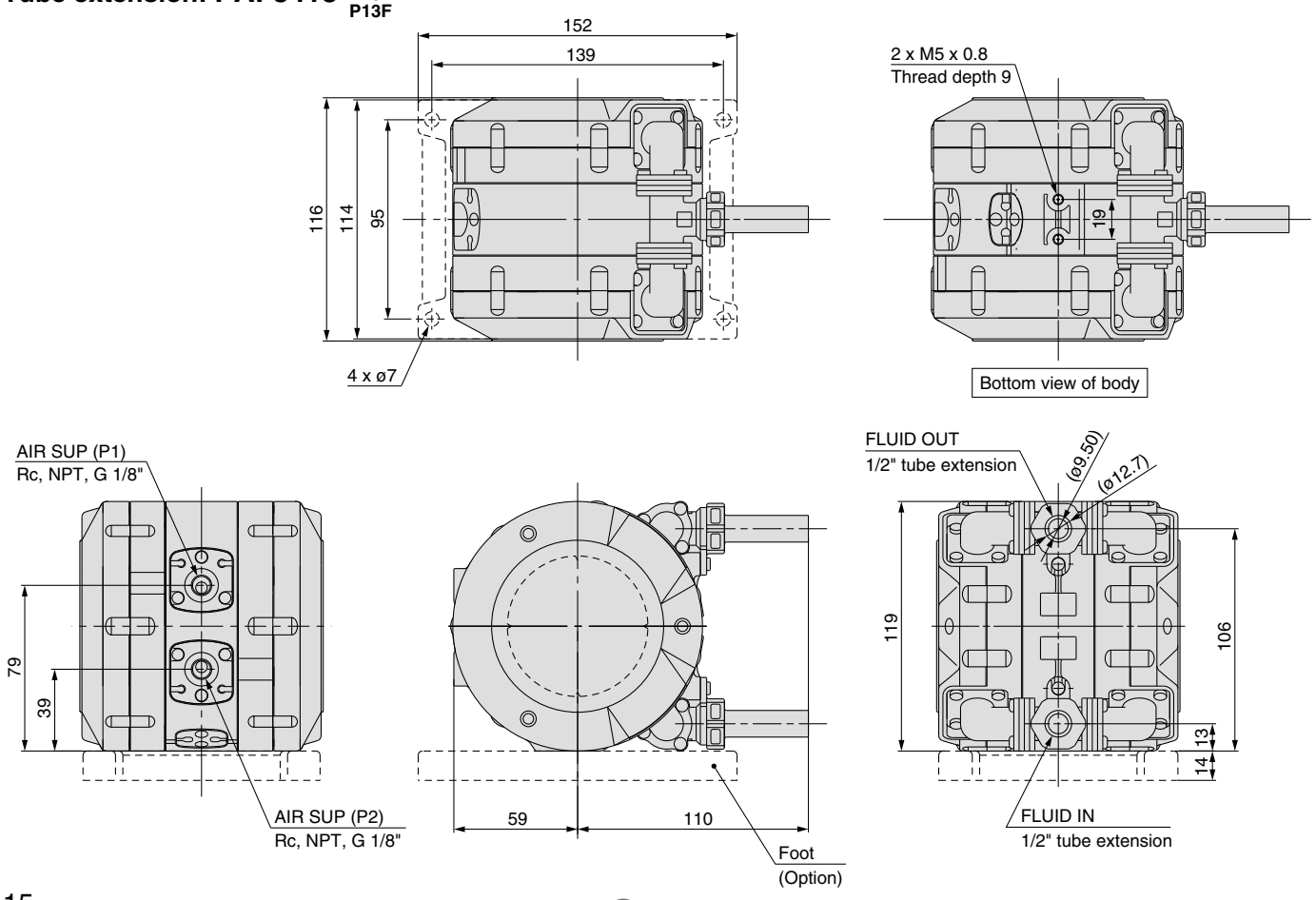


Dimensions: Air Operated Type (PAF3000 Series)

Female threaded: PAF3413-$^{03}_{N03}_{F03}$

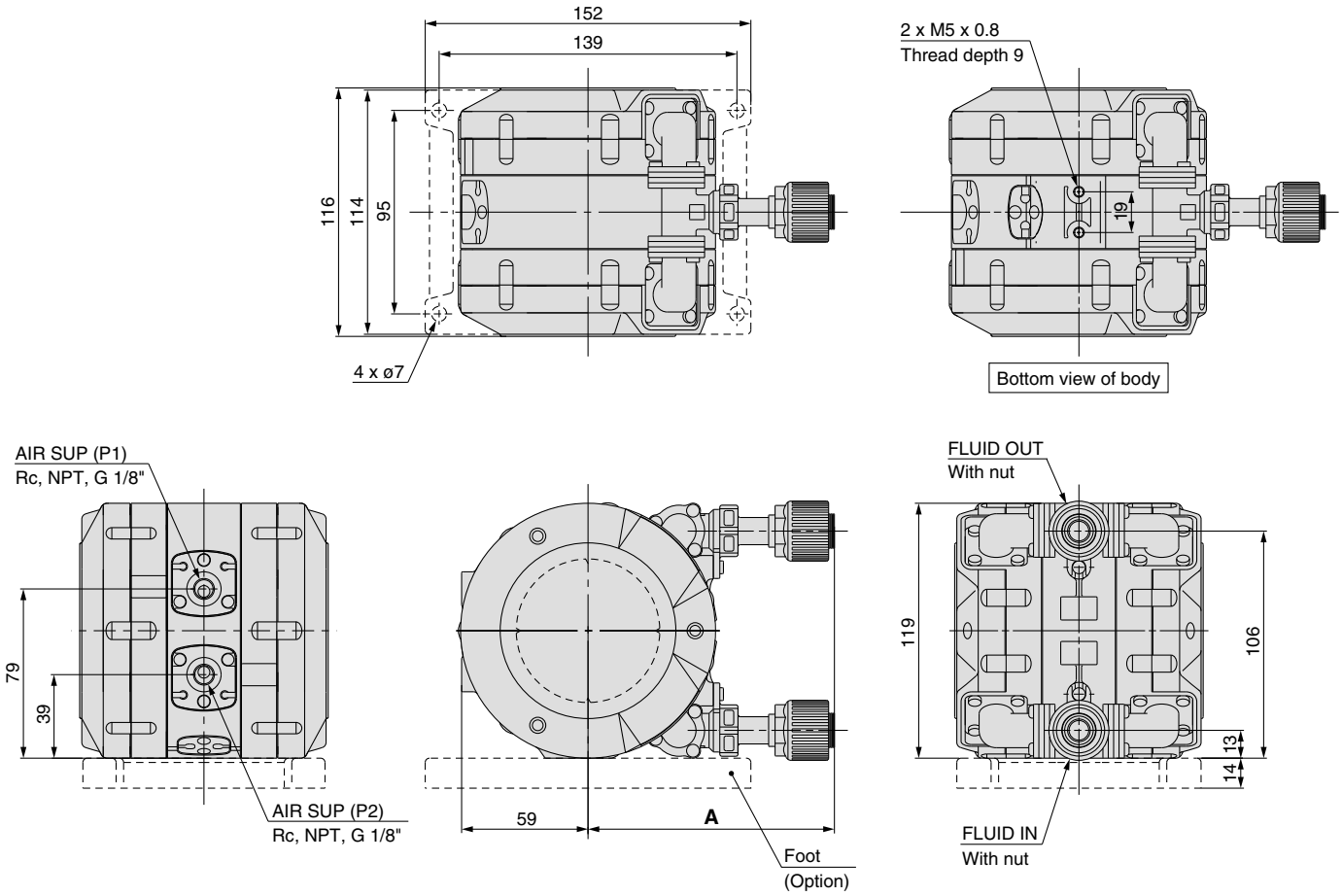


Tube extension: PAF3413-$^{P13}_{P13N}_{P13F}$



Dimensions: Air Operated Type (PAF3000 Series)

With nut (with LQ1 fitting): PAF3413S-$^{1S13\square}_{1S19\square}$



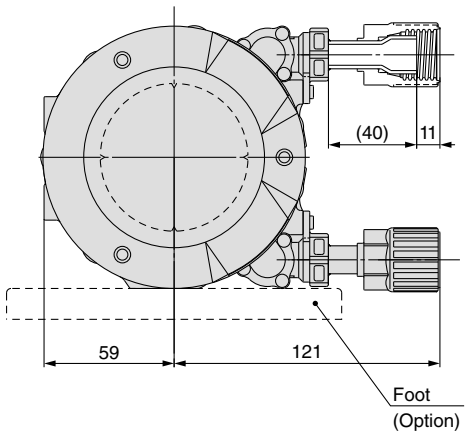
(mm)

Model	A
PAF3413S-1S13□	115
PAF3413S-1S19□	118

Tubing Size Applicable for Nut Size
(Tubing size can be altered, using a reducer even within the same nut size.)

Size	Applicable tubing size
4	10 x 8, 12 x 10, 3/8" x 1/4", 1/2" x 3/8"
5	12 x 10, 19 x 16, 1/2" x 3/8", 3/4" x 5/8"

With nut (with LQ3 fitting): PAF3413S-3S13□



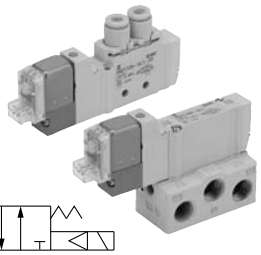
Related Products

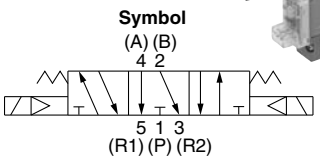
<For driving the PAF3413 series>

5 Port Solenoid Valve

VQZ14□0/24□0

(Exhaust center)





Specifications

Model			VQZ1420	VQZ2420	VQZ1450	VQZ2450
Piping			Body ported		Base mounted	
Valve construction			Metal seal			
Type of actuation			3 position exhaust center			
Max. operating pressure			0.7 MPa (High-pressure type 1.0 MPa)			
Min. operating pressure			0.1 MPa			
Flow characteristics	**1→4/2 (P→A/B)**	**C[dm³/(s·bar)]**	0.55	1.1	0.56	1.5
		b	0.28	0.23	0.2	0.16
		Cv	0.13	0.28	0.13	0.35
	4/2→5/3 (A/B→EA/EB)	**C[dm³/(s·bar)]**	0.54	1.4	0.7	1.9
		b	0.26	0.2	0.21	0.16
		Cv	0.13	0.32	0.17	0.4
Max. operating frequency			10 Hz			

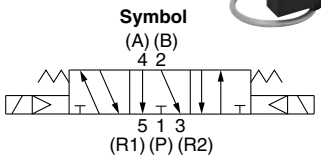
Refer to CAT.ES11-89 for further details.

<For driving the PAF5413 series>

5 Port Solenoid Valve

VQ44⁰₅0

(Exhaust center)



Specifications

Model			VQ44⁰₅0
Piping			Base mounted
Valve construction			Metal seal
Type of actuation			3 position exhaust center
Max. operating pressure			1.0 MPa (0.7 MPa)
Min. operating pressure			0.15 MPa
Flow characteristics	**1→4/2 (P→A/B)**	**C[dm³/(s·bar)]**	6.2
		b	0.18
		Cv	1.5
	4/2→5/3 (A/B→EA/EB)	**C[dm³/(s·bar)]**	6.9
		b	0.17
		Cv	1.7

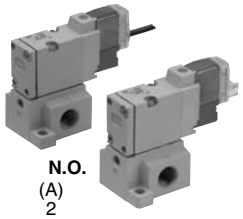
Note) ( ): Low wattage (0.5 W) specifications

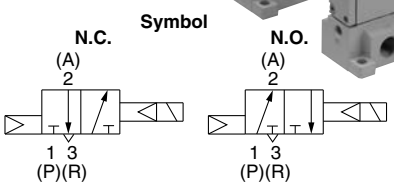
Refer to "Best Pneumatics" catalog for further details.

<For driving the PAF3413 series>

3 Port Solenoid Valve

SYJ514/714





Specifications

Model			SYJ314	SYJ514	SYJ714
Piping			Base mounted		
Valve construction			Rubber seal		
Type of actuation			N.C.		
Max. operating pressure			0.7 MPa		
Min. operating pressure			0.15 MPa		
Flow characteristics	**1→2 (P→A)**	**C[dm³/(s·bar)]**	0.41	1.2	2.9
		b	0.18	0.41	0.32
		Cv	0.086	0.32	0.71
	2→3 (A→R)	**C[dm³/(s·bar)]**	0.35	1.1	2.7
		b	0.33	0.46	0.34
		Cv	0.086	0.32	0.69

Note) Two 3-port valves are needed to drive a double acting pump.

Refer to CAT.ES11-86 for further details.

<For extending the maintenance cycle>

Micro Mist Separator

Series AMD

The AMD series can separate and remove aerosol state oil mist in compressed air and remove carbon or dust of more than 0.01 μm.

Model

Model	AMD250C	AMD350C
Rated flow Note) (ℓ/min (ANR))	500	1000
Port size (Nominal size B)	1/4, 3/8	3/8, 1/2
Mass (kg)	0.55	0.9

Note) Maximum flow rate at pressure 0.7 MPa
Maximum flow rate varies depending on the operating pressure.

Refer to CAT.ES30-11 for further details.

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure Note 1)	0.05 MPa
Proof pressure	1.5 MPa
Ambient and fluid temperature	5 to 60°C
Nominal filtration rating	0.01 μm (99.9% filtered particle diameter)
Downstream oil mist concentration	Max. 0.1 mg/m³ (ANR) Note 2) (Before saturated with oil, less than 0.01 mg/m³ (ANR) ≈ 0.008 ppm)
Element service life	When 2 years passed, or pressure drop reached 0.1 MPa.

Note 1) With auto drain is 0.1 MPa (N.O. type), 0.15 MPa (N.C. type).
Note 2) When compressor discharge oil mist concentration is 30 mg/m³ (ANR).

<For extending the maintenance cycle>

Mist Separator
Series AM

The AM series separates and removes the oil mist in compressed air and removes fine particles of rust and carbon, etc., of 0.3 μm or larger.

Model

Model	AM150C	AM250C
Rated flow (ℓ/min (ANR))	300	750
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8
Mass (kg)	0.38	0.55

Refer to CAT.ES30-11 for further details.

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure Note 1)	0.05 MPa
Proof pressure	1.5 MPa
Ambient and fluid temperature	5 to 60°C
Nominal filtration rating	0.3 μm (99.9% filtered particle diameter)
Downstream oil mist concentration	Max. 1.0 mg/m³ (ANR)(≈ 0.8 ppm) Note 2)
Element service life	When 2 years passed, or pressure drop reached 0.1 MPa.

Note 1) With auto drain is 0.15 MPa.
Note 2) When compressor discharge oil mist concentration is 30 mg/m³ (ANR).

<For supplying air for regulating pressure>

Filter Regulator + Mist Seperator Air Combination
Series AC20D/30D/40D

Model

Model		AC20D	AC30D
Component devices	Filter regulator	AW20	AW30
	Mist seperator	AFM20	AFM30
Port size Rc		1/8 1/4	1/4 3/8
Pressure gauge port size Rc		1/8	1/8

Refer to "Best Pneumatics" catalog for further details.

Note 1) Conditions: Upstream pressure 0.7 MPa, set pressure 0.5 MPa. The rated flow rate varies depending on the set pressure.
Note 2) When compressor discharge concentration is 30 mg/N·m³.

Specifications

Model	AC20D	AC30D	AC40D	AC40D-06
Proof pressure	1.5 MPa			
Max. operating pressure	1.0 MPa			
Min. operating pressure	0.05 MPa			
Set pressure range	0.05 to 0.85 MPa			
Rated flow rate (ℓ/min (ANR)) Note 1)	150	330	800	800
Ambient and fluid temperature	–5 to 60°C (No freezing)			
Nominal filtration rating	AW: 5 μm, AFM: 0.3 μm (99.9% filtered particle diameter)			
Downstream oil mist concentration	Max. 1.0 mgf/N·m³ (≈ 0.8 ppm) Note 2)			
Bowl material	Polycarbonate			
Construction/Filter regulator	Relieving type			
Mass (kg)	0.57	0.74	1.38	1.43

<When it is desired to easily remove water droplets from system.>

Water Separator
Series AMG

The AMG series is installed in air pressure lines to remove water droplets from compressed air. Use it when it is necessary to remove water, but when air as dry as that from an air dryer is not necessary.

Model

Model	AMG150C	AMG250C
Rated flow Note) (ℓ/min (ANR))	300	750
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8
Mass (kg)	0.38	0.55

Note) Maximum flow rate at pressure 0.7 MPa

Refer to CAT.ES30-11 for further details.

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure Note)	0.05 MPa
Proof pressure	1.5 MPa
Ambient and fluid temperature	5 to 60°C
Dehumidification rate	99%
Element service life	When 2 years passed, or pressure drop reached 0.1 MPa.

Note) With auto drain is 0.15 MPa.

<When it is desired to easily remove moisture from system.>

Membrane Dryer
Series IDG

Macromolecular membrane dryers that act like filters.
It is possible to achieve a low dew point at –20°C simply by mounting a dryer to the air pressure line.
A power supply is not required.

Note 1) No freezing
Note 2) ANR represents the flow rate converted to the value under 20°C at atmospheric pressure.
Note 3) Including the dew point indicator purge air flow rate of 1 ℓ/min (ANR) (inlet air pressure at 0.7 MPa) (Except IDG1, IDG5)

Refer to "Best Pneumatics" catalog for further details.

Standard Specifications/Single Unit (Standard Dew Point –20°C)

Model		Standard dew point: –20°C				
		IDG5	**IDG10**	**IDG20**	**IDG30**	**IDG50**
Range of operating conditions	**Fluid**	Compressed air				
	Inlet air pressure (MPa)	0.3 to 0.85			0.3 to 1.0	
	Inlet air temperature (°C) Note 1)	–5 to 55			–5 to 50	
	Ambient temperature (°C)	–5 to 55			–5 to 50	
Standard performance	**Outlet air atmospheric pressure dew point (°C)**	–20				
Standard performance conditions	**Inlet air flow rate (ℓ/min (ANR))** Note 2)	62	125	250	375	625
	Outlet air flow rate (ℓ/min (ANR))	50	100	200	300	500
	Purge air flow rate (ℓ/min (ANR)) Note 3)	12	25	50	75	125
	Inlet air pressure (MPa)	0.7				
	Inlet air temperature (°C)	25				
	Inlet air saturation temperature (°C)	25				
	Ambient temperature (°C)	25				
Dew point indicator purge air flow rate		–	1 ℓ/min (ANR)			
Port size (Nominal size B)		1/8, 1/4	1/4, 3/8			
Mass (kg) (with bracket)		0.25 (0.31)	0.43 (0.51)	0.66 (0.76)	0.74 (0.87)	0.77 (0.90)

<For strainers>

Industrial Filter
Vessel type
Series FGD

Specifications

Model	Port size Rc	Set pressure	Set temperature	Number of elements	Element size	Main material: Cover	Case	Gasket O-ring	Seal
FGDCA	3/8	0.7 MPa	80°C	1	Ø65 x ℓ250	Aluminum	SPCD	NBR	Nylon
FGDTA	3/8	1 MPa	80°C	1	Ø65 x ℓ250	SCS 14	Stainless steel 316L	Fluororesin	Fluororesin

Note) Consult SMC for wetted material compatibility.

Refer to CAT.E90 for further details.

Maintenance Parts

PAF3000/5000 Series

Content	PAF3000 series		PAF5000 series	
	PAF3410	**PAF3413**	**PAF5410**	**PAF5413**
Diaphragm kit	KT-PAF3-31		KT-PAF5-31	
Check valve kit	KT-PAF3-36		KT-PAF5-36	
Switching valve parts kit	KT-PAF3-37□	—	KT-PAF5-37□	—
Pilot valve kit	KT-PAF3-38	—	KT-PAF5-38	—
Foot set	KT-PAF3-40		—	
Water leakage sensor	KT-PAF3-47		KT-PAF5-47	
Stroke sensor	—	KT-PAF3-48	—	KT-PAF5-48

Applicable Fluids

Material and Fluid Compatibility Check List for Process Pumps

- The data below is based on the information presented by the material manufacturers.
- SMC is not responsible for its accuracy and any damage happened because of this data.
- The material and fluid compatibility check list provides reference values for reference only, therefore we do not guarantee the application to our product.

⚠ Caution

1. Select models by choosing wetted materials suitable for fluid to be transferred.
  - Use fluids which will not corrode the wetted materials.

2. These products are not suitable for use in medical applications or with food products.
3. Possible applications will change depending on additive agents. Take note of additives.
4. Possible applications will change depending on impurities. Take note of impurities.
5. Some examples of transfer fluids are shown below. As the applicability of various fluids can change according to the conditions of usage, confirm these with experimental trials.
6. Compatibility is indicated for fluid temperatures of 90°C or less.

PAF3000/5000 Series

Table symbols ○: Can be used. ×: Cannot be used.
—: Since the possible applications will change depending on operating conditions, consult SMC.

Model			PAF3410 / PAF5410	PAF3413 / PAF5413
Body material			New PFA	
Diaphragm material			PTFE	
Chemical	**Acetone**		○ Note 1, 2)	
	Ammonium hydroxide		○ Note 2)	
	Isobutyl alcohol		○ Note 1, 2)	
	Isopropyl alcohol		○ Note 1, 2)	
	Hydrochloric acid		○	
	Ozone		○	
	Hydrogen peroxide	**Concentration 5% or less 50°C or less**	○	
	Ethyl acetate		○ Note 1, 2)	
	Butyl acetate		○ Note 1, 2)	
	Nitric acid (Except fuming nitric acid)	**Concentration 10% or less**	○ Note 2)	
	Pure water		○	
	Sodium hydroxide	**Concentration 50% or less**	○	
	Super pure water		○	
	Toluene		○ Note 1, 2)	
	Hydrofluoric acid (Except fuming sulfuric acid)		○ Note 2)	
	Sulfuric acid		○ Note 2)	
	Phosphoric acid	**Concentration 80% or less**	○	

Note 1) Take measures against the static electricity, since the static electricity may occur.
Note 2) Fluid may be permeated, affecting other material parts.