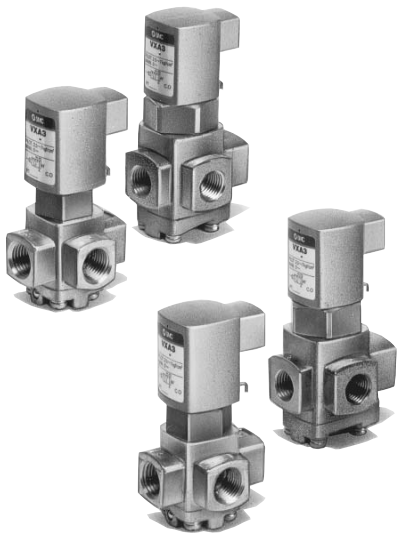
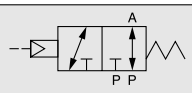
Direct Air Operated 3 Port Valve
For Air, Gas, Vacuum, Water and Oil
Series VXA31/32

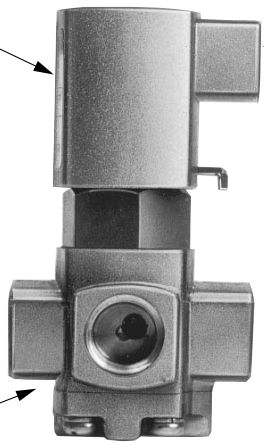


- **Able to control a wide variety of fluids. Wide variations of combination.**
  Application can be matched by simply choosing body material (Brass or Stainless steel) and seal material (NBR, FKM or EPDM).
- **C.O. type easy to use; operatable as either N.C. or N.O.**
- **Easy to disassemble and reassemble in a short time.**
- **High viscosity fluids (500 cSt).**

Variations

Valve ●

Common (C.O.) 



● **Pilot port** (Free take off direction)

Port size ——— Rc 1/8
Pilot pressure —— 0.25 to 0.7 MPa

Material ●

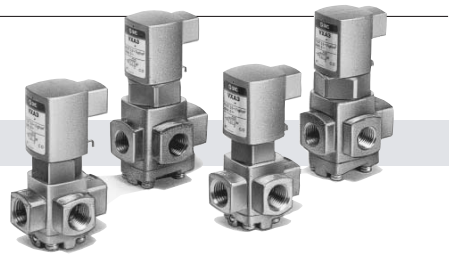
Body —— Brass, Stainless steel
Seal —— NBR, FKM, EPDM

Model

Model	Port size Rc	Orifice size (mmø)
VXA3114	1/8, 1/4	1.5
VXA3124	1/8, 1/4	2.2
VXA3134	1/8, 1/4	3
VXA3224	1/4, 3/8	2.2
VXA3234	1/4, 3/8	3
VXA3244	1/4, 3/8	4

Applicable Fluids Check List

3 Port Direct Air Operated Series VXA31/32



Common (C.O.)

Refer to pages 17-3-54 and 17-3-55 for specifications and models.

Option Symbol and Composition

Option symbol	Seal material	Body material	Support material (Driving parts)
Standard	NBR	Brass	Polyacetal
A	FKM		
B	EPDM		
G	NBR	Stainless steel	
H	FKM		
J	EPDM		
M[Note 1] **(Non-leak)**	FKM		
N	FKM		Stainless steel
P	EPDM		
V[Note 1] **(Non-leak)**	FKM	Brass	Polyacetal

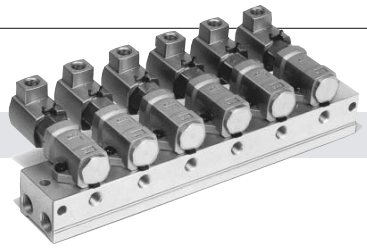
Note 1) Grease for vacuum has been applied to the sliding part, silicon grease to the other options.

Fluid Name and Option

Fluid (Application)	Option symbol and body material	
	Brass	Stainless steel
Silicon oil	A	H
Vacuum (up to 1.3 x 10^{-1} Pa)	V[Note 1]	M[Note 1]
Fuel oil (up to 60°C)	A	H
Insulation oil	A	H
Non-leak (10^{-6} Pa·m³/s)	V[Note 1]	M[Note 1]
Brake oil	B	P
Water (up to 60°C)	A	H

∗ If using for other fluids, please contact SMC.
Note 1) The leakage amount (10^{-6} Pa·m³/s) is value when differential pressure is 0.1 MPa.

Manifold Series VVXA31/32



Common (C.O.)

Refer to pages 17-3-58 and 17-3-59 for specifications and models.

Option Symbol and Composition

Option symbol	Seal material	Body material	Support material (Driving parts)
Standard	NBR	Aluminum	Polyacetal
A	FKM		
B	EPDM		
V[Note 1] **(Non-leak)**(1)	FKM	Brass (1)	

Note 1) Grease for vacuum has been applied to the sliding part, silicon grease to the other options.
Note 2) Manifold base material: Aluminum

Fluid Name and Option

Fluid (Application)	Option symbol
Vacuum (up to 1.3 x 10^{-1} Pa)	V[Note 1]
Vacuum pad	Standard
Non-leak (10^{-6} Pa·m³/s)	V[Note 1]
Brake oil	B

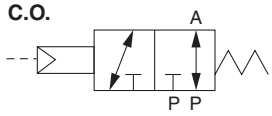
∗ If using for other fluids, please contact SMC.
Note 1) The leakage amount (10^{-6} Pa·m³/s) is value when differential pressure is 0.1 MPa.

The VX∗ series will be revised shortly.

Common (C.O.)

JIS Symbol

C.O.



Fluid

Standard specifications	Option Note)
Water (Standard, up to 40°C) Air (Standard, Dry) Turbine oil Vacuum (up to 1.3 x 10^2 Pa) Carbon dioxide (CO_2), Nitrogen gas (N_2)	Vacuum (up to 1.3 x 10^{-1} Pa) ····· (V, M) Non-leak (10^{-6} Pa·m^3/s or less) ····· (V, M)

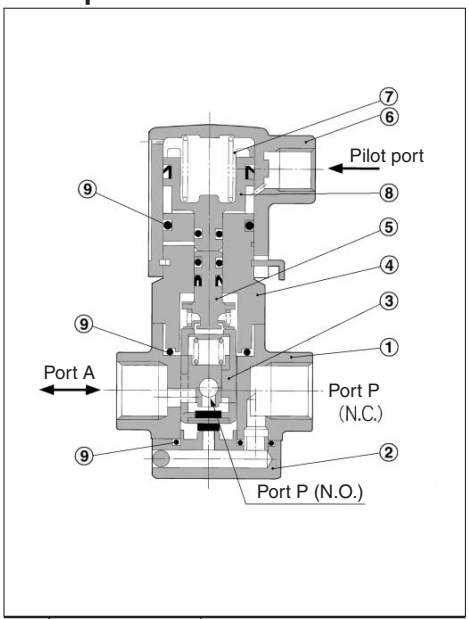
Note) Refer to page 17-3-14 “Applicable Fluids Check List” for details of special fluids outside of the standard options and specifications.

Model/Valve Specifications

Port size	Orifice size (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics					Max. system pressure (MPa)	Proof pressure (MPa)	Weight (g)
				Water, Oil		Air					
				Av x 10^{-6} (m^2)	Cv converted	C [dm^3/(s·bar)]	b	Cv			
1/8 (6A)	1.5	**VXA3114**	1.0	1.9	0.08	0.29	0.32	0.08	1.0	1.5	280
	2.2	**VXA3124**	0.5	3.8	0.16	0.60	0.25	0.15			
	3	**VXA3134**	0.3	8.0	0.24	0.82	0.20	0.20			
1/4 (8A)	1.5	**VXA3114**	1.0	1.9	0.08	0.29	0.32	0.08			
	2.2	**VXA3124**	0.5	3.8	0.16	0.60	0.25	0.15			
		VXA3224	1.0	4.6	0.19	0.64	0.40	0.17			410
	3	**VXA3134**	0.3	8.0	0.24	0.82	0.20	0.20			280
		VXA3234	0.6	9.0	0.33	1.1	0.25	0.27			410
	4	**VXA3244**	0.3	12	0.50	1.6	0.20	0.38			
3/8 (10A)	2.2	**VXA3224**	1.0	4.6	0.19	0.64	0.40	0.17			
	3	**VXA3234**	0.6	9.0	0.33	1.1	0.25	0.27			
	4	**VXA3244**	0.3	12	0.50	1.6	0.20	0.38			

Note) Refer to “Glossary” on page 17-3-15 for details of max. operating pressure differential and max. system pressure.

Construction/ Principal Parts Material



No.	Description	Material	
		Standard	Option
①	Body assembly	Brass	Stainless steel
②	Retainer assembly	Brass	Stainless steel
③	Valve assembly	NBR, Polyacetal	FKM/EPDM Stainless steel
④	Adapter	Brass	Stainless steel
⑤	Travel assembly	Stainless steel, NBR, Polyacetal	FKM/EPDM Stainless steel
⑥	Pilot cover	Aluminum	—
⑦	Piston spring	Stainless steel	—
⑧	Piston assembly	Polyacetal, NBR	—
⑨	O-ring	NBR	FKM/EPDM

Operating Fluid and Ambient Temperature

Temperature conditions	Operating fluid temperature (°C)				Ambient temperature (°C)
	Water (Standard)	Air (Standard)	Oil (Standard)	Vacuum (3) (V, M)	
Maximum	40	60	40	40	40
Minimum	1	–5 (1)	–5 (2)	–5	–5

Note 1) Dew point: –5°C or less Note 2) 500 cSt or less
Note 3) “V”, “M” in parentheses are option symbols.

Tightness of Valve (Leak rate)

Seal material \ Fluid	Air	Liquid	Non-leak, Vacuum (2)
NBR, FKM, EPDM	1 cm^3/min or less	0.1 cm^3/min or less (1)	10^{-6}Pa·m^3/s or less

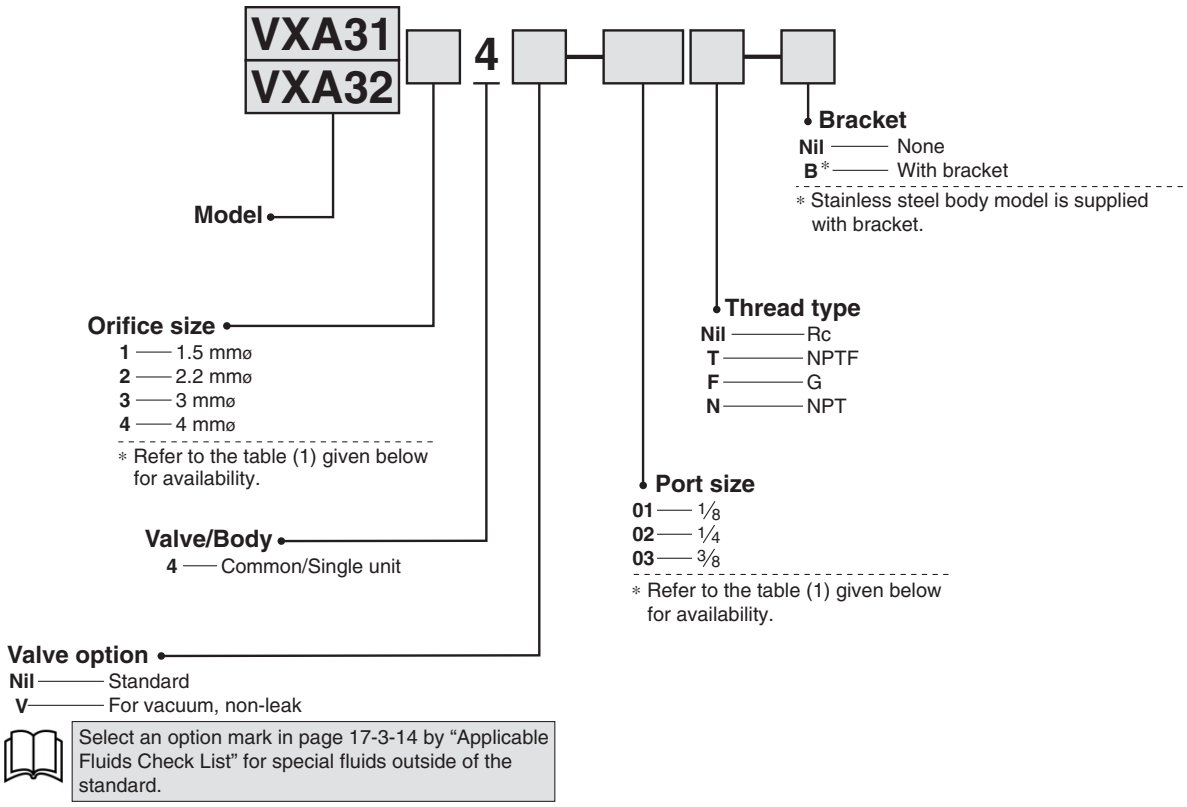
Note 1) Differs depending on the operating conditions such as pressure, etc.
Note 2) Value on option “V”, “M” (Non-leak, Vacuum).

Pilot Pressure

Model	Pressure (MPa)
VXA31□4 **VXA32□4**	0.25 to 0.7

The VX∗ series will be revised shortly.

How to Order



Select an option mark in page 17-3-14 by "Applicable Fluids Check List" for special fluids outside of the standard.

Table (1) Port/Orifice Size

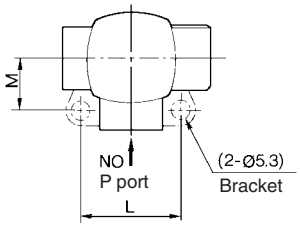
Valve (Port size)		Orifice size (No.)			
VXA31	**VXA32**	**1 (1.5 mmø)**	**2 (2.2 mmø)**	**3 (3 mmø)**	**4 (4 mmø)**
01 (1/8)	—	●	●	●	—
02 (1/4)	—	●	●	●	—
—	02 (1/4)	—	●	●	●
—	03 (3/8)	—	●	●	●

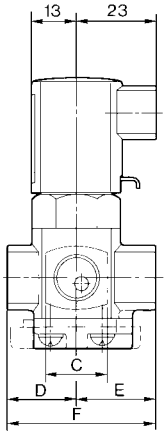
Ordering example

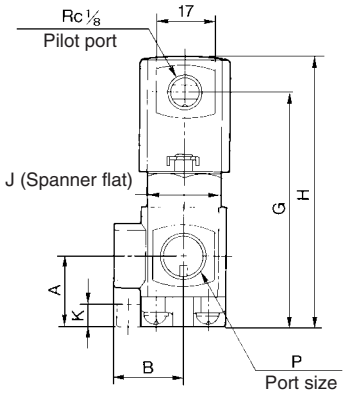
(Example) Series VXA31, Orifice size 1.5 mmø, Rc 1/8
(Part no.) **VXA3114-01**

The VX∗ series will be revised shortly.

Dimensions

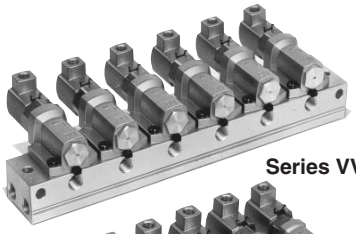






Model \ Symbol	P Port size Rc	A	B	C	D	E	F	G	H	J	With bracket K	With bracket L	With bracket M
VXA31	1/8, 1/4	19	20	18	20	22.5	42.5	71	81	21	6	29	14.5
VXA32	1/4, 3/8	25	20	21	20	27.5	47.5	80	90	27	7.5	32	17

Direct Air Operated 3 Port Valve/Manifold
For Air, Gas, Vacuum and Oil
Series VVXA31/32



Series VVXA32

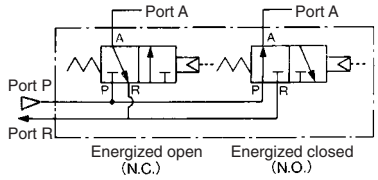
Series VVXA31

- **A wide variety of applicable fluids.**
  Combination of seal materials (NBR, FKM, or EPDM) can be selected freely, depending on the purpose.
- **Able to replace valves with the piping remained unchanged.**
- **N.C./N.O. switchover is easy.**
- **Weight-saving aluminum base and body.**
  (Not applicable to water or steam.)

Variations

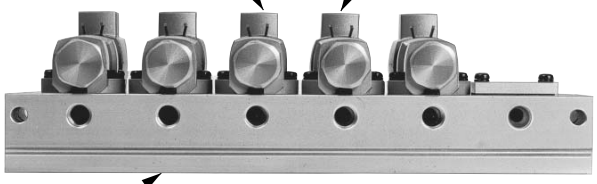
Valve

Common (C.O.)



Material

Base, Body — Aluminum
Seal material — NBR, FKM, EPDM



Manifold

Manifold — B mount
Manifold stations — 2 to 10 stations

Model

Manifold base model	Port A Rc	Port P Rc	Port R Rc
VVXA311-stations	1/8	1/4	1/4
VVXA312-stations	1/4		
VVXA321-stations	1/8		
VVXA322-stations	1/4		

The VX∗ series will be revised shortly.

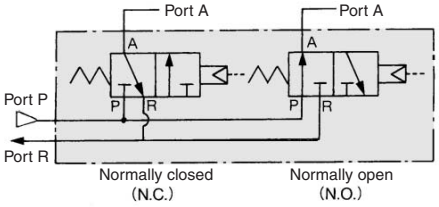
Common (C.O.)

Fluid

Standard specifications	Option Note)
Air (Standard, Dry) Vacuum (up to 1.3 x 10^2 Pa) Turbine oil Carbon dioxide (CO_2), Nitrogen gas (N_2)	Vacuum (up to 1.3 x 10^{-1} Pa)·····(V) Non-leak (10^{-6} Pa·m^3/s or less)····· (V) ⋮ Other

Note) Refer to page 17-3-14 "Applicable Fluids Check List" for details of special fluids outside of the standard options and specifications.

JIS Symbol



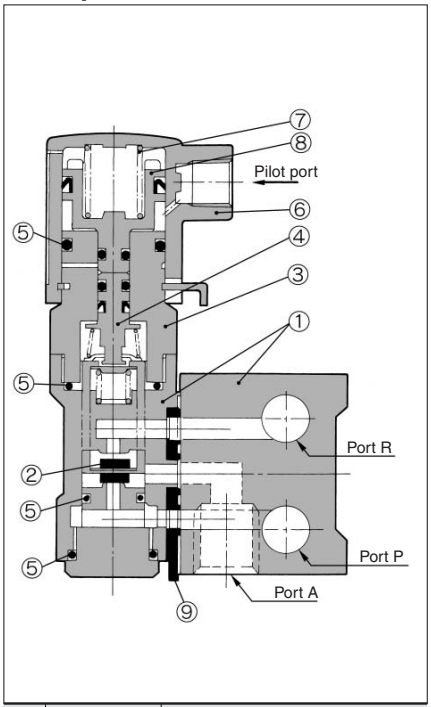
Manifold Specifications

Manifold	B Mount	
Manifold type	Common supply, Common exhaust, Individual out	
Number of valves	2 to 10 stations	
Blanking plate (with gasket, screws)	VVXA31	VX011-004
	VVXA32	VX011-005

Manifold Base And Applicable Valve Part No.

Manifold base	Individual port Rc	Applicable valve	Base weight (g)
VVXA311-stations	1/8	VXA31□5-00	n x 100 + 50
VVXA312-stations	1/4		
VVXA321-stations	1/8	VXA32□5-00	n x 160 + 70
VVXA322-stations	1/4		

Construction/ Principal Parts Material



No.	Description	Material	
		Standard	Option
①	Manifold body, Base	Aluminum	Brass (Base is made of aluminum.)
②	Valve assembly	NBR, Polyacetal	FKM/EPDM
③	Adapter	Aluminum	FKM/EPDM
④	Travel assembly	NBR, Polyacetal	FKM/EPDM
⑤	O-ring	NBR	FKM/EPDM
⑥	Pilot cover	Aluminum	—
⑦	Piston spring	Stainless steel	—
⑧	Piston	NBR, Polyacetal	—
⑨	Gasket	NBR	FKM/EPDM

Model/Valve Specifications

Orifice size (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics					Max system pressure (MPa)	Proof pressure (MPa)	Weight (g)
			Oil		Air					
			Av x 10^{-6} (m^2)	Cv converted	C [dm^3/(s·bar)]	b	Cv			
1.5	**VXA3115-00**	1.0	1.9	0.08	0.29	0.32	0.08	1.0	1.5	150
2.2	**VXA3125-00**	0.5	3.8	0.16	0.60	0.25	0.15			
	VXA3225-00	1.0	4.6	0.19	0.64	0.40	0.17			230
3	**VXA3135-00**	0.3	8.0	0.24	0.82	0.20	0.20			150
	VXA3235-00	0.6	9.0	0.33	1.10	0.25	0.27			230
4	**VXA3245-00**	0.3	12	0.60	1.66	0.20	0.38			

Note) • Add the V type (VXA31) 80 g, (VXA32) 130 g
• Refer to "Glossary" on page 17-3-15 for details of max. operating pressure differential and max. system pressure.

Operating Fluid and Ambient Temperature

Temperature conditions	Operating fluid temperature (°C)			Ambient temperature (°C)
	Air (Standard)	Oil (Standard)	Vacuum (3) (V)	
Maximum	60	40	40	40
Minimum	–5 (1)	–5 (2)	–5	–5

Note 1) Dew point: –5°C or less
Note 2) 500 cSt or less
Note 3) "V" in parentheses is option symbol.

Tightness of Valve (Leak rate)

Fluid / Seal material	Air	Liquid	Non-leak, Vacuum (2)
NBR, FKM, EPDM	1 cm^3/min or less	0.1 cm^3/min or less (1)	10^{-6} Pa·m^3/s or less

Note 1) Differs depending on the operating conditions such as pressure, etc.
Note 2) Value on option "V" (Non-leak, Vacuum).

Pilot Pressure

Model	Pressure (MPa)
VXA31□5 **VXA32□5**	0.25 to 0.7

The VX∗ series will be revised shortly.

How to Order

VXA31
VXA32 □ **5** □ — **00**

Model

Orifice size
1 — 1.5 mmø
2 — 2.2 mmø
3 — 3 mmø
4 — 4 mmø
∗ Refer to the table (1) given below for availability.

Valve/Body
5 — Common/For manifold

Valve option
Nil — Standard specifications
V — For vacuum, non-leak

Select an option mark in page 17-3-14 by "Applicable Fluids Check List" for special fluids outside of the standard.

Connection
00 — No connection screw/For manifold

Table (1) Orifice Size

Model	Orifice size (No)			
	1 (1.5 mmø)	2 (2.2 mmø)	3 (3 mmø)	4 (4 mmø)
VXA31	●	●	●	—
VXA32	—	●	●	●

How to Order Manifold Base

VVXA31
VVXA32 □ □

Manifold base

Symbol	Applicable valve
VVXA31	VXA31□5-00
VVXA32	VXA32□5-00

Number of stations
02 — 2 stations
:
10 — 10 stations

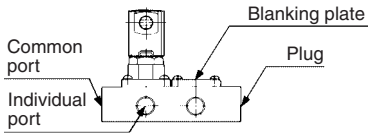
Port size (Individual port)
1 — Rc 1/8
2 — Rc 1/4
∗ All common ports are Rc 1/4.
The common SUP is indicated as "P" on the common port and the individual SUP is indicated as "R".

How to Order Manifold

■ **Write both the base part number and the solenoid valve to be mounted or blanking plate part number.**
(Example)
7 stations of VXA31, Individual port Rc 1/8

(Base P/N) VXA311-07····· 1 pc
(Valve P/N) VXA3115-00····· 6 pcs
(Blanking plate P/N) VX011-004·····1 pc

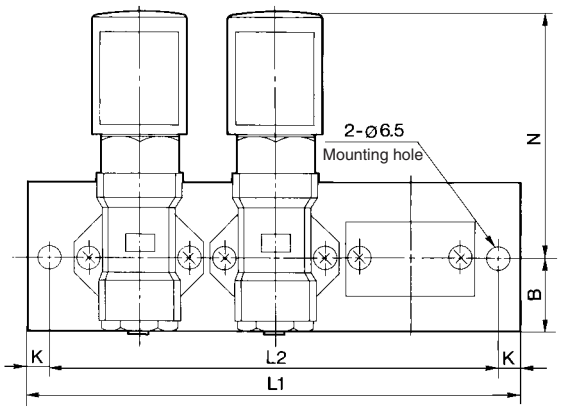
■ **Arrangement of solenoid valves**

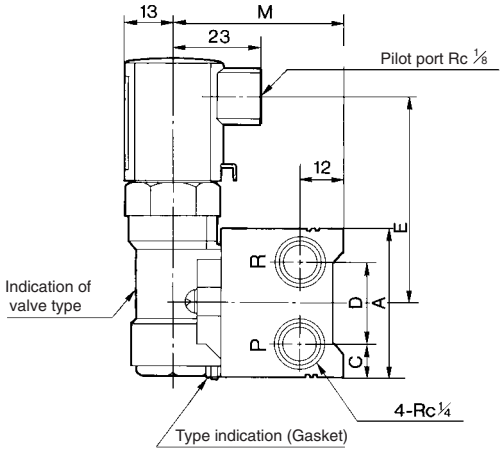


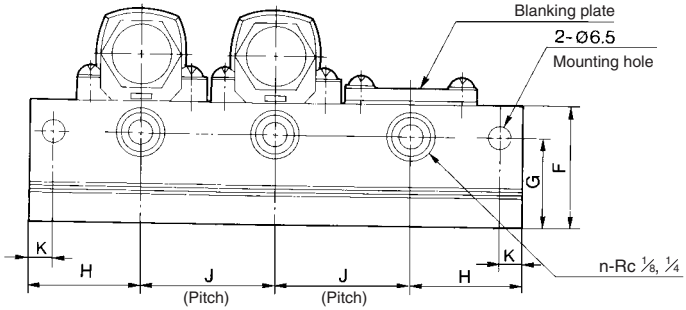
The standard arrangement of manifolds should be placed on an individual port on this side, each solenoid valve from the left side and a blank plate in the right side. The right side of the common port provides plug.

The VX∗ series will be revised shortly.

Dimensions







Model \ Stations / Symbol		2	3	4	5	6	7	8	9	10
VVXA31	L1	96	132	168	204	240	276	312	348	384
	L2	84	120	156	192	228	264	300	336	372
VVXA32	L1	126	172	218	264	310	356	402	448	494
	L2	108	154	200	246	292	338	384	430	476

Model \ Symbol	A	B	C	D	E	F	G	H	J	K	M	N
VVXA31	40	20	9	22	59	33	24	30	36	6	45.5	69
VVXA32	44	22	10	24	66	34	25	40	46	9	50.5	76