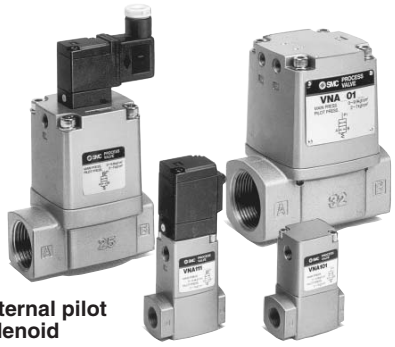
Model

Model	Port size Rc	Orifice size ø (mm)	Flow characteristics				Weight (kg)	
			Measured by air		Measured by water Note)			
			C [dm³/ (bar·sec)]	b	Cv	Av x 10^{-5} m²	Air operated	External pilot solenoid
VNA1□□□-6A	1/8	10	3.5	0.35	0.88	25	0.1	0.2
VNA1□□□-8A	1/4		5.9	0.24	1.5	41		
VNA1□□□-10A	3/8		7.9	0.16	1.9	51		
VNA2□□□-10A		15	16	0.35	3.8	110	0.3	0.4
VNA2□□□-15A	1/2		23	0.25	4.8	130		
VNA3□□□-20A	3/4	20	34	0.16	7.5	210	0.5	0.6

Note) This product cannot be used for water application.

Model	Port size Rc	Orifice size ø (mm)	Flow characteristics		Weight (kg)	
			Cv	Effective area (mm)²	Air operated	External pilot solenoid
VNA4□□□-25A	1	25	12	220	0.8	0.9
VNA5□□□-32A	1 1/4	32	18	320	1.3	1.4
VNA6□□□-40A	1 1/2	40	28	500	2.1	2.2
VNA7□□□-50A	2	50	43	770	3.1	3.2



External pilot solenoid

Air operated

Valve Specifications

Fluid		Refer to "Table (1)" on page 17-4-6.
Fluid temperature	**VNA□□□ A**	–5 to 60°C (1)
	VNA□□□ B **□□□ C**	–5 to 99°C (1) (Air operated type only)
Ambient temperature		–5 to 50°C (1) (Air operated type: 60°C)
Proof pressure		1.5 MPa
Operating pressure range		0 to 1 MPa
External pilot air	Pressure range	0.2 to 0.7 MPa
	Lubrication	Not required (Use turbine oil Class 1 ISO VG32, if lubricated.(2))
	Temperature	–5 to 50°C (1) (Air operated type: 60°C)

Note 1) No freezing Note 2) Lubrication is not allowed for use with EPR seal

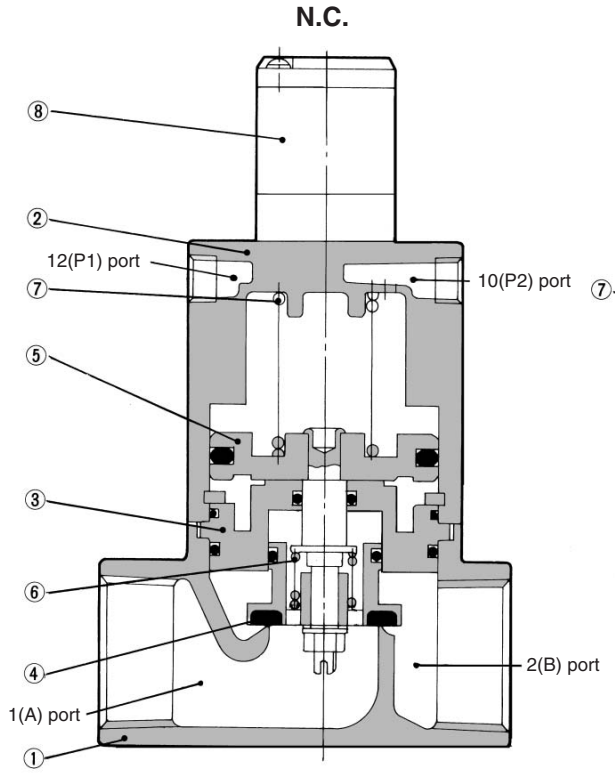
Pilot Solenoid Valve Specifications

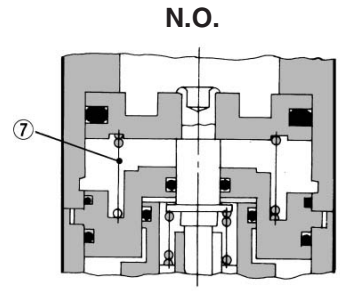
Port size			6A to 25A	32A to 50A
Pilot solenoid valve			**SF4-□□□-23**	**VO301-00□□□**
Electrical entry			Grommet, Grommet terminal Conduit terminal DIN terminal	Grommet, Conduit DIN terminal Other (Option)
Coil rated voltage (V)	AC (50/60 Hz)		100 V, 200 V, Other voltage (Option)	
	DC		24 V, Other voltage (Option)	
Allowable voltage fluctuation			–15% to +10% of rated voltage	
Coil insulation type			Class B or equivalent (130°C)	
Temperature rise			35°C or less (When rated voltage is applied.)	70°C or less (When rated voltage is applied.)
Apparent power	AC	Inrush	5.6 VA (50 Hz), 5.0 VA (60 Hz)	12 VA (50 Hz), 10.5 VA (60 Hz)
		Holding	3.4 VA (50 Hz), 2.3 VA (60 Hz)	7.5 VA (50 Hz), 6 VA (60 Hz)
Power consumption	DC		1.8 W	4.8 W
Manual override			Non-locking push type Other (Option)	Non-locking push type

JIS Symbol

Style \ Valve type	N.C. Normally closed	N.O. Normally open	C.O. Double acting
Air operated	**VNA□01**	**VNA□02**	**VNA□03**
External pilot solenoid	**VNA□11**	**VNA□12**	

Construction





∗ C.O. type does not have a return spring ⑦.

Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Platinum silver painted
②	Cover assembly	Aluminum alloy	Platinum silver painted
③ Note)	Plate assembly	Aluminum alloy	Valve material (NBR, FKM, EPR)
④ Note)	Valve element	Aluminum alloy	Valve material (NBR, FKM, EPR)
⑤	Piston assembly	Aluminum alloy	—
⑥	Travel spring	Stainless steel	—
⑦	Return spring	Piano wire	—
⑧	Pilot solenoid valve	—	—

Note) Parts ③ and ④ are for selection of valve composition.

Working Principle

VNA□01□, □11□ (N.C.)
When the pilot solenoid valve ⑧ is not energized (or when air is exhausted from the 12(P1) port of the air operated style), the valve element ④ linked to the piston ⑤ is closed by the return spring ⑦.

● **When valve element opens**
When the pilot solenoid valve is energized (or when pressurized air enters through the 12(P1) port of the air operated style), the pilot air that has entered under the piston moves upward to open the valve element.

● **When valve element opens**
When the power to the pilot solenoid valve is turned off (or when fluid is exhausted from the 12(P1) port of the air operated style), the pilot air under the piston is exhausted, and the return spring closes the valve element.

VNA□02□, □12□ (N.C.)
In contrast with the N.C., when the power to the pilot solenoid valve is turned off (or when air is exhausted from the 10(P2) port of the air operated style), the valve is held open by the return spring. When the pilot solenoid valve is energized (or when pressurized air enters through the 10(P2) port of the air operated style), the valve element closes.

VNA□03□ (C.O.)
The valve element of the C.O. type, which has no return spring, is in an arbitrary position when air is exhausted through the 12(P1) and 10(P2) ports. When pressurized air enters the 12(P1) port (exhaust from the 10(P2) port), the valve element opens, and it closes when pressurized air enters the 10(P2) port.

Replacement Parts

No.	Description			Part no.						
				VNA1□□A -6A, 8A, 10A	**VNA2□□□ -10A, 15A**	**VNA3□□□ -20A**	**VNA4□□□ -25A**	**VNA5□□□ -32A**	**VNA6□□□ -40A**	**VNA7□□□ -50A**
③	Plate assembly	Valve Composition	NBR	VN1-A3AA	VN2-A3AA	VN3-A3AA	VN4-A3AA	VN5-A3AA	VN6-A3AA	VN7-A3AA
			FKM	VN1-A3AB	VN2-A3AB	VN3-A3AB	VN4-A3AB	VN5-A3AB	VN6-A3AB	VN7-A3AB
			EPR	VN1-A3AC	VN2-A3AC	VN3-A3AC	VN4-A3AC	VN5-A3AC	VN6-A3AC	VN7-A3AC
④	Valve disc (Valve disc assembly for 25A-50A)	Valve Composition	NBR	VN1-4AA	VN2-4AA	VN3-4AA	VN4-A4AA	VN5-A4AA	VN6-A4AA	VN7-A4AA
			FKM	VN1-4AB	VN2-4AB	VN3-4AB	VN4-A4AB	VN5-A4AB	VN6-A4AB	VN7-A4AB
			EPR	VN1-4AC	VN2-4AC	VN3-4AC	VN4-A4AC	VN5-A4AC	VN6-A4AC	VN7-A4AC
⑧	Pilot solenoid valve			SF4-□□□-23 (Refer to page 17-4-12 for details.)				VO301-00□□□ (Refer to page 17-4-12 for details.)		

How to Order Pilot Solenoid Valves

Valve size 1/2/3/4

SF4 — 1 DZ — 23

Coil rated voltage
- **1** — 100 VAC 50/60 Hz
- **2** — 200 VAC 50/60 Hz
- **3*** — 110 VAC 50/60 Hz
- **4*** — 220 VAC 50/60 Hz
- **5** — 24 VDC
- **6*** — 12 VDC
- **7*** — 240 VAC 50/60 Hz
- **9*** — Other

* Option

Manual override
- **Nil** — Non-locking push type
- **A*** — Non-locking extended type
- **B*** — Locking slotted type

* Option

Electrical entry/ With light/surge voltage suppressor

G	Grommet
GS	Grommet with surge voltage suppressor
E	Grommet terminal
EZ	Grommet terminal with light/surge voltage suppressor
T	Conduit terminal
TZ	Conduit terminal with light/surge voltage suppressor
D	DIN terminal
DZ	DIN terminal with light/surge voltage suppressor

Valve size 5/6/7

VO301-00 □ □ □

Coil rated voltage
- **1** — 100 VAC 50/60 Hz
- **2** — 200 VAC 50/60 Hz
- **3*** — 110 VAC 50/60 Hz
- **4*** — 220 VAC 50/60 Hz
- **5** — 24 VDC
- **6*** — 12 VDC
- **7*** — 240 VAC 50/60 Hz
- **9*** — Other

* Option

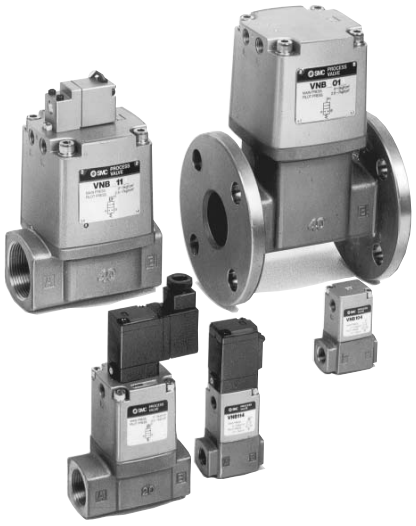
Electrical entry
- **G** — Grommet
- **C** — Conduit
- **T** Note) — Conduit terminal
- **D** — DIN terminal
- **DL*** — DIN terminal with indicator light

* Option

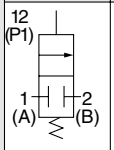
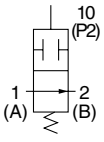
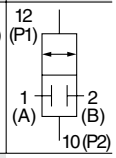
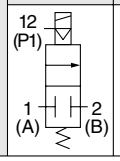
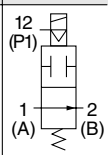
With surge voltage suppressor
- **Nil** — None
- **S** — Surge voltage suppressor (Except "DL")

Note) When the electrical entry is T, the pilot solenoid valve parts are as follows;
V0301-00□T□-X302
- Light/Surge voltage Suppressor
- Coil rated voltage

Accessory
Function plate (D seal, with screw): DXT060-32-4A



JIS Symbol

Type \ Valve type	N.C. Normally closed	N.O. Normally open	C.O. Double acting
Air operated	**VNB□0$^{1}_{4}$** 	**VNB□02** 	**VNB□03** 
External pilot solenoid	**VNB□1$^{1}_{4}$** 	**VNB□12** 	

Option Specifications
Vacuum pilot valve VNB□□□□V

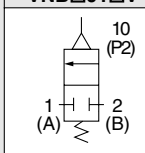
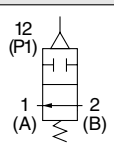
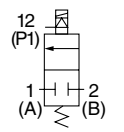
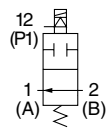
(Valve size 2 to 7)

It is used when the valve is to be operated by the main vacuum in the absence of pressurized air.

Valve Specifications

Fluid	Vacuum
Operating pressure range	–101 kPa to Atmospheric pressure
Pilot pressure range	–101 to –47.9 kPa

JIS Symbol (Vacuum pilot type)

Type \ Valve type	N.C. Normally closed	N.O. Normally open
Air operated	**VNB□01□V** 	**VNB□02□V** 
External pilot solenoid	**VNB□11□V** 	**VNB□12□V** 

Model

Model	Port size Rc	Orifice size ø (mm)	Flow characteristics: Measured by air C [dm³/(bar·sec)]	b	Cv	Flow characteristics: Measured by water Av x 10^{-6} m²	Weight (kg): Air operated	Weight (kg): External pilot solenoid
VNB1□□□-6A	1/8	7	3.3	0.29	0.80	25	0.3	0.4
VNB1□□□-8A	1/4		4.6	0.17	1.0	29		
VNB1□□□-10A	3/8		4.7	0.18	1.1	31		
VNB2□4□-10A		11	9.6	0.40	2.6	71	0.6	0.7
VNB2□□□-10A		15	17	0.32	4.0	110		
VNB2□4□-15A	1/2	11	9.6	0.40	2.6	76		
VNB2□□□-15A		15	19	0.24	4.8	140		
VNB3□4□-20A	3/4	14	18	0.42	5.4	140	0.9	1.0
VNB3□□□-20A		20	35	0.13	7.4	270		

Model	Port size Rc	Port size Flange (Note)	Orifice size ø(mm)	Flow characteristics Cv	Flow characteristics Effective area (mm²)	Weight (kg): Air operated	Weight (kg): External pilot solenoid
VNB4□4□-25A	1	–	16	7	130	1.4	1.5
VNB4□□□-25A			25	12	220		
VNB5□4□-32A	1 1/4	–	22	11	210	2.5	2.6
VNB5□□□-32A			32	18	320		
VNB5□4□-32F	–	32	22	11	210	5.7	5.8
VNB5□□□-32F			32	18	320		
VNB6□4□-40A	1 1/2	–	28	19	330	4.1	4.2
VNB6□□□-40A			40	28	500		
VNB6□4□-40F	–	40	28	19	330	7.7	7.8
VNB6□□□-40F			40	28	500		
VNB7□4□-50A	2	–	33	29	520	6.3	6.4
VNB7□□□-50A			50	43	770		
VNB7□4□-50F	–	50	33	29	520	11.4	11.5
VNB7□□□-50F			50	43	770		

Note) The flange should be JIS B 2210 10K (ordinary style) or its equivalent.

Valve Specifications

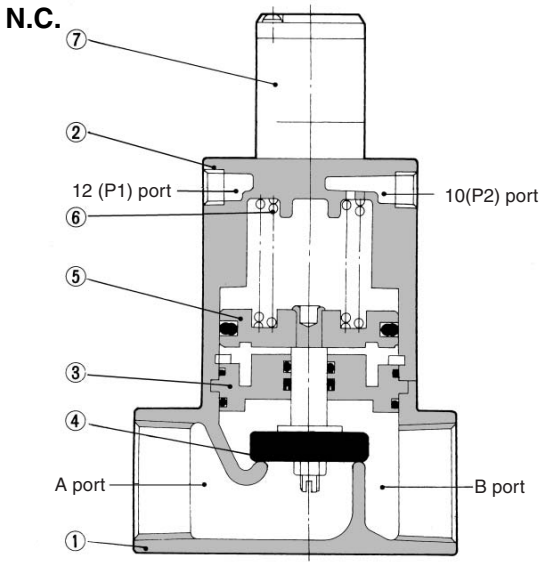
Fluid			Water/Oil/Air/Vacuum, etc.
Fluid temperature	**VNB□□□A**		–5 to 60°C (1)
	VNB□□□$^{B}_{C}$		–5 to 99°C (1) (Water, Oil etc. Air Operated only)
Ambient temperature			–5 to 50°C (1) (Air operated type: 60°C)
Proof pressure			1.5 MPa
Applicable pressure range	**VNB□□1□**		Low vacuum to 0.5 MPa
	VNB□□$^{2}_{3}$□		Low vacuum to 1 MPa
External pilot air	Pressure	**VNB□□$^{1}_{4}$□**	0.25 to 0.7 MPa
		VNB□□$^{2}_{3}$□	0.1 + 0.25 x (Operating pressure) to 0.25 + 0.25 x (Operating pressure) MPa (3) Refer to "Graph (1) ".
	Lubrication		Not required (Use turbine oil Class 1 ISO VG32, if lubricated. (2))
	Temperature		–5 to 50°C (Air operated type: 60°C)

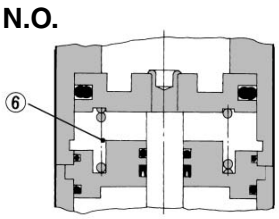
Note 1) No freezing
Note 2) Lubrication is not allowed in the case of seal material EPR.
Note 3) Adjust the operating pressure to 0.1 MPa for low vacuum.

Pilot Solenoid Valve Specifications

Port size			6A to 25A	32A to 50A, 32F to 50F
Pilot solenoid valve			**SF4-□□□-23**	**V0301□-00 □□□**
Electrical entry			Grommet, Grommet terminal, Conduit terminal, DIN terminal	Grommet, Conduit, DIN terminal, Other (Option)
Coil rated voltage (V)	AC (50/60 Hz)		100 V, 200 V, other voltage (Option)	
	DC		24 V, other voltage (Option)	
Allowable voltage fluctuation			–15% to +10% of rated voltage	
Coil insulation type			Class B or equivalent (130°C)	
Temperature rise			35°C or less (when rated voltage is applied.)	70°C or less (when rated voltage is applied.)
Apparent power	AC	Inrush	5.6 VA (50 Hz), 5.0 VA (60 Hz)	12 VA (50 Hz), 10.5 VA (60 Hz)
		Holding	3.4 VA (50 Hz), 2.3 VA (60 Hz)	7.5 VA (50 Hz), 6 VA (60 Hz)
Power consumption	DC		1.8 W	4.8 W
Manual override			Non-locking push type Other (Option)	Non-locking push type

Construction





∗ C.O. type does not have a return spring ⑥.

Component Parts

No.	Description	Material	Note
①	Body	Bronze*	Clear coated
②	Cover assembly	Aluminum alloy	Platinum silver painted
③	Plate assembly	Brass*	Valve material (NBR, FKM, EPR)
④	Valve element	Valve material (NBR, FKM, EPR)	Stainless steel or brass*
⑤	Piston assembly	Aluminum alloy	—
⑥	Return spring	Piano wire	—
⑦	Pilot solenoid valve	—	—

Note) Parts ③ and ④ are for selection of valve composition.
∗ The body option "S" is stainless steel, and "L" is aluminum.

Working Principle (Vacuum pilot type is excluded)

VNB□0$\frac{1}{4}$□, □1$\frac{1}{4}$□ (N.C.)
When the pilot solenoid valve ⑦ is not energized (or when air is exhausted from the P1 port of the air operated type), the valve element ④ linked to the piston ⑤ is closed by the return spring ⑥.

- **When valve opens**
  When the pilot solenoid valve is energized (or when pressurized air enters through the P1 port of the air operated style), the pilot air that has entered under the piston moves upward to open the valve element.
- **When valve closes:**
  When the power to the pilot solenoid valve is turned off (or when fluid is exhausted from the P1 port of the air operated style), the pilot air under the piston is exhausted, and the return spring closes the valve element.

VNB□02□, □12□ (N.O.)
In contrast with the N.C., when the power to the pilot solenoid valve is turned off (or when air is exhausted from the P2 port of the air operated style), the valve is held open by the return spring. When the pilot solenoid valve is energized (or when pressurized air enters through the P2 port of the air operated style), the valve element closes.

VNB□03□ (C.O.)
The valve element for the C.O. type, which has no return spring, is in an arbitrary position when air is exhausted through the P1and P2 ports. When pressurized air enters the P1 port (exhaust from the P2 port), the valve element opens, and it closes when pressurized air enters the P2 port (exhaust from the P1 port).

Replacement Parts

No.	Description			Part no.									
				VNB1□□□ -6A, 8A, 10A	VNB2□□□ -10A, 15A	VNB3□□□ -20A	VNB4□□□ -25A	VNB5□□□ -32A, 32F	VNB5□4□ -32A, 32F	VNB6□□□ -40A, 40F	VNB6□4□ -40A, -40F	VNB7□□□ -50A, 50F	VNB7□4□ -50A, 50F
Note) ③	Plate assembly	Valve material	NBR	VN1-A3BA	VN2-A3BA	VN3-A3BA	VN4-A3BA	VN5-A3BA	VN5-A3BA	VN6-A3BA	VN6-A3BA	VN7-A3BA	VN7-A3BA
			FPM	VN1-A3BB	VN2-A3BB	VN3-A3BB	VN4-A3BB	VN5-A3BB	VN5-A3BB	VN6-A3BB	VN6-A3BB	VN7-A3BB	VN7-A3BB
			EPR	VN1-A3BC	VN2-A3BC	VN3-A3BC	VN4-A3BC	VN5-A3BC	VN5-A3BC	VN6-A3BC	VN6-A3BC	VN7-A3BC	VN7-A3BC
Note) ④	Valve element [32A to 50A come in valve element assembly]	Valve material	NBR	VN1-4BA	VN2-4BA	VN3-4BA	VN4-4BA	VN5-A4BA	VN5-A4BA-3	VN6-A4BA	VN6-A4BA-3	VN7-A4BA	VN7-A4BA-3
			FPM	VN1-4BB	VN2-4BB	VN3-4BB	VN4-4BB	VN5-A4BB	VN5-A4BB-3	VN6-A4BB	VN6-A4BB-3	VN7-A4BB	VN7-A4BB-3
			EPR	VN1-4BC	VN2-4BC	VN3-4BC	VN4-4BC	VN5-A4BC	VN5-A4BC-3	VN6-A4BC	VN6-A4BC-3	VN7-A4BC	VN7-A4BC-3
⑦	Pilot solenoid valve			SF4-□□□-23 (Refer to the table below.)				VO301□-00□□□ (Refer to the table below.)					

Note) In the case of body options "S" and "L", the materials of the part nos. ③ and ④ are as follows: (Example): VN1-A3B□A
However all brackets of valve element VNB 1 to 4 are made of stainless steel. (No need to add options "S" and "L".) └ L: Aluminum, S: Stainless steel

How to Order Pilot Solenoid Valves

Valve size 1/2/3/4

SF4 — 1 DZ □ — 23

Coil rated voltage
1 — 100 VAC 50/60 Hz
2 — 200 VAC 50/60 Hz
3* — 110 VAC 50/60 Hz
4* — 220 VAC 50/60 Hz
5 — 24 VDC
6* — 12 VDC
7* — 240 VAC 50/60 Hz
9* — Other

∗ Option

Manual override
Nil — Non-locking push type
A* — Non-locking extended type
B* — Locking slotted type

∗ Option

Electrical entry/With indicator light/ surge voltage suppressor

G	Grommet
GS	Grommet with surge voltage suppressor
E	Grommet terminal
EZ	Grommet terminal with light/surge voltage suppressor
T	Conduit terminal
TZ	Conduit terminal with light/surge voltage suppressor
D	DIN terminal
DZ	DIN terminal with light/surge voltage suppressor

Valve size 5/6/7

VO301 □ — 00 □ □ □

Body option
Nil — Standard
V — Vacuum pilot

Coil rated voltage
1 — 100 VAC 50/60 Hz
2 — 200 VAC 50/60 Hz
3* — 110 VAC 50/60 Hz
4* — 220 VAC 50/60 Hz
5 — 24 VDC
6* — 12 VDC
7* — 240 VAC 50/60 Hz
9* — Other

∗ Option

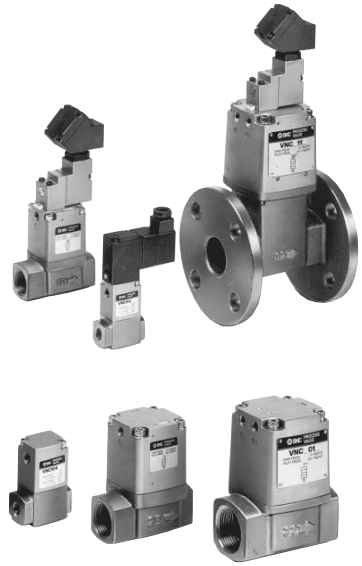
With surge voltage suppressor
Nil — None
S — Surge voltage suppressor (Except "DL")

Electrical entry
G — Grommet
C — Conduit
T Note) — Conduit terminal
D — DIN terminal
DL* — DIN terminal with indicator light

∗ Option

Note) When the electrical entry is T, the pilot solenoid valve parts are as follows;
V0301□-00□T□-X302
Coil rated voltage └ └ Light/Surge voltage suppressor

Accessory
Function plate (D sealing, with thread) : DXT060-32-4A



Model

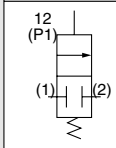
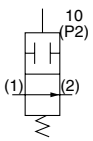
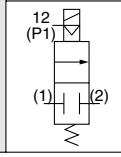
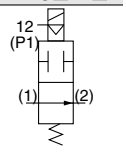
Model	Port size		Orifice size ø (mm)	Flow characteristics	Weight (kg)	
	Threaded	Flange Note)		Av x 10^{-6} m^2	Air operated	External pilot Solenoid
VNC1□□□-6A	1/8	–	7	30	0.2	0.3
VNC1□□□-8A	1/4	–		32		
VNC1□□□-10A	3/8	–		36		
VNC2□4□-10A			11	95	0.5	0.7
VNC2□□□-10A			15	120		
VNC2□4□-15A	1/2	–	11	110		
VNC2□□□-15A			15	140		
VNC3□4□-20A	3/4	–	14	170	0.8	1.0
VNC3□□□-20A			20	260		
VNC4□4□-25A	1	–	16	220	1.2	1.4
VNC4□□□-25A			25	370		
VNC5□4□-32A	1 1/4	–	22	400	2.2	2.4
VNC5□□□-32A			32	560		
VNC5□4□-32F	–	32	22	400	5.0	5.2
VNC5□□□-32F			32	560		
VNC6□4□-40A	1 1/2	–	28	630	3.6	3.8
VNC6□□□-40A			40	820		
VNC6□4□-40F	–	40	28	720	6.8	7.0
VNC6□□□-40F			40	960		
VNC7□4□-50A	2	–	33	990	5.5	5.7
VNC7□□□-50A			50	1500		
VNC7□4□-50F	–	50	33	1000	10.2	10.4
VNC7□□□-50F			50	1600		

Note) The companion flange is JIS B 2210 10K (standard) or its equivalent.

Model	Port size Flange Note)	Orifice size ø (mm)	Flow characteristics		Weight (kg)
			Cv	Effective area (mm^2)	External pilot solenoid
VNC814□-65F	65	45	49	880	15.7
VNC811□-65F		65	70	1260	
VNC914□-80F	80	56	73	1400	21.2
VNC911□-80F		80	100	1800	

Note) The companion flange is JIS B 2210 10K (standard) or its equivalent.

JIS Symbol

Operation \ Valve type	N.C.	N.O.
	VNC□0 1/4 □	**VNC□02□**
Air operated		
	VNC□1 1/4 □	**VNC□12□**
External pilot solenoid		

Valve specifications

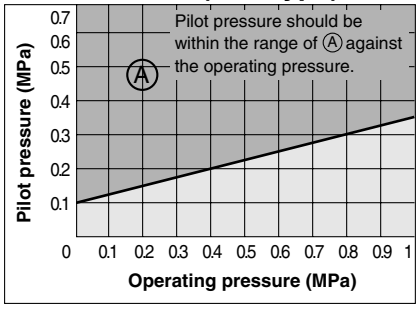
Fluid			Coolant
Fluid temperature	**VNC□□□A**		–5 to 60°C*
	VNC□□□B		–5 to 99°C* (Air operated type only)
Ambient temperature			–5 to 50°C (Air operated type: 60°C) *
Proof pressure			1.5 MPa
Applicable pressure range	**VNC□□1□**		0 to 0.5 MPa
	VNC□□ 2/4 □		0 to 1 MPa
External pilot air	Pressure	**VNC□□ 1/4 □**	0.25 to 0.7 MPa
		VNC□□2□	0.1 + 0.25 x (Operating pressure) to 0.7 MPa Refer to "Graph (1)".
	Lubrication		Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)
	Temperature		–5 to 50°C (Air operated type: 60°C) *

* No freezing

Pilot Solenoid Valve Specifications

Model			**VNC1□□□**	**VNC2□□□ to 9□□□**
Pilot solenoid valve			SF4-□□□-23	VO301-00□T□-X302
Electrical entry			Grommet Grommet terminal Conduit terminal DIN terminal	Conduit terminal
Coil rated voltage (V)	AC (50/60 Hz)		100 V, 200 V, Other voltage (Option)	
	DC		24 V, Other voltage (Option)	
Allowable voltage fluctuation			–15% to +10% of rated voltage	
Coil insulation type			Class B or equivalent (130°C)	
Temperature rise			35°C or less (when rated voltage is applied.)	70°C or less (when rated voltage is applied.)
Apparent power	AC	Inrush	5.6 VA (50 Hz) 5.0 VA (60 Hz)	12 VA (50 Hz) 10.5 VA (60 Hz)
		Holding	3.4 VA (50 Hz) 2.3 VA (60 Hz)	7.5 VA (50 Hz) 6 VA (60 Hz)
Power consumption	DC		1.8 W	4.8 W
Manual override			Non-locking push type, Other (Option)	Non-locking push type

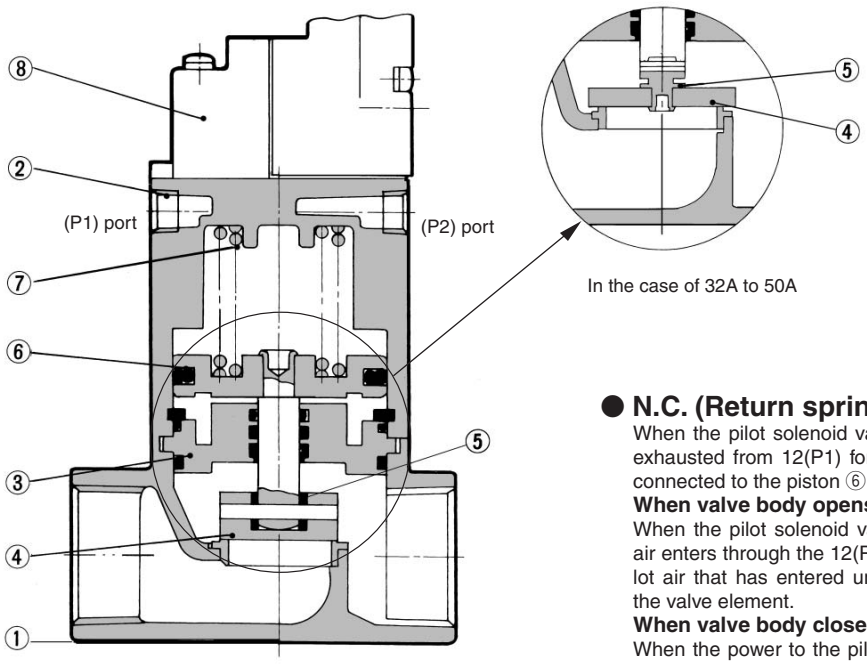
Graph (1) VNC□□2□ Pilot Pressure (N.O. type)



VC□
VDW
VQ
VX2
VX□
VX3
VXA
VN□
LVC
LVA
LVH
LVD
LVQ
LQ
LVN
TI/ TIL
PA
PAX
PB

Construction

N.C.



● N.C. (Return spring normally closed)

When the pilot solenoid valve ⑧ is not energized (or when air is exhausted from 12(P1) for air operated style), the valve body ④ connected to the piston ⑥ is closed by the return spring ⑦.

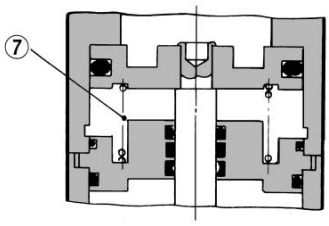
When valve body opens

When the pilot solenoid valve is energized (or when pressurized air enters through the 12(P1) port of the air operated style), the pilot air that has entered under the piston moves upward to open the valve element.

When valve body closes

When the power to the pilot solenoid valve is turned off (or when fluid is exhausted from the 12(P1) port of the air operated style), the pilot air under the piston is exhausted, and the return spring closes the valve element.

N.O.



● N.O. (Return spring normally open)

In contrast with the N.C., when the pilot solenoid valve is not energized (or when air is exhausted from the 10(P2) port of the air operated style), the valve body is opened by the return spring. When the pilot solenoid valve is energized (or when pressurized air enters through the 10(P2) port of the air operated style), the valve body closes.

Component Parts

No.	Description	Material	Note
①	Body assembly	Cast iron	Plated
②	Cover assembly	Aluminum alloy	Platinum silver painted
③	Plate assembly	Iron	Valve composition, NBR, FKM
④	Valve element	Stainless steel	
⑤	Valve cover	NBR, FKM	32A to 50A are O-ring.
⑥	Piston assembly	Aluminum alloy	
⑦	Return spring	Piano wire	
⑧	Pilot solenoid valve	—	

Note) ③⑤ components determine the valve composition.

Replacement Parts

No.	Description			Part no.						
				VNC1□□□ -6A, 8A, 10A	**VNC2□□□ -10A, 15A**	**VNC3□□□ -20A**	**VNC4□□□ -25A**	**VNC5□□□ -32A, 32F**	**VNC6□□□ -40A, 40F**	**VNC7□□□ -50A, 50F**
③	Plate ass'y	Valve material	NBR	VN1-A3CA	VN2-A3CA	VN3-A3CA	VN4-A3CA	VN5-A3CA	VN6-A3CA	VN7-A3CA
			FKM	VN1-A3CB	VN2-A3CB	VN3-A3CB	VN4-A3CB	VN5-A3CB	VN6-A3CB	VN7-A3CB
⑤	Valve cover (32A to 50A are O-ring.)	Valve material	NBR	–	VN2-12CA		VN4-12CA	AS568-010	AS568-011	AS568-012
			FKM	–	VN2-12CB		VN4-12CB			
⑧	Pilot solenoid valve			SF4-□□□-23	VO301-00□T□-X302 (Refer to page 17-4-29 for part no.)					

Replacement Parts: Applicable Flange

No.	Description			Part no.	
				VNC811□-65F	**VNC911□-80F**
③	Plate assembly	Valve material	NBR	VN8-A3CA	VN9-A3CA
			FKM	VN8-A3CB	VN9-A3CB
⑧	Pilot solenoid valve			VO301-00□T□-X302 (Refer to page 17-4-29 for part no.)	

How to Order Pilot Solenoid Valves

Valve size 1

SF4 — 1 D Z □ — 23

Coil rated voltage
- **1** — 100 VAC 50/60 Hz
- **2** — 200 VAC 50/60 Hz
- **3*** — 110 VAC 50/60 Hz
- **4*** — 220 VAC 50/60 Hz
- **5** — 24 VDC
- **6*** — 12 VDC
- **7*** — 240 VAC 50/60 Hz
- **9*** — Other

* Option

Electrical entry
- **G** — Grommet
- **E** — Grommet terminal
- **T** — Conduit terminal
- **D** — DIN terminal

Light/Surge voltage suppressor
- **Nil** — None
- **Z** — With light/Surge voltage suppressor (Except type "G")
- **S** — With surge voltage suppressor (Type "G" only)

Manual override
- **Nil** — Non-locking push type
- **A*** — Non-locking extended type
- **B*** — Locking slotted type

* Option

Valve size 2 to 9

VO301-00 □ T □ — X302

Coil rated voltage
- **1** — 100 VAC 50/60 Hz
- **2** — 200 VAC 50/60 Hz
- **3*** — 110 VAC 50/60 Hz
- **4*** — 220 VAC 50/60 Hz
- **5** — 24 VDC
- **6*** — 12 VDC
- **7*** — 240 VAC 50/60 Hz
- **9*** — Other

* Option

Light/surge voltage suppressor
- **Nil** — None
- **S** — With surge voltage suppressor
- **Z*** — With light/surge voltage suppressor
- **L*** — With indicator light

* Except 12 VDC, 240 VAC, other voltages.

Accessory
Function plate (D seal, with thread): DXT060-32-4A

How to Order

VNH 2 1 1 A — □ 15A — 1 T — □

Note) Silencer is provided as standard on pilot EXH port (P2).

Port

1	3 port
3*	2 port

* 2 port is 7.0 MPa only.

Valve type

1	N.C./3.5 MPa
3	N.C./7.0 MPa

Gasket material

A	NBR seals
B	FKM seals

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Valve size / Port size

1	10A	Rc 3/8
2	15A	Rc 1/2
3	20A	Rc 3/4
4	25A	Rc1

Rated voltage

Nil	Air operated
1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3*	110 VAC 50/60 Hz
4*	220 VAC 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC 50/60 Hz
9*	Other

* Option

Electrical entry/With light/surge voltage suppressor

T	Conduit terminal
TS	Conduit terminal with surge voltage suppressor
TZ*	Conduit terminal with light/surge voltage suppressor
TL*	Conduit terminal with indicator light

* Rated voltage: Except 6, 7, 9.

Bracket

Nil	None
B	With bracket

Option

Description		Component part no.			
		VNH1□□	VNH2□□	VNH3□□	VNH4□□
Bracket (With bolt and washer)	B	VNH1-16	VNH2-16	VNH3-16	VNH4-16

How to Order Pilot Solenoid Valves

VO301-00 □ T □ — X302

Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3*	110 VAC 50/60 Hz
4*	220 VAC 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC 50/60 Hz
9*	Other

* Option

Light/surge voltage suppressor

Nil	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
L	With indicator light

Accessory
Function plate (D sealing, with thread): DXT060-32-4A

Specifications

Model		3 port valve								2 port valve			
		VNH111$^{A}_{B}$-10A	VNH211$^{A}_{B}$-15A	VNH311$^{A}_{B}$-20A	VNH411$^{A}_{B}$-25A	VNH113$^{A}_{B}$-10A	VNH213$^{A}_{B}$-15A	VNH313$^{A}_{B}$-20A	VNH413$^{A}_{B}$-25A	VNH133$^{A}_{B}$-10A	VNH233$^{A}_{B}$-15A	VNH333$^{A}_{B}$-20A	VNH433$^{A}_{B}$-25A
Operating fluid pressure		0 to 3.5 MPa				0 to 7.0 MPa							
Fluid		Coolant											
Operation		External pilot solenoid/Air operated											
Operating fluid temperature	VNH□□$^{1}_{3}$A	–5 to 60°C */–5 to 60°C * (NBR seal)											
	VNH□□$^{1}_{3}$B	–5 to 60°C */–5 to 99°C * (FKM seal)											
Pilot air	Pressure	0.25 to 0.7 MPa											
	Temperature	–5 to 50°C *											
	Lubrication	Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)											
Proof pressure		5.5 MPa				10.5 MPa							
Ambient temperature		–5 to 50°C *											
Max. operating frequency		20 times/min											
Mounting position		Vertical upwards											
Port size		Rc 3/8	Rc 1/2	Rc 3/4	Rc1	Rc 3/8	Rc 1/2	Rc 3/4	Rc1	Rc 3/8	Rc 1/2	Rc 3/4	Rc1
Orifice size (mm)		ø7.1 **	ø8.7 **	ø10.6 **	ø14.3 **	ø3.9 **	ø5.2 **	ø6.2 **	ø7.3 **	ø8	ø9.5	ø13	ø15.7
Flow characteristics Av x 10^{-5}		46	86	110	190	15	29	38	58	54	75	140	210
Pilot port size		Rc 1/8		Rc 1/4		Rc 1/8		Rc 1/4		Rc 1/8		Rc 1/4	
Weight (kg)		2	3.1	5.6	8.2	2	3.1	5.6	8.2	2	3.1	5.6	8.2
Face-to-face dimension (mm)		60	80	100	115	60	80	100	115	60	80	100	115

* No freezing
** Equivalent size

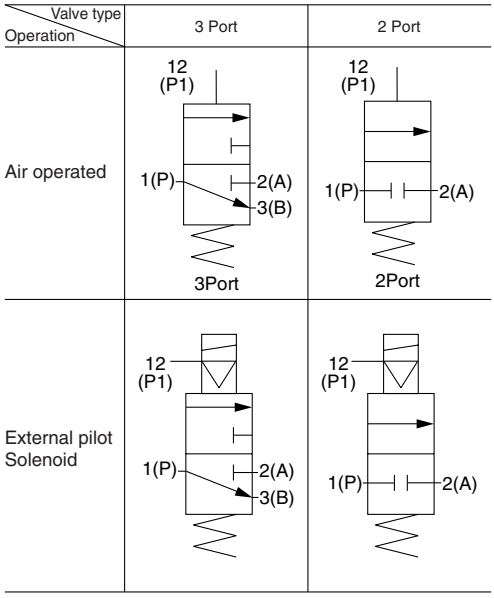
3.5 MPa

7.0 MPa

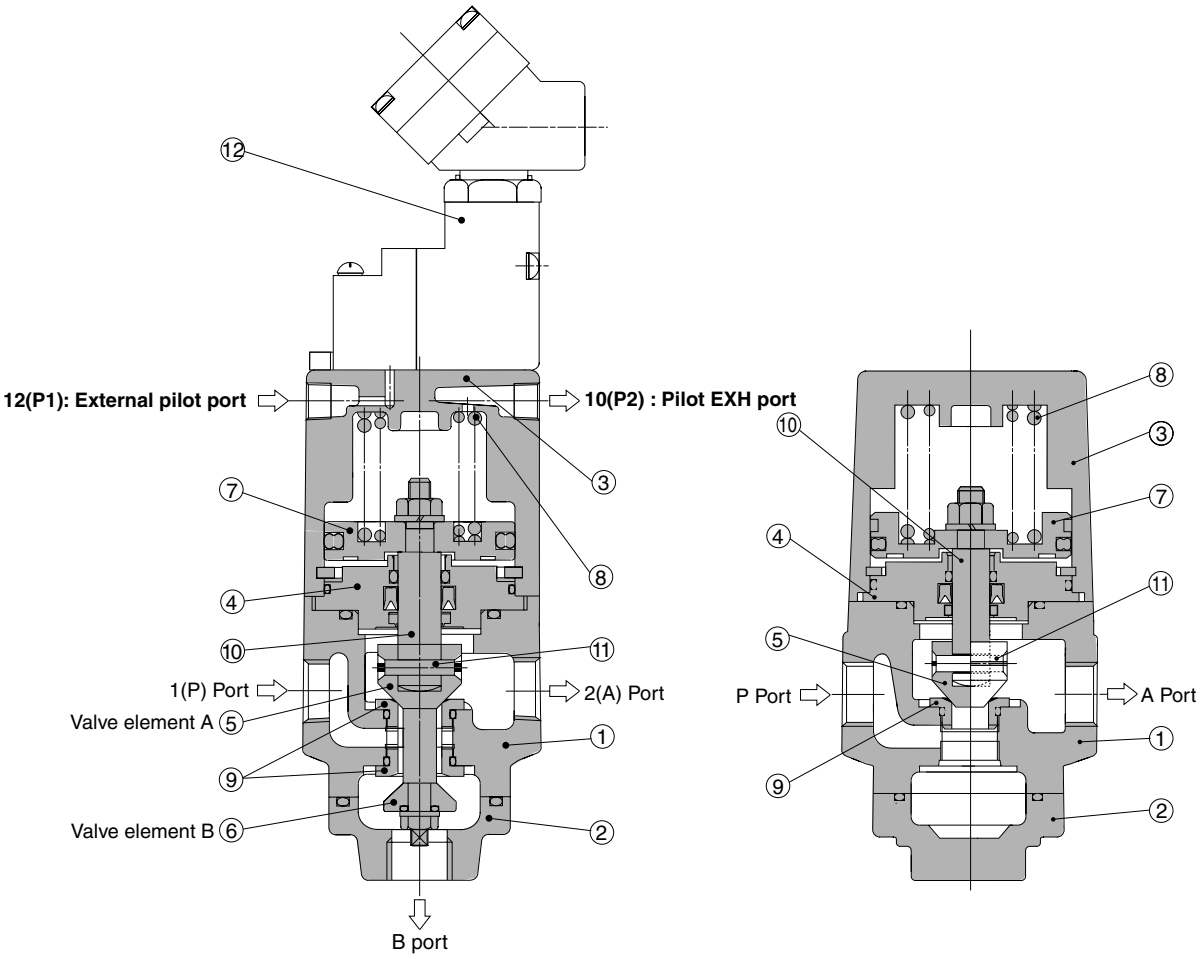
Pilot Operated Solenoid Valve Specifications

Pilot solenoid valve			VO301-00□T□-X302
Electrical entry			Conduit terminal
Coil rated voltage (V)	AC (50/60/Hz)		100 V, 200 V, Other voltage (Option)
	DC		24 V, Other voltage (Option)
Allowable voltage fluctuation			–15 to 10% of the rated voltage
Coil insulation type			Class B or equivalent (130°C)
Temperature rise			70°C or less (When rated voltage is applied.)
Apparent power	AC	Inrush	12 VA (50 Hz), 10.5 AV (60 Hz)
		Holding	7.5 VA (50 Hz), 6 VA (60 Hz)
Power consumption	DC		4.8 W
Manual override			Non-locking push type

JIS Symbol



Construction



3 Port valve **2 Port valve**

Working Principle

When the pilot operated solenoid valve ⑫ is not energized, the valve element A ⑤ connected to the piston ⑦ is closed by the return spring ⑧. Then valve element B ⑥ connected to the valve element A ⑤ is open. When the pilot operated solenoid valve ⑫ is energized, the pilot air supplied to the bottom of the piston ⑦ moves upward to open the valve element A ⑤ and closes the valve element B ⑥. Because rod ⑩ is connected to valve element A ⑤ by parallel pin ⑪. Valve element becomes free to incline and it reaches valve seat ⑨.

Component Parts

No.	Description	Material	Note
①	Body	Cast iron	Plated
②	Undercover	Cast iron	Plated
③	Cover	Aluminum alloy	
④	Plate	Iron	
⑤	Valve element A	Stainless steel	
⑥	Valve element B	Stainless steel	
⑦	Piston	Aluminum alloy	
⑧	Return spring	Piano wire	
⑨	Valve seat	Stainless steel	
⑩	Rod	Stainless steel	
⑪	Parallel pin	Stainless steel	
⑫	Pilot solenoid valve	Refer to “How to Order” in page 17-4-32.	