

Coolant Valve

Series VNC

Air Operated/External Pilot Solenoid



Cylinder actuation by pilot air

Wide selection of port
size and variations

Threaded type (6A to 50A)
Flange type (32F to 80F)

Low water hammer

For details, refer to page 407.



Large valve capacity

Av factor 30×10^{-6} to 1600×10^{-6}
(VNC1 to VNC7)
Cv factor 49 to 100
(VNC8 to VNC9)

VNA

VNB

SGC

VNC

VNH

VND

VCC

Coolant Valve: Air Operated/External Pilot Solenoid Series VNC



[Option]

Note) CE compliant: For D or DZ only

How to Order

Seal material

A	NBR seals
B	FKM seals

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Bracket (Valve size: 1/2/3/4)

Nil	None
B [Note]	With bracket (VN□-16)

[Note] Only valve sizes 1, 2, 3 and 4. Shipped after assembled at our factory.
Bracket part no.
Valve size 1: VN1-A16 (with thread)
Valve sizes 2 to 4: VN□-16
2 to 4

Air operated VNC **2** **0** **1** **A** - **15A** - (Except valve size 8, 9)

External pilot solenoid VNC **2** **1** **1** **A** - **15A** - **1** **T** - - -

Valve size

Symbol	Orifice diameter (mm)	Symbol			Symbol	Port size Rc
		1 N.C. 0.5 MPa	2 N.O. 1 MPa	4 N.C. 1 MPa		
1	ø7	—	●	●	6A	1/8
		—	●	●	8A	1/4
		—	●	●	10A	3/8
2	ø15 (ø11)	●	●	●	10A	3/8
		●	●	●	15A	1/2
3	ø20 (ø14)	●	●	●	20A	3/4
4	ø25 (ø16)	●	●	●	25A	1
		●	●	●	32A	1 1/4
5	ø32 (ø22)	●	●	●	32F	1 1/4 B Flange
		●	●	●	40A	1 1/2
6	ø40 (ø28)	●	●	●	40F	1 1/2 B Flange
		●	●	●	50A	2
7	ø50 (ø33)	●	●	●	50F	2B Flange
		●	—	●	65F	2 1/2 B Flange
8	ø65 (ø45)	●	—	●	65F	2 1/2 B Flange
9	ø80 (ø56)	●	—	●	80F	3B Flange

Values in parentheses are N.C. at 1 MPa.

Rated voltage

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

Note 1) Electrical entry: D or DZ only
Note 2) Semi-standard

CE compliant

Nil	—
Q	CE compliant

Note) Electrical entry: D or DZ only

Manual override

Nil: Non-locking push type

A: Non-locking * push type A (projecting)

B: Slotted locking type B * (tool required)

Valve size 1

Nil: Non-locking push type

Valve size 2 to 9

* Semi-standard

Electrical entry/With light/surge voltage suppressor

Symbol	Electrical entry	Valve size
G	Grommet	Valve size 1
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	Valve size 2 to 9 [Note 2]
D	DIN terminal	
DZ	DIN terminal with light/surge voltage suppressor	
T	Conduit terminal	
TS	Conduit terminal with surge voltage suppressor	
Note 1) TZ	Conduit terminal with light/surge voltage suppressor	
Note 1) TL	Conduit terminal with indicator light	

CE compliant

Symbol	Electrical entry	Valve size
D	DIN terminal*	Valve size 1 to 9
DZ	DIN terminal with light/surge voltage suppressor*	



Note 1) Except rated voltage: 6, 7 and 9.

Note 2) For valve sizes 2 to 9 of the D DIN terminal and the DZ DIN terminal with light/surge voltage suppressor, be sure to add suffix -X200 at the end of the part number. (For CE compliant product, -X200 is not required.) In this case, the pilot solenoid valve is VO307-□D□.

Coolant Valve: Air Operated/External Pilot Solenoid **Series VNC**



Model

Model	Port size		Orifice dia. ø (mm)	Flow characteristics Av x 10 ⁻⁶ m ²	Mass (kg)	
	Threaded	(Note) Flange			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□□□-10A	3/8	—	11	95	0.5	0.7
VNC2□□□-10A	1/2	—	15	120		
VNC2□□□-15A	1/2	—	11	110		
VNC2□□□-15A	1/2	—	15	140	0.8	1.0
VNC3□□□-20A	3/4	—	14	170		
VNC3□□□-20A	3/4	—	20	260		
VNC4□□□-25A	1	—	16	220	1.2	1.4
VNC4□□□-25A	1	—	25	370		
VNC5□□□-32A	1 1/4	—	22	400		
VNC5□□□-32A	1 1/4	—	32	560	2.2	2.4
VNC5□□□-32F	—	32	22	400		
VNC5□□□-32F	—	32	32	560		
VNC6□□□-40A	1 1/2	—	28	630	3.6	3.8
VNC6□□□-40A	1 1/2	—	40	820		
VNC6□□□-40F	—	40	28	720		
VNC6□□□-40F	—	40	40	960	6.8	7.0
VNC7□□□-50A	2	—	33	990		
VNC7□□□-50A	2	—	50	1500		
VNC7□□□-50F	—	50	33	1000	10.2	10.4
VNC7□□□-50F	—	50	50	1600		



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

Model	Port size Flange (Note)	Orifice dia. ø (mm)	Flow characteristics		Mass (kg) External pilot solenoid
			Cv	Effective area (mm ²)	
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

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

Specifications

Fluid (Main piping)		Coolant (Note 2)
Fluid	VNC□□□A	—5 to 60°C (Note 1)
temperature	VNC□□□B	—5 to 99°C (Air operated type only) (Note 1)
Ambient temperature		—5 to 50°C (Air operated type: 60°C) (Note 1)
Proof pressure		1.5 MPa
Applicable pressure range	VNC□□1□	0 to 0.5 MPa
	VNC□□2□	0 to 1 MPa
External pilot air	Pressure	VNC□□1□
		VNC□□2□
	Lubrication	0.1 + 0.25 x (Operating pressure) to 0.7 MPa Refer to "Graph (1)".
	Temperature	Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)
		—5 to 50°C (Air operated type: 60°C) (Note 1)
Mounting orientation		Unrestricted (Note 3)

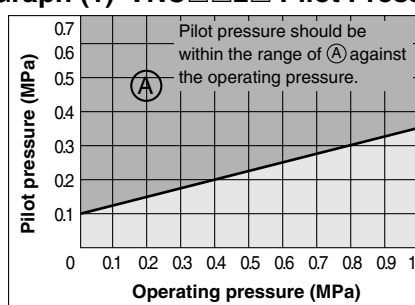


Note 1) No freezing

Note 2) This product cannot be used in water.

Note 3) For external pilot solenoid, it is recommended that the pilot solenoid valve be oriented either vertically upward or horizontally.

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



Pilot Solenoid Valve Specifications

Model		VNC1	VNC2 to 9	VNC2 to 9 (CE compliant)
Pilot solenoid valve		SF4-□□□-23	VO301-00□□-X302	VO307-00□□□□-Q
Electrical entry		Grommet Grommet terminal Conduit terminal DIN terminal	Conduit terminal	DIN 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		
Temperature rise		35°C or less (when rated voltage is applied.)	70°C or less (when rated voltage is applied.)	50°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)	7.6 VA (50 Hz) 6 VA (60 Hz)
Power consumption	DC	1.8 W (without light), 2 W (with light)	4.8 W (without light), 5 W (with light)	
Manual override		Non-locking push type, Other (Option)	Non-locking push type	

Note) Refer to page 406 for how to order pilot solenoid valves.

VNA

VNB

SGC

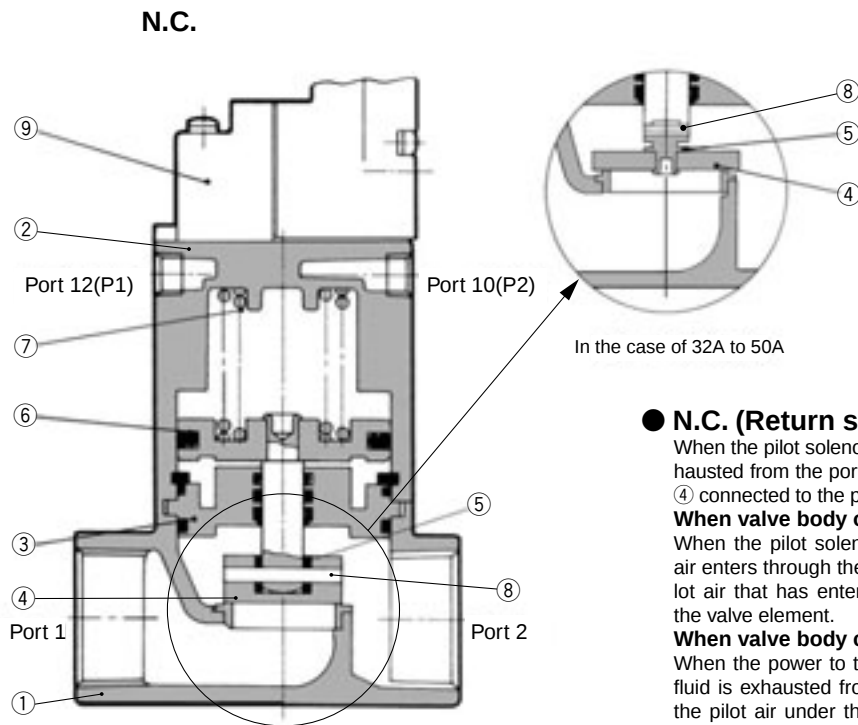
VNC

VNH

VND

VCC

Construction



● N.C. (Return spring normally closed)

When the pilot solenoid valve ⑨ is not energized (or when air is exhausted from the port 12(P1) for air operated style), the valve body ④ connected to the piston ⑥ is closed by the return spring ⑦.

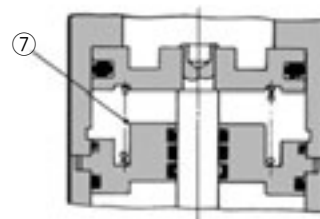
When valve body opens

When the pilot solenoid valve is energized (or when pressurized air enters through the port 12(P1) 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 port 12(P1) 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 port 10(P2) 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 port 10(P2) 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	Spiral pin	Stainless steel	
9	Pilot solenoid valve	—	

Note) 3, 5 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	Seal material	NBR FKM	Refer to Note 1)	VN2-A3CA VN2-A3CB	VN3-A3CA VN3-A3CB	VN4-A3CA VN4-A3CB	VN5-A3CA VN5-A3CB	VN6-A3CA VN6-A3CB	VN7-A3CA VN7-A3CB	
5	Valve cover (32A to 50A are O-ring.)	Seal material	NBR FKM		VN2-12CA VN2-12CB		VN4-12CA VN4-12CB	AS568-010	AS568-011	AS568-012	
8	Spiral pin				VN2-60-1	Refer to Note 2)		VN4-60-1	VN5-60-1	VN6-60-1	VN7-60-1
9	Pilot solenoid valve				SF4-□□□-23	VO301-00□□□-X302 (Refer to page 406 for part no.)					

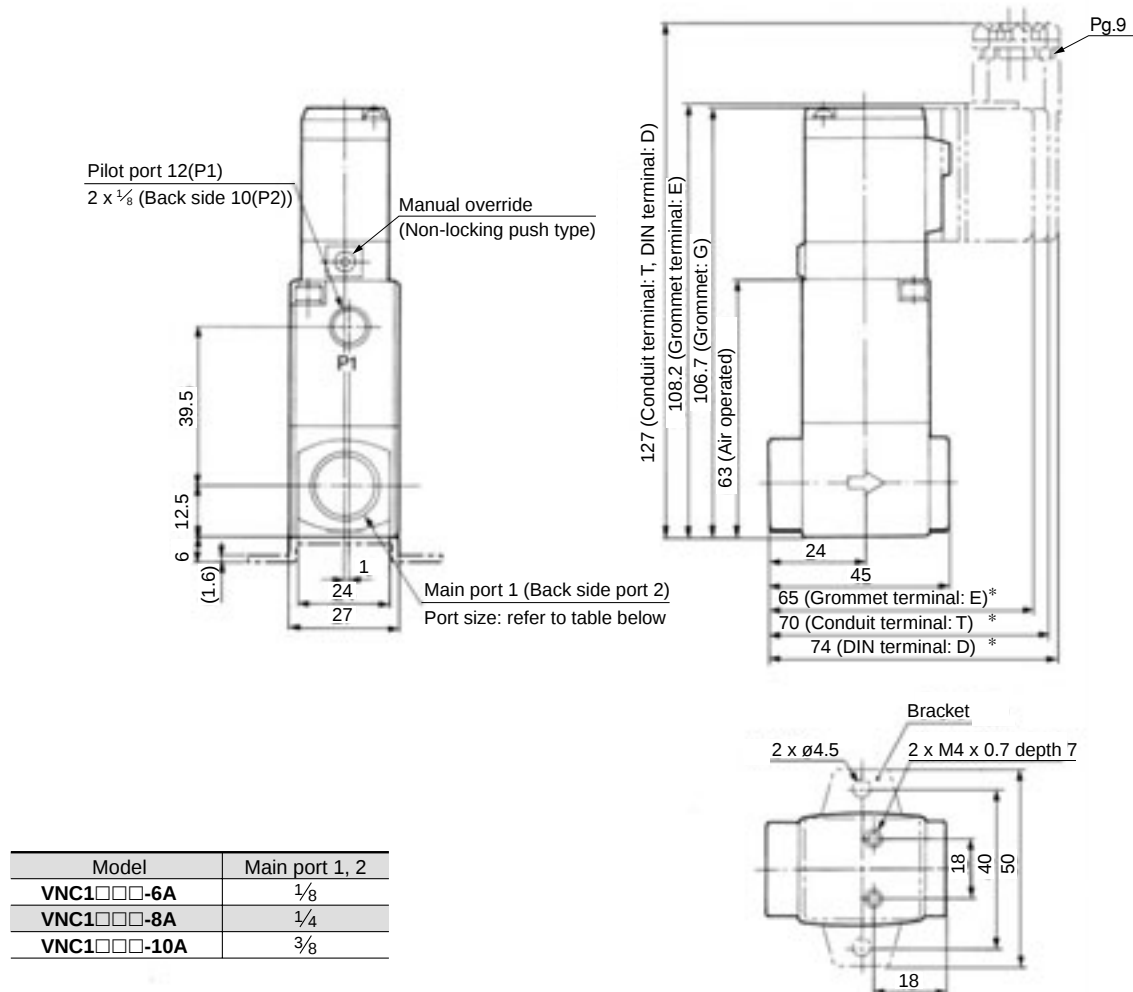
Note 1) Request factory repair.

Note 2) For VNC3□□□ use VN3-60-1, and for VNC3□□□ use VN2-60-1.

Replacement Parts: Applicable Flange

No.	Description			Part no.	
				VNC811□-65F	VNC911□-80F
3	Plate assembly	Seal material	NBR FKM	VN8-A3CA VN8-A3CB	VN9-A3CA VN9-A3CB
8	Spiral pin			VN7-60-1	
9	Pilot solenoid valve			VO301-00□□□-X302 (Refer to page 406 for part no.)	

Threaded Type/Port size: 6A, 8A, 10A

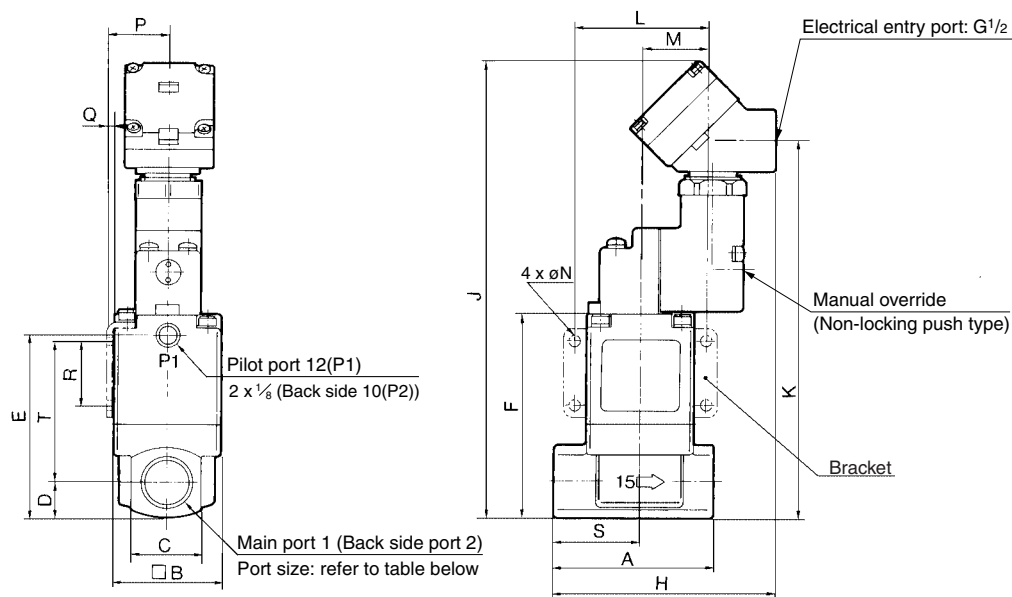


* In the case of "EZ" or "TZ" or "DZ", the length is longer by 9 mm.

- VNA
- VNB
- SGC
- VNC**
- VNH
- VND
- VCC

Series VNC

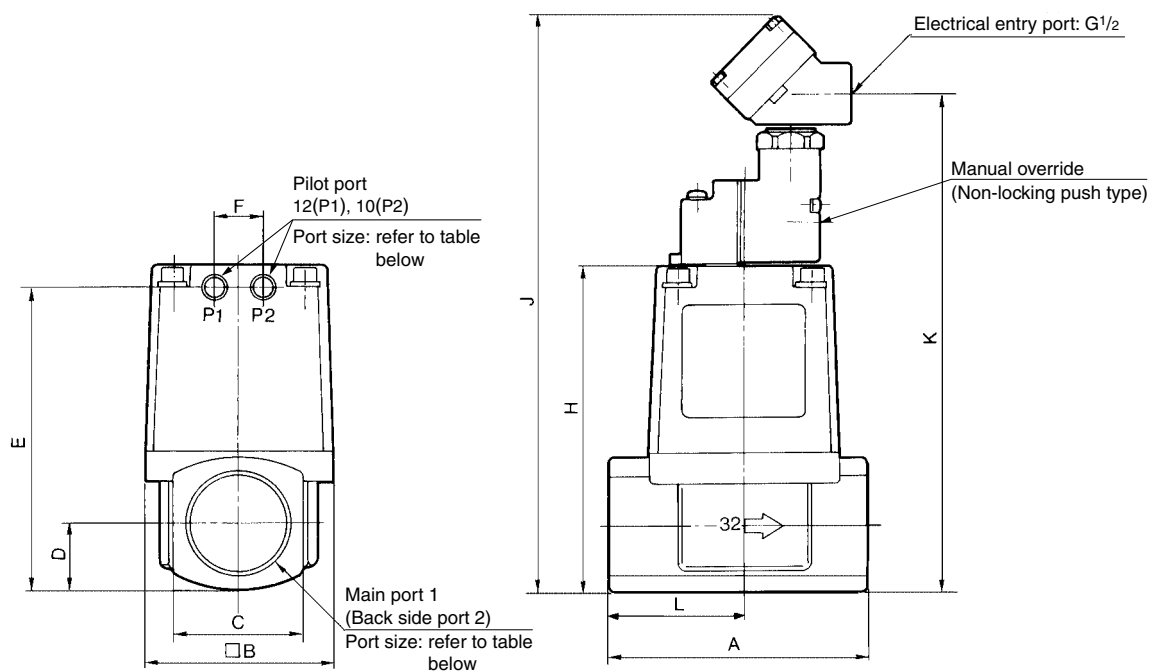
Threaded Type/Port size: 10A, 15A, 20A, 25A



Model	Main port 1, 2	A	B	C	D	E	F	H	J (Note)	K	L	M	N	P	Q	R	S	T
VNC2□□□-10A	3/8	63	42	28	14	72.5	80.5	87	180.5 (166.5)	148	52	26	4.5	24.3	2.3	25	34	55
VNC2□□□-15A	1/2	63	42	28	14	72.5	80.5	87	180.5 (166.5)	148	52	26	4.5	24.3	2.3	25	34	55
VNC3□□□-20A	3/4	80	50	35	17.5	84	92	92	192 (178)	159.5	62	31	5.5	28.3	2.3	30	43	60.5
VNC4□□□-25A	1	90	60	40	20	100	108	93	208 (194)	175.5	72	36	6.5	33.3	2.3	35	49	73

Note) (): CE compliant product (-Q)

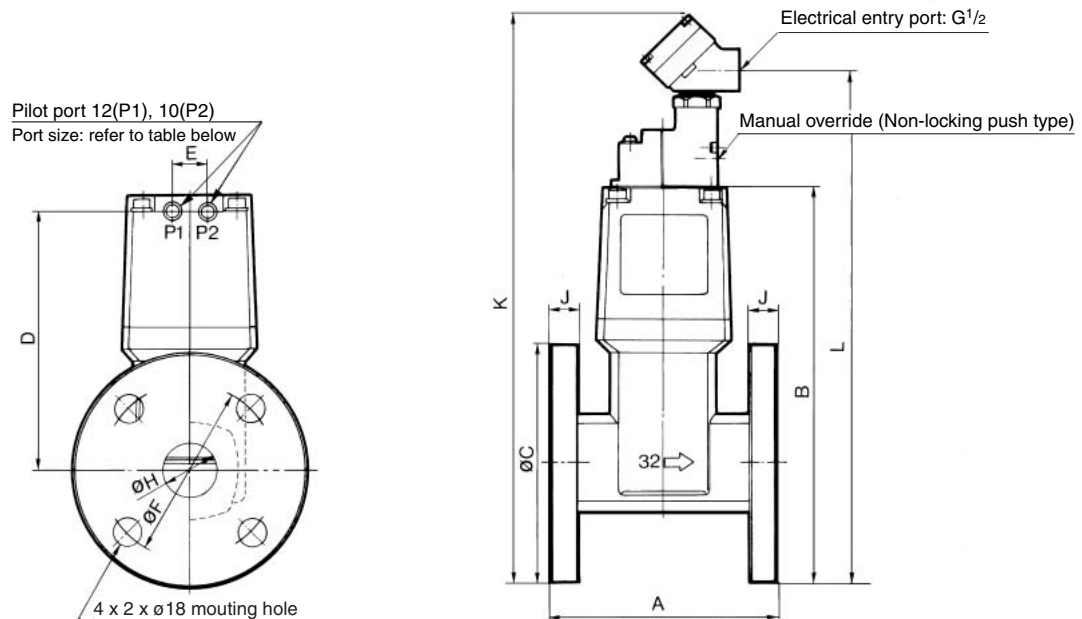
Threaded Type/Port size: 32A, 40A, 50A



Model	Main port 1, 2	Pilot port 12(P1), 10(P2)	A	B	C	D	E	F	H	J (Note)	K	L
VNC5□□□-32A	1 1/4	1/8	105	77	53	26.5	120.5	20	129.5	229.5 (215.5)	197	55
VNC6□□□-40A	1 1/2	1/4	120	96	60	30	137	24	147	247 (233)	214.5	63
VNC7□□□-50A	2	1/4	140	113	74	37	160	24	170	270 (256)	237.5	74

Note) (): CE compliant product (-Q)

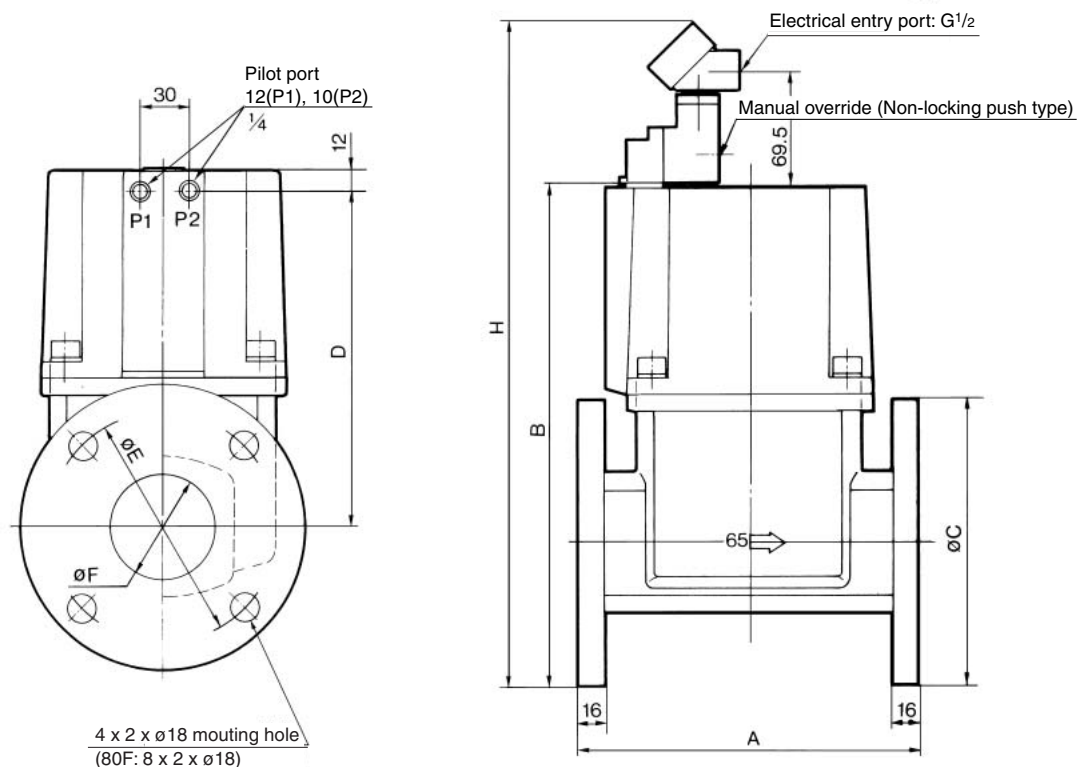
Flange Type/Port size: 32F, 40F, 50F



Model	Applicable flange Port 1, 2	Pilot port 12(P1), 10(P2)	A	B	C	D	E	F	H	J	K (Note)	L
VNC5□□□-32F	32	1/8	130	210.5	135	134	20	100	36	12	310.5 (296.5)	278
VNC6□□□-40F	40	1/4	150	226	140	146	24	105	42	12	326 (312)	293.5
VNC7□□□-50F	50	1/4	180	250	155	162.5	24	120	54	14	350 (336)	317.5

Note) (): CE compliant product (-Q)

Flange Type/Port size: 65F, 80F



Model	Applicable flange Port 1, 2	A	B	C	D	E	F	H (Note)
VNC81 ¹ / ₄ □-65F	65	210	305.5	175	204	140	65	405.5 (391.5)
VNC91 ¹ / ₄ □-80F	80	240	341.5	185	235	150	80	441.5 (427.5)

Note) (): CE compliant product (-Q)

VNA

VNB

SGC

VNC

VNH

VND

VCC

How to Order Pilot Solenoid Valves

Valve size 1

SF4 - 5 D - 23 - Q

SF4 - 5 D - 23

CE compliant
* Electrical entry:
D or DZ only

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

* Semi-standard

Manual override

Nil	Non-locking push type
A*	Non-locking push type A (projecting)
B*	Slotted locking type B (tool required)

* Semi-standard

Electrical entry/

With light/surge voltage suppressor		CE compliant
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 2 to 9

VO307 -

Q

CE compliant
Note 1) Electrical entry: D or DZ only

VO301 - 00 - 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

* Semi-standard

Light/surge voltage suppressor

		CE compliant
T	Conduit terminal	—
TS	Conduit terminal with surge voltage suppressor	—
Note 1) TZ	Conduit terminal with light/surge voltage suppressor	—
Note 1) TL	Conduit terminal with indicator light	—
D	DIN terminal	●
Note 2) DZ	DIN terminal with light/surge voltage suppressor*	●

Note 1) Except rated voltage: 6, 7 and 9.

Note 2) VO307 only

Accessory

Function plate for VO301 (D seal, with thread): DXT060-32-4A

Function plate for VO307 (D seal, with thread): DXT152-14-1A



Series VNC

Specific Product Precautions

Be sure to read this before handling.

Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

External Pilot

⚠ Caution

Pilot port 12(P1) and 10(P2) piping
P1 and P2 piping should be as follows according to the model.

Port	Air operated		Solenoid
	VNC□0□□	VNC□02□	VNC□1□□
12 (P1)	External pilot	Bleed port	External pilot
10 (P2)	Bleed port	External pilot	Pilot exhaust

Installing a silencer to the exhaust port and the bleed port is recommended for noise reduction and for dust entry prevention.

Piping

⚠ Caution

When high temperature fluids are used, use fittings and tube with heat resistant features. (Self-align fittings, Teflon® tubing, Copper piping, etc.)

Pilot Solenoid Valve

⚠ Warning

With external pilot solenoids, the pilot solenoid valves are not splash proof specifications, and so care must be taken not to get fluid on oneself such as when performing maintenance.

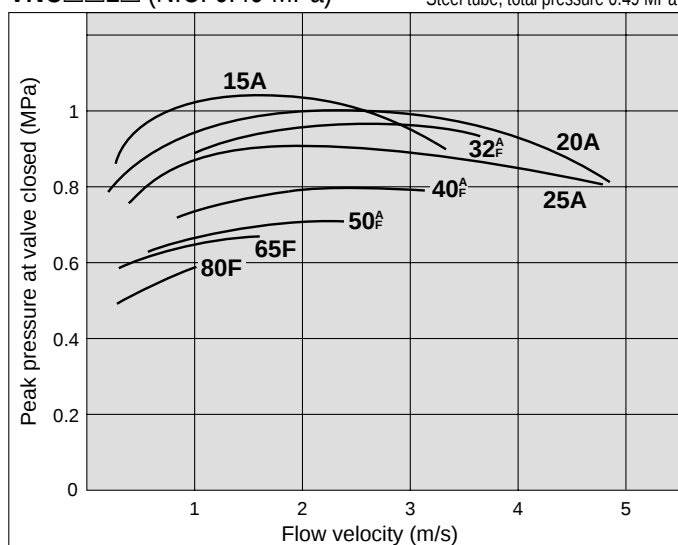
⚠ Caution

Direction of mounting

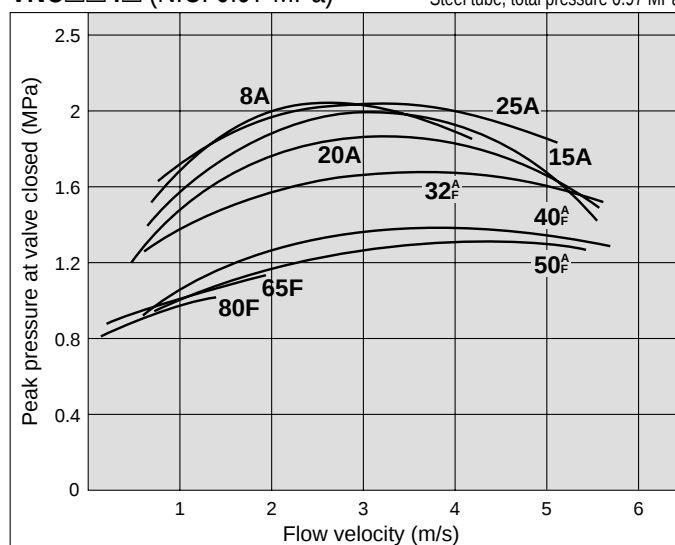
When replacing a valve, if an external pilot solenoid valve is mounted in the wrong direction, it may malfunction or leak air.

Water Hammer Characteristics

VNC□□1□ (N.C. 0.49 MPa) Conditions: Piping 30 m
Steel tube, total pressure 0.49 MPa



VNC□□4□ (N.C. 0.97 MPa) Conditions: Piping 30 m
Steel tube, total pressure 0.97 MPa



Calculating the Flow Velocity

$$v = 21.2 \times Q/d^2$$

(Symbol)

v: flow velocity (m/s)

Q: flow rate (l/min)

d: piping inner diameter (mm)

VNA

VNB

SGC

VNC

VNH

VND

VCC