Process Valve

Series VNA

2 Port Valve For Compressed Air and Air-hydro Circuit Control

Exclusively for air pressure system and air-hydro circuit control

Universal 2 Port Valve

Cylinder actuation by external pilot air

The balance poppet permits normal and reverse flow.

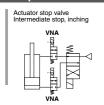
> Operation from 0 MPa is possible.

Wide variations

N.C., N.O., C.O., types are available. Threaded type from 6A to 50A is standardized



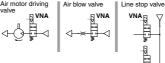
Compressed Air Air pressure circuit: Application examples

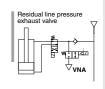






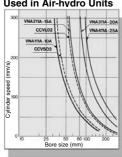
Actuator exhaust valve





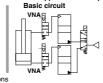
Air-hydro Air pressure circuit: Application examples

Operation Capacity When Used in Air-hydro Units



This series can supplement the capacity of conventional air-hydro valve units. They are suited to operate large bore cylinders as well as to simultaneously cylinders as well as to simultaneously operate multiple cylinders and suspend their operation. Thus they can be used in the same way as the conventional air-hydro units.

Air-hydro circuit: Application example

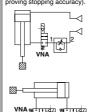


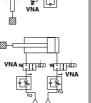
JUHUHUHS						
0.49 MPa						
ISC	VG32					
No	load					
1 m						
VNA111A, CCVSO2	3/8B (9 mm)					
VNA211A, CCVLO2	1/2B (13 mm)					
VNA311A	3/4B (19 mm)					
VNA411A	1B (25 mm)					
	0.4 ISC No VNA111A, CCVSO2 VNA211A, CCVLO2 VNA311A					

Refer to Air-hydro Unit pages in "Best Pneumatics No. 2 (Series CC)" for further information on air-hydro.

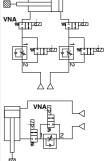
When speed controller is mounted

Connect a speed controller (Series AS etc.) to A port of VNA□11 (in order to protect the speed control valve from surges when cylinder operation is suspended, thus improving stopping accuracy).





Skip valve function Combination of 2 or more valves of Series VNA provides a skip valve function. Connect the skip valve to the A port side of a stop



Process Valve: 2 Port Valve

For Compressed Air and Air-hydro Circuit Control

Series VNA

Note) CE-compliant: For D or

DZ only



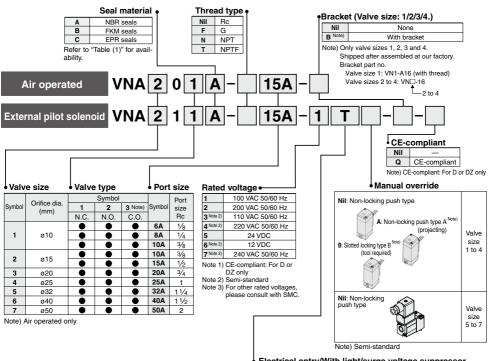


Table (1) Applicable Fluids

Model	VNA□□□A (Valve material: NBR seal)	VNA□□□B (Valve material: FKM seal)	VNA□□□C (Valve material: EPR seal)	
Fluid	Air (Standard, Dry) Carbon dioxide (COs) (Less than 0.7 MPa) Nitrogen gas (Nz) Turbine oil, (Kinematic viscosity) Hydraulic fluid (40 to 100 mm/ls)	Argon Helium Turbine oil, (Kinematic viscosity) Hydraulic fluid (40 to 100 mm·is	Carbon dioxide (CO ₂) (0.7 MPa or more)	

This product cannot be used for water application.

Flectrical entr	v/With light/eurge	voltage suppressor
Liceti icai ciiti	y, with ngninaunge	voitage auppreasor

Symbol	Electrical entry	Valve size 1 to 4	Valve size 5 to 7
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	•	•

CE-com	pliant
--------	--------

Symbol	Electrical entry	Valve size 1 to 4	Valve size 5 to 7						
D	DIN terminal	•	•						
DZ	DIN terminal with light/surge voltage supressor	•	•						

VNA

VNB

SGC SGH

VNC

VNH

VND VCC

TO

Series VNA

Model

	0.17		Flow characteristics				Weight (kg)	
Model	Port size	Orifice diameter	Orifice Measured by air M		Measured by water Note)		vveigit (kg)	
Woder	Rc	ø (mm)	C [dm³/ (bar-sec)]	b	Cv	Av x 10 ⁻⁶ m ²	Air operated	External pilot solenoid
VNA1□□□-6A	1/8		3.5	0.35	0.88	25	0.1	0.2
VNA1□□□-8A	1/4	10	5.9	0.24	1.5	41		
VNA1□□□-10A	3/8		7.9	0.16	1.9	51		
VNA2□□□-10A	78	15	16	0.35	3.8	110	0.3	0.4
VNA2□□□-15A	1/2	15	23	0.25	4.8	130	0.3	0.4
VNA3□□□-20A	3/4	20	34	0.16	7.5	210	0.5	0.6

Note) This product cannot be used for water application.

Port size		Orifice Flow characteristics		acteristics	Weight (kg)	
Model	Po a		Cv	Effective area (mm) ²	Air operated	External pilot solenoid
VNA4□□□-25A	1	25	12	220	0.8	0.9
VNA5□□□-32A	11/4	32	18	320	1.3	1.4
VNA6□□□-40A	11/2	40	28	500	2.1	2.2
VNA7□□□-50A	2	50	43	770	3.1	3.2



Air operated

Specifications

Specifications					
Fluid (Main pip	Fluid (Main piping)		Refer to "Table (1)" on page 469.		
Fluid	VNA□□□ A		-5 to 60°C Note 1)		
temperature	VNA□□□ B		-5 to 99°C Note 1)		
temperature	□□□C		(Air operated type only)		
Ambient temper	Ambient temperature		−5 to 50°C Note 1) (Air operated type: 60°C)		
Proof pressure	Proof pressure		1.5 MPa		
Operating pres	ssure	range	0 to 1 MPa		
		Pressure range			
External pilot	air	Lubrication	Not required (Use turbine oil Class 1 ISO VG32, if lubricated. Note 2)		
	Temperature		−5 to 50°C Note 1) (Air operated type: 60°C)		
Mounting orientation		n	Unrestricted Note 3)		

Note 1) No freezing

Note 2) Lubrication is not allowed for use with EPR seal material.

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

Cumbal

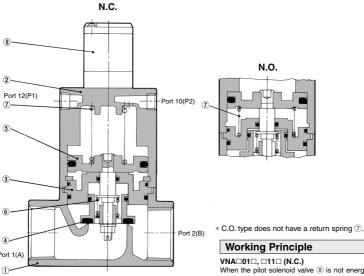
Symbol							
Valve	N.C.	N.O.	C.O.				
Style type	Normally closed	Normally open	Double acting				
	VNA□01	VNA□02	VNA□03				
Air operated	12 (P1) \$\frac{1}{2}	10 (P2)	12 (P1) \$\forall \tau_1 \\ \forall \tau_1 \\ \fo				
	VNA□11	VNA□12	,				
External pilot solenoid	12 (P1)	12 (P1) H H 2					

Pilot Solenoid Valve Specifications

Port size			6A to 25A	32A to 50A		
Pilot solenoid valve		_	SF4-□□□-23	VO307-□□□1		
Pilot soleno	iu vaiv	е	SF4-□ ^B z-23-Q	VO307-□ ^D _{DZ} -Q		
			Grommet, Grommet terminal			
Electrical en	itry		Conduit terminal	Grommet, DIN terminal		
			DIN terminal			
Coil rated	AC (5	60/60 Hz)	100 V, 200 V, Other vo	ltage (Semi-standard)		
voltage (V)		DC	24 V, Other voltage (Semi-standard)			
Allowable vo	ltage fl	uctuation	-15% to +10% of rated voltage			
Temperature	rico		35°C or less	50°C or less		
remperature	: 1150		(When rated voltage is applied.)	(When rated voltage is applied.)		
Apparent	AC	Inrush	5.6 VA (50 Hz), 5.0 VA (60 Hz)	12.7 VA (50 Hz), 10.7 VA (60 Hz)		
power	AC	Holding	3.4 VA (50 Hz), 2.3 VA (60 Hz)	7.6 VA (50 Hz), 5.4 VA (60 Hz)		
Power		DC	1.8 W (without light),	4 W (without light),		
consumption		ьс	2 W (with light)	4.2 W (with light)		
Manual override			Non-locking push type	Non-locking push type		
wanda over	iiue		Other (Semi-standard)	14011-100king push type		

Note) For "How to Order" pilot solenoid valves, refer to page 474.

Construction



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	Seal material (NBR, FKM, EPR)
4 Note)	Valve element	Aluminum alloy	Seal 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.

Replacement Parts

neplacement raits												
	Description			Part no.								
No.				VNA1□□A	VNA2□□□	VNA3□□□	VNA4□□□	VNA5□□□	VNA6□□□	VNA7□□□		
				-6A, 8A, 10A	-10A, 15A	-20A	-25A	-32A	-40A	-50A		
	Plate assembly	Seal material	NBR	VN1-A3AA	VN2-A3AA	VN3-A3AA	VN4-A3AA	VN5-A3AA	VN6-A3AA	VN7-A3AA		
3			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		
	Valve disc (Valve disc assembly for 25A-50A)	Seal material	NBR	VN1-4AA	VN2-4AA	VN3-4AA	VN4-A4AA	VN5-A4AA	VN6-A4AA	VN7-A4AA		
4			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 va	lve		SF4-	□□□-23 (Refer	to page 474 for	details.)	VO307-□□□1	(Refer to page 4	174 for details.)		

When the pilot solenoid valve ® is not energized (or when air is exhausted from the port 12(P1) 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 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 element 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.

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 port 10(P2) 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 port 10(P2) 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 ports 12(P1) and 10(P2). When pressurized air enters the port 12(P1) (exhaust from the port 10(P2)), the valve element opens, and it closes when pressurized air enters the port 10(P2) (exhaust from the port 12(P1)).

SGC SGH VNC

VNA

VNB

VNH VND

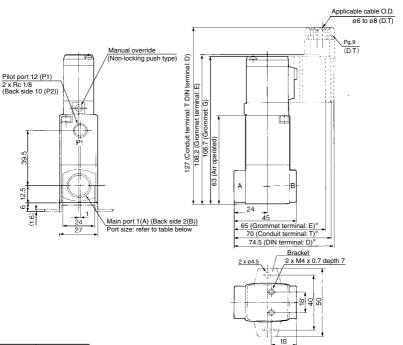
VCC

TO



Series VNA

Port size: 6A, 8A, 10A

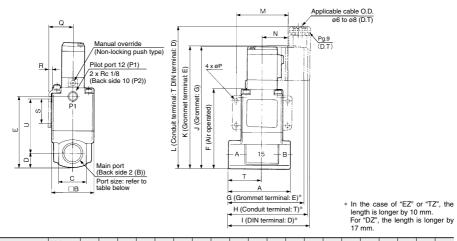


Model	Main port 1(A), 2(B)
VNA1□□□-6A	1/8
VNA1□□□-8A	1/4
VNA1□□□-10A	3/8

^{*} In the case of "EZ" or "TZ", the length is longer by 10 mm. For "DZ", the length is longer by 17 mm.

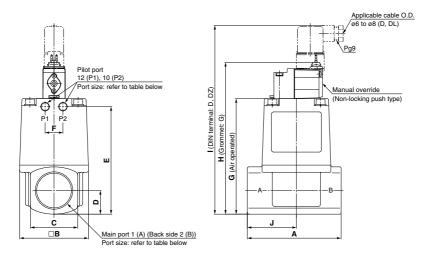
Process Valve: 2 Port Valve For Compressed Air and Air-hydro Circuit Control Series VNA

Port size: 10A, 15A, 20A, 25A



Model	Main port 1(A), 2(B)	Α	В	С	D	E	F	G	н	1	J	K	L	М	N	Р	Q	R	s	Т	U							
VNA2□□□-10A	3/8	63	42	42	12	12	12	12	12	12	28	14	72.5	80.5	75	80	84.5	124	125.5	1445	52	26	4.5	24.3	2.3	25	34	55
VNA2□□□-15A	1/2	00			20	14	12.5	2.5 00.5	/3	00	04.5 124	124	123.3	144.5	52	20	4.5	24.5	2.0	23	34	33						
VNA3□□□-20A	3/4	80	50	35	17.5	84	92	84	89	93.5	135.5	137	156	62	31	5.5	28.3	2.3	30	43	60.5							
VNA4□□□-25A	1	90	60	40	20	100	108	90	95	99.5	151.5	153	172	72	36	6.5	33.3	2.3	35	49	73							

Port size: 32A, 40A, 50A



Model	Main port 1(A), 2(B)		Α	В	С	D	E	F	G	н	1	J
VNA5□□□-32A	1 1/4	1/8	105	77	53	26.5	120.5	20	129.5	170.1	211.5	55
VNA6□□□-40A	1 1/2	1/4	120	96	60	30	137	24	147	187.6	229	63
VNA7□□□-50A	2	1/4	140	113	74	37	160	24	170	210.6	252	74

VNA

VNB

SGH VNC

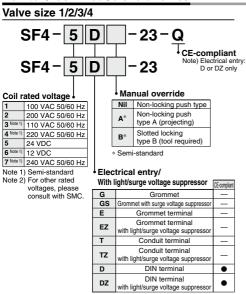
VNH

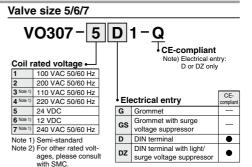
VND

VCC

Series VNA

How to Order Pilot Solenoid Valves





Accessory

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



Series VNA Specific Product Precautions

Be sure to read before handling. Refer to front matter 41 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

Design

⚠ Warning

Extended periods of continuous energization

If a valve is continuously energized for long periods, heat generation of the coil may result in reduced performance and shorter service life. This may also have an adverse effect on the peripheral equipment in proximity. Should a valve be continuously energized for long periods, or its daily energized state exceeds its non energized state, please use an energy saving type AC, energizing for long periods of time continuously, select the air-operated valve and use the continuous duty type of the VT307 for a pilot valve.

Mounting

⚠Warning

1. Do not apply external force to the coil section.

When tightening is performed, apply a wrench or other tool to the outside of the piping connection parts.

Do not warm the coil assembly with a heat insulator, etc.

Use tape, heaters, etc., for freeze prevention on the piping and body only. They can cause the coil to burn out.

Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.

Piping

⚠ Caution

1. Applied voltage

When electric power is connected to a solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

2. Confirm the connections.

After completing the wiring, confirm that the connections are correct.

External Pilot

⚠ Caution

Pilot port piping

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

Port	VNA□01□	VNA□02□	VNA□03□	VNA□1½□
12 (P1)	External pilot	Bleed port	External pilot (*)	External pilot
10 (P2)	Bleed port	External pilot	External pilot (*)	Pilot exhaust

(*) If the pilot air is not supplied, the valve position will not be held. Pressurize Port 12 (P1) or Port 10 (P2) when using the product.

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

Piping

∧ Warning

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

Mounting Direction of 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.

Use with Air-hydro Unit

∆ Warning

1. Piping

Surge pressure is generated between the cylinder and the VNA during intermediate stoppage. To directly thread in the cylinder, use durable fittings (Stainless steel square nipples etc.) instead of ductile iron fittings (JIS B 2301) or steel pipe fittings (JIS B 2302). When VNA is installed away from the cylinder, use a high-pressure rubber hose (JIS B 6349) instead of steel pipe, when possible.

2. Air bleeding

Series VNA valves have no air bleeding port. Bleed air comes from the middle piping. Bleeding by a vacuum pump is more effective.

3. Hydraulic fluid

Turbine oil, Grade 1 ISO VG32, with petroleum hydraulic fluid is recommended.

4. Speed control valve

The combination shown in the following table is recommended for best performance of the Series VNA. (Piping: JIS K 6349 high pressure hose)

Combination between Series-VNA and Speed controller (Series AS)

Combination between deries viva and opeca controller (deries Ac)									
	VNA	AS	Piping (I.D.)						
10A	VNA111	AS420-03	3/8B (ø9.5)						
15A	VNA211	AS420-04	1/2B (ø12.7)						
20A	VNA311	AS500-06	3/4B (ø19.1)						
25A	VNA411	AS600-10	1B (ø25.4)						
32A	VNA511	AS800-12	1 1/4B (ø31.8)						
40A	VNA611	AS900-14	1 1/2B (ø38.1)						
50A	VNA711	AS900-20	2B (ø50.8)						

For details about speed control valve (Series AS), refer to Best Pneumatics No. 6.



VNA

VNB SGC

SGH

VNC

VNH

VCC

TQ