High Pressure Coolant Valve

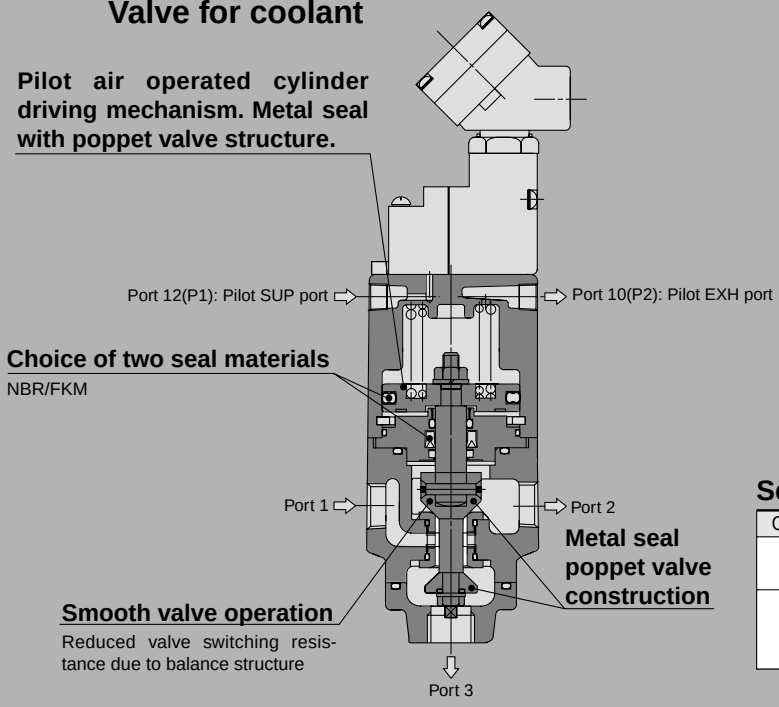
Series VNH

3.5 MPa, 7.0 MPa

Corresponding to high speed grinding and long drilling processes

Valve for high pressure coolant liquid (up to 3.5 MPa or 7.0 MPa) that is ideal for lubrication, dust blowing and cooling.

Valve for coolant



Series

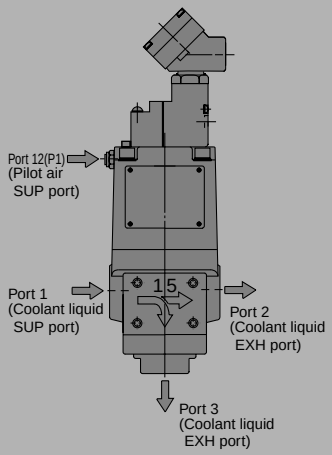
Operating fluid pressure	Port	Port size Rc
3.5 MPa	3 Port	3/8(10A), 1/2(15A) 3/4(20A), 1(25A)
7.0 MPa	2 port (Large flow type)	3/8(10A), 1/2(15A) 3/4(20A), 1(25A)
	3 Port	

··· Application Example ···

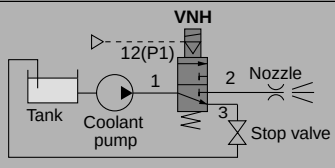
3 port valve (3.5 MPa, 7.0 MPa)

Piping

Inlet side (supply side): port 1, Outlet side (exhaust side): port 2 and port 3. Supply pilot air higher than 0.25 MPa to port 12(P1).

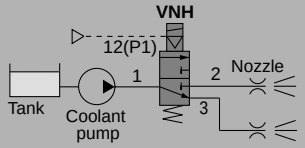


Ex. 1) 3 port valve: Reducing load to pump



For reducing load to pump, coolant liquid is returned from B port to tank each time.

Ex. 2) 3 port valve: Switching nozzle

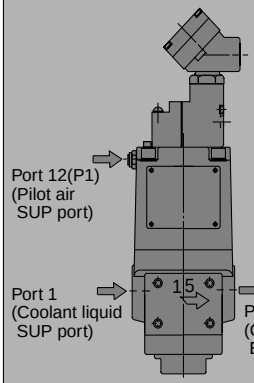


Switching nozzles on supplying coolant liquid.

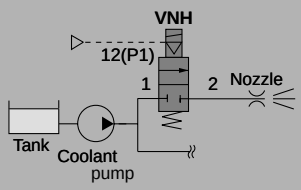
2 port valve (7.0 MPa)

Piping

Inlet side (supply side): port 1, Outlet side (exhaust side): port 2. Supply pilot air higher than 0.25 MPa to port 12(P1).



Ex.1) 2 port valve: Nozzle ON/OFF



High Pressure Coolant Valve: 3.5 MPa, 7.0 MPa

Series VNH

How to Order

Air operated VNH 2 1 1 A – ☐ 15A – ☐

External pilot solenoid 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

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Seal material

A	NBR seals
B	FKM seals

Valve size / Port size

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

Electrical entry/With light/surge voltage suppressor

T	Conduit terminal
TS	Conduit terminal with surge voltage suppressor
TZ Note 1)	Conduit terminal with light/surge voltage suppressor
TL Note 2)	Conduit terminal with indicator light

Note 1) Rated voltage: Except 6, 7, 9.
Note 2) For DIN terminal, add suffix - X200 to the end of the part number. In this case, pilot solenoid valve is VO307-□D□.

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

* Semi-standard

Option

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

Option

Nil	None
B	With bracket

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

* Semi-standard

Light/surge voltage suppressor

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

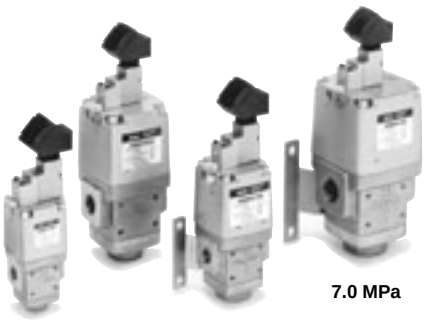
Accessory
Function plate (D sealing, with thread): DXT060-32-4A

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 (Main piping)		Coolant Note 2)											
Operation		External pilot solenoid/Air operated											
Operating fluid temperature	**VNH□□$^{1}_{3}$A**	–5 to 60°C Note 1)/–5 to 60°C Note 1) (NBR seal)											
	VNH□□$^{1}_{3}$B	–5 to 60°C Note 1)/–5 to 99°C Note 1) (FKM seal)											
Pilot air	**Pressure**	0.25 to 0.7 MPa											
	Temperature	–5 to 50°C Note 1)											
	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 Note 1)											
Max. operating frequency		20 times/min											
Mounting position		Vertical upwards Note 4)											
Port size		3/8	1/2	3/4	1	3/8	1/2	3/4	1	3/8	1/2	3/4	1
Orifice diameter (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 $10^{-6}m^2$		46	86	110	190	15	29	38	58	54	75	140	210
Pilot port size		1/8		1/4		1/8		1/4		1/8		1/4	
Mass (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

∗ Equivalent size
Note 1) No freezing
Note 2) This product cannot be used for water applications.
Note 3) Non-lubricant specifications are not available for this product.
Note 4) Indicates orientation of pilot solenoid valve for external pilot solenoid. Same orientation for air-operated.

3.5 MPa



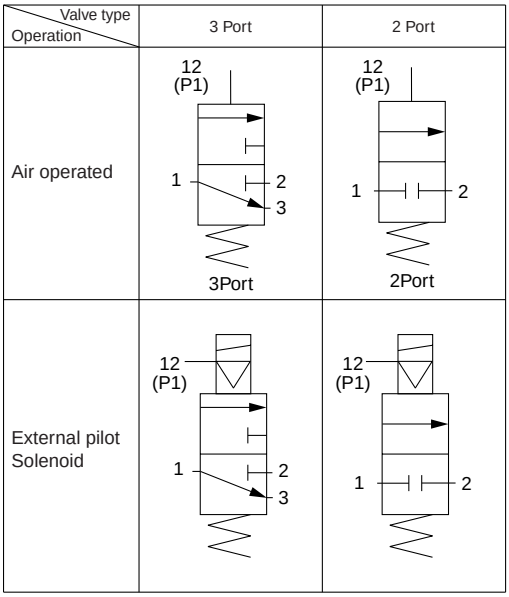
7.0 MPa

Pilot Operated Solenoid Valve Specifications

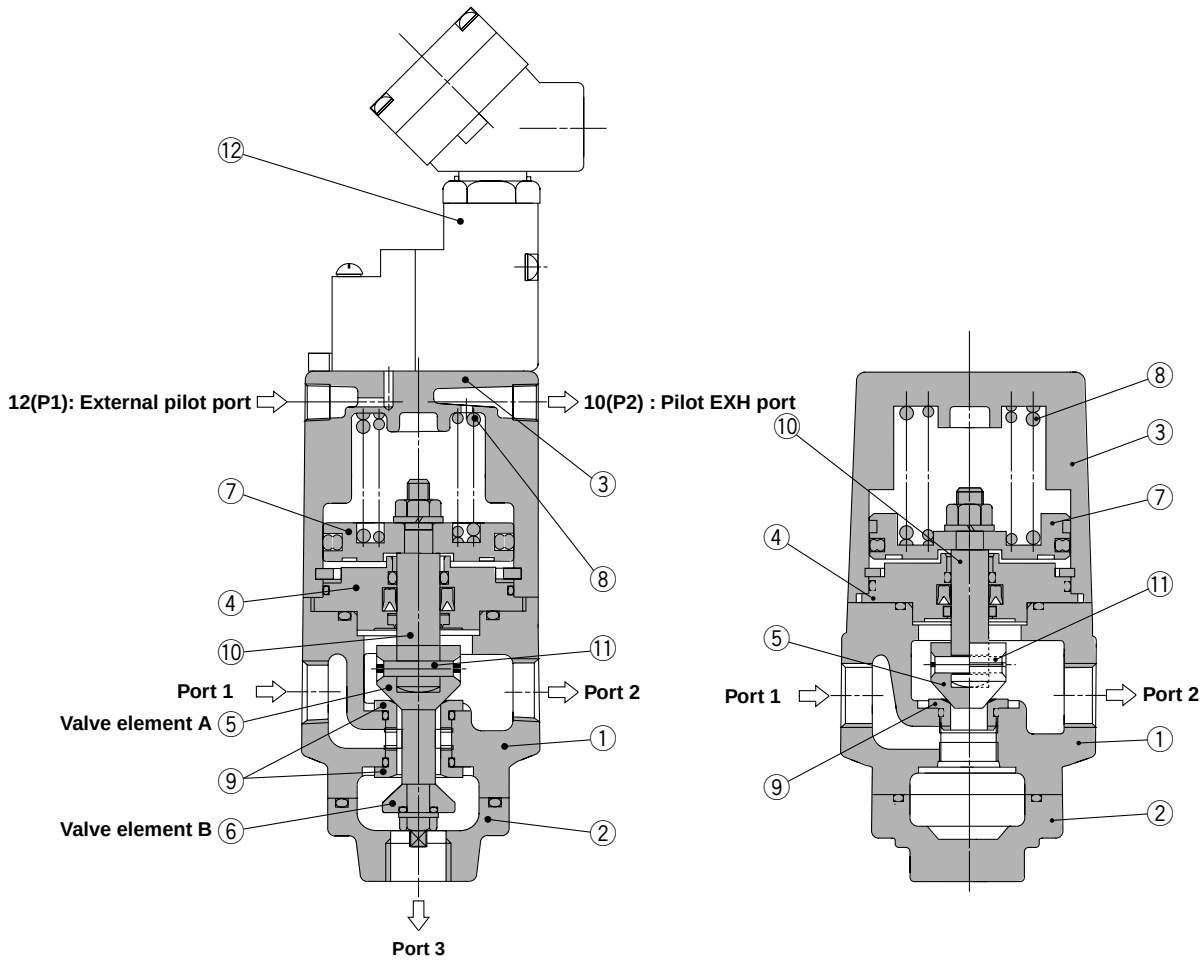
Pilot solenoid valve			VO301-00□T□-X302
Electrical entry			Conduit terminal
Coil rated voltage (V)	**AC (50/60 Hz)**		100 V, 200 V, Other voltage (Option)
	DC		24 V, Other voltage (Option)
Allowable voltage fluctuation			–15 to 10% of the rated voltage
Coil insulation type			Class B or equivalent (130°C)
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

Note) Refer to page 412 for how to order pilot solenoid valves.

JIS Symbol



Dimensions



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 (or when pressurized air enters through the port 12(P1) of the air operated style), 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.

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 410.	

How to Order Pilot Solenoid Valves

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

∗ Semi-standard

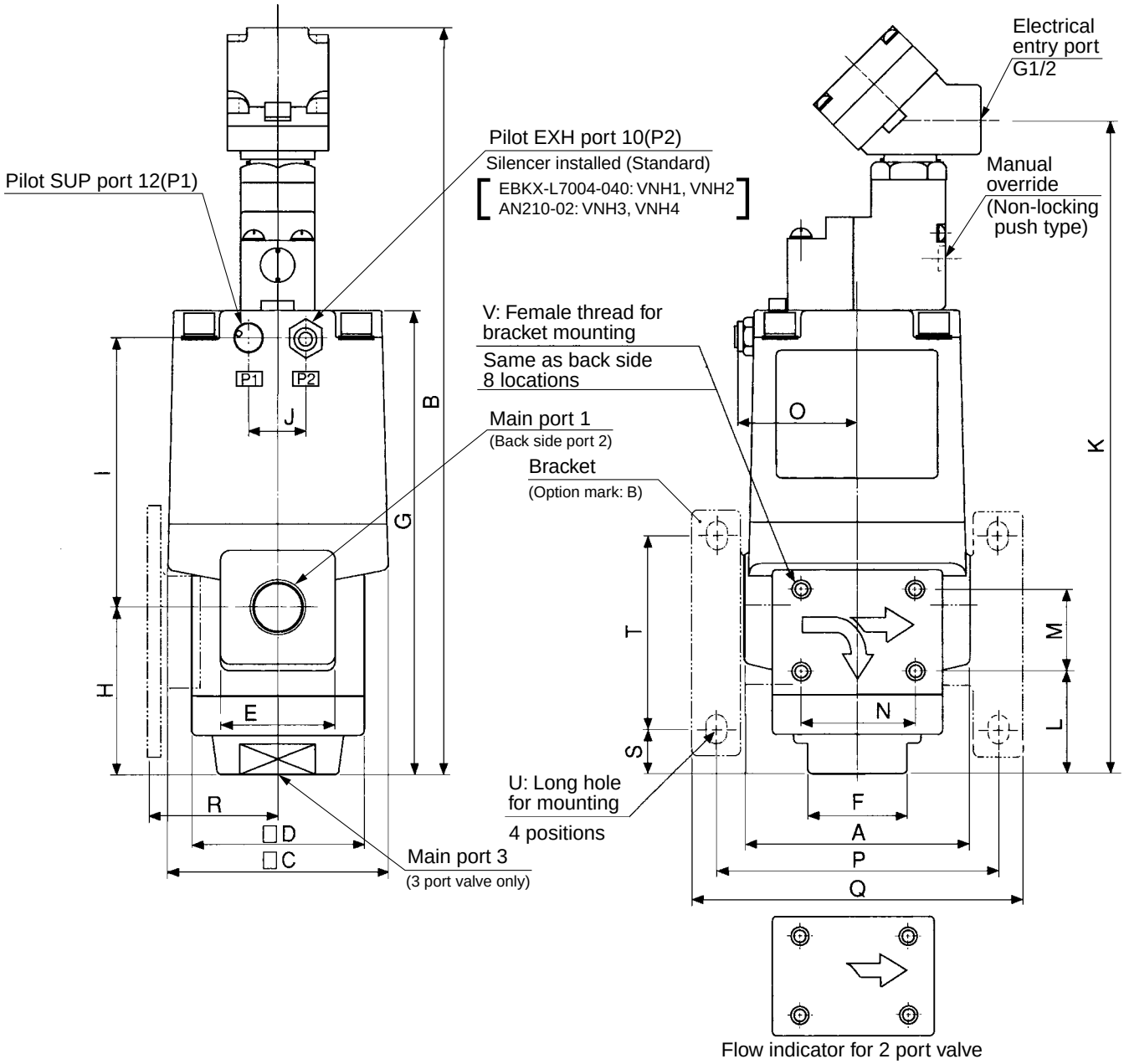
Light/surge voltage suppressor

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

Dimensions



Dimensions

(mm)

Model	Main port 1, 2, 3		Pilot port	A	B	C	D	E	F	G	H	I
	2 Port	3 Port	12(P1), 10(P2)									
VNH1□□$^{A}_{B}$-10A	2 x 3/8	3 x 3/8	1/8	60	235	60	46	34	24	135	50	77
VNH2□□$^{A}_{B}$-15A	2 x 1/2	3 x 1/2	1/8	80	264.5	77	60	40	36	164.5	60	95.5
VNH3□□$^{A}_{B}$-20A	2 x 3/4	3 x 3/4	1/4	100	300	96	76	50	41	200	79	111
VNH4□□$^{A}_{B}$-25A	2 x 1	3 x 1	1/4	115	319	113	85	60	50	219	90	119

Model	J	K	L	M	N	O	P	Q	R	S	T	U	V
VNH1□□$^{A}_{B}$-10A	–	202.5	29	25	30	37	75	88	34	10.5	62	6 x 8	M5 x 0.8 depth 5.5
VNH2□□$^{A}_{B}$-15A	20	232	36	30	40	43	100	118	44.5	16	70	7 x 10	M6 x 1 depth 6
VNH3□□$^{A}_{B}$-20A	24	267	48	35	50	50.5	126	148	60.5	19.5	92	9 x 12	M8 x 1.25 depth 6
VNH4□□$^{A}_{B}$-25A	24	286.5	51	38	56	58.5	141	163	66.5	15.5	109	9 x 12	M8 x 1.25 depth 6

Series VNH
Specific Product Precautions

Be sure to read 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.

Back Pressure of 3 Port Valve (VNH□13)

⚠ Caution

1. Ensure that back pressure of 3 port from VNH□13 is less than 5 MPa.

Quality of Operating Fluid

⚠ Caution

Please note that using fluids that contain foreign mterial (especially hard objects like glass chips), may cause damage to the valve, will reduce sealing performance, and may cause early failure.

Piping

⚠ Caution

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