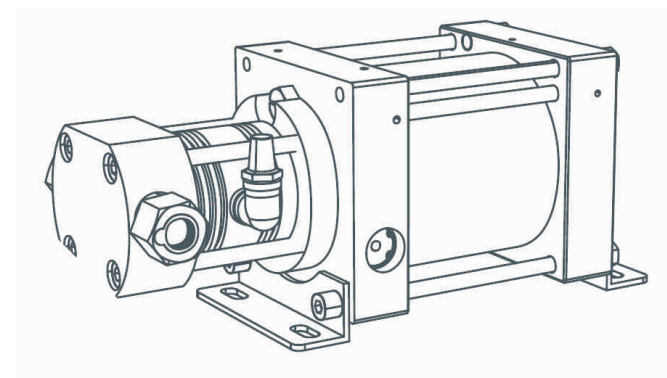


USUN[®]

OXYGEN GAS BOOSTER



Usun Fluid Control Equipment Co Ltd

Add: 4th Floor Chong Ying Building , Panlong Road liaoBu town,
DongGuan city , GuangDong Province , China

E-mali: Sunny@u-sun.cn

Tel: 0086 0769 33388195 /15876407183

Web: www.u-sun.cn

Operations & Maintenance manual

(100MM driven)

Version (2.0) Date 10/10/2022

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1.0 Introduction

His installation and operation manual offers detailed informational service.

Installation and maintenance of some assemblies are similar to maintenance of pumps from other series.

Most of the information contained in this manual is applicable to all USUN Gas Booster Pumps.

2.0 Operation Principles

CAUTION!

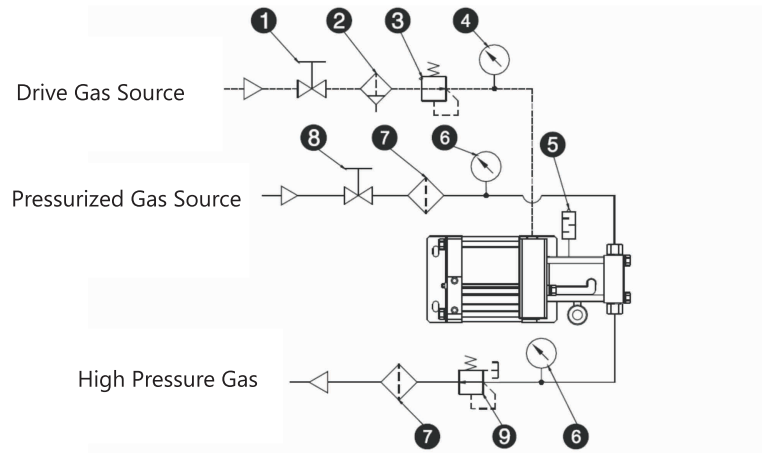
Misuse of pressurized air or gas might cause serious injuries or even death.

Adopt the following precautionary measures to minimize the risk.

- Before operation carefully read the manual
- You must wear safety goggles
- When you are adding pressure do not randomly disconnect high-pressure duct
- When you are decreasing pressure do not touch outlet of high-pressure gas duct
- Ensure that input and output pump pressure is compliant with pump's pressure rating

USUN XB Gas Booster Pump series use a single pneumatic control non-equilibrium gas distributing valve, so the pump can realize automatic reciprocating movement. It is produced entirely from aluminum alloys and stainless steel. The maximum drive pressure is 8.3 Bar. However, to ensure longer pump life, pressure ≤ 7 Bar is recommended. Drive piston diameter of XB serial gas booster pump is 100 MM. All pump head components have venting and cooling functions.

Figure 1. Classic installation circuit diagram



- 1. Drive air source switch
- 2. Air filter
- 3. Air pressure regulator
- 4. Air pressure gauge
- 5. Silencer
- 6. Pressure gauge
- 7. precision filter
- 8. Needle valve
- 9. Relief valve

3.0 Installation

Drive pressure connection range of USUN XB Gas Booster Pump series is (3- 8.3Bar max).

CAUTION!

Modification or changes of the system (machinery, liquid gas, pneumatic, etc.) may cause harm or damage to the system and injury to operators.

4.0 Operation

- 4.1 Working environment must be free of dust and pests.
- 4.2 Each pressure pump is equipped with two L-shaped biponds , which means that dimensions need to be considered during installation.

4.3 Air source requirements

Solid particles		Pressure dew point		Maximum oil content	
Category	µm	Category	°C	Category	mg/m3
6	≤ 5	4	≤ +3	2	≤ 0.1

Category standard: ISO 8573-1

4.4 Gas insert

On standard drive connection (end thread dimension must be taken into account), connect drive pre-pressured medium. Oil atomizer deployed in drive inlet air lubricates pump's body (we recommend that you add VG32 turbine oil to oil atomizer. Other oils might cause accelerated wear and tear of sealing components).

4.5 Pipe requirements

According to output pressure, you must select pipes that can withstand maximum output pressure of the pump.

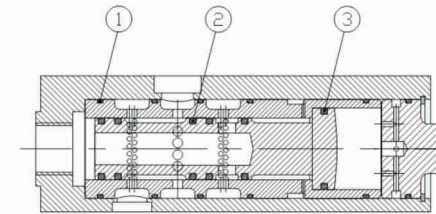
4.6 Activation

- a. Ensure that all joints are tightly screwed and that all components are in their designated positions.
- b. Using relief valve, adjust the pressure to 0 psi.
- c. Open inlet air switch and slowly increase the value on relief valve until you activate the pump (under usual circumstances, activation pressure of the pump is 15~43 psi), continue to adjust and observe the pressure on pressure gauge, until you reach desired pressure.

5.0 Trouble shooting

No.	Symptoms	Malfunction reason analysis	Solution
1	No reciprocating movement in pump, silencer does not vent the air or in small amount	1. Stuck directional valve 2. Clogged silencer	1. Disassemble stuck directional valve spring, and extract directional valve core, clean dirt, apply appropriate amount of lubricant. 2. Disassemble silencer, clean.
2	No reciprocating movement in pump, silencer vents excessive amount of air	O-ring of directional valve core is seriously worn	Extract stuck directional valve ring, use new sealing component to replace damaged sealing component, apply appropriate amount of lubricant and install
3	Pump movement, process is irregular, pump often abnormally accelerates or abnormally decelerates	1. Stuck impactor 2. O-ring impactor detached	1. Unscrew impactor, use cutting pliers to take out impactor and wipe it clean. 2. Unscrew impactor, return O-ring to starting position
4	Pump movement normal, no increased pressure or might increase pressure, but increased pressure does not reach rated pressure.	1. Stuck check valve or check valve has foreign matter in it. 2. Sealing components of pressurizing piston are seriously worn.	1. Inspect single directional valve, clean dirt 2. Remove stuck check valve and replace pressuring piston sealing component.

6.0 Directional Valve Assembly



NO.	Name	Dimension(mm) internal diameter*wire diameter	Qty
1	O-ring	ID17x1.8	6
2	O-ring	ID8.7x1.8	5
3	O-ring	ID12.7x1.8	1



Actual appearance

6.1 Directional valve assembly

Maintenance , disassembly and explanation of pneumatic directional valve as follows

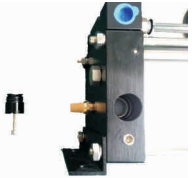


CAUTION!

1. During disassembly and installation process , you must first ensure ensure that drive air source is disconnected , and only then perform the operations described below. otherwise there is a risk of injury or damage.
2. During disassembly and installation , you must be careful to keep note of the sealing rings position . All parts must be kept clean and without damage . Where metal and sealing rings are in contact there must be appropriate silicone used.

Figure 6-1

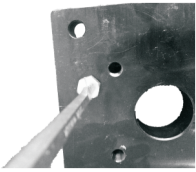
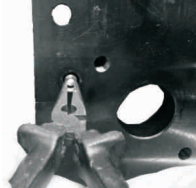
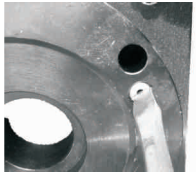




Take out the washer as above picture

<p>Figure 6-2</p>		<p>Use M6 screw to take out valve cover As picture stated</p>																								
<p>Figure 6-3</p>		<p>Use Pliers to take out valve core and valve body</p>																								
<p>Figure 6-4</p>		<p>Manually extract the sealing ring of the valve core's sleeve</p>																								
<p>Figure 6-5</p>	<p>Direction Valve components</p> <table border="1" data-bbox="314 1081 929 1390"> <thead> <tr> <th>No.</th> <th>Name</th> <th>Dimensions</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Valve sleeve</td> <td></td> </tr> <tr> <td>2</td> <td>Valve core</td> <td></td> </tr> <tr> <td>3</td> <td>Valve lid</td> <td></td> </tr> <tr> <td>4</td> <td>Shield Ring</td> <td></td> </tr> <tr> <td>5</td> <td>O-ring</td> <td>O-ring-8.7x1.8</td> </tr> <tr> <td>6</td> <td>O-ring</td> <td>O-ring-12.7x1.8</td> </tr> <tr> <td>7</td> <td>O-ring</td> <td>O-ring-17x1.8</td> </tr> </tbody> </table>		No.	Name	Dimensions	1	Valve sleeve		2	Valve core		3	Valve lid		4	Shield Ring		5	O-ring	O-ring-8.7x1.8	6	O-ring	O-ring-12.7x1.8	7	O-ring	O-ring-17x1.8
No.	Name	Dimensions																								
1	Valve sleeve																									
2	Valve core																									
3	Valve lid																									
4	Shield Ring																									
5	O-ring	O-ring-8.7x1.8																								
6	O-ring	O-ring-12.7x1.8																								
7	O-ring	O-ring-17x1.8																								

7.0 Impactor Assembly

Maintenance ,Disassembly and explanation of impactor is as follows

<p>Figure 7-1</p>		<p>Use a Spanner or slotted screwdriver to remove the Nut as shown . Inspect O-ring on Nut for damage</p>
<p>Figure 7-2</p>		<p>As shown in figure , First Extract Pressurized Spring and then from the back push out impactor or use sharp pliers and pull impactor Out .</p>
<p>Figure 7-3</p>		<p>Use slotted Screwdriver to disassemble guide sleeve And remove guide sleeve .</p>
<p>Figure 7-4</p>		<p>Extract the seal on the bottom of guide sleeve as shown. Clean sealed groove , inspect and replace sealing ring if it is damaged .</p>
<p>Figure 7-5</p>		<p>After removing all the components , clean sealing groove and all components and inspect seals for damage.</p>

Direction Valve components

No.	Name	Dimensions	Qty
1	Guide Sleeve		1
2	O ring	D4X1.8	1
3	Impactor		1
4	O ring	D5.6X1.8-90°	1
5	Pressurizing Spring	D7XCS1x25-8.5	1
6	O ring	D11.8x1.8	1
7	Impactor Nut		1

8.0 Drive and Pressurized Components

8.1 Disassembly procedure


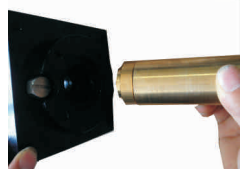

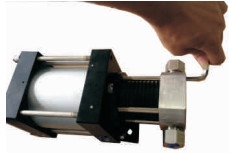
	Use M8 spanner and disassemble the nuts from the M8 fixing rod in counter-clockwise direction
	Take out the high pressure cap horizontally
	Take out black cold coupling and it has D45X2.65 and D50X2.65 seals for each

	Take out high pressure barrel outward and take out bronze sleeve and it has D19X1.8 and RC16-18 seals for each
	Use the tooling to get out the High pressure seals and see if it is damaged and the replaced seals model is :RC16-18
	Use the rubber hammer to dis Attach the middle cap from the air Driven barrel and separate it
	Take out the &8 and &10 gas line And you can see the D4.5X1.8 and D6.9x1.8 O ring seals for each
	Take out the rod seals firstly and then take out O rings and use solvent to clean the sink and check if rod seals is broken and also there is O rings on rod in size D95X2.65

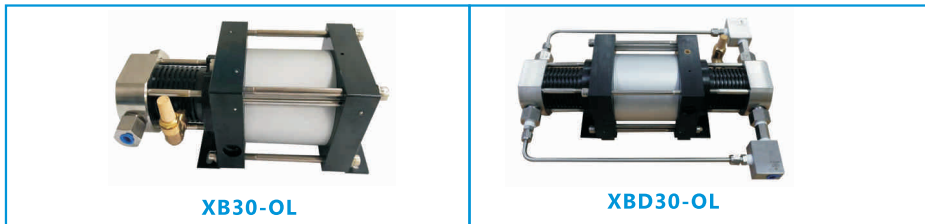
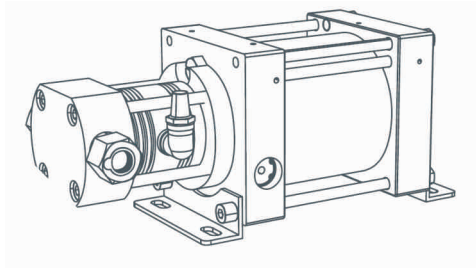
8. 2 Installing steps

Warning : Should Make sure it is clean and dry for any parts for contacting High pressure and parts and should do-grease before installing and grease must be compatible for oxygen gas use .

	<p>Clean the rod sealing and add lubricants firstly .The o rings should be placed firstly ad then put circle Ring into the sink</p>
	<p>Add some lubricants on piston</p>
	<p>Should put the D4.5X1.8 and D6.9x1.7 O rings inside of the gas line cap firstly and then install the gas line</p>
	<p>Use oxygen compatible lubricants For greasing the High pressure barrel and Bottom of High pressure cap</p>

	<p>Use install the High pressure seals as the left picture and then install high pressure bronze guide sleeve</p>
	<p>Insert the High pressure barrel part carefully</p>
	<p>Install the O rings firstly and then assemble the cold coupling And it has 2 O Rings on the two ends of Cold coupling</p>
	<p>After installing The High pressure cap should fix the 4 pcs nuts of M8 flange rod</p>

9.0 Technical data for XB30-OL XBD30-OL Oxygen gas booster



Model	Pressure ratio	Air driven piston diameter	High pressure piston diameter	Minimum inlet gas PI(Bar)	Maximum gas outlet PO (Bar)
XB30-OL	30:1	100	18	25	240
XBD30-OL	30:1	100	18	25	265

Model	Maximum gas outlet formula PO (Bar)	Displacement per stroke	Inlet gas port	Outlet gas port size	Net Weight (KG)
XB30-OL	PO=30XPA	16.53ML	NPT1/4	NPT1/4	6.8
XBD30-OL	PO=30XPA+ PI	30.5ML	NPT1/4	NPT1/4	10.8

Remark: PI stands for inlet gas supply and PO stands for outlet gas supply and PA stands for air driven gas

9.1 Transport and storage

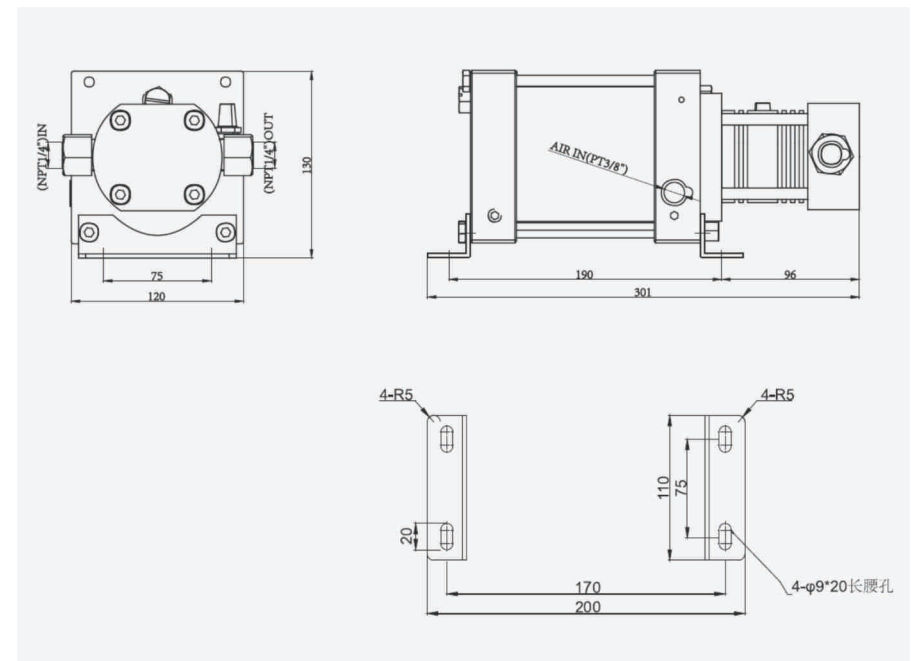
USUN products are precision machinery equipment and during transport they must be appropriately fastened ,Tilting is strictly prohibited , please gently lift and put down ,do not turn upside down.

- When storing please protection against moisture ,rust and dust.
- When stored ,do not tilt or stack on other products .

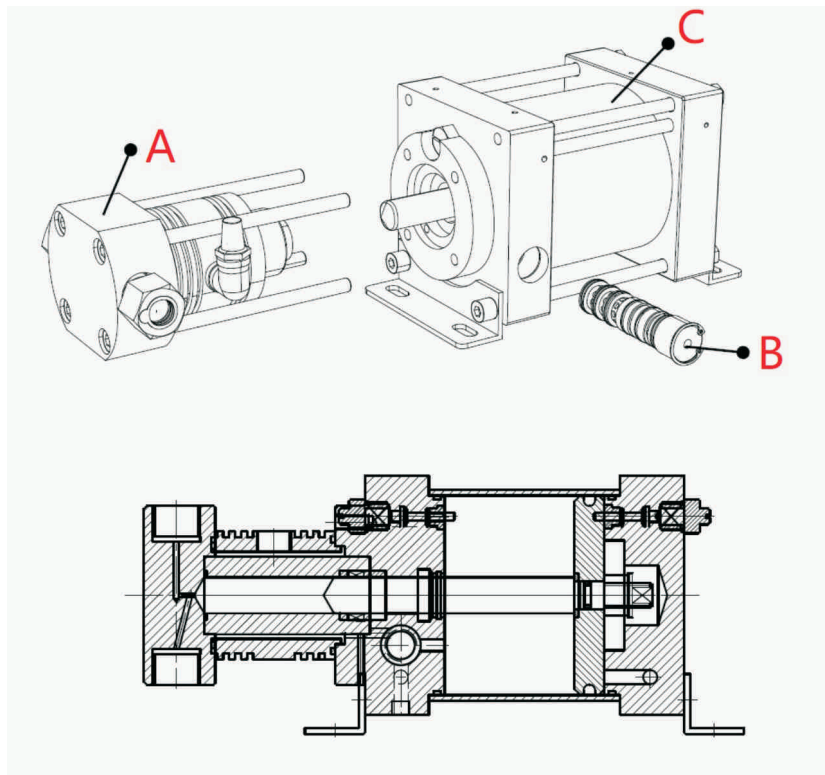
10.0 Partial break down and supplementary data

10.1 Outside view

XB30-OL layout drawing



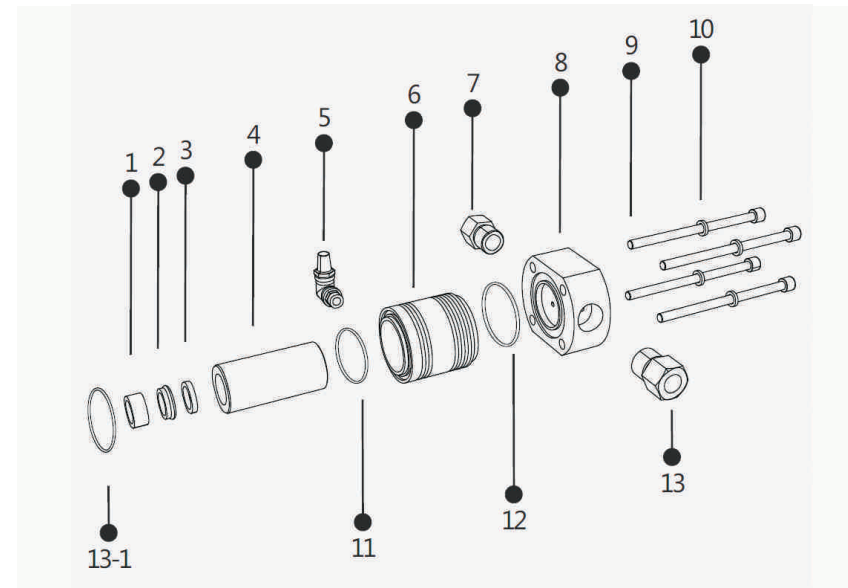
10.2 XB30-OL Exploded view drawing



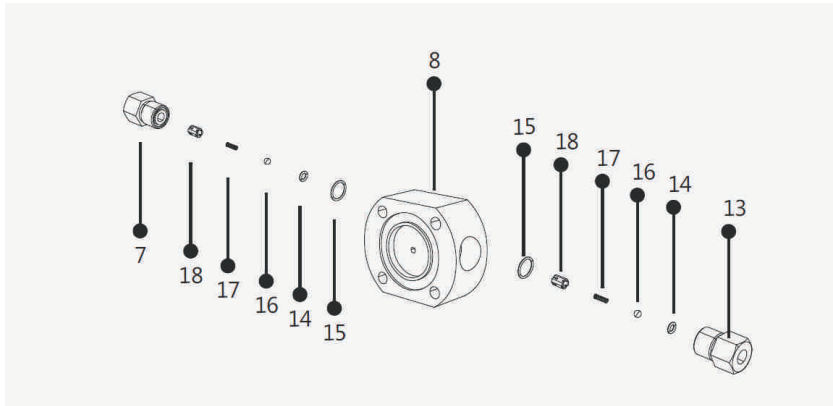
Product Main components

Part Code	Part name	Unit	Quantity	Remark
A	High pressure components	Set	1	Disassemble steps should be follow by A-B-C
B	Air cycling components	Set	1	
C	Air driven part components	Set	1	

High pressure Components item list

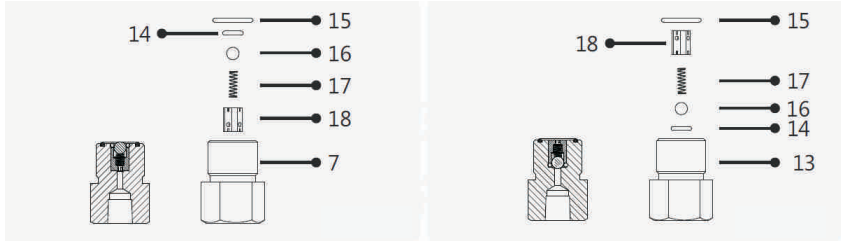


NO	Serial code	Item name	Unit	QTY	Remark
1	OTO25018-001	Bronze sleeve	PC	1	
2	GYF708-18	High pressure seals	PC	1	* Easy broken seals
3	VFO25018-001	High pressure POM	PC	1	* Easy broken seals
4	AHO18039-001	High pressure cylinder	PC	1	
5	XYQ-G3/8	Voice silencer	PC	1	
6	CJ044065-001	Cooling jacket	PC	1	
7	VB2702-NPT	NPT1/4 Outlet check valve body	PC	1	
8	CHO74036-001	High pressure cylinder cap	PC	1	
9	NLJ8x150	hexagon screw	PC	1	
10	TD8	screw washer	PC	1	
11	OXQ19x1.8-90-NBR	O ring seals	PC	1	* Easy broken seals
12	OXQ45x2.65	O ring seals	PC	1	
13	VB2702-NPT	NPT1/4 Inlet check valve body	PC	1	
13-1	OXQ50x2.65	O ring seals	PC	1	



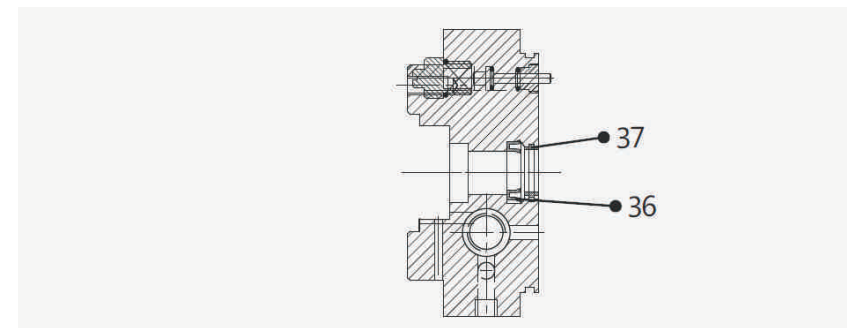
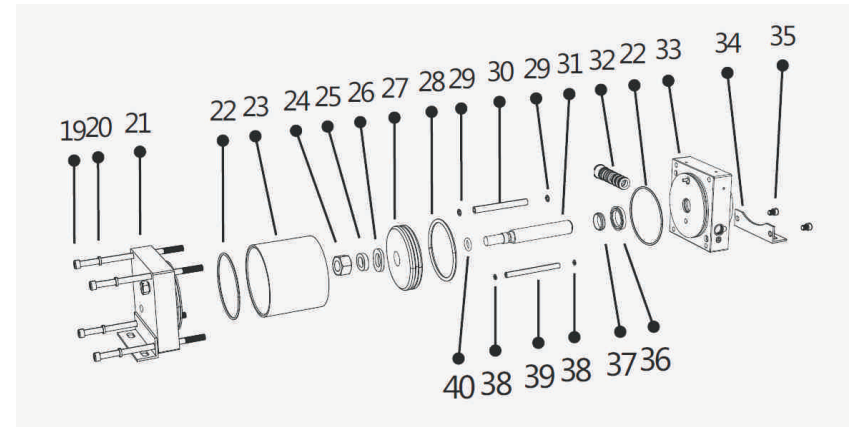
Outlet Check valve

Inlet check valve



Check valve components list

No	Serial code	Item name	Unit	Qty	Remark
14	QXQ5x2-HNBR-90	O ring seals	PC	2	* Easy broken seals
15	OXQ15x1.8-90°	O ring seals	PC	2	* Easy broken seals
16	TCOD5.953	Ceramic ball	PC	2	
17	YSTH1/4	Pressurized spring	PC	2	* Easy broken seals
18	VS2702-002	1/4 valve core	PC	2	



Air driven part components list

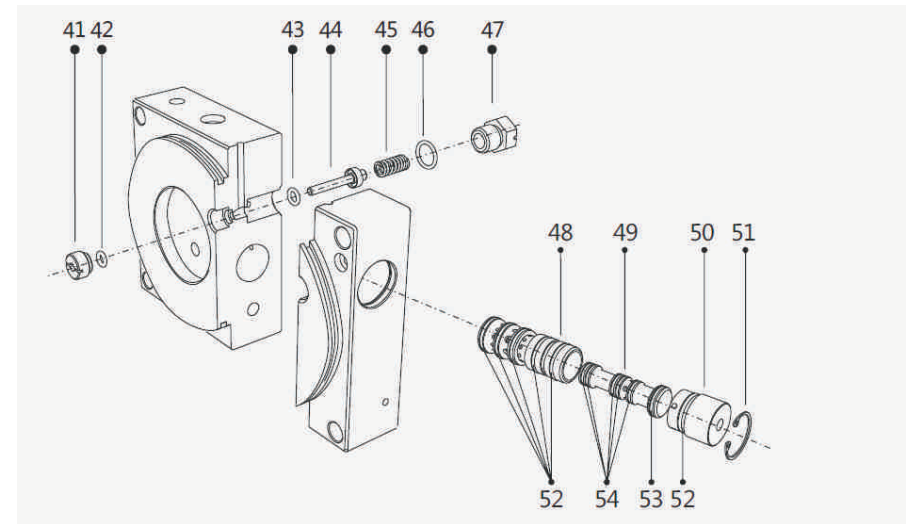
NO	Serial code	Item name	Unit	QTY	Remark
19	NLJ8x150	Outer hexagon Screw	PC	4	
20	TD8	Screw washer	PC	4	
21	CB100030-001	Air cycling plate	PC	1	
22	QXQ95x2.65	O rings	PC	2	# easy to get broken
23	AL100096-001	Air driven cylinder	PC	1	
24	LM12	Nuts	PC	1	

Air driven part components list

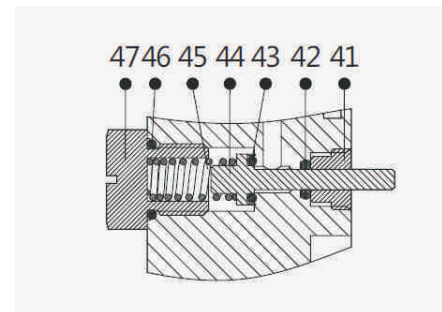
NO	Serial code	Item name	Unit	QTY	Remark
25	Td12	Spring washer	PC	1	
26	PD12	flat washer	PC		
27	PT100015-008	Air driven piston	PC	1	
28	OXQ92.5x5.3	O ring seals	PC	2	# easy to get broken
29	OXQ4.5x1.8	O ring seals	PC	2	
30	GO007	Metal tube	PC	1	
31	PRO18165-001	Piston rod	PC	1	
32	VAO20090	3/8"Air cycling valve kits without valve body	PC	1	
33	CF100004-001	XH blind cap	PC	1	
34	HL100-002	Mounting bracket	PC	2	
35	NIJ8x10	Inner hexagon screw	PC	2	
36	ZF18x26x5/6	Shaft seals	PC	1	# easy to get broken
37	DXH18	Guide ring	PC	1	
38	OXQ6.9x1.8	O ring seals	PC	2	
39	G0006	Metal tube	PC	1	
40	OXQ10x2.65	O ring seals	PC	1	

Exploded view for Pins and Directional valve components

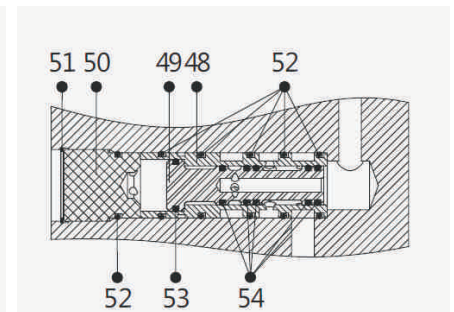
Exploded view for air cycling plate



Pilot pins review



3/8 Air cycling assembly review



Pilot pins and directional valve components list

NO	Serial code	Item name	Unit	QTY	Remark
41	FP1000-003	Pins guide sleeve	PC	2	
42	OXQ4.0x1.8	O rings	PC	2	*stands for easy to get broken parts
43	OXQ5.6x1.8-90°	O rings	PC	2	*stands for easy to get broken parts
44	FP1000-002	Pins	PC	2	*stands for easy to get broken parts
45	YSTHD7	Springs	PC		*stands for easy to get broken parts
46	OXQ11x1.8	O rings	PC	2	
47	FP1000-004	Pins nuts	PC	1	
48	VE020090-001	3/8 directional valve sleeve	PC	1	
49	VS020090-001	3/8 directional valve core	PC	1	
50	VC020090-001	3/8 directional valve cover	PC	1	
51	KY22-MG	Hole circlip	PC	1	
52	OXQ17x1.8	O rings	PC	6	& easy to get broken
53	OXQ12.7x1.8	O rings	PC	1	& easy to get broken
54	OXQ8.7x1.8	O rings	PC	5	&easy to get broken