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国家产品质量免检 | 中国著名品牌

2X系列真空泵

2X Series Vacuum Pump

Product Catalog 2020

CATALOG

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First Summarize

1.1 Use

2X Series Rotary Vacuum Pumps is a basic equipment used for pumping air from sealed vessels to attain vacuum condition. Suitable for Metallurgy, Chemical Engineering, Petroleum, Medical Treatment, Produce Medicine, Print, Electric Appliances, The Electric Vacuum, Semiconductor, Food packing, A-energy, Spinning, Researching Organization etc.

1.2 Characteristics and Unfit

1. 2X Series Rotary Vacuum Pumps is one of the basic equipment used for pumping air, it can used alone, also can be wised used as backing pump together with booster pump, diffusion pump or molecular pump in devices fabricating, Vacuumize, Filtering, Coating Film, Welding, Petroleum, Medical Treatment, Produce Medicine, Printing, Electric Appliances, The Electric Vacuum, Semiconductor, Food packing, A-energy, Spinning, Researching Organization etc.

2. Ambient temperature is 5-40 ℃, pump can long term running if the suction pressure not excess 10Torr. You should open the gas ballast valve if the air relative humidity excess 90%.

3. The pump can not running exceed 3 minutes without suction port connect to air

4. The Vacuum Pump is made of ferrous metal and belongs to precise equipments. The main parts of the vacuum pump immerse in the special vacuum oil. Therefore, it is unfit used for taking out poisonous gas, volatile gas, high oxygen gas, caustic gas which can fret black metals or affect the vacuum pump oil. Also it can not used as compressor or transport pump.

1.3 Variety, Specification, Main performance parameter(Table 1)

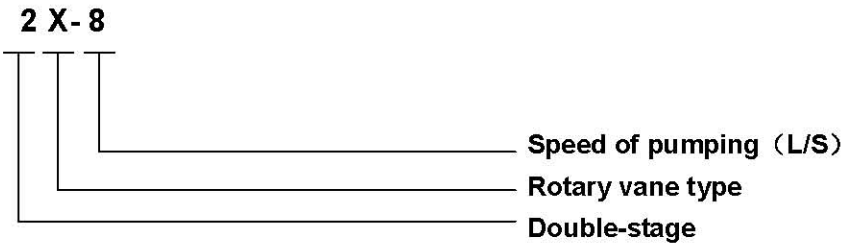
Table 1

ITEM \ TYPE			2X-4A	2X-8A (Origin 2XF-8)	2X-8	2X-15A	2X-15	2X-30	2X-70
Speed of pumping L/S			4	8		15		30	70
Maximal pressure	Closing aeration-valve	Pa (Torr)	$6\times10^{-2}(\leq5\times10^{-4})$						
	Opening aeration-valve		$6\times10^{-1}(5\times10^{-3})$						
Noise dB(A)			72	75		80		82	86
Motor power (KW)			0.55	1.1		1.5		3	5.5
Motor ratational speed (r/min)			1450						
V belt	Type/ length mm		A/889	A/965		A/1120		B/1400	B/1600
	Amount		1			2		3	4
Consumption of oil	Type		NO.1 Vacuum oil						
	Amount (L)		1.1	1.5	1.3	3	2.5	4.5	8
Rotate speed of main axis (r/min)			450	590		450			
Inlet Diameter (mm)			Φ32	Φ32		Φ40		Φ60	Φ80
Method of connecting the inlet			With rubber tube			With flange			
Method of cooling			Natural cooling		Water cooling	Natural cooling	Water cooling		
The least consumption of cooling water L/h			-		480	-	480		

Note: ①The thermally coupled to a variety of steam and permanent total gas pressure and Maxwell can only measures the divided pressure of permanent gas. So the numerical value of Table 1 has certain differences.

②The geometry speed of pumping is figured out of the geometry dimension. In the atmospheric pressure, the geometry speed of pumping basically accord with factual pumping speed. At the all kinds of pressure, pumping speed bear on pressure (refer to picture 5)

1.4It represents the meaning in the composition of the type



1.5Condition of environment for use

Ambient temperature is 5-40 ℃.The relative humidity should not excess 90%.

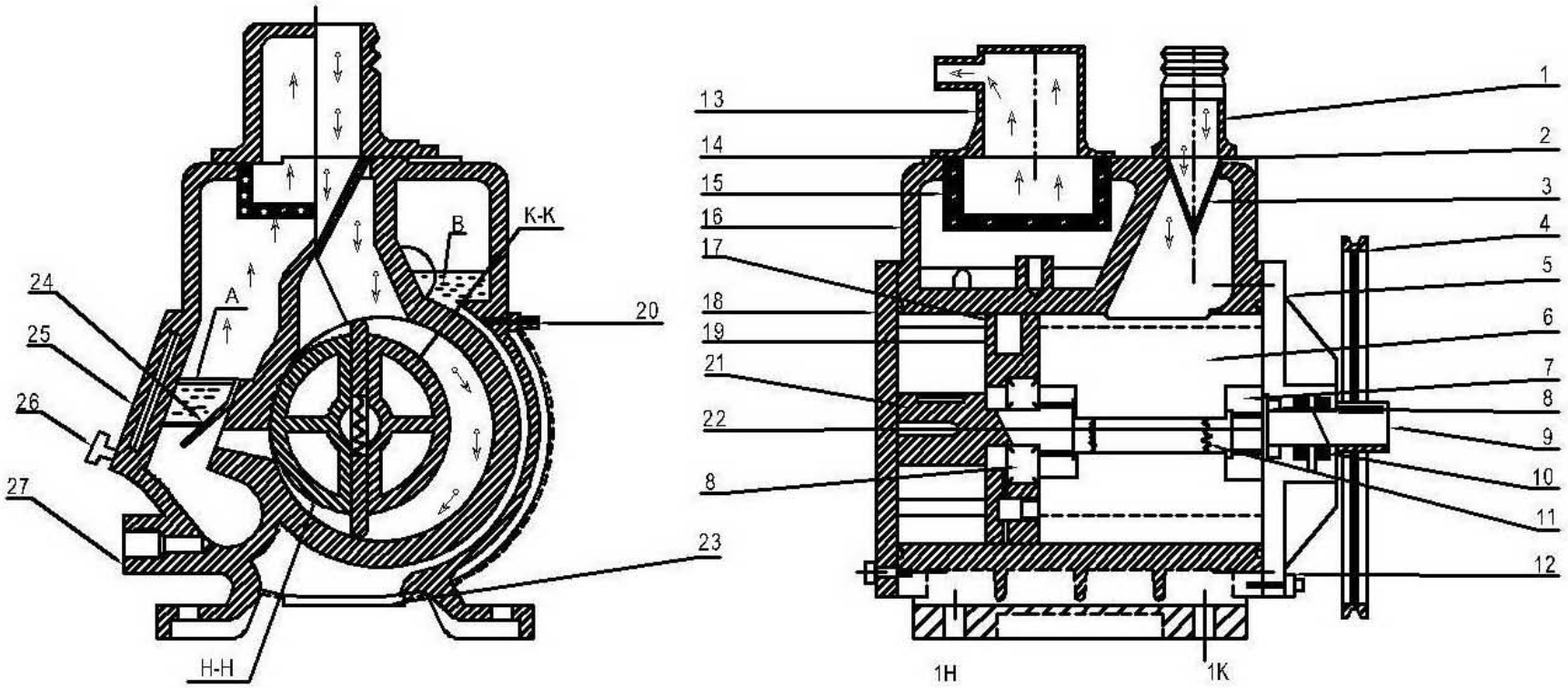
Second Structure and operation principle

2.1 Structure

The structure of 2X series vacuum pumps are basically the same. The pump's rotor ran by V belt from the electromotor. Electromotor and pump are fixed on chassis with screws.

Vacuum Pump is made up of pump body, high-pressure rotor, low-pressure rotor, front end-plates, back end-plates, high-pressure rotary vane, low -pressure rotary vane, exhaust valve, exhaust cover, observation mirror etc. Refer to Fig.1, Fig.2.

A septi-board is pressed into the pump's body and divided the pump's body into high vacuum room and low vacuum room, each room has exhaust vent, high vacuum room's exhaust vent connects low vacuum room's entry. Head axletree extended from high pressure rotor. Back axletree extended from low pressure rotor. Head axletree is braced by head end-plates' axis, pass through hermetic oil room to extend out of head end-plates. Back axletree is braced by clapboard's axis, pass through low-pressure room. And low-pressure room's axis is installed in back axletree. Thus high-pressure rotor and low-pressure is driven by head axletree. They all have folio slot. And two "T" shape rotary vane install in the slot. The air inlet of pump has a percolation net, and exhaust vent have block-oil-net. Big pump has oil-baffle. Observe mirror have a valve on the left. Underside has a oil-escape-plug.



1. entry-mouth 2. seal rubber circle 3. percolation net 4. V belt rotary table 5. front end-plates 6. high-pressure rotary vane 7. high-pressure rotor 8. axis 9. front axis 10. the oil sealed chamber 11. Spring 12. onentation lock 13. exhaust cover 14. exhaust cushion 15. block-oil-net 16. pump body 17. septi-board 18.back end-plates 19. low-pressure rotor 20. water tie-in 21. feather key 22. low rotary vane 23.water cover 24.exhaust valve 25. observation mirror 26. aeration-valve 27. oil-escape-plug

Fig.2

Note: 2X-15A . 2X-15 . 2X-70 type have not entry-mouth and exhaust cover
2X-15A . 2X-15 . 2X-70 type pump's two end planes are sealed with seal rubber circle
⇢ shows high-pressure gas path ⇢ shows low-pressure gas path

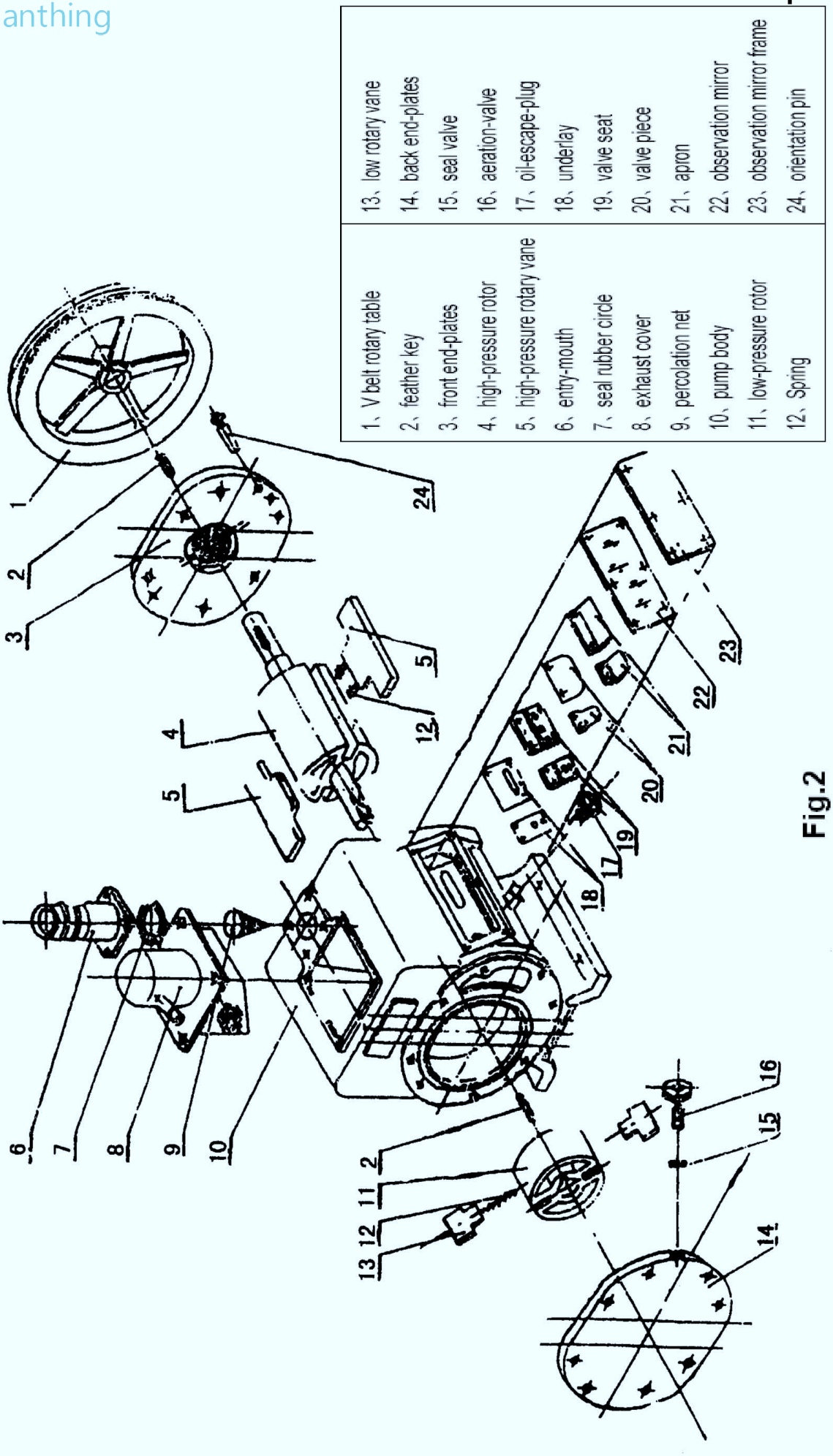

1、V belt rotary table
2、feather key
3、front end-plates
4、high-pressure rotor
5、high-pressure rotary vane
6、entry-mouth
7、seal rubber circle
8、exhaust cover
9、percolation net
10、pump body
11、low-pressure rotor
12、Spring
13、low rotary vane
14、back end-plates
15、seal valve
16、aeration-valve
17、oil-escape-plug
18、underlay
19、valve seat
20、valve piece
21、apron
22、observation mirror
23、observation mirror frame
24、orientation pin

Fig.2

2.2 Operation principle

Fig. 3 is the 2X series vacuum pump's principle diagram, Rotor3 and rotor7 tangent to high-vacuum room1 and low-vacuum room6.Rotor3 and rotor7 follow the arrowhead direction to revolve, drive the rotary vane8 to rotate.

Because of spring9 and centrifugal force effect, rotary vane's end sticks to the interior surface of vacuum room to slide closely, separate the crescent inter space from entry-mouth2 to exhaust valve5 and from air channels4 to exhaust valve10 into two or three room, and changes its size periodically. Then as Fig.3 show that with rotary vane rotating continuously A and C room will be increase. The gas of container will be inhaled into the pump. B and D room will be reduced gradually at the same time. Then B and D room's pressure rises. Subsequently exhaust valve5, 10 will be opened by pressure washing. Then gas can be expelled from the vacuum room. When pressure is higher and both valves in the high and low vacuum room exhaust, the 2X vacuum pump is equal to the single-stage pump. When vacuum is higher, all gas enter vacuum room, and then exhaust valve10, 2X vacuum pump become double-stage pump.

If the gas contains higher steam, when it is compressed, divided pressure of steam exceed this steam saturation pressure under temperature in the pump, the steam will be compressed into liquid, can not be exhausted from vacuum pump. It will mix in the oil of vacuum, and makes the performance of the pump reduce greatly. If mix right amount of air when compressed, enables divided pressure of steam lower than saturation pressure, the gas can be exhausted from the pump in front of steam become liquid. So each 2X series pump put an aeration-valve which can get some gas into pump (Fig3)

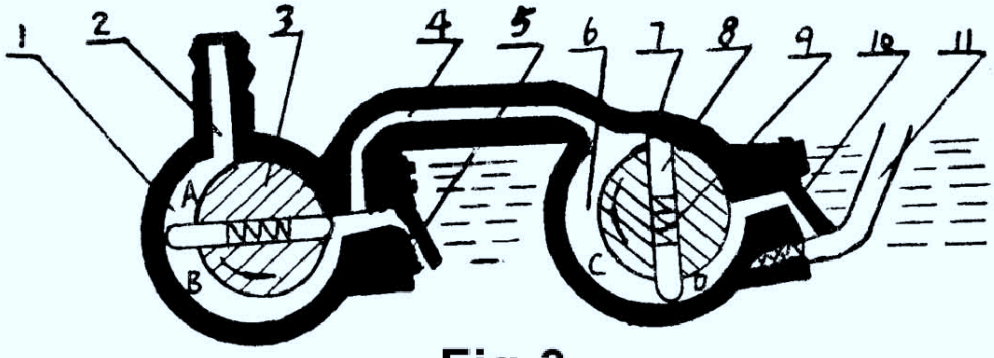


Fig.3

1、High pressure room 2、entry-mouth 3、High-pressure rotor 4、Breather pipe
5、High pressure exhaust valve 6、Low pressure room 7、Low pressure rotor
8、rotary vane 9、Spring 10、Low pressure exhaust valve 11、Exhaust valve

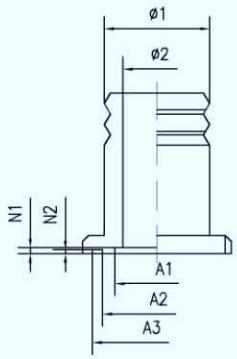
Third Size and weight

3.1 Form size and weight

ITEM \ TYPE		2X-4A	2X-8A	2X-8	2X-15A	2X-15	2X-30	2X-70
Form size	L_1 mm	530	580		630		800	900
	B_1 mm	320	340		370		490	660
	H_1 mm	330	380		525		600	700
Weight kg		60	80		128		260	420

3.2 Connect size and install size (Fig.4 and table3)

CODE \ TYPE	Φ1	Φ2	Φ3	A1	A2	A3	M	Φd	H2	H3	L2	L3	B2	B3	Φd1
2X-4	32	28	55	30	35	55	55	6.5	312	252	450	119	260	190	10
2X-8A / 2X-8	/	32	64	40	43.5	65	64	8.5	360	282	490	130	280	210	10
2X-15A / 2X-15	/	40	80	50	55	70	80	8.5	460	380	570	160	350	275	11
2X-30	/	65	105	80	84	105	100	8.5	580	500	725	178	370	340	12
2X-70	/	80	130	90	100	130	130	11	/	530	830	280	515	465	12



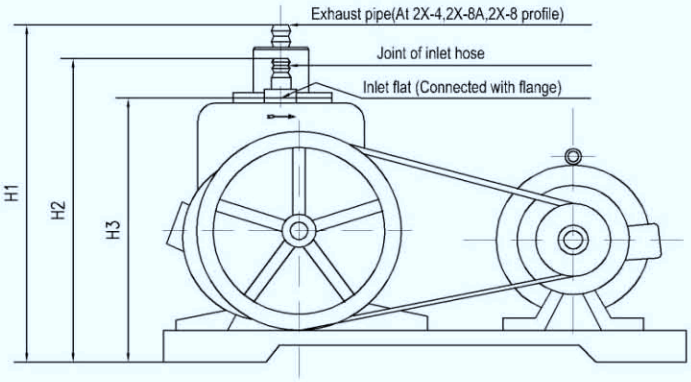
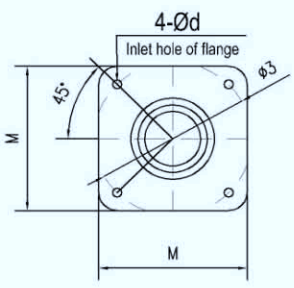
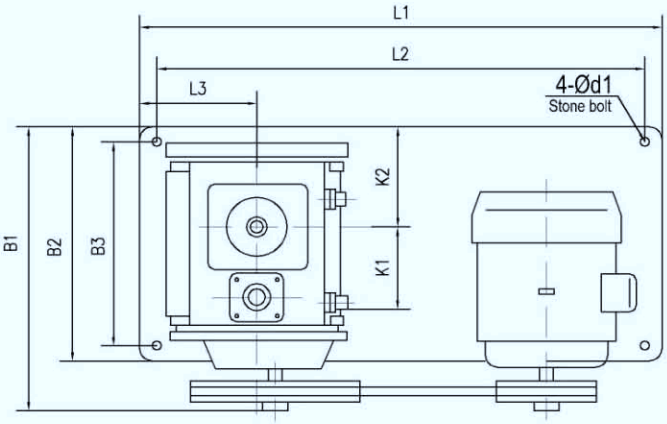


Fig.4





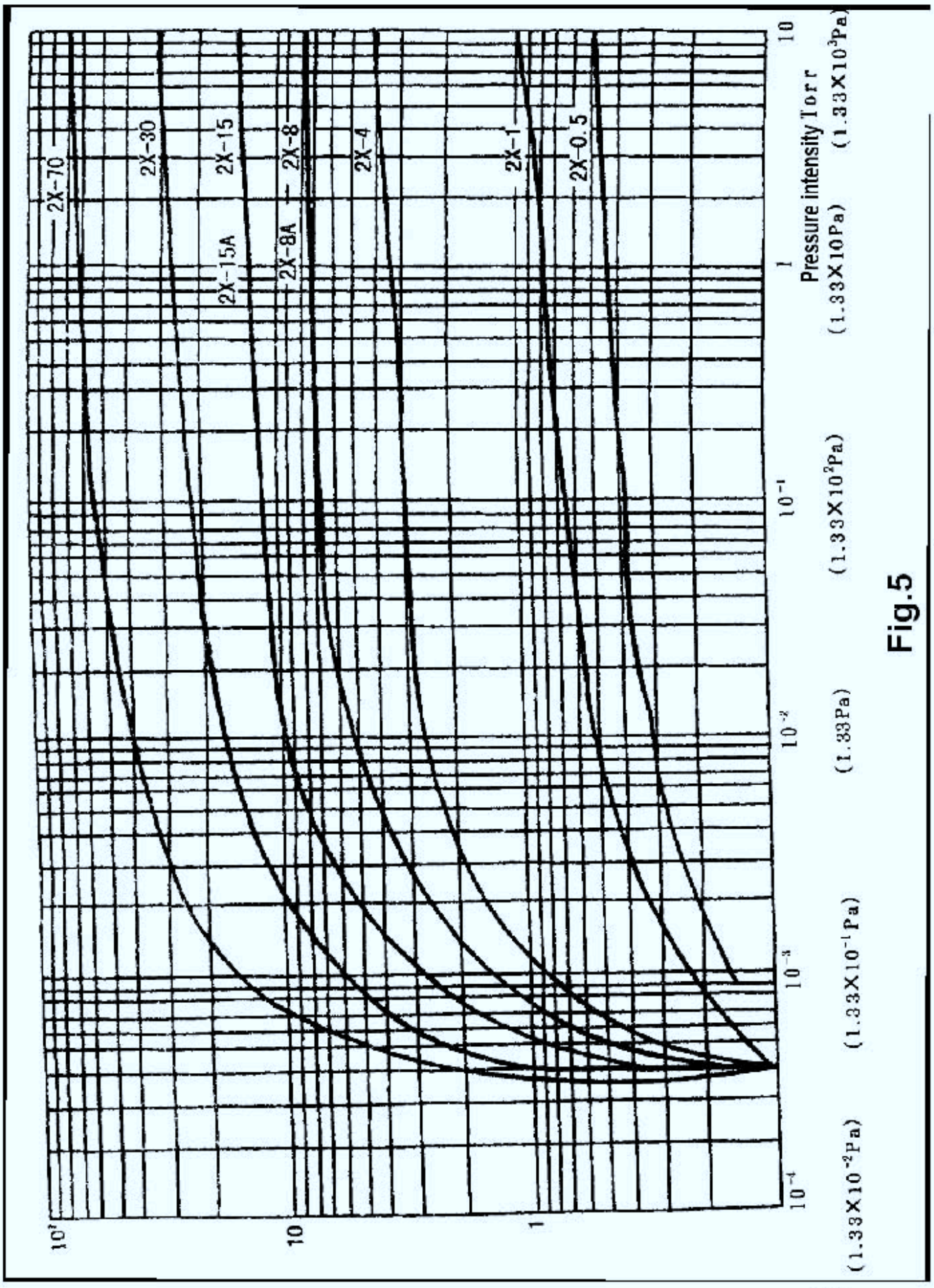

2X-70
2X-30
2X-15
2X-15A
2X-8
2X-8A
2X-4
2X-1
2X-0.5
Pressure intensity Torr
(1.33X10³Pa)
(1.33X10Pa)
(1.33X10⁻¹Pa)
(1.33X10⁻²Pa)
(1.33Pa)
10
1
10⁻¹
10⁻²
10⁻³
10⁻⁴
10⁷
10
1

Fig.5

Fourth Install and debug

4.1 install

4.1.1 Open the pack, take out the vacuum pump carefully, and check attachments and manual. Remove the filler, clean the surface dust, grease of the pump. Check the figure according to the packing list.

4.1.2 The vacuum pump is installed in cleaned, ventilated condition，accords with the 1.5th requirements. Pump should install in a commodious field in order to convenient use. (Boundary dimension of pump can refer to Table2) . The vacuum pump can be put on the solid and smooth ground, does not need a special foundation, if needing to be fixed can add some screws and foundation to reinforce.(The screw size of foundation refer to Fig. 4 and Table 3). When it closed to the exact meter, it should add some incabloc.
4.1.3 Connected container with the vacuum hose or flange. When connected with flange, there should have seal-rubber in the flange's groove.(Form and size refer to Table 3 and Fig. 4) . From 2X-0.5 to 2X-8 vacuum pump can connect its entry-mouth with the vacuum hose.2X-8A to 2X-70 connect entry with flange. The connecting should not be smaller than the diameter of air inlet of the pump. The pipeline should be short, and the connecting should be little. Or else it influence the speed, to leak tolerance should little piecing of pipeline. The gas amount of container should be suitable for the pumping speed of the pump (the pumping speed of the vacuum pump Fig. 5).

4.1.4 Connect the power supply according to the electro motor's sign shown the voltage and the method of connecting wire, propose. Adopt safety so as not to overload. Judged the rotary direction of the motor, it should keep the same with arrow point direction on the pump.

4.1.5 Take down the exhaust-plug and install the exhaust-cover, or take off the exhaust-mouth's cover. It should water cooling or connect the source of water.

4.1.6 Should be careful to prevent foreign matter falling into the pump while installing.

4.2 Debugging

4.2.1 To install the pump at the first time, should make once trial run. Then the vacuum pump should not have vibration and the special striking sound because of improperly installing. The electromotor should not overload, The temperature of the oil and the maximal pressure should accord with the technical specification.

4.2.2 Continue starting the pump with 1-2 times. Observing the pump whether has unusual sound and special vibration. If there is no problem, it can be operated continuously.

4.2.3 Notice that the level of oil should be between two oil-marks of the observation mirror, it will cause the starting difficulty that there is many oil amount, return to bad phenomena such as the oil, gushing out the oil, etc., has at least influenced the vacuum degree. You should refuel when the oil amount is insufficient. Notice that should drop naturally the pump oil stopped for a long time, and will raise the oil after operating the pump continuously.

4.2.4 Open the cooling water.
4.2.5 Open the valve of entry-mouth, the open size according to circumstance.

4.2.6 When there is steam in the gas, should open the aeration-valve. When the oil should purified, please open the aeration-valve after pumping the steam out. While reducing the noise of 2X-8 vacuum pump, you can open the aeration-valve slightly too.

4.2.7 The 2X series is the high vacuum pump in the machine. Should install the valve in the entry-mouth in case of gushing oil use the model DDC-JQ which at the same step with motor is the most great. Otherwise, should be shut off the valve of entry-mouth first while parking the pump. The pump which installed an aeration-valve should be deflated after turning off the power and the source of water.

Fifth Operation instruct

5.1 Attentive item while using

5.1.1 Often pay attention to the level of oil.
5.1.2 Slowly open the valve after the pump is started.
5.1.3 Often notice it is normal that the pump operates. Is there special sound? Is the electromotor have the overload operation?
5.1.4 Notice whether the cooling water is cut off.
5.1.5 Notice the pump's temperature never exceed 40 ℃.
5.1.6 After parking the pump, the cooling water must be clean-out before the temperature of pumps below 5℃.

5.2 Safe item while using

5.2.1 If must make the vacuum pump draw the poisonous gas which corrode the ferrous metal, and the gas can make the chemical change, the gas exceed the normal atmospheric temperature and contain dust, should add

neutralization, cooling, filter devices on the piping to work in pump. Or else the vacuum pump' serviceability and life span will be influence. While drawing the harmful gas endanger human body, should set up the corresponding pipeline to collect the harmful gas into a container, and dispose it at outdoors out of the work area.

5.2.2 The style 2X-4 to 2X-8 of vacuum pump only has oil-baffle. For 2X-15 to 2X-70 of vacuum pump, our factory produce the oil collecting device by avoiding the gushing oil, in order to reduce the pollution and economize the consumption of oil.

Sixth Fault analysis and Disposal

6.1 The vacuum degree is not high

6.1.1 The temperature of pumps is too high:

a. If pumped gas' temperature is high, should cool the gas first.

b. If suck some hard things wear and tear into pump, it should repair and change.

c. If cooling water of the pump is not enough, should increase the flux of cooling water.

d. If it is set up improperly, cause wear and tear, should check and set up again

6.1.2 The level of oil is too low to get the observation mirror's level line, should add enough the amount of oil.

6.1.3 Aeration-valve has not closed tight and leaked gas: Should close it tight

6.1.4 The oiliness is changed badly: Please replace new oil.

6.1.5 The pump leaks gas: Mostly caused by the fact that the oil surface of the pump is sealed badly, there should add vacuum oil into exhaust cover, or drive for several seconds in air, to make the oil pool B abound with oil .(The oil pool B is shown in Fig. 3)

6.1.6 If rotary vane's springs have broken, should change it.

6.1.7 If vane piece is damaged, should change it.

6.1.8 Head end-plate: the seal rubber circle of the oil sealed chamber should be changed when it has damaged.

6.1.9 When use the pump for a long time, wear and tear increase，should repair or change the damaged part in time.

6.1.10 If the percolation net has stopped up, please take it down and wash it.

6.2 Fault analysis and Disposal

6.2.1 The temperature of pumps is too high: according to the 6.1.1 one.

6.2.2 When the pump's cavity has wore and tore, because of some foreign matters (e.g. scrap iron) are inbreathed in pump, should repair or change the damaged part in time.

6.3 Others

6.3.1 If the end of axis leaks oil, the seal rubber is wore and tore or installed incorrectly, it should be changed or re-installed.
6.3.2 When the oil gush out or the level of oil is too high, it should let surplus oil out. Exhaust cover under block-oil-net install opposite, should be reinstalled. Low side turns towards behind.
6.3.3 Terminal surface leaks oil, because front and back terminal surface are not smooth which were damaged, end-plate does not tighten, should build, tighten it and flat the terminal surface.

Seventh maintenance

7.1 Daily maintenance.

7.1.1 The vacuum pump should be paid attention as 5.1 attentive item at work.
7.1.2 The vacuum pump must often keep clean, can't put other objects on the pump.
7.1.3 Notice whether the belt's elasticity is appropriate, adjust once each half year.
7.1.4 Stop the leakage of the joint of the pipeline in time.

7.2 Maintenance while operating.

7.2.1 After the vacuum pump works for three months until half a year continuously, it should change oil once. In the area have larger humidity, or in moist season, pumped gas is polluted greatly, should follow detailed circumstances to shorten the time of replacing oil.
7.2.2 Remove the pump out of the vacuum system. Underlay objects with the chassis of the electro motor's side, open the oil-escape-plug and put the oil out. Rotate the vacuum pump, and cover the gas vent, to put all oil out from oil-exit. And then put the oil into pump from the gas inlet, rotate 5-10 times to wash inside continuously.
According to this operation 3-5 times, after clean out the corrupt oil, then put the oil-escape-plug on. Recline pump flat, add new oil from the air inlet and the exhaust vent respectively.
7.2.3 Should not start the electromotor for a long time while changing the oil, avoid vent valve pieces flop too violent and tired.
7.2.4 Forbid washing the pump with kerosene, petrol, alcohol, etc. when it is informal dismantled

7.3 Maintenance while parking for a long time.

If park time longer, should take down the exhaust cover and change the air

lock. Close the air inlet. Dispose of the water cleanly

Eighth unpacks and checks

Unpack, check the following several contents:

a. Certificate of quality of the products

b. Operation instructions of products

c. Spare part and quantity (Table 4) ;

table4

CODE	NAME	AMOUNT	Material
1	High vacuum valve piece	1	5261 rubber
2	Low vacuum valve piece	1	5261 rubber
3	spring	3	65mn spring steel
4	Axis seal rubber circle	2	
5	Inlet seal rubber circle	1	5261 rubber

NOTE：The different vacuum pump can use same spare parts, but with different Specification.

Ninth Service

Please use the products correctly according to the manual, it can't be used beyond the applicable scope (for example: Situation that the clause1.2 describes, etc.)

Please install and service the product according to clause 4-7 correctly.

If violate the procedure of operating, use incorrectly, and make damage with person, etc. artificially, our factory will not offer any repair-service.

Our factory has the right of final interpretation.