

Modular adsorption air dryer series

# Operation manual

**Be adopted in:**

**EP-MZ series**

Thanks for your purchase of



Modular adsorption air dryer series

Please read this manual carefully before your operation

**Guangdong Epsea Industrial Co., Ltd.**

**Epsea Industrial (HK) Co., Ltd.**

# Catalog

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## Preface

Thanks for your use of **EPSEA** EPSEA modular adsorption compressed air dryer. It will bring you with clean compressed air for your normal application.

The machine has undergone strict inspection in quality and test in performance before its delivery. Please do read this operation manual carefully for your equipment running safely and reliably.

This manual will mainly focus on introducing procedure , installment, running, repair, maintenance, electric control route as well as error removal.

Operator should pay attention to all running conditions provided in technique materials before dryers actual working.

If you need any service or want to offer us good advice, welcome your connection with us anytime.



Standard attestation of ISO quality management system

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## **NOTE**

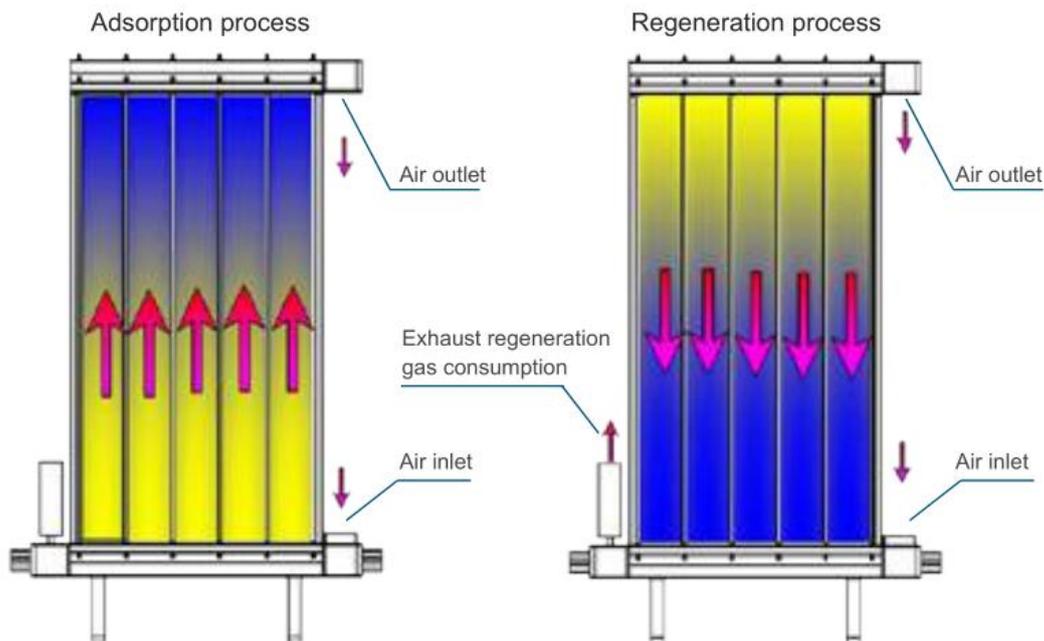
**Please read this manual carefully and ensure fully understanding of it before operating the equipment**

For your later operation and repair, please preserve this manual well

## Summary

### Working principle of adsorption dryer

The equipment uses the drop power in bottom hitting and side shock when manufacturing. It tightly pads two tanks with the high-grade moisture adsorption material—molecular sieve (alumina) . When “gas with moisture” flows in specific direction, it compacts adsorbent in curve and adsorbs liquid water in the air with pressure condition. As with instant pressure drop method, adsorbent will automatically desorb the H<sub>2</sub>O after its saturation in adsorption of it, this product is made in this theory. It adopts shifting in two tanks to alternatively work in process of adsorption, desorption, regeneration and pressure stamping.



### Procedure

Each cycle contains 4 step:

Tank A working, tank B regenerating:

First, compressed air stamps pressure for tank A and B. When the pressure has reached working point, tank A starts to adsorb those liquid H<sub>2</sub>O in the air to depress the dew point to -30~-70°C. Most of the air after drying will input to air using passage and the other part (about 7.5%) will drop to normal pressure

after throttling of the regeneration regulating valve and its dew point will be lower. It enters tank B to desorb and regenerate adsorbent closing to H<sub>2</sub>O saturation, then exhausts at silencer after passing solenoid valve.

#### Tank A working, tank B stamping pressure:

After desorption and regeneration work of tank B, the dryer will automatically open the solenoid valve between the two tanks to balance the pressure in them in a short time and the pressure stamping of tank B finishes.

#### Tank B working, tank A regenerating:

At this time, tank B take over adsorbing and drying work. The air after drying will deliver most of it into air using pipe in the same way and a handle of it drops pressure to atmospheric level after throttling of regeneration valve. It enters tank A with lower dew point to desorb and regenerate the adsorbent there.

#### Tank B working, tank A stamping pressure:

After finishing desorption and regeneration work of tank A, the dryer automatically opens the solenoid between the two tanks again to balance their pressure in a short time. When tank B is adsorbing, tank A stamps its pressure. In this way tanks moving on to next cycle.

Time for adsorption generally needs 3~20 minutes, and 10~40 minutes for stamping pressure.

## **Basic knowledge of adsorption dryer**

### What is adsorption? And how it happens?

Adsorption is an automatically concentration changing phenomenon of substance in two intersection boundaries. All solids more or less have the power of adsorbing surrounding medium molecules, atoms and ions to its surface. From the perspective of thermodynamics, the reason why solid surface can adsorb other medium is that there is a energy what in physics is called "surface free enthalpy", which tends to adsorb other matters to reduce its surface energy.

## What is adsorbent? What is adsorbate?

The substance has an obvious adsorption effect for particular medium is called “adsorbent” and what is adsorbed is “adsorbate”. On some conditions, adsorbents can adsorb more with larger surface area. Therefore, it must enlarge its adsorption area reasonably to improve its adsorbing capacity.

## What adsorbents are usually used in adsorption dryer.

What we use often are silica gel, active alumina as well as molecular sieve.

## What is the effect of silencer of adsorption dryer?

Silencer is used to reduce the noise from exhausting waste gas in adsorption dryer regeneration process. As the regenerative waste gas is in some pressure at exhausting, fast gas release will arise vibration and produce heavy noise which generally can reach 80~110db. As what national noise regulation has noted, silencing measures should be taken when the gas exhausting noise is over 75db. As exhausted regeneration gas contains plenty of dust and moisture in adsorption dryer, condensate collects at moderate temperature, which is easy for silencer blockage. Therefore, working condition for silencer in adsorption is worse and precaution, clean and maintenance for the part is needed.

## Features of the equipment

1. It adopts aerospace aluminium alloy with high pressure resistance and fully anti-corrosion after particularly oxidizing and corrosion proof dry power double spraying.
2. With installment of spring clamp device in adsorption tank, adsorbents will always keep in tight which will remove friction loss of adsorbents for their gaps to increase service life of adsorption tanks.
3. Adsorbents release heat after adsorbing moisture. But the higher temperature is, the poorer adsorption effect will be. After designing the tanks in modular, heat will be divided equally to decrease temperature, bringing more powerful adsorption effect.
4. With adoption of modular design, the cross-sectional area will increase, which will slow down the flowrate of gas in cavities, prolong the touching time and enlarge the touching area for gas and adsorbents. All of these contribute

to more fully adsorption.

5. Modular design makes it more compact in structure ,smaller in size, less in space and convenient in installment.

6. The volume of single adsorption tank is less than 25L, not in the coverage of special inspection for pressure vessel.

Guangdong Epsea Industrial Co.,Ltd.has solemn commitment that parts and accessories used in our modular series products are in internationally well-known brands, inspection of purchased material arrival in our factory is strictly carried out, IQC is put forward seriously according international standards, non-standard and faking shoddy for best components are strictly prohibited to enter factory production.

We have passed “the standard attestation of ISO9001 International Quality Management System” and established sound quality assurance team to conduct examinations and tests for products strictly in international standard. Defective ones are seriously prohibited to enter market.



REGISTERED



ISO9001International  
quality certification



Production license:  
IE06-010-00645

## Safety Specification



**Note:** This equipment is used in air drying. Please do not apply it in other ways apart from what original set. If encountering any questions in use, do contact us to ensure your profits and safety for your equipment and workers.

This equipment provides lots of safety measures to guarantee safety for it and people, but we sincerely advice you not to rely too much on these safe apparatuses and overlook the specifications, especially the following notes. You are expected to know them well before operation for fear of dangers to equipment and people when it in fault.

### Safety specification

1 ) Please confirm the operator has fully understand all the contents described in this manual, and no person or obstruction in the forbidden area, when turning on the power.

2 ) Please memorize the " master switch " position, to ensure the operator or other relevant personnel can immediately press the switch, when an emergency occurs, to avoid danger.

3 ) please use safety equipment o operate the machine, such as safety shoes, gloves etc.

4 ) Please don't put the tools, parts or other unnecessary items on the equipment table top or the position of the moving items or others may interfere with the operation of machine, to confirm the machine normal operation .

5 ) Please confirm the operation switch is correct, when you operate any button, And remember to avoid inadvertently touch the button , so as to avoid the misoperation or danger.

6 ) Please immediately shut off the main power to protect equipment, when the supply voltage is not stable,

7 ) The maintenance of the circuit system must be operated by the by the professionals , and the general operator is not allowed to disassemble.

8 ) Grounding must be reliable, to ensure the safety of the stuff and machine.

9 ) Please don't touch any electrical with wet hand, to avoid the electric shock danger.

10 ) The hardware and related parts of machine have been adjusted and locked, please do not change or modify at will.

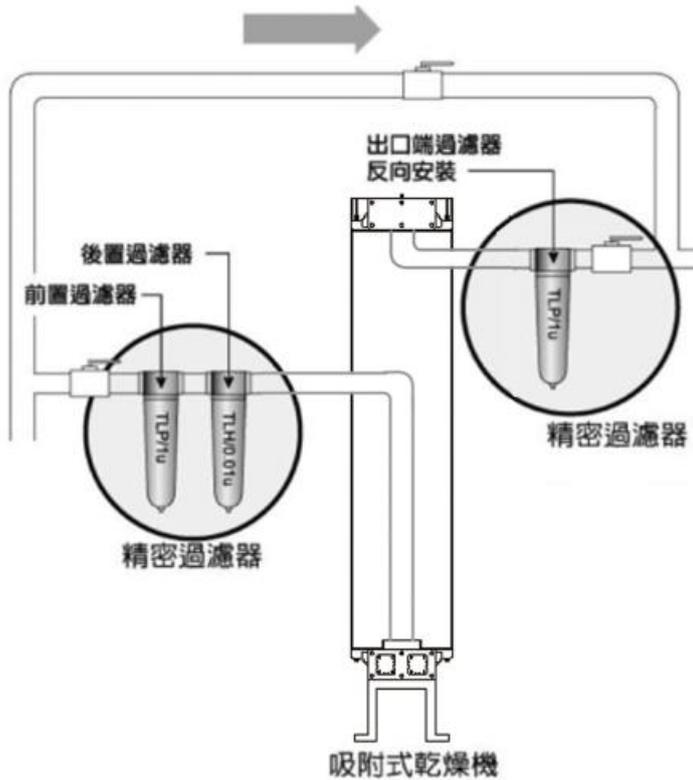
11 ) Please do not knock the equipment, to ensure the safety and precision .

12 ) Please keep the accessories clean.

## **Specially noted items**

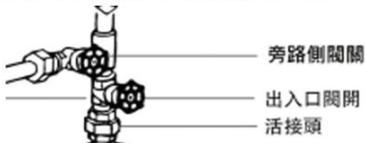
When you know the oil removal effect not well will affect with adsorbent, you should also know how to install the precision filter, if this, will have the most positive help for the adsorption type dryer.

1. Please equipped with a pre-filter and post-filter at the position of before and after adsorption dryer inlet, to make the oil content reach the standard 0.01ppm. But at outlet still need to equipped with a ( 0.01u ) filter and need anti install, which is filtrating the dust of adsorbent releasing. The air can't directly into the filter element, or it will block easily, so it should be enter by filter extranet, then go through filter element to outlet, and let the dust leave in the filter mesh bottom and easy to discharge, that will not easy to block filter. Installation diagram as follows:



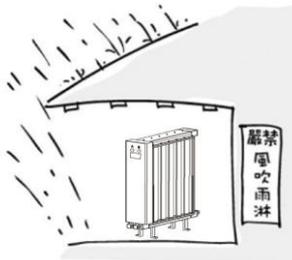
2. Please must install bypass pipe;

● 请装置旁路配管(维护时一定会用到, 务必设置)。



3. The place of installation should avoid direct rain shower, outdoor should build a shelter;

● 安装之场所, 应避免风雨直接吹淋到之处所, 户外应搭建遮雨棚。



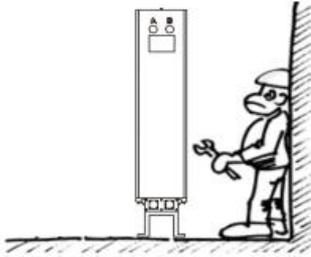
4. The pedestal of machine use high quality C type channel steel as a solid base, usually only need placed on the ground;

- 机台底座采用加厚型优质C型钢做坚实基座，机台通常只要放在地面即可，并不必特别的基础工程。



5. Need reserved the maintenance space for service person;

- 预留服务人员之维修空间。



6. The plug need connect with 220v/380v socket or protection switch;
7. The power need equipped with circuit breaker;
8. The area of power supply frequency in 50Hz, please control in 210~230V, 360~400V; In 60Hz, please control at 208~230V;
9. Access the ground wire before using;
10. Share wiring with multiple electrical equipment at the same time will cause to heat , it's very dangerous, please avoid it;
11. Please refer to the maximum operating current when setting the leakage circuit breaker.

## Operation

**Examination of starting up:** please control nameplate data, check the following conditions:

Power supply: three-phase: 380V/50HZ, single phase : 220V/50HZ ( with nameplate )

environmental temperature: $\leq 45\text{ }^{\circ}\text{C}$

Rated working pressure: 0.6-1.0Mpa,

inlet temperature $\leq 45\text{ }^{\circ}\text{C}$

Processing gas flow within the rated range.

Pre-filter in the working state, manual ball valve of drainage device in the " on" position,each valve pipe should be in normal working position.

**Boot:** close the bypass valve, open a little exhaust valve, start up the air compressor, slowly open the inlet valve.when the pressure of tow tank equilibrium to the set pressure, turn on the controller power switch , that is enter the working state. when the system pressure rise to the set working pressure, and fully open the exhaust valve. If the pipeline is provided with pressure maintenance valve can be fully open the exhaust valve first,other operation same as above.

**Operation:** please avoid long-term working under the condition of low pressure after starting up. The low pressure limiting of air compressor pressure regulator can not be set too low, so as to avoid the system pressure fluctuates greatly to effect the normal operation of the dryer and gas using equipment. Compressed air drying degree is proportional to regeneration gas(the factory has been in the 5 to 8% adjustment of gas processing .) user can be increased according to the actual demand ( counterclockwise rotation of the throttle valve ) or decrease ( clockwise rotation of the throttle valve ) regeneration gas, (if without the guidance or permission of company's technical staff, can not adjust the regeneration valve, or, face the consequences ). If the actual gas consumption less than rated processing gas or humidity ( dew point temperature ) no need below than  $- 40\text{ }^{\circ}\text{C}$  , can extend the cycle relative regeneration time or regeneration air flow to achieve energy-saving effect.

**Shutdown:** close the inlet valve, after the pressure in tank fully release, then close exhaust valve,and cut off power supply. There is a close relationship between the output gas quality and inlet air flow rate, temperature,

pressure and environment temperature. Inlet air flow rate shall not be greater than the rated of the dryer, and the inlet temperature not higher than 40 °C, the lower the temperature, the output gas drier. The inlet air temperature every increase 5 °C, saturated water content increased by about 30%, and the product gas dew point increases 8 ~ 10 °C. Inlet air pressure the lower, dryer load the higher, and output gas quality will be worse.

## Regular inspection and handing

### The maintenance in the working

1. Please starting up the air compressor first, waiting pressure more than 4kg/cm<sup>2</sup>, then starting the dryer. Indicator light will shows the equipment current operation state.

2. The adsorbent should be treatment, when re-running the machine that long time no work;

3. Close the dryer outlet valve dryer, and ope the inlet valve , confirm the inlet valve pressure less than 4kg/cm<sup>2</sup>, then open the machine power switch, next turn up the throttle valve ( Counterclockwise rotation 5 turns ), increase the regeneration gas, make it operation,. after 50 hours of self drying, the machine can work normally. Then, make the throttle valve reset (if without the guidance or permission of company's technical staff, can not adjust the regeneration valve, or, face the consequences ), can also through the no-load operation to deal with the adsorbent accumulation water, the method is start up according to the normal operation, and product gas not access workshop use before 50 hours.

4. In the operation, should frequently check each indicator of pressure gauge, Regenerative cycle, shift is regular.

5. Please special attention to the equipped refrigerated dryer is working properly, and the automatic drainage device whether have a large amount of condensed water discharge.

### Daily maintenance

1. Check the time program, two drying tank switch, heating temperature and the drainage valve filter is normal.

2. Check the muffler exhaust is unobstructed, the filter differential pressure indicator whether exceed the standard.

3. Check the before and after differential pressure of dryer whether too high.

4. Check the desiccant is oil pollution or powdering, if desiccant damage or failure according to the following three cases treatment:

1 ) Due to improper operation or low voltage operation can cause high speed airflow washout desiccant, resulting in a large number of dust falling, at this time should be dismantle the dryer , after sieving to refill;

2) Because of the high inlet temperature ,the liquid water impact or no switching action to work overtime, desiccant supersaturated even soaked by water, at this time, should immediate removal of fault, and take reduce processing capacity and expand the regeneration gas ( turn up throttle valve) and other measures, in the boot state gradually dewetting, until recovery of the original dry degree (if without the guidance or permission of company's technical staff, can not adjust the regeneration valve, or, face the consequences);

3) Due to the filter failure or not install oil filter, lubricating oil into the drying chamber, and blocking the adsorbent surface pore channel, cause the adsorbent reduce or loss of adsorption capacity ( oil poisoning ). At this point you must replace the adsorbent;

4) Regular cleaning or replacement of filter, ensure the standard of inlet air ;

5) Silencer should be soaked by warm soapy water every 3 -- 4months ( blow dry then to use ), usually need to be replaced every year;

6) Make the work record card: including inlet temperature, operation pressure; gas consumption; adsorption regeneration cycle; replacement of filter element;

7) Adsorbents used for about one year ( about 5000 -- 8000 hours), as the case should be all renewed.

## The proposed system configuration:

To ensure the quality of compressed air dryer after treatment, extend the service life of machine, we propose the system configuration as below:

1) Install pre-filter at dryer inlet , to deal with the liquid water, solid particles and oil mist may exist in the compressed air . If liquid water directly into the dryer adsorption tank will serious deteriorate the operating conditions, and lead to the outlet dew point improved greatly, even cause the dryer operation failed. Oil mist will seriously pollute the adsorbent, that not only causes the dew point increases, but also shorten the service life of the adsorbent. For extending filter service life, suggest user install the filter from coarse to fine, step by step to filtration;

Recommended C filter produced by our company as rough filter, which can make the compressed air solid and liquid particles content reach  $3\mu\text{m}$ , oil mist residual content only 5ppm;

Recommended C filter produced by our company in the P/S grade filter as the oil filter, which can make the compressed air solid and liquid particles content reach  $0.01\mu\text{m}$ , and 0.01ppm oil mist residual content.

2) Adsorbent long-term compression and impact, will produce some adsorbent dust. In order to ensure the downstream compressed air clean, usually need install the post- filter. According to the compressed air quality requirements, the user can configure different post filter.

Recommend the Q filter produced by our company as a coarse filter, which can make the compressed air solid and liquid particles content reach  $1\mu\text{m}$ , and 1ppm oil mist residual content. If require higher quality, optional P/S filter.

3) when user configuration system should be set up by-pass valve, stop valve and pressure relief valve, to avoid affect the downstream gas supply when maintenance.

4) The dryer should be provided with reliable grounding device.

## Model selecting method

In the setting of the dew point temperature, the dryer allowed inlet air flow rate associated with the actual working condition and environment temperature, i.e.

$$\text{Inlet air flow rate} = (\text{nominal flow}) * (\text{pressure coefficient}) * (\text{inlet temperature coefficient}) * (\text{ambient temperature coefficient})$$

$$\text{Effective supply gas capacity} = \text{inlet air flow rate} - \text{gas consumption}$$

Pressure coefficient table

Working pressure(Bar)	4	5	6	7	8	9	10
Pressure coefficient	0.6	0.75	0.9	1.0	1.1	1.2	1.3

Ambient temperature coefficient table

Ambient temperature (°C)	<20	20	25	30	35	40	43
Temperature coefficient	1.16	1.16	1.12	1.08	1.03	0.98	0.8

Entrance temperature coefficient table

Inlet temperature (°C)	20	25	30	35	40	45	50
MAX Temperature coefficient	1.16	1.12	1.08	1.03	0.98	-	-
Pressure dew point	-40	-40	-40	-40	-40	-	-

## systematic procedure and function

### System flow:

The wet compressed air, first into the pre-filter, then go through the inlet air control valve ( A ) into the drying tower ( Tower 1 ), water vapor in the adsorption process from the gas stream to remove and adsorbed on the adsorbent, dry air from the drying tower exhaust go into check valve ( F1 ) and then directly go through the post-filter and filter adsorbent dust.

At the same time in the drying cycle, 10% outlet dry air already close to the atmospheric pressure, through the regeneration flow regulating valve bypass flow down, through the regeneration tower ( Tower II ) and then to the regeneration / storage pressure control valve ( D ), discharged to the atmosphere through the outlet muffler. Thus, the adsorbent in the regeneration tower ( Tower II ) by this dry and low pressure air flow to irrigation, can be discharge the adsorbed on the adsorbent moisture with this air flow.

At a predetermined time, the automatic timer will turn off this solid regeneration / storage pressure control valve ( D ), and increase pressure slowly in the Tower II , finally reached with the inlet pressure equal status, and the inlet control valve ( A ) will be closed , at same time to open the inlet control valve ( B ), and another regeneration / storage pressure control valve ( C ) open. Thus the airflow to the drying tower in Tower II , and Tower II turn into regeneration tower to start regeneration, the the regeneration air flow through regulating valve and then to the regeneration / storage pressure control valve ( C ), and discharged to the atmosphere via the muffler.

### Equipped with refrigeration dryer before adsorption type:

As everyone knows, if the air is compressed, the temperature will be increased, which typically up to 50°C-- 70 °C, and the relative humidity close to 100% . The high inlet temperature and relative humidity will make dryer's adsorbent early reach to saturation, lead to a part of the adsorbent failure within a short period of time or even permanent failure , cause the product gas dew point increased , and can not reach the expected effect, so, there is need equipped with the refrigerated air dryer at before. The high temperature and

humidity of 50°C-- 70 °C compressed air from air compress will be treated by refrigerated air dryer, which can make the compressed air temperature reach 20°C, and remove 98% water vapor. Refrigerate air dryer is one-time investment equipment, and the electrical power consumption is little, basically no " consumables " parts. The majority of water vapor in the compressed air is treated with refrigerated dryer,can greatly reduce the load for adsorption dryer, prolong the service life of expensive adsorbent.It provides a strong guarantee for low dew point and high quality products.

### **Relationship between adsorption type dryer and precision filter:**

the dust and impurity contained in the compressed air were mixed together with oil , if not by the precision filter, the compressed air will directly through into the adsorption dryer make it attached to the adsorbent surface and oxidation incrustation, which will reduce the adsorbent and air contact area, and gradually reduce the adsorption and regeneration of adsorbent (often say that the adsorbent "oil poisoning"). Therefore, It is very important to filter out the impurities, oil and dust in the compressed air with the precision filter, which plays an key role in the best efficiency of the adsorption dryer.

### **The main raw materials:**

Adsorbents are consumables, and expensive, its service life, to a large extent depends on the inlet air temperature, humidity and purity. If don't equipped with freeze dryers and precision filters are unscientific.

In summary, must install the refrigerated dryer and high-quality precision filter at before adsorption dryer, do not make improper decision to save costs.

### **Treatment of dust of adsorbent releasing:**

The adsorbent in the adsorption dryer with 3 -- 5mm granular, due to the work of adsorption and regeneration of impact and back pressure friction, there will be a trace of dust, with the air discharge, so a dust filter ( 0.01ppM ) should be anti installed at the dryer outlet , let the dust falls on the filter external and the bottom of the shell, which will easy to discharge, and the filter will not be blocked.

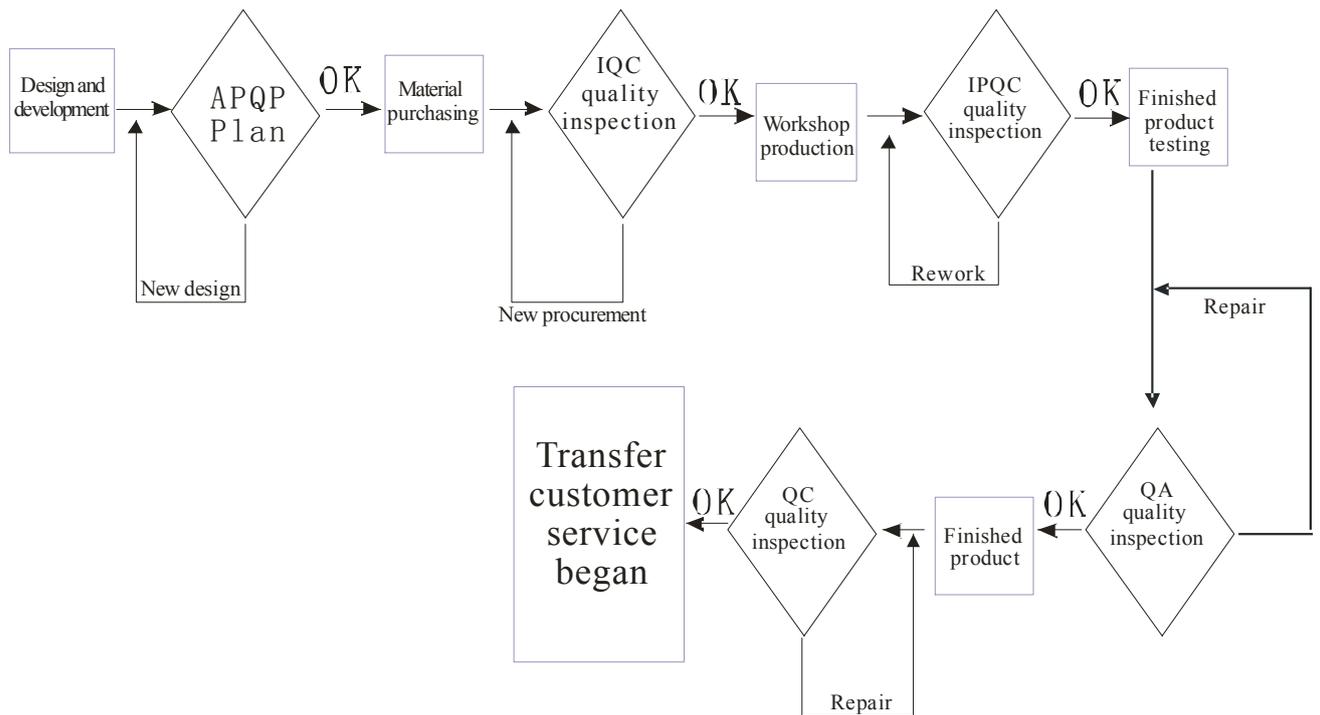
## Trouble shooting

No.	Phenomenon	Reasons	Proposal
1	Boot no response	The power supply is not normal	Check the power supply line
		Fuse break	Replace the fuse
2	Silencer release different	A tower regeneration solenoid valve was bad.	Replace the solenoid valve
		B tower regeneration solenoid valve was failure	Clean the valve plug, the valve stem or replace solenoid valve
3	Two Towers does not switch	The programmable controller failure	Maintenance program controller
		The main electromagnetic valve failure	Electromagnetic valve repair or replacement
4	The regeneration tower pressure reduction is not normal	Regeneration gas is too large	Adjust the throttle valve to reduce the amount of regeneration
		A bad check valve or leakage	Replacement of valve leakage or valve core component
		The main electromagnetic valve leakage	
5	High dew point	Regeneration gas is too small	Adjust the throttle valve, properly increasing the regeneration gas
		Two Towers switching cycle improper.	Reset the switching cycle
		The adsorbent is pollution	Replace adsorbent, ruled out the causes of pollution
6	High pressure	Adsorbent broken	Replace adsorbent
		Filter layer obstruction	Release the adsorbent, clean or replace the filter
		System has a leak	Find out the leak point

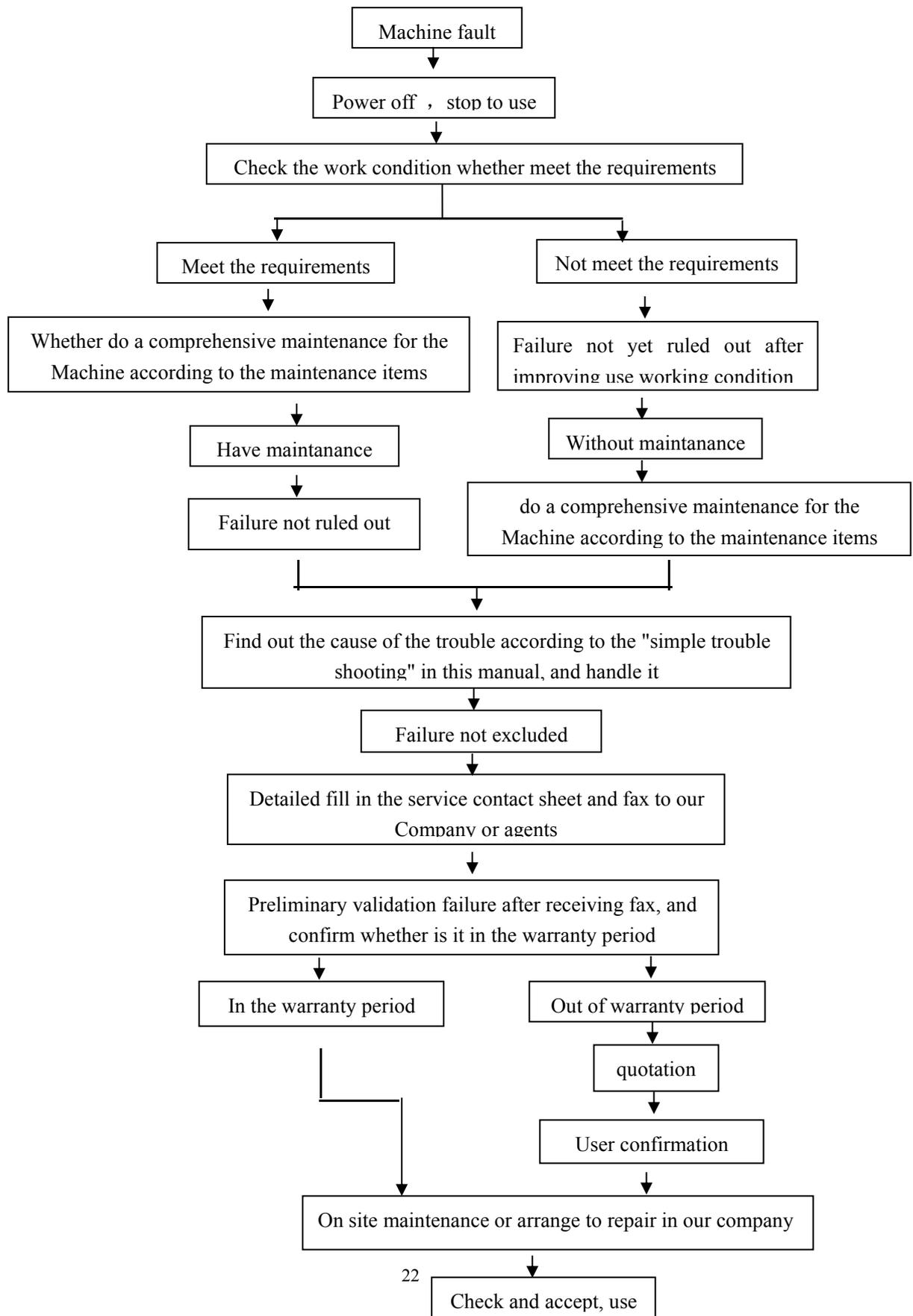
No.	Phenomenon	Reasons	Proposal
7	Intelligent control instrument without signal or no signal, signal and the actual work does not match	1.1 No power output or terminal loose 1.2 The output end in whole or in part without output 1.3 The error output terminal 1.4 Electric pressure fluctuation is too big	1.1 Check the power line and the fuse whether good or replacement. 1.2 Correct the wrong wiring 1.3 Correct the error source 1.4 Stabilized power supply
8	Dew point is not up to the requirements	2.1 The adsorbent is insufficient or crushing failure 2.2 Insufficient regeneration gas or A, B column switching is not normal 2.3 High inlet air temperature 2.4 The high oil content of inlet, adsorbent failure 2.5 Low working pressure to make low adsorption capacity 2.6 The switching cycle is too long	2.1 Adsorbent addition or replacement 2.2 Adjust to a reasonable capacity, adjustment of A, B column switching to normal 2.3 Adjusting the process configuration, improve the cooling efficiency of the cooler 2.4 Improve the effect of oil filter , replace adsorbent 2.5 Increasing air pressure 2.6 Reasonably adjust the switching period
9	The pressure drop is too large ( more than 3% of inlet pressure )	3.1 The adsorbent is seriously damaged 3.2 Filter blocked 3.3 The adsorbent has expired or broken into powder	3.1 Remove damaged adsorbent and supplement 3.2 Check and clean the blocked filter 3.3 Sieving or replace adsorbent
10	Flow rate loss large	4.1 Outlet pipe diameter is not meet the requirements 4.2 The outlet pipe is not smooth 4.3 Regeneration gas is too large	4.1 Replacement 4.2 Cleaning and sewage 4.3 Appropriate to reduce the regeneration gas
11	The regeneration tower pressure is not zero or two tower pressure drop at the same time	5.1 Silencer or the pipe blockage 5.2 Pneumatic valve failure or serious leakage 5.3 Regeneration gas is too large 5.4 Regeneration gas outlet pipe is not smooth	5.1 Cleaning silencer ( replace the filter element ) or silencer pipe 5.2 Check and replace damaged parts 5.3 Appropriate to reduce the regeneration gas 5.4 Check the air outlet pipe, silencer.

Dear customer, our company solemnly promise to you: the product before shipping has passed the strict quality control to ensure the excellent quality, Please reliable use.

## Quality control flow chart



# After sale service flow chart



High-quality after-sales service depends on the advanced technology and experienced after-sales service staff, store enough spare parts. In order to provide better customer service, we are adhere to the service concept of the " customer needs, we supply; brand first, goodwill is the gold " .

Our technical support department gathered Senior Service Engineer, all the engineers are highly professional technical training. Their enthusiasm service attitude, professional service technology obtained the general customers the high praise.

## **After-sale service**

1. Provide one year free warranty service;
2. Our company has specialized guidance teacher, Provide professional training and guidance;
3. After the warranty period, If the customer needs to continue to guarantee, and can sign the after service contract again;
4. If the customer need to change parts, we will provide the best price, after the warranty period.

## Product guarantee

model:

Manufacturing No.:

Purchase date :

Please contact us, when you need the service:

Guangdong Epsea Industrial Co., Ltd.

Yongguang Road, Yongsheng Industrial Park, Qishi Town, Dongguan

Tel: 0769-81928666

Fax: 0769-81928777

### Guarantee Clause

1. This warranty is valid in the following conditions:

1) This product according to the "use and maintenance manual" operation and maintenance;

2) The failure of this product is not due to improper installation, operation, repair or user's negligence, natural disasters, war and other factors;

3) Manufacturing number and chassis shell without dismantling, wear or transformation

2.This guarantee does not apply to automatic drain valve, precision filter, adsorption desiccant and other consumable materials;

3. Our company not responsibility for compensation for any consequential damages caused by the machine, If we considers it necessary, the maximum amount of compensation shall be equivalent to the amount of the machine;

4. The user shall keep the product guarantee, if necessary please show it, to get the safeguard rights.