

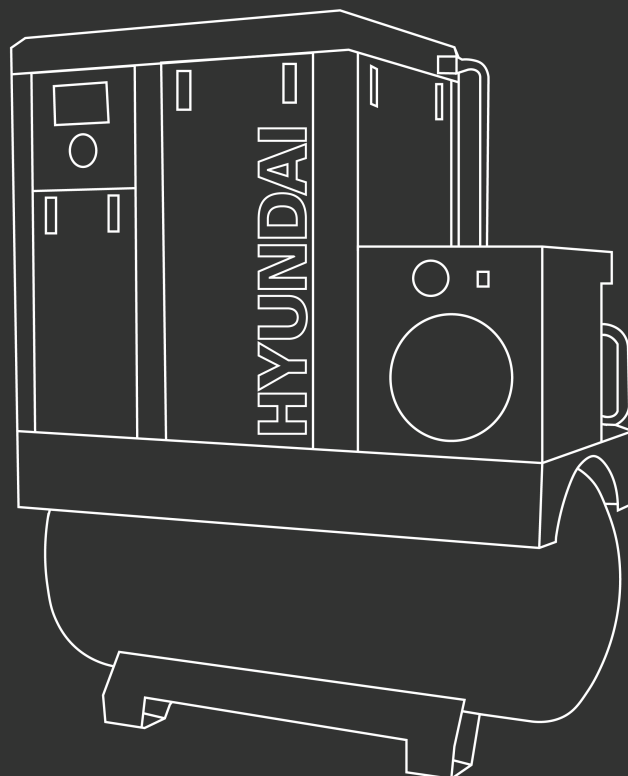
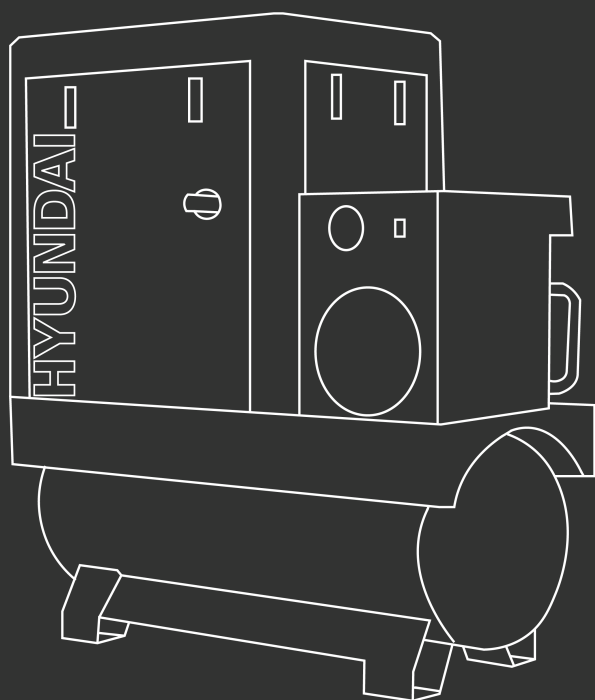
**HYUNDAI**  
POWER PRODUCTS



# SCREW AIR COMPRESSOR

**HYSC75300, HYSC75350D, HYSC100300, HYSC100350D,  
HYSC150300, HYSC150500D, HYSC200300, HYSC200500D**

Combined Manual



Before installation and initial operation of the air compressor, please read the manual carefully and clearly learn about relevant information guideline for operation and maintenance about the compressor.

Please hand over the manual and the machine together to the user.

There are important safety information in the technical manual, please save it together with the compressor.

# SAFETY

## 1.1 General Safety Notes.

- 1.2 The operator of the machine is responsible for, and has a duty of care in making sure that the machine is operated safely and in accordance with the instructions in this user manual. Keep the manual safe and pass it on if the machine is loaned or sold to another user.
- 1.3 Please note the following safety points.
- 1.4 The machine should never be left in a condition which would allow an untrained or unauthorised person/s to operate this machine.
- 1.5 All due care and diligence should be taken by the operator for the safety of and with regard to those around whilst using the machine.
- 1.6 Some or all of the following - warning signs, symbols and/or PPE pictograms may appear throughout this manual. You **MUST** adhere to their warnings. Failure to do so may result in personal injury to yourself or those around you.



## DANGER

Indicates a hazard, which, if not avoided, could result in serious injury or death.



## WARNING

Indicates a hazard, which, if not avoided, could result in serious injury.



## CAUTION

Indicates a hazard which, if not avoided, might result in minor or moderate injury.



## NOTE

Indicates a situation that could easily result in equipment damage.

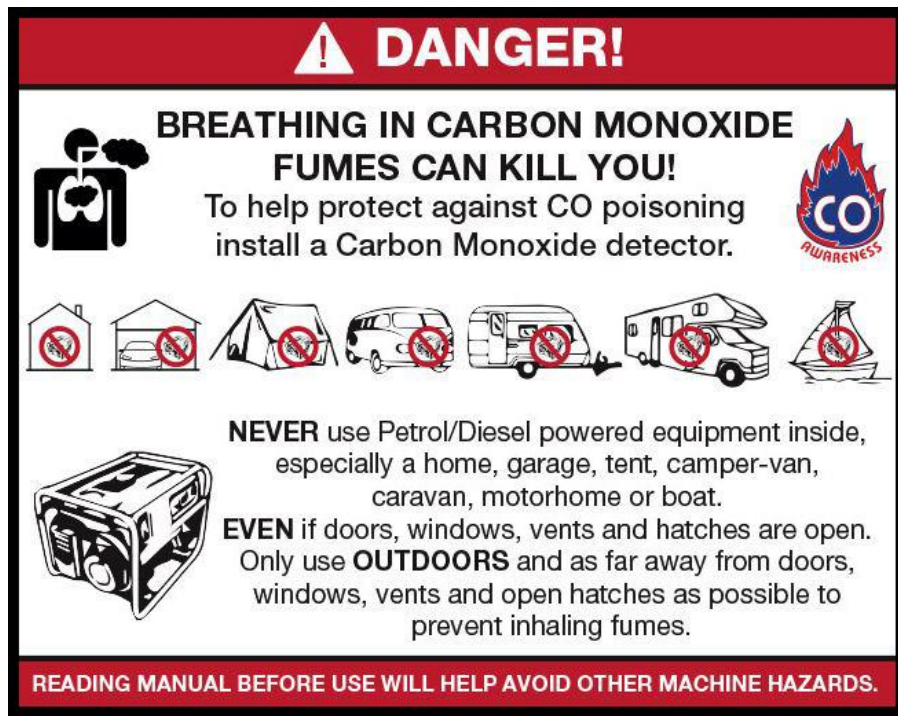
READ and keep the manual safe and pass it on if the machine is loaned or sold to another user.

You **MUST** fully understand all instructions to ensure you use and operate the machine safely.

Appropriate Personal Protective Equipment (PPE), **MUST** be worn at all times when operating or repairing the machine.



1.10 Carbon Monoxide (where applicable).



- 1.11 Carbon monoxide is a colourless and odourless gas. Inhaling this gas can cause death as well as serious long term health problems such as brain damage.
- 1.12 The symptoms of carbon monoxide poisoning can include but are not limited to the following;  
Headaches, dizziness, nausea, breathlessness, collapsing or loss of consciousness.
- 1.13 Carbon monoxide poisoning symptoms are similar to flue, food poisoning, viral infections and simply tiredness. It is quite common for people to mistake this very dangerous poisoning for something else.
- 1.14 To avoid carbon monoxide poisoning **DO NOT** use Petrol/Diesel powered equipment inside any of the following; Home, garage, tent, camper van, mobile home, caravan or boat. This is not exhaustive and if you are in any doubt contact your dealer.
- 1.15 If you think you have or someone around you has been affected by carbon monoxide poisoning;
- 1.16 Get them fresh air immediately, by leaving the affected area or by opening doors and windows. If safe and practical to do so make sure that the machine is turned off.  
**DO NOT** enter a room you suspect of having carbon monoxide present – instead call the emergency services.
- 1.17 Contact a Doctor immediately or go to Hospital – let them know that you suspect carbon monoxide poisoning.
- 1.18 **DO NOT** use in an enclosed area or moving vehicle.

## 1.20 General Fuel Safety (where applicable).



### CAUTION

#### ALL FUELS ARE FLAMABLE

1.21 Fire Hazard – keep fuel away from all sources of ignition for example heaters. Lamps, sparks from grinding or welding.



1.22 **DO NOT** carry out hot work on tanks that have contained fuel.

1.23 **ALWAYS** keep the work area tidy.

1.24 **ALWAYS** clean up spills promptly using absorbent granules and a lidded bin.

1.25 **ALWAYS** dispose of waste fuels correctly.

## 1.30 Fueling/De-fueling (where applicable).



### CAUTION

#### ALL FUELS ARE FLAMABLE

1.31 **ALWAYS** fuel and defuel in a well-ventilated area outside of buildings.

1.32 **ALWAYS** wear correct, suitable and fit for purpose Personal Protective Equipment (PPE), suggested items are but not limited to safety gloves, overalls.



1.33 When fueling/de-fueling **ALWAYS** avoid inhaling fumes.

1.34 When de-fueling **ALWAYS** use a proper fuel retriever.



1.35 **ALWAYS** carry fuel in the correct and clearly marked container.

## 1.40 Electrical Safety (where applicable).

1.41 Electricity can kill – **NEVER** work on **LIVE/ENERGISED** equipment.


1.42 Prior to carrying out any maintenance work you **MUST** identify electrical isolation methods and isolate all electrical supplies.

1.43 Prior to use and with all electrical supplies isolated, you **MUST** check all electrical cables, plugs and connectors for the following;

1.44 Are intact and have no signs of damage, to include but not limited to bare wires, chaffing, cuts and loose wiring.

1.45 If there are any signs of damage, the damaged item **MUST** be taken out of service until the damage has been repaired by an electrically competent person.

1.46 All trailing cables should be routed so as not to cause any kind of trip hazard.

1.47  **NEVER** work on or near electricity with wet hands, wet clothing and wet gloves.

## 1.50 Batteries (where present).

1.51 Batteries present a risk if they become damaged by the possible leaking of electrolyte. This electrolyte is an acid and can cause serious burn injuries. Care should be taken when working on or near them. **NOTE** the electrolyte may be in a liquid or gel form.

1.52 Should you come in to contact with electrolyte you should;

1.53 Remove all clothing contaminated with electrolyte. If you cannot remove then saturate them in water.

1.54 Get medical assistance as soon as possible. You must advise the medical staff of the type of acid.


1.55 Lead/acid battery = dilute sulphuric acid.

1.56 Nickel/cadmium = potassium hydroxide alkali electrolyte.

1.57 Use fresh running water to wash off excess electrolyte, continue this until medical assistance arrives. Make sure that you do not wash the electrolyte to another part of your body or face.

1.58 If electrolyte comes in to contact with Eyes the electrolyte needs to be immediately washed away with large amounts of water. Make sure that you do not wash the electrolyte to another part of your face or body.

1.59 Gasses from charging batteries are highly flammable and great care should be taken to charge in well ventilated areas.

1.59.1  There is an explosion risk if the battery terminals are short circuited, when connecting/disconnecting **ALWAYS** exercise great care so that the terminals or battery leads are **NOT** allowed to touch and cause a spark. **ALWAYS** use suitable insulated tools.

## 1.60 Vibrations (where applicable).

1.61 Prolonged use of hand held (operated) machines will cause the user to feel the effects of/from vibrations. These vibrations can lead to white finger (Raynaud's phenomenon) or carpal tunnel syndrome. This condition reduces the ability of the hand to feel and regulate temperature, causing numbness and heat sensations and may cause nerve damage and circulatory tissue death.

1.62 Not all factors that lead to white finger disease are known, but cold weather, smoking and other diseases that affect blood vessels and blood circulation as well as large and long-lasting impact of shocks are considered factors in the formation of white finger. Note the following to reduce the risk of white finger and carpal tunnel syndrome;


1.63 Wear gloves and keep your hands warm.

1.64 Take regular breaks.

1.65 All of the above precautions may help reduce the risk of white finger disease but not rule out the carpal tunnel syndrome. Long-term and regular users are therefore

recommended to observe the condition of your hands and fingers. Seek medical attention immediately if any of the above symptoms should occur.

## **1.70 Noise (where applicable).**

- 1.71 The operating noise of the machine can damage your hearing. Wear hearing protection such as earplugs or ear defenders to protect your hearing. Long-term and regular users are advised to have hearing checked regularly. Be especially vigilant and cautious when hearing ear protection because your ability to hear alarm warnings will be reduced.
- 1.72 Noise emissions for this equipment is unavoidable. Carry out noisy work at approved times and for certain periods. Limit the working time to a minimum. For your personal protection and protection of people working nearby it is also advisable for them to wear hearing protection.
- 1.73  See Certificate of Conformity section for Outdoor Noise declaration of conformity.

## **MACHINE SPECIFIC SAFETY**

- 2.0 DO NOT direct the output jet of air towards people or animals.
- 2.1 Familiarise yourself with the application and limitations of the air compressor.
- 2.2 Ensure that the compressor is in good order and condition before use.  
If in any doubt, do not use the compressor and contact your service agent.
- 2.3 Before moving or maintaining the compressor, ensure that the air tank pressure has been vented.
- 2.4 Only use recommended attachments and parts. Unapproved items may be dangerous and will invalidate the warranty.
- 2.5 Read the instructions for any accessory used with the compressor. Ensure that the safe working pressure of any air appliance used, exceeds the output pressure of the compressor.  
If using a spray gun, check the area selected for spraying is provided with an air change system or adequate ventilation.
- 2.6 Make sure that the air supply valve is turned off before disconnecting the air supply hose.
- 2.7 Use the compressor in a well-ventilated area and ensure it is placed on a firm surface.
- 2.8 Keep tools and other items away from the compressor when it is in use and keep the work area clean.
- 2.9 Make sure that the air hoses are not tangled, twisted or pinched.
- 2.10 Keep children and unauthorised persons away from the work area.
- 2.11 DO NOT disassemble the compressor for any reason if you are not qualified to do so. The unit must be checked by qualified persons only.



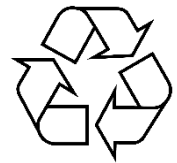
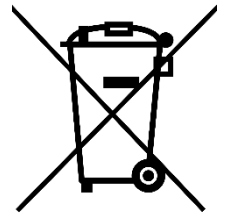
- 2.12 DO NOT operate the compressor within the vicinity of flammable liquids, gases or solids.
- 2.13 DO NOT touch the compressor cylinder, cylinder head or pipe from the head to the tank as these may be hot and will remain so for some time after shutdown.
- 2.14 DO NOT operate the compressor without all the safety guards in place.
- 2.15 DO NOT attempt to move the compressor by pulling the air hose.
- 2.16 DO NOT use the compressor for a task for which it was not designed.
- 2.17 DO NOT deface the certification plate attached to the compressor tank.
- 2.18 DO NOT operate the compressor without an air filter.
- 2.19 DO NOT allow anyone to operate the compressor unless they have received full instruction.
- 2.20 DO NOT leave the compressor unattended.
- 2.21 DO NOT block the ventilation grills.
- 2.22 DO NOT cover the compressor or restrict airflow around the machine whilst it is operating.
- 2.23 The air tank is a pressure vessel and the following safety measures apply;  
DO NOT tamper with the safety valve DO NOT modify or alter the tank in any way.  
DO NOT strap anything to the tank.  
DO NOT subject the tank to impact, vibration or heat.  
DO NOT allow contact with abrasive or corrosive materials.  
YOU MUST drain condensation from the tank daily and inspect side walls for corrosion every 12 months.
- 2.24 The pressure safety valves on Hyundai compressors have been updated to comply with the latest CE certification standards. The pressure release pull ring has been removed from the valve due to the pull ring being incorrectly used to drain the air from the compressor tank, causing excessive wear to this safety valve. The air and moisture should drained from the tank by releasing the drain valve on the bottom of the tank.
- 2.25 Correct Personal Protective Equipment (PPE) **MUST** be worn at all times when operating or repairing this machine. This should include but is not limited to;





## RECYCLING AND PRODUCT DISPOSAL

- 10.0 We do not offer a take back scheme for the recovery of Waste Electrical Electronic Equipment (WEEE) & Batteries.  
Instead the responsibility to dispose of WEEE and or Batteries is passed on to you by us.  
So when it becomes necessary to dispose of your machine you must take it to your local Civic Amenity Site.  
For further information please contact your local Authority for disposal advice.
- 10.1 You MUST make sure that all unused oil and fuel is disposed of correctly either beforehand or at your local Civic Amenity Site.  
Under NO circumstances must any fuel or oil be put down drains.
- 10.2 Certain products contain WEEE waste which should be disposed of in your domestic waste.
- 10.3 You MUST recycle WEEE in accordance with your local authority or recycling centre.
- 10.4 Certain products contain batteries which should not be disposed of in your domestic waste.
- 10.5 You MUST recycle batteries in accordance with your local authority or recycling centre.
- 10.6 Unwanted packaging and materials should be stored and taken to a recycling centre so it can be disposed of in a manner which is compatible with the environment.
- 10.7 The following symbol means that you should 'Reduce – Reuse - Recycle'
- 10.8 We are a member of the VALPAK National Compliance Scheme and our registration number is RM08660.
- 10.9 For further information about disposal please contact your Local Authority.
- 10.10 You can also get more advice and guidance about recycling at the following website <http://recycle-more.co.uk>
- 10.11 Should you pass this product on to another user either sold or loaned, you MUST pass on this user manual.  
This will make sure that all other users can use and maintain this machine safely.



## **1. Introduction**

Thank you for purchasing your HYUNDAI product. Please read the user's manual carefully before operating the machine.

The HYUNDAI screw compressor is a two-shaft positive displacement rotating type air compressor; with an alternate name of two-shaft air compressor. The compressor has high and reliable operation characteristics, high gas transmission efficiency characteristics, excellent dynamic balance characteristics, low noise and vibration as well as easy operation and maintenance. It is of long performance life and environment protection. Commonly used in industries of precision machinery and instruments, electronic products and food, Chemical Fiber and Textile, aerospace application and chemistry, decorative coating, medical pharmaceutical, traffic transportation and agriculture etc., Products have a universally acknowledged development prospects.

### **1.1 Description on the compressor**

The screw compressor manufactured by HYUNDAI is an achievement of several years' research and development. The combination of these prerequisite conditions guarantees a long performance life, high reliability and operational efficiency. The products meet all requirements for environment protection.

### **1.2 Range of application**

The machines and units of the series are manufactured according to mature technology and recognized safety rules. The occurrence of the following, however, might cause threat to the user or life and body of the third party, which might cause damage to the machines and other material possessions

- Incorrect range of application
- Operation by unqualified personnel
- Unreasonable modification or transform to the machines
- Nonobservance to safety rules

As a result, all staff that has the right to operate, maintain or repair the machines has to read and obey all safety rules. It can be confirmed by signature if necessary.

The following shall also be obeyed:

- Relevant accident prevention rules
- Acknowledged safety rules
- National laws and regulations.

The machines and units of the series must be operated in perfect technical conditions and must be operated compliance with the range of application and guideline specified in the operation manual. The operators shall have strong safety awareness and fully recognize the risks during the operation of the machines. Any functional breakdowns, especially those that will threaten the safety, must be repaired in time (or ask others to repair it).

**The meaning of operating the machines in range of application also includes observing the guideline in the operation manual, check and maintaining as required.**

### **1.3 Maintenance**

The machines must be carefully maintained to meet various requirements for screw compressors or compressor units. The machines, therefore, must be carefully maintained during the specified maintenance period, especially in condition of bad working environment.

If there is any breakdown or requirements for spare parts, please contact with compressor manufacturer of my company. If there is any damage to the equipment, the well-trained serviceman of my company will provide excellent after-sales service with the parts manufactured by my company. The authentic parts manufactured by my company are of mature technology and therefore are able to guarantee reliable operation of the machine.

### **Guarantee**

You must understand the machine as well as relevant introductions before operating the machine. If the operation of the machine is inconsistent with the range of application or intended use goes beyond the range mentioned in the manual, the company will not be responsible for safety of the operation.

In following conditions, warranty claim will not be accepted:

- Maloperation
- Improper maintenance
- Misuse of auxiliary materials
- Nonuse of the original parts manufactured by my company
- Modifying or repairing the equipment

HYUNDAI refuses to expand the warranty or compensation conditions.

Any arbitrary modifications to the compressor or compressor station or installation of parts which are not authorized by the manufacturer are not accepted by the manufacturer for warranty or compensation conditions.

### **Safety rules**

Safety rules in the operation guideline shall be strictly abided by.

### **Technical modification**

We reserve the right to modify the parts without prior notification during the process of technical research and development.

## 2. Operating Principle

A complete operating cycle of screw air compressor includes three procedures, inspiration, compression and exhaust. Each pair of gears which are meshing to each other will complete the same operating cycle in succession when the rotor is rotating. To make thing simple and clear, we research the whole operating process of a pair of gears.

a) Procedure of inspiration: As the rotor begins to rotate, one end of the gear gradually demeshes to form a cavity between gears. With expansion of the cavity, there forms some vacuum inside. As the cavity between gears are only connected to air entry, therefore air flows inside under the effect of differential pressure. During the subsequent process of rotor rotation, the male rotor gear ceaselessly demeshes from the gear slot of the female rotor, with on increase in cavity between gears. The cavity breaks from the air entry and the sealed up between the gears. The procedure of inspirations is completed.

b) Procedure of compression: As the rotor is rotating, cavity between gears continuously reduces as rotating gear meshes. Reduction in volume of the air in the sealed cavity between gears causes pressure rise. Thereby the procedure of air compression is carried out.

c) Procedure of exhaust: As the cavity between gears continuously reduces, the air with exhausting pressure is ceaselessly conveyed to exhaust orifice and exhausted out. This process continues till the complete mesh of shaped wires in the end. For the time being, the compressed air in cavity between gears is conveyed to exhaust orifice and completely exhausted out. The volume of sealed cavity between gears becomes zero and the procedure of air compression is carried out.

### 3. Main Technical Data

Type		HYSC75300	HYSC100300	HYSC150300	HYSC200300
Motor power	KW	5.5	7.5	11	15
Air displacement / Exhaust pressure	(m³/min) /Mpa	0.9/0.7	1.2/0.7	1.65/0.7	2.55/0.7
		0.8/0.8	1.1/0.8	1.53/0.8	2.25/0.8
		0.69/1.0	0.95/1.0	1.32/1.0	1.82/1.0
		0.6/1.25	0.8/1.25	1.1/1.25	1.55/1.25
		Air cooled	Air cooled	Air cooled	Air cooled
Cooling mode		Air cooled	Air cooled	Air cooled	Air cooled
Drive mode		Directly connected	Directly connected	Directly connected	Directly connected
Starting mode		Y-Δ	Y-Δ	Y-Δ	Y-Δ
Length × Width × Height (mm)		L	840	910	910
Net weight		H	600	700	700
Noise		Kg	880	1000	1000
Diameter of outlet pipe		dB(A)	185	205	245
		62±2	62±2	63±2	63±2
		G3/4"	G3/4"	G3/4"	G3/4"

Type		HYSC75350D	HYSC100350D	HYSC150500D	HYSC200500D
Motor power	KW	5.5	7.5	11	15
Air displacement / Exhaust pressure	(m³/min) /Mpa	0.9/0.7	1.2/0.7	1.65/0.7	2.55/0.7
		0.8/0.8	1.1/0.8	1.53/0.8	2.25/0.8
		0.69/1.0	0.95/1.0	1.32/1.0	1.82/1.0
		0.6/1.25	0.8/1.25	1.1/1.25	1.55/1.25
Cooling mode		Air cooled	Air cooled	Air cooled	Air cooled
Drive mode		Directly connected	Directly connected	Directly connected	Directly connected
Starting mode		Y-Δ	Y-Δ	Y-Δ	Y-Δ
Length × Width × Height (mm)	L	1800	1800	1800	1800
	W	600	600	700	700
	H	1560	1560	1750	1750
Net weight	Kg	370	380	505	515
Noise	dB(A)	62±2	62±2	63±2	62±2
Diameter of outlet pipe		G3/4"	G3/4"	G3/4"	G3/4"
Tank volume (m³)		0.5	0.5	0.5	0.5

**As the products of the company are continuously optimized and upgraded, the information is subject to changes in specifications and relevant data.**

4. Main Structures

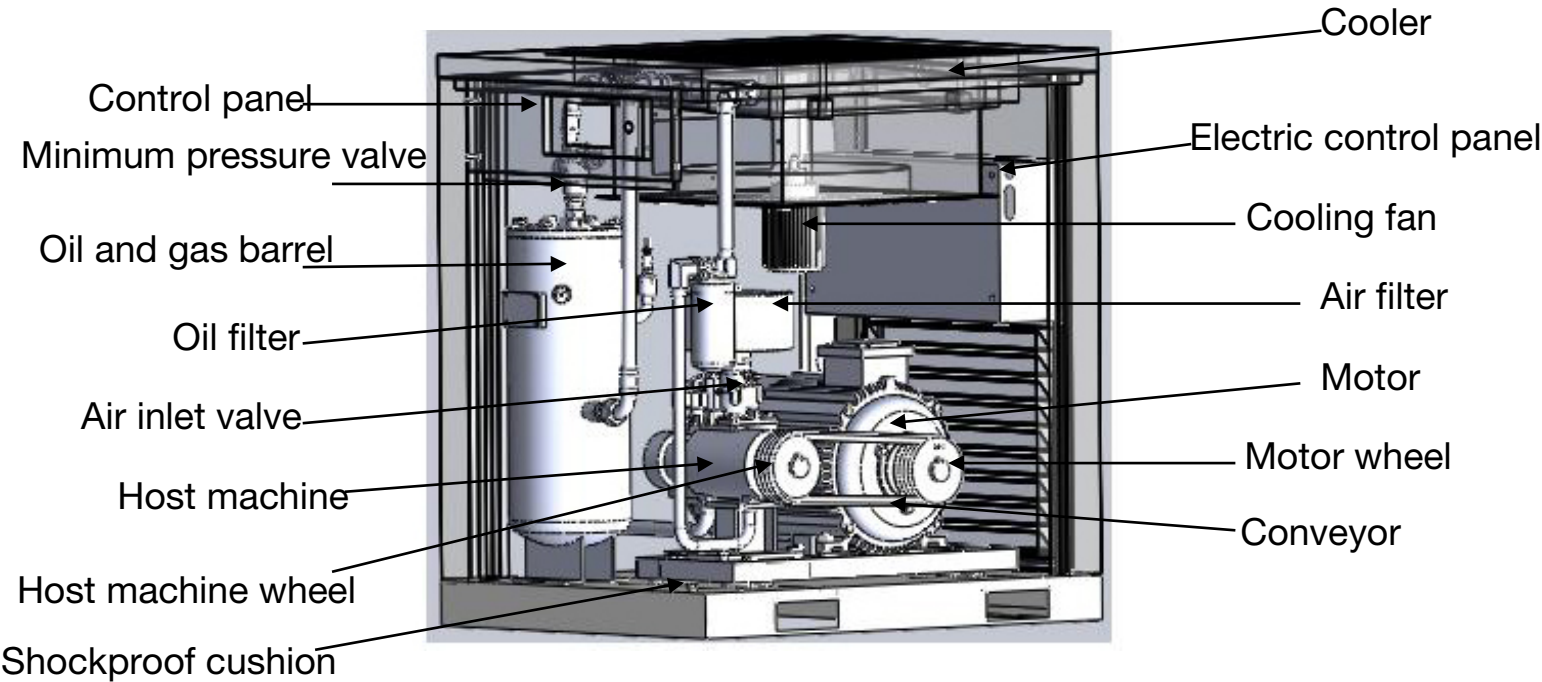


Diagram 1. Conveyor - Type Screw Compressor

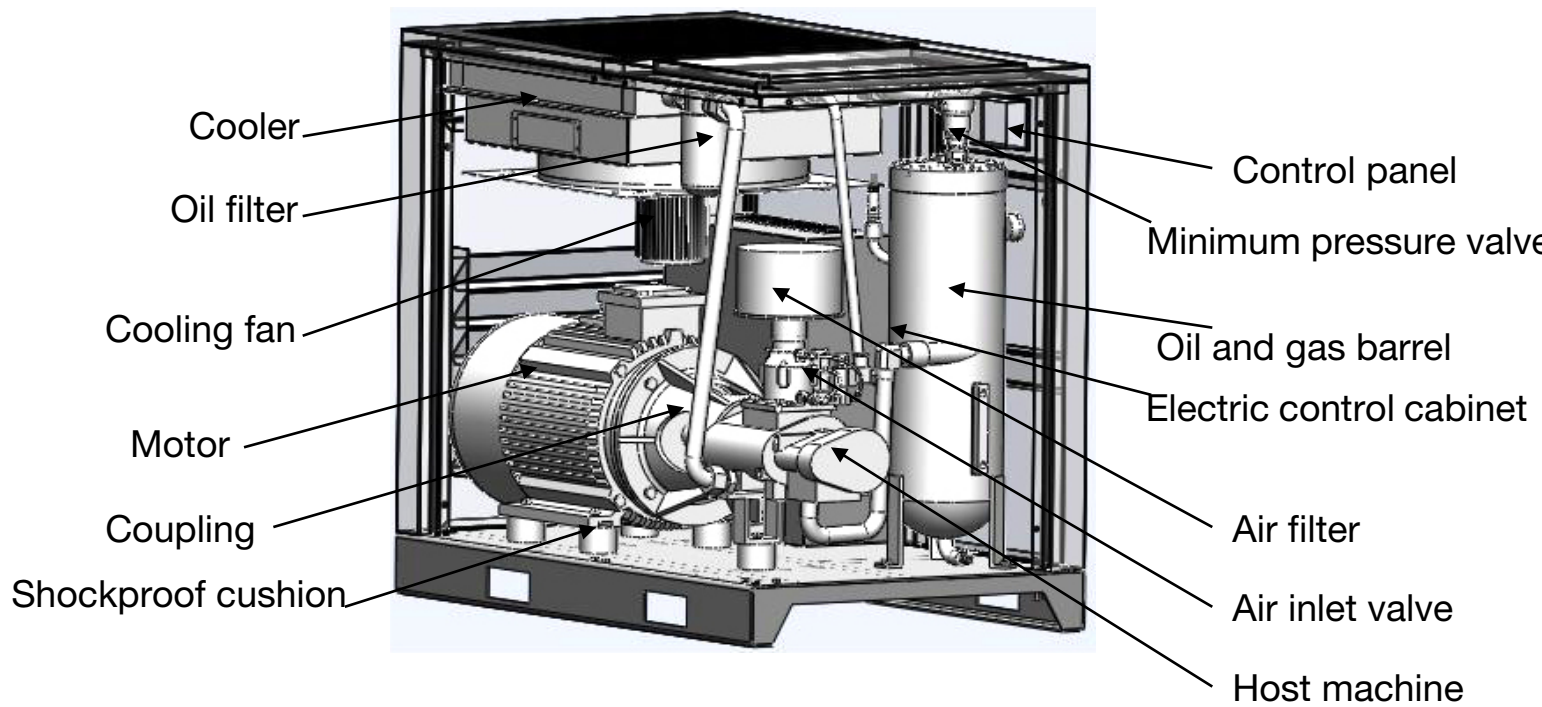
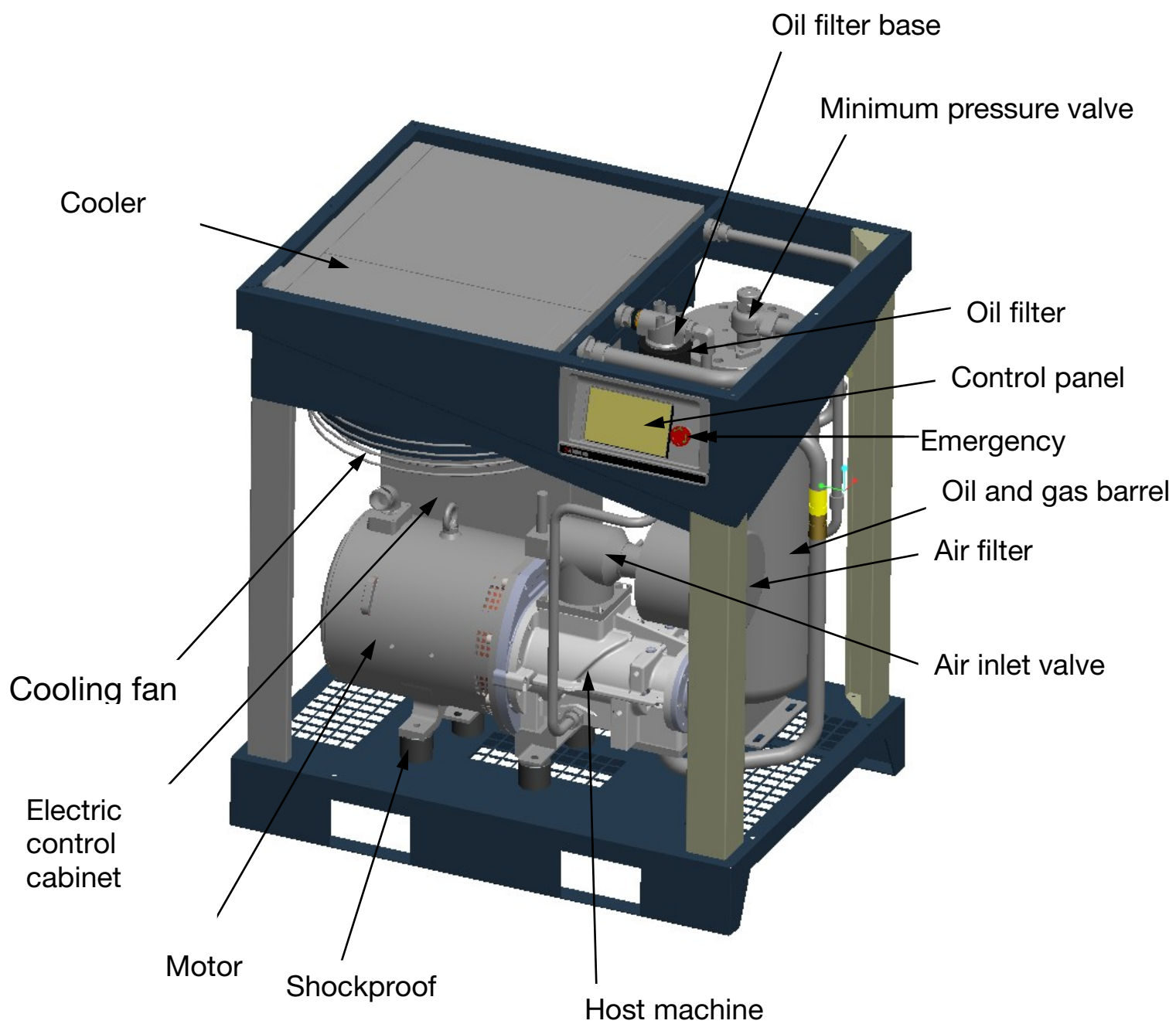
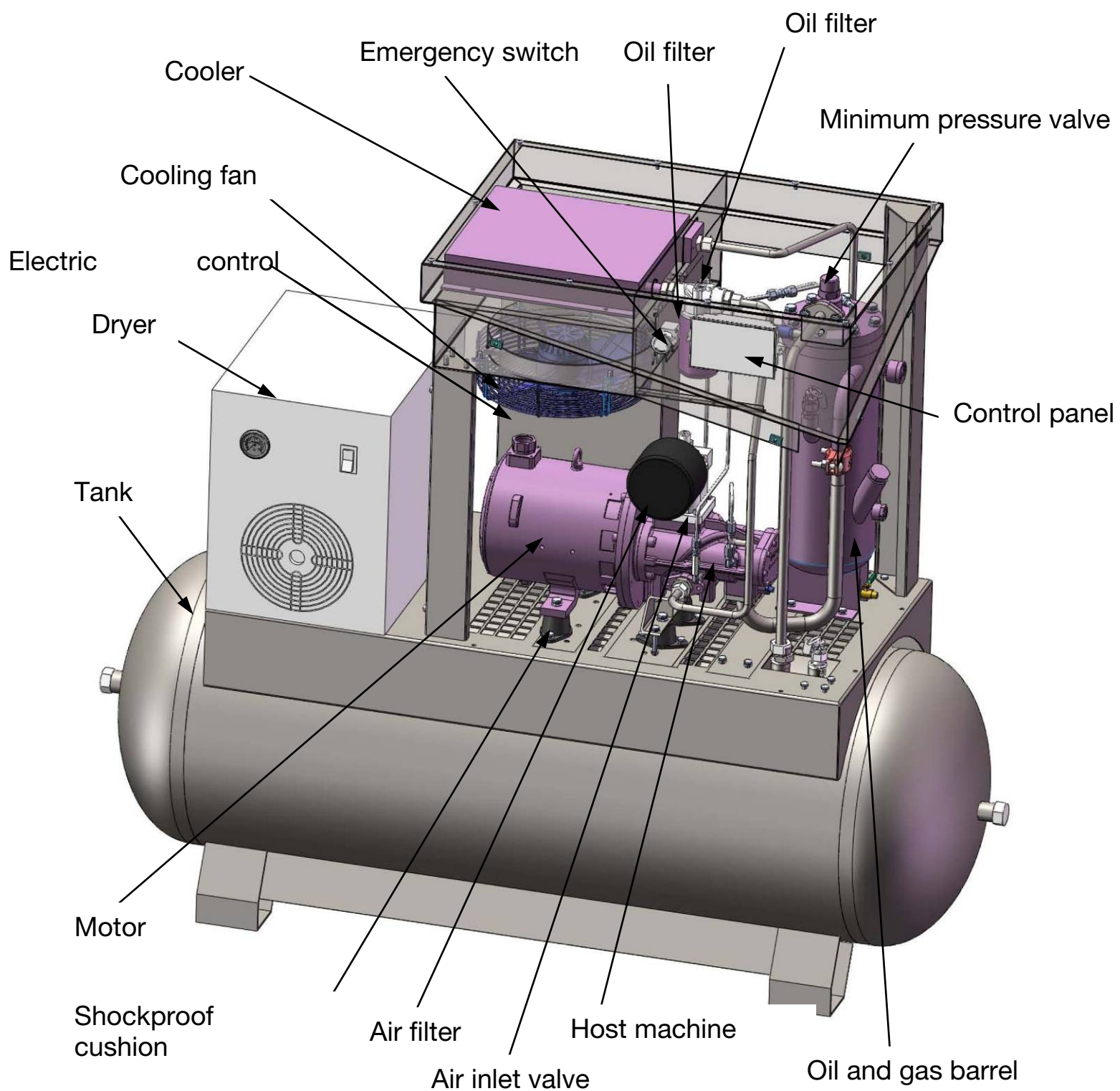


Diagram 2. Directly Connected - Type Screw Compressor



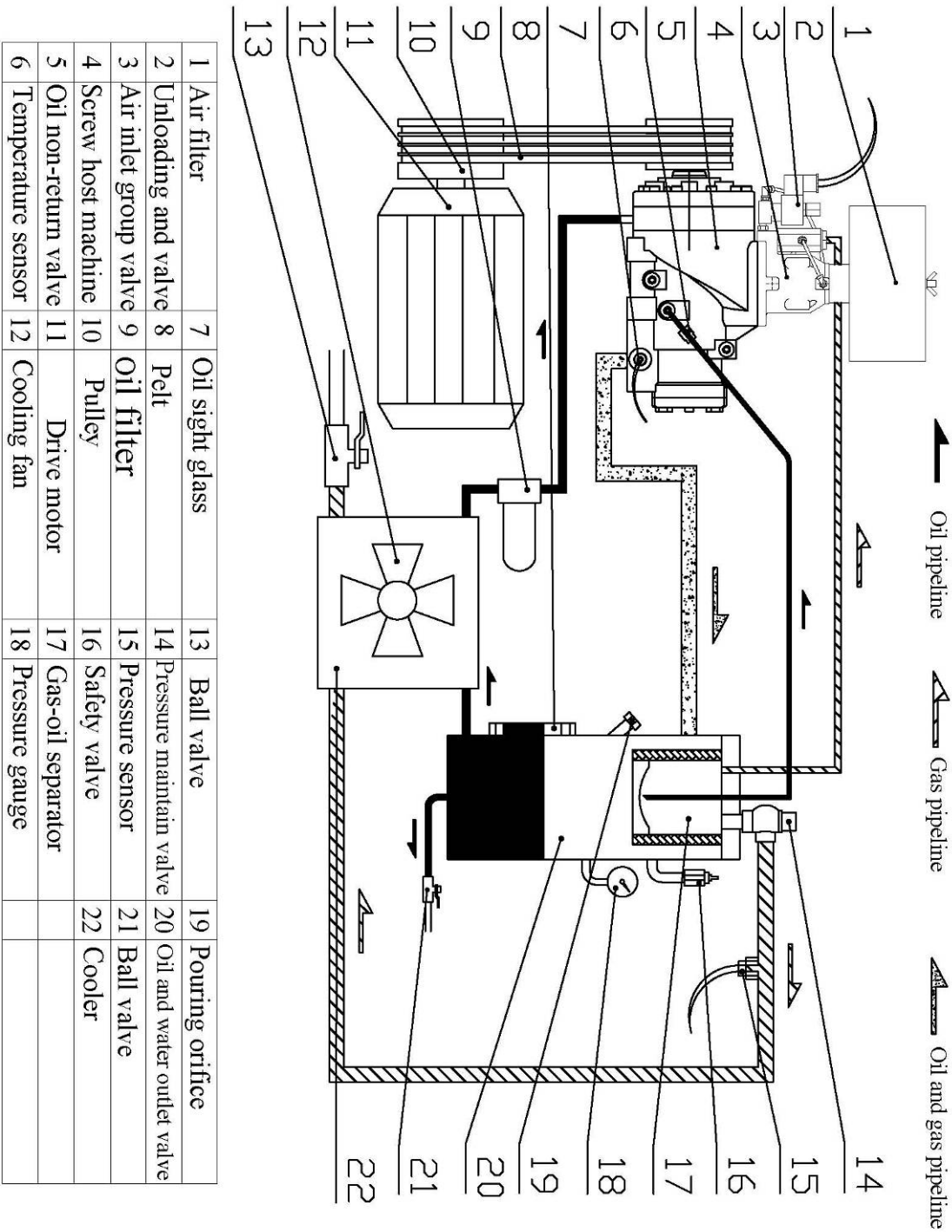


**Diagram 3. Directly Connected - Type Screw Compressor**

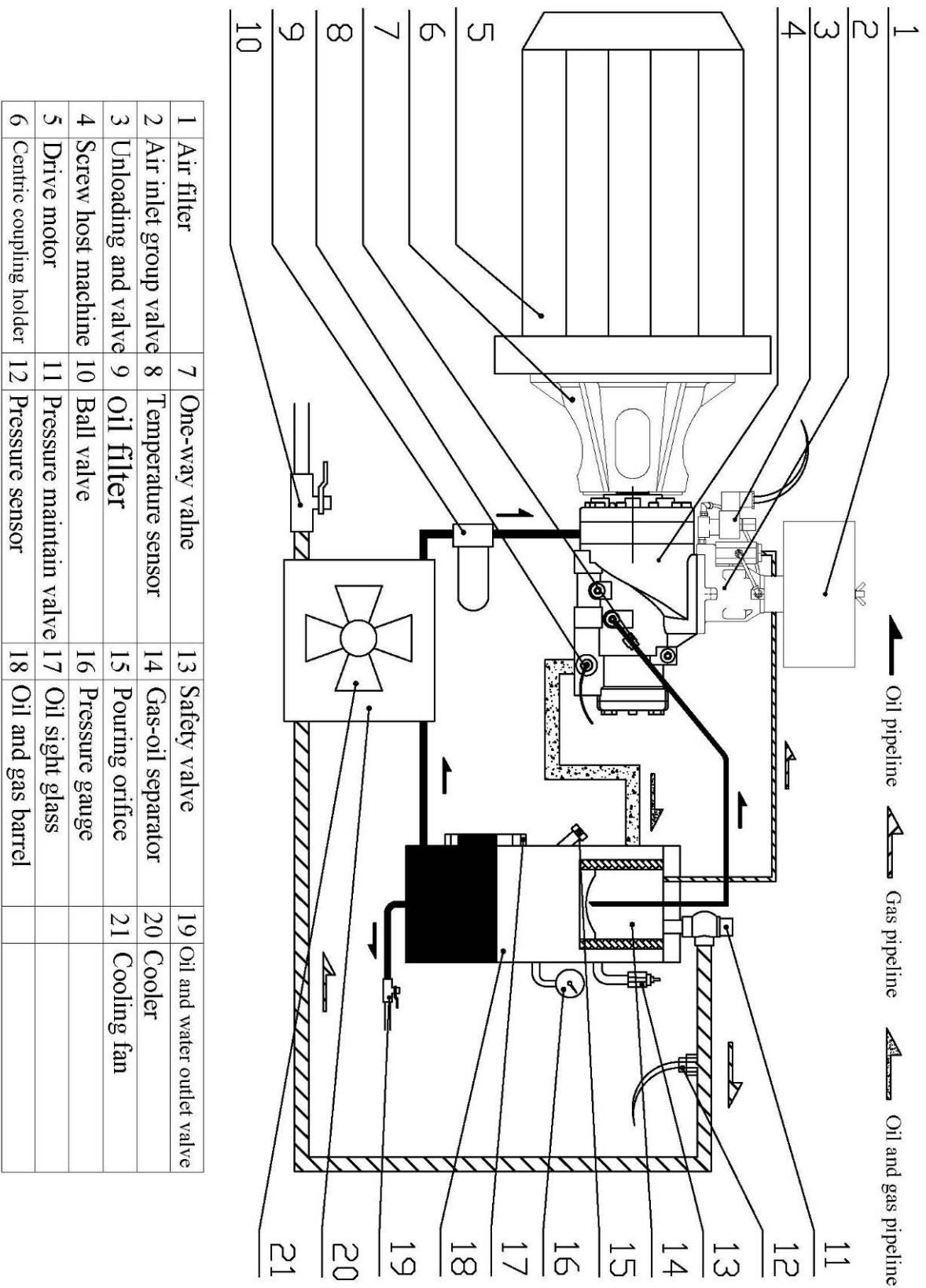


**Diagram 4. Directly Connected - Type Screw Compressor**

# 5. Pipeline Flow Diagrams

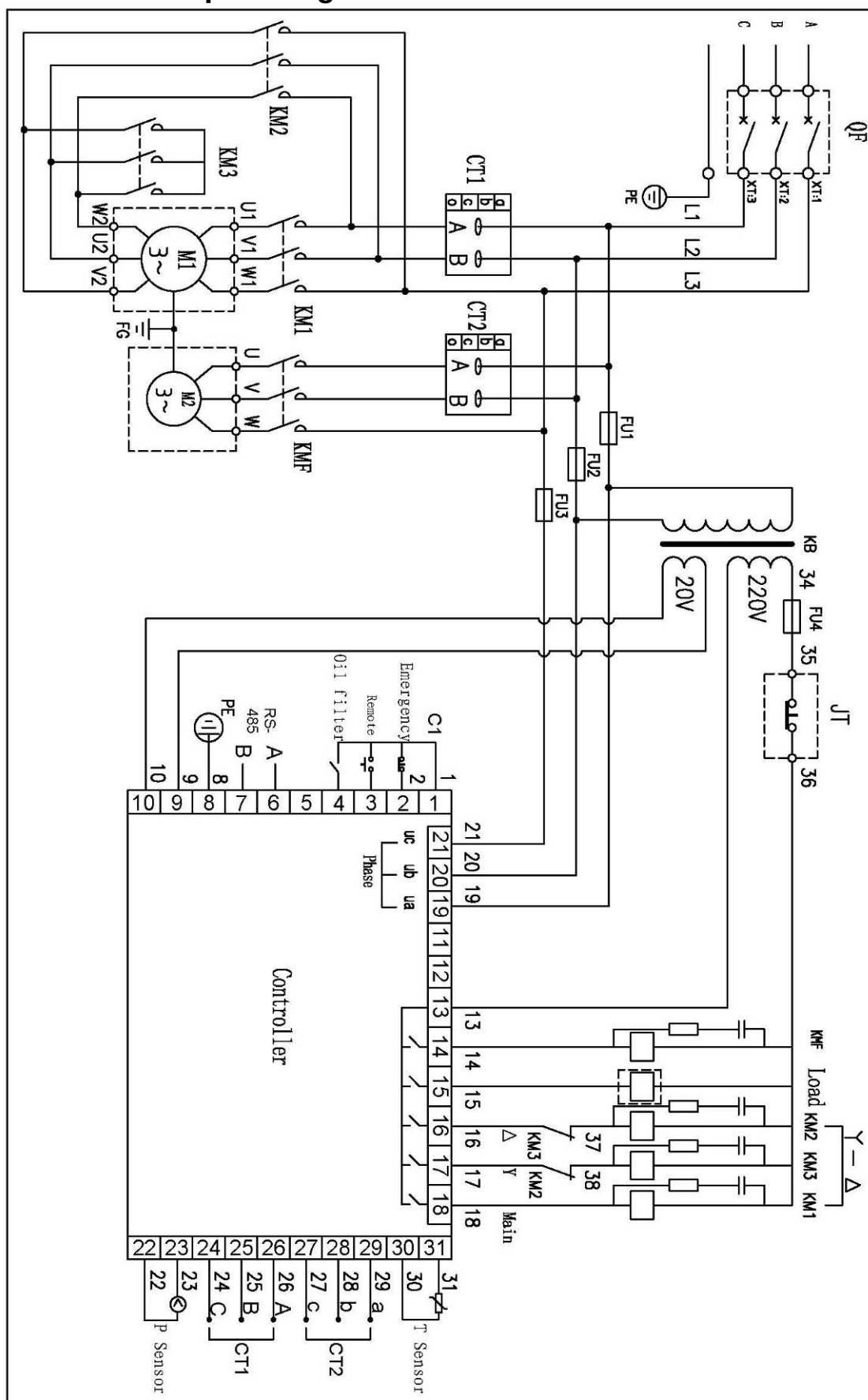


**Diagram 5. Conveyor - Type Screw Compressor Flow Diagram**



**Diagram 6. Directly Connected Screw Compressor Flow Diagram**

## 6. Electric Principle Diagram



### Diagram 7. Electric Principle Diagram For Split Type Main Controller

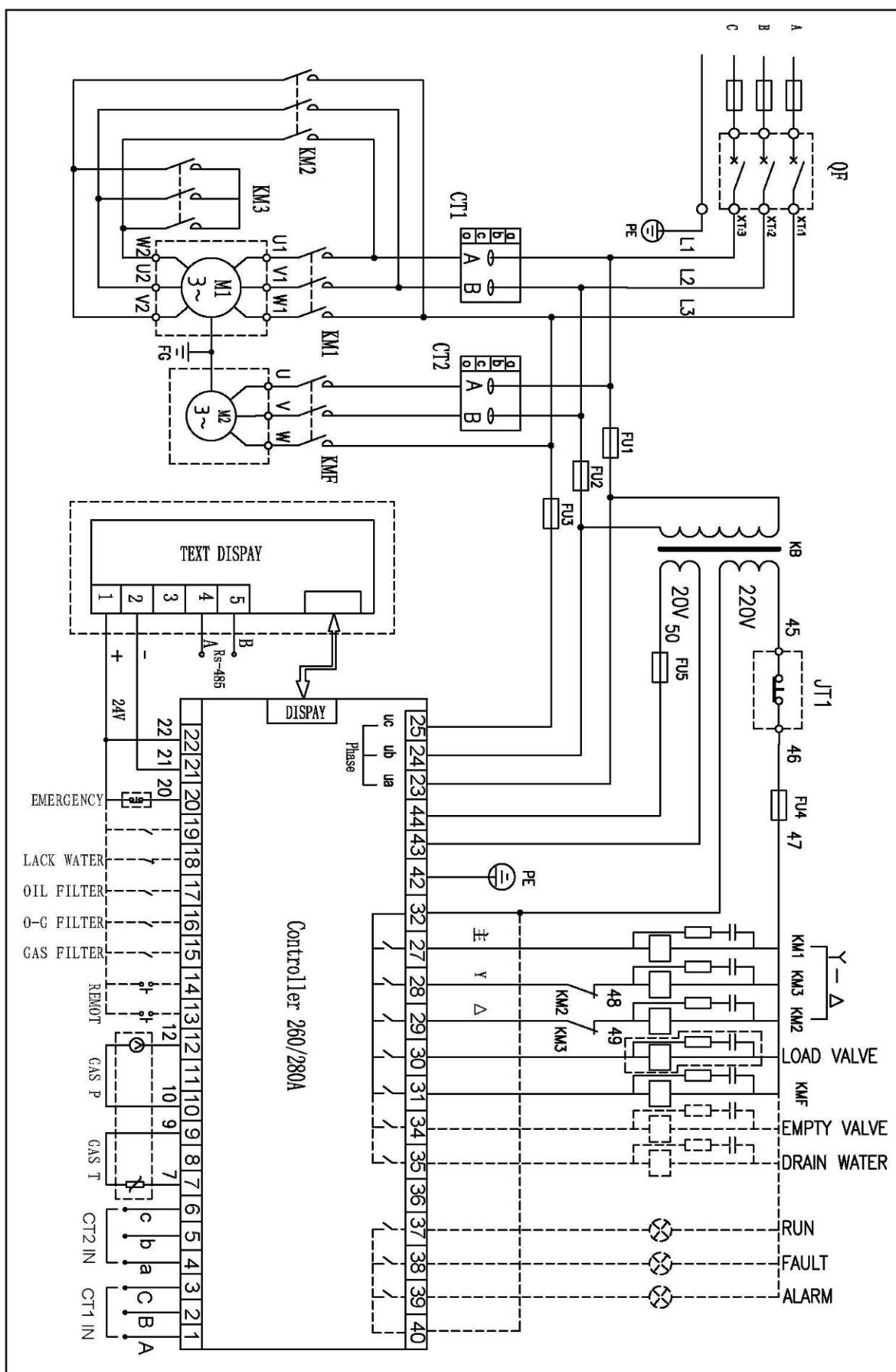


Diagram 8. Integral-Type Main Controller Electric Principle Diagram

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## 7. Warnings and Announcements

### 7.1 Power distribution for the machine

a) According to the power, voltage frequency and other characteristics of the air compressor, select and use matched power supply and suitable power line (If conditions permit, excellent power line with properties of anti-high temperature and anti-aging shall be equipped to avoid breakdown in the air compressor caused by power line or power).

b) Cross area of the power line shall be no less than the data in Table 2.

**Table 2. Minimum cross area of the power line (Copper wire mm<sup>2</sup> )**

Code of the product	Motor power ( KW )	Cross area ( mm <sup>2</sup> )
HYSC75300	5.5	50
HYSC100300	7.5	6
HYSC150300	11	10
HYSC200300	15	16

c) Proper air switch shall be selected and equipped by professional electrician according to the power and voltage of the air compressor to protect the power electrical system for safety guarantee, which is shown in Picture 9



**Picture 9. Air Switch**

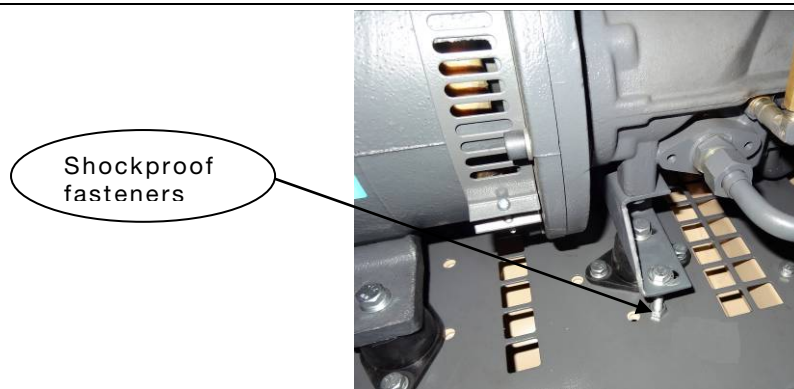
d) The air compressor must be reliably grounded to avoid the dangers caused by electricity leakage and static electricity.

e) Air compressor with large displacement shall use a separate set of power supply unit to avoid impact on the normal operation of other equipments, or it goes against the normal operation of the air compressor( It causes to the operation of screw protective devices)

### 7.2 Announcements

a) In order to avoid the damage caused by jolt during the process of storage and transportation has been screwed when it leaves the factory. The user has to lock in the transportation fastening screw and loosen the fasteners before using the equipments, which is shown in Picture 10





**Picture 10.**

- b) Debugging of the new machine must be operated by appointed or authorized person by the company.
- c) Operators must read, comprehend and follow the relevant operating procedures, announcements and maintenance specifications in the manual.
- d) The air compressor without air storage tin can only be used after being equipped with air storage tin.
- e) The air compressor shall not be arbitrarily altered or set the rated operating voltage to avoid overload damage to the motor.
- f) Air compressor shall be operated indoor, with good ventilation and a temperature that is less than 45°C.
- g) The end of the inlet wire of power supply shall be equipped with a terminal to guarantee that the bolt in the terminal is fixed and won't become flexible. The wire must be installed by professional electricians( As shown in Picture 11).









**Picture 11.**






- h) It is strictly prohibited that the compressor operates under a pressure less than 0.4Mpa in long-term basis.
- i) Keep the lubricating oil between the range of upper and lower limits of the oil indicator. Mixture of different brands of lubricating oils is strictly prohibited to avoid serious accident caused by coke accumulation in pipeline system.
- j) It is strictly prohibited to examine and repair the electrical equipment and circuit under the condition that the power supply is not off.
- k) It is strictly prohibited to examine and repair the pressure volume and pressure pipeline.
- l) Timely get rid of the moisture in gas and oil barrel.
- m) The exhaust temperature shall be between 70 and 105°C.
- n) Cleansers which are inflammable, explosive and volatile cleaners cannot be used to maintain and

clean the parts. Safe dissolvent free from corrosion shall be used instead.  
o) If there is breakdown alarm in the compressor, please don't start up the machine forcefully. Please timely find out the cause and deal with it accordingly.

### 7.3 Warning symbols

Table 3

S.N.	Name	Symbol	Description
1	Safety electricity utilization in		Make sure the working supply voltage is off during operation
2	Danger! Electricity!		Watch out charged body, leakage body and other electrical parts
3	Danger warning		Pay attention to and be careful about relevant warning information
4	Reading instruction the		Read the instruction before operation
5	Ignition hazard		Inflammable and explosive materials shall be away form the machine
6	Exploration hazard		Please don't weld or repair the air storage tank

S.N.	Name	Symbol	Description
7	Electric shock hazard		Please don't place the equipment in wet places or outdoors to avoid electricity leakage due to reduction in electrical insulation resistance
8	No air leakage		No air leakage here
9	Caution, hand injury		Don't touch transmission part
10	Rotational direction of the motor		Check rotational direction of the motor during the process of first starting up or changing wire to avoid serious breakdown to the machine
11	Danger, hot!		Hot surface, avoid burns

## 8. Equipment Installations

### Installation site choosing and heat elimination and ventilation system

An installation site plan must be made to correctly use the air compressor to create good environment for its operation and maintenance. A reasonable site must meet the following requirements.

- Air compressor must be installed indoor, which is clean, dry, ventilated, dust free and harmful gases free.
- Operating environment temperature shall not exceed 45°C. And the relative humidity of the surrounding atmosphere shall be less than 80%.
- The floor for installation shall be solid, smooth and horizontal.
- If the planning site is an air compressor station, proper compressed air processing devices, valves, pipelines and pressure containers shall be equipped according to relevant provisions. In order to assure good heat dissipation and maintenance space, the distance between the air compressor and the wall shall be no less than one meter and space of more than 1.5 meters shall be reserved on the top to avoid wind bridge which is formed by the outlet hot wind and inlet cold wind. Exhaust devices shall be equipped in the machine room which is badly ventilated.

## 9. Equipment Operation

### 9.1 Transportation shockproof fixation bolt shall be loosened before the

**operation (Please refer to what is stated in item 7.2 in announcements)**

**9.2 Air compressor can only be come into service when it is equipped with air storage tank(as what is shown in Table 1-Main Technical Data).**

### **9.3 Test run of the new machine**

a) Testing voltage on page 12, item 7.1-a, shall meet the requirements in relevant provisions. According to the requirement of item 7.1-d on page 12, it shall be grounded. According to the items 7.1-b and c on page 12, it shall be connected to the power line. The cross area and length of the power line shall meet the provisions in Table 2 on page 12.

b) Check the oil level in gas and oil barrel to see if it is between the upper and lower limits.

c) To guarantee safety of starting up, it shall be firstly confirmed that there are no personnel, tools and inflammable and explosive materials in the unit.

d) Pour approximate 0.2 liters lubricating oil which is specially used for air compressor to the air inlet valve and turn the hand piece if the machine for several turns to avoid damage in dynamic and static tray in air compressor due to oil shortage.(A funnel with net is used for filtrating to prevent foreign matters from entering the hand piece.)

e) Charge electricity to the control panel in air compressor

f) Trial operation test: Trial operation shall be done for two or three times before the formal operation. The purpose of Trial operation, starting up the machine and shut it down immediately, is to check if the rotating direction of the air compressor is correct or not and if there is abnormal noise and vibration.

g) Normal operation: Press the start button again to start the operation of the air compressor.

h) After the starting up of the machine, motors with power more than 11kw shall be set as Y- $\Delta$  starting up, the initial operation is slowly speeded up in way of Y shape and automatically changed to quick speeding up in way of  $\Delta$  shape.

i) Stop: When the stop button is pressed, the air compressor stops to run. The compressed air in pressure pipeline will be discharged by load relief valve when the machine is stopped, getting ready for the next no load starting up of the equipment. It is a normal phenomenon if some weak sound of air discharging can be heard.

### **9.4 Safety protection**

a) Motor protection

**Table 4**

<b>S.N.</b>	<b>Breakdown description</b>	<b>Breakdown display</b>	<b>Causes</b>
1	Phase shortage	Shutdown	Breakdown in power supply, contactor and motor circuit
2	Overload	Shutdown	Increase in load capacity or mechanical breakdown
3	Locked-rotor	Shutdown	Increase in load capacity or mechanical breakdown
4	Imbalance	Shutdown	Three- phase voltage of the power supply is not stable or circuit breakdown in motor
5	Short circuit	Shutdown	Serious electricity leakage, short circuit between circles of the motor or error in current setting

b) Air (Oil) exhaust standard exceeding protection

When temperatures of air (oil) exhausting reach the set warning temperature, there will be alerting information on the controller and give an alarm. When the temperature reaches set breakdown temperature, the controller execute the order and shutdown

---

When the phase sequence of the three-phase power supply is different from that set in the controller, the controller is unable to output the starting up signal and the motor cannot start operation. For the time being, you have to exchange any two power lines and see the rotating direction of the motor.

c) Exhaust pressure overpressure protection

When the exhaust pressure is high than the upper limit value, the controller execute the order and shutdown

d) Sensor failure protection

When pressure sensor and temperature sensor are in breakdown or disconnection, the controller execute the order and shutdown.

---

## 10 Operations and Maintenance

### 10.1 Routine operation and maintenance (According to provisions in Table 5)

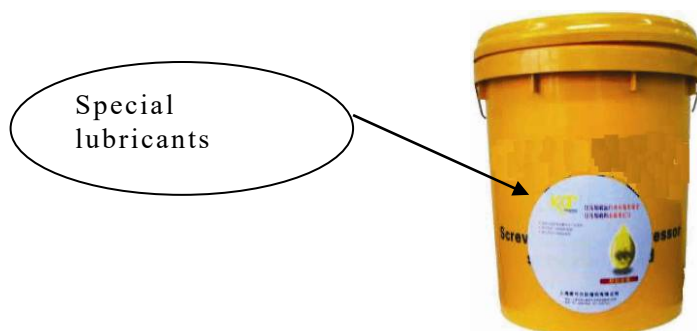
#### 10.1.1. Examining and maintaining before operation

- a) Check to see if the equipment is clean and complete.
  - b) Check and maintain the intact of the electrical elements and firmness of the grounding.
  - c) Check and maintain the reliability of the fasteners.
  - d) Check and adjust the tension of the belt and change it if necessary.
  - e) Check , adjust and change the coupling or bumper block if necessary.
  - f) Check, add and change the lubricating oil if necessary.
- Oil level shall be between the upper and lower red line of the oil indicator, as what is shown in Picture 12.
- 



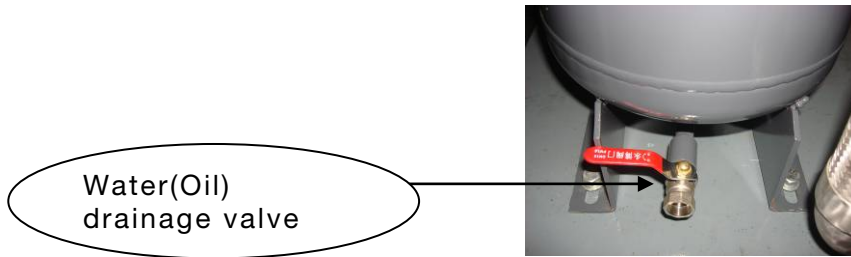
**Picture 12.**

- Special lubricants for screw machine as shown in Picture 1 should be used.



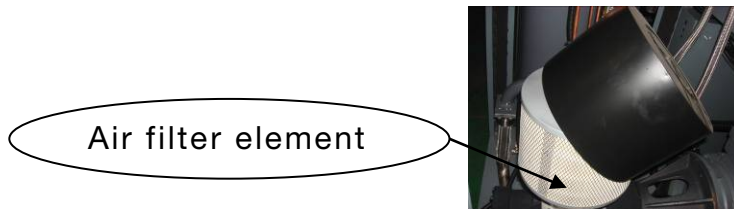
**Picture 13.**

- Refueled oil should be filtered through Cleaned funnel(Filtering precision is 14um )
- The used oil should be discharged before the change of lubricant as shown in Picture 14.



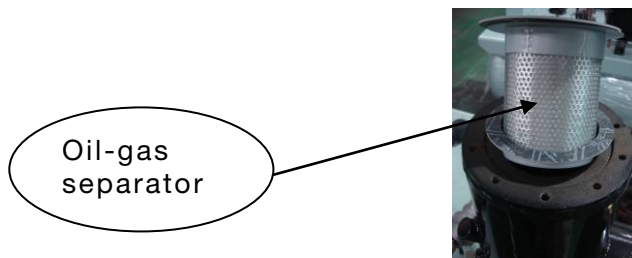
**Picture 14.**

- g) Check to see if it is necessary to discharge the condensate water in the gas and oil barrel.(Slightly open the liquid discharge valve on the bottom of gas and oil barrel and discharge the condensate water till the lubricating oil flows out.)
- h) Check, clean and replace the filter element of the air filter if necessary as shown in Picture 15.



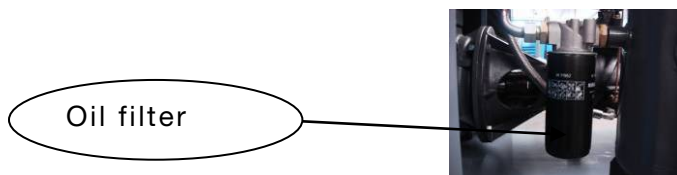
**Picture 15.**

- i) Check, clean and replace the oil-gas separator if necessary as shown in Picture 16.



**Picture 16.**

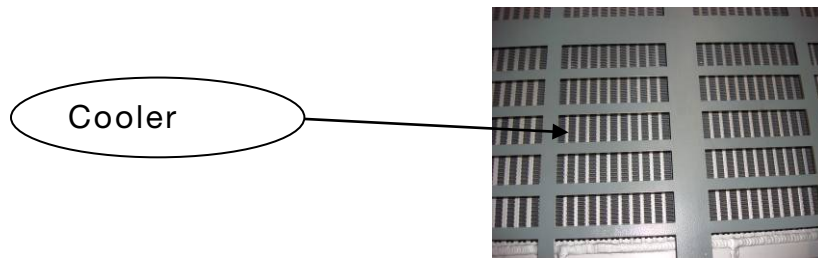
- j) Check, clean and replace the oil filter if necessary as shown in Picture 17.



**Picture 17.**

- m) Check and clean the cooler if necessary as shown in Picture 18.



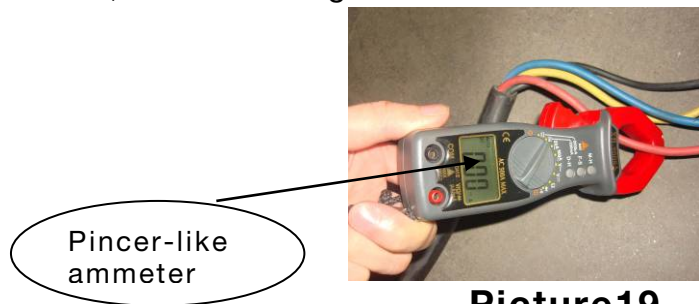


**Picture 18.**

### 10.1.2 Starting up Checking

- a) Check the operating button to see if it is in normal condition.
  - b) Check whether there are phenomena of abnormal noise vibration and oil leakage.
  - c) Check the instruments of pressure gauge, oil thermometer, ammeter and indicator light etc. to see if they are in normal condition.
  - d) Check the oil return pipe to see if it is in normal condition.
  - e) Check the pressure of the automatic stop and that starting up to see if it is in normal condition.
  - f) Check the unloading valve to see if it is deflating or not when the machine stopped.
- Check the exhaust temperature to see if it is in normal condition.
- g) Check to see if the temperature is in normal condition

- h ) Check the voltage and electric current to see if they are in normal condition.



**Picture19.**

- i) Check, clean and replace the safety valve if necessary.
- Check the motor insulation resistance.
- k) Record the voltage, current, air pressure, exhaust temperature and oil level every day and take notes of the working time, maintenance status and abnormalities per shift.

## Maintenance plans

Table 5

S.N .	Checking Items	Working content	Maintenance cycle						Remarks
			Day	Week	Month	Half year	A year	Two years	
1	Fastener	Check the bolts and transmission components	☆						The bolts and transmission components can't fall off or loosen.
2	Coupling	Check the coupling	☆						Concentricity is normal with no damage.
3	Strainer of oil return pipe	Check the strainer			★				No sundries
4	Condition of oil return in transparent return pipe	Make sure the oil return is normal	☆						Oil return is fluent
5	Unloading valve	Make sure the machine is stopped and	☆						Normal stop, unloading and deflating
6	α Lubricating oil	Check the level and quality of oil	☆						The oil level should be within the alerting line, without oxidation discoloration
7	Air (oil) exhausting temperature	Make sure the venting temperature	☆						The normal temperature is between 70°C and 105°C
8	Voltage and current	Check the voltage and current.	☆						Within 1.2 times of that of the rated current
9	α Air filter	Cleaning		☆					Replace the filter element only
10	Drainage in Gas and oil barrel	Water drainage		☆					Discharge from the oil discharge valve
11	dustproof gauze	Cleaning and maintenance			☆				Take out and clean
12	Pipeline system	Check the situation of oil leakage and air leakage.	☆						No phenomenon of oil leakage
13	Circuit system	Line terminal or displaying information	☆						No phenomena of information alarming or wire decrustation
14	αOil strainer	Checking and cleaning			☆				Replace the filter element only

15	Filter element of oil-gas separator	Cleaning and replacement			★				Replace the filter element only
16	Mechanical seal for the host machine	Checking the leakage	☆						The quantity of oil leakage is less than 1.5g/h
17	Motor insulation	Checking the insulation resistance					★		More than 2MΩ when the voltage is 500V
18	Relief valve	Checking the sensitivity of the action				☆			In condition of rated pressure, it can discharge when the discharging ring of the relief valve is pulled with a force less than 1 kg and the sundries are cleared off.
19	Pressures of automatic stop and automatic start up	Checking the sensitivity of the action	☆						Stop pressure and start-up pressure are in normal condition.
20	Cooler	Maintenance and cleaning	☆						Clean the surface dirt in the way of blowing
21	Indicator of the oil level indicator	Checking the clarity	☆						Replace it when the oil level is fuzzy.
22	Belt and pulley	Checking the firmness or replacement.	☆						Extrude the center of the belt with the thumb to make sure it is 10 to 15 mm and with no damage.

**Notes:** “☆”refers to parts that are maintained by users, “★”refers to parts that are entrusted to service center . “□”refers to parts that must be replaced after the new machine running continuously for 500 hours, then replace them after 3000 hours’ work. The maintenance parts are those whose working time are less than 6000 hours.

### 10.1.3 Processing method of long-term shutdown

#### 10.1.3.1 Equipment should be sealed if it is shutdown for a long period of time.

- Clean the equipment and spread some antirust oil on the parts which are easy to be rusted.
- Electric equipment such as motor control panel etc., all Valves, tables, indicators shall be wrapped up with plastic paper or oil paper.
- The water in the oil cooler (gas and oil barrel), gas cooler and air storage tank shall be all discharged..
- Covering all the equipment with plastic paper or some other similar materials.
- Transportation fixed screw should be locked if the transfer storage space is changed.

**10.1.3.2 To restart the sealed air compressor , the Motor insulation resistance should be measured first (No less than 1 MΩ).then do as the operating instructions on page 16 item 9.3.The air compressor sealed more than one year should replace the lubricant .**

**11. Breakdown and Elimination**  
**Table 6**

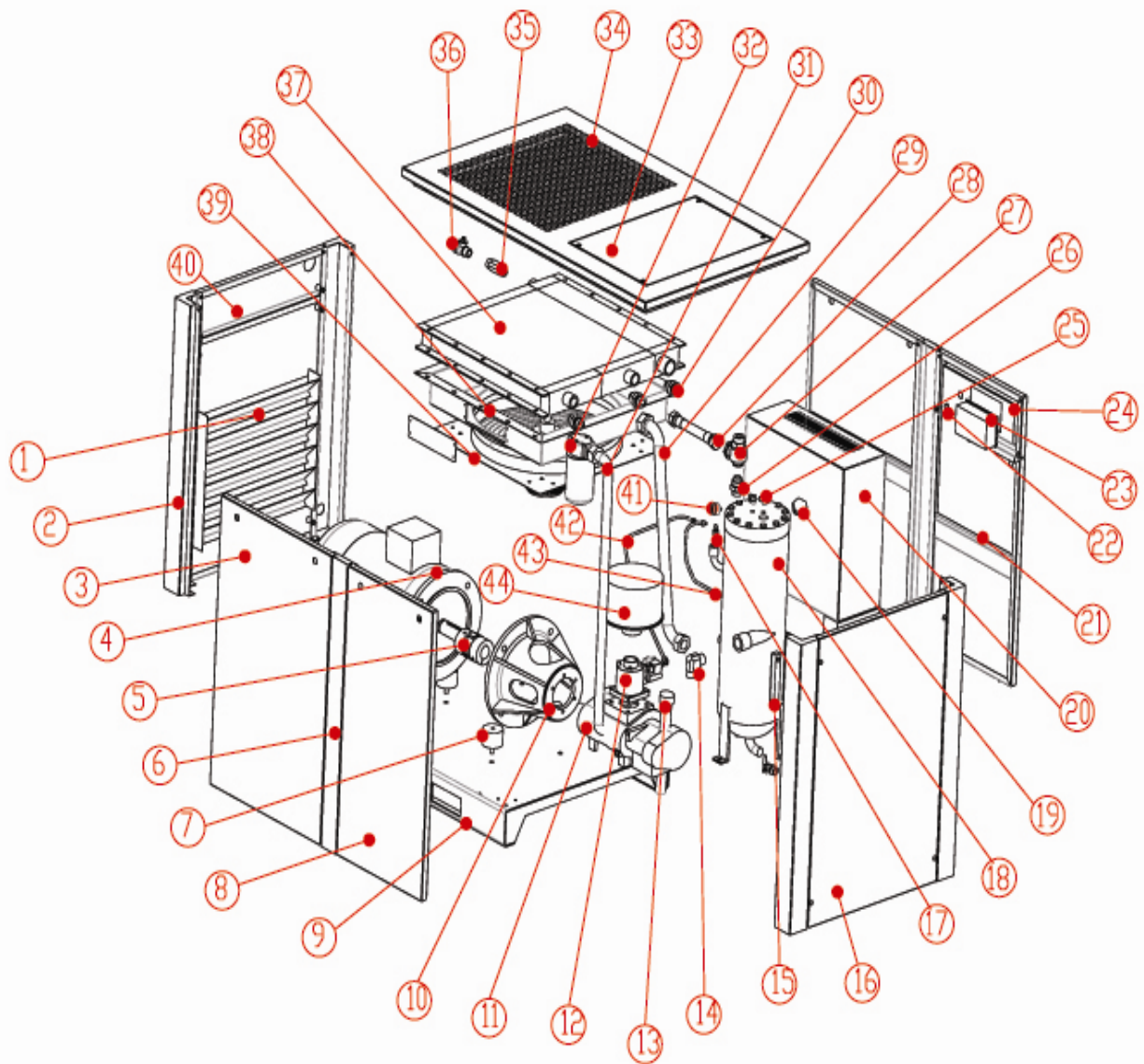
S.N.	Breakdown phenomena	Causes	Breakdown elimination
1	Motor starting up failure	No input voltage or the voltage is in abnormal condition.	Check the power supply circuit
		Phase failure ( The motor gives out "buzz-buzz" sound)	Check the power line terminal, electric controller and on-line terminals
		Connection error in power phase position	Adjust the phase-sequence and repair or replace the main controller
		Blown fuse	Check and make sure there is no error in circuit and replace the fuse
		Burning of AC contactor or failure	Repair or replace
		Failure of pressure switch (Pressure sensor)	Repair or replace
		Motor burning out and bearing failure	Repair or replace
		Clamping stagnation in dynamic tray in hand piece or block up caused by bearing failure	Repair or replace
		Temperature sensor operation protection	Find out the causes and eliminate the breakdown
		Current protector operation protection	Find out the causes and eliminate the breakdown
2	Story frequent starting up	Failure in starting up the time delay unit	Check and reset the time delay unit and main controller or replace it
		Serious leakage in pipeline	Check the leaking parts and eliminate the breakdown
		Volume of air storage tank is not large enough	Add air storage tanks or replace larger air storage tanks
		Environmental temperature is too high	Increase the air volume in the unit room
		The cooler is dirty and with bad heat dissipation	Clean the cooler
		Blocking in oil pipeline	Check and get the pipe through
		Failure of temperature sensor	Repair and replace
3	Exhaust (oil) temperature is too high	The lubricating oil is not enough	Add lubricating oil
		Failure in cooling fan	Repair or replace
		Failure in pressure switch, force sensor and main controller	Repair adjust and replace
		Too much air consumption	Repair the pipeline, buy more air compressors and control the air volume
4	Too low exhaust pressure	Serious leakage in pipeline	Repair and replace if necessary

	Blocking in air filter	Clean and replace the filter element
	Breakdown in air inlet valve	Repair or replace
	Blocking in oil-gas separator	Repair or replace
	Leakage in unloading solenoid valve	Repair or replace
	Slipping in V shape rotational belt	Repair, adjust and replace

5	Great consumption of lubricating oil	Blocking in oil return pipe	Disentangle or replace
		Warranty period of oil-gas separator is due	Clean or replace
		Too high lubricating oil level	Decrease the oil level
		Breakdown in minimum pressure valve	Repair or replace
		No use of special lubricating oil	Exchange the special lubricating oil
6	Abnormal noise and vibration	Fasteners become flexible. Host bearing wear or damage in motor	Repair or replace
		Conveyor wear	Replace the belt
		Wear or looseness in the coupling	Check, fasten or replace
		Foreign matters enter rotating parts such as hand piece, motor or fan	Repair or replace
		Failure in empty the used lubricating oil	Empty the used oil and add new special lubricating oil
7	Early deterioration in lubricating oil	No use of special lubricating oil	Exchange special lubricating oil
		Too high exhausting temperature	Increase air volume and decrease the environmental temperature or repair the temperature control valve and cooling system
8	Oil leakage in air filter when it is shutdown	Breakdown in air inlet valve	Repair or replace
		Gas return in minimum pressure valve	Repair or replace
		Unloading solenoid valve fails to deflate	Repair or replace
		Breakdown in hand piece, motor and the bearing	Repair or replace
		V shape rotation belt is too tight	Repair and adjust the hand piece
9	Great current or trip caused by slow rotation of the motor	Low input voltage(The wire is too long and the diameter is too small)	Adjust the wire
		Poor contact in circuit	Repair or replace
		Too great differential pressure in pipeline (Blocking in filter element)	Repair or replace
		Serious imbalance in three-phase voltage	Check and eliminate the breakdown
		Poor contact or current capacity of the breaker is not large enough	Repair or replace

		No use of special lubricating oil	Exchange for special lubricating oil
		Too high temperature, great current and operation of overload protector	Repair or replace
		Phase failure	Check the circuit and AC contactor
		Breakdown in temperature controller and main controller	Repair or replace
		Inconformity in three-phase resistance value ( Motor burnt out)	Repair or replace
		Breakdown in fan bearing	Repair or replace
10	Failure of rotating in cooling fan		

## 12. Directly-Connected Type Screw Machine

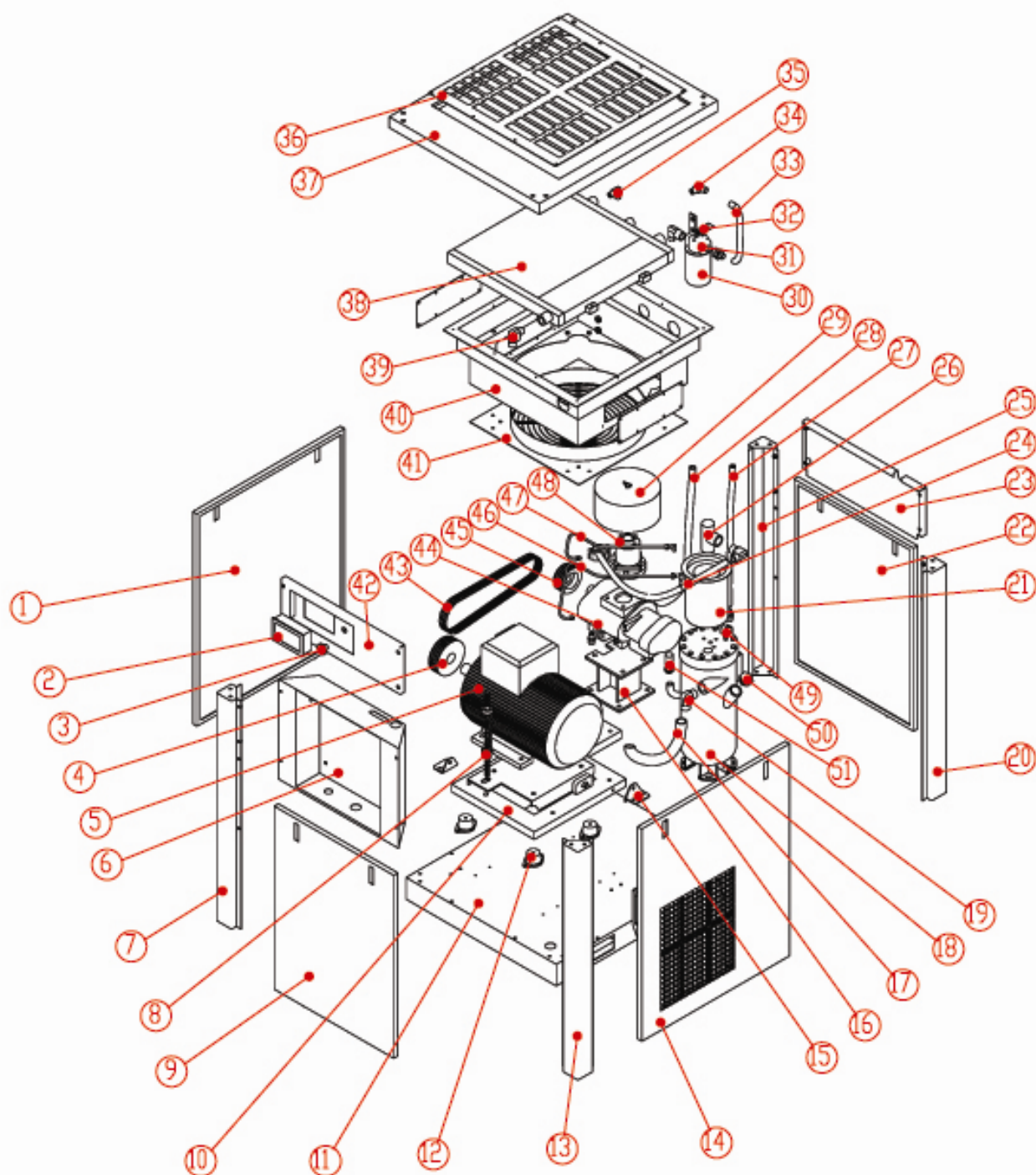




### List of the parts of directly-connected type screw machine

S.N.	Name	Quantity	S.N.	Name	Quantity
1	Right shutter	1	24	Control shutter	1
2	Right front side vertical shaft	1	25	Bend	1
3	Front and back right shutters	1	26	Adjustable pipe joint	1
4	Motor	1	27	Minimum pressure valve	1
5	Coupling	1	28	Air outlet pipe	1
6	Back-central gatepost	1	29	Head oil inlet	1
7	Anti-vibration pad	1	30	Oil inlet joint of the cooler	1
8	Back-left gatepost	1	31	Oil filter assembly	1
9	The main baseplate	1	32	Oil filter joint	1
10	Center bracket	1	33	Camp of the head cover	1
11	Screw hand piece	1	34	Head cover	1
12	Air inlet valve	1	35	Gas supply pipe	1
13	Exhausting pipe of hand piece	1	36	Ball valve	1
14	Bend	1	37	Fin type heat exchanger	1
15	Oil mirror	1	38	Wind cover assembly	1
16	Left shutter	1	39	Fan	1
17	Relief valve	1	40	Deflation opening board	1
18	Oil-gas barrel	1	41	Pressure gauge of the oil-gas barrel	1
19	Refueling cover of the oil-gas barrel	1	42	Fine oil differentiating return pipe	1
20	Electric control cabinet	1	43	Unloading pipe	1
21	Front-left shutter	1	44	Air filter assembly	1
22	Emergency "stop" button	1			
23	Controller	1			

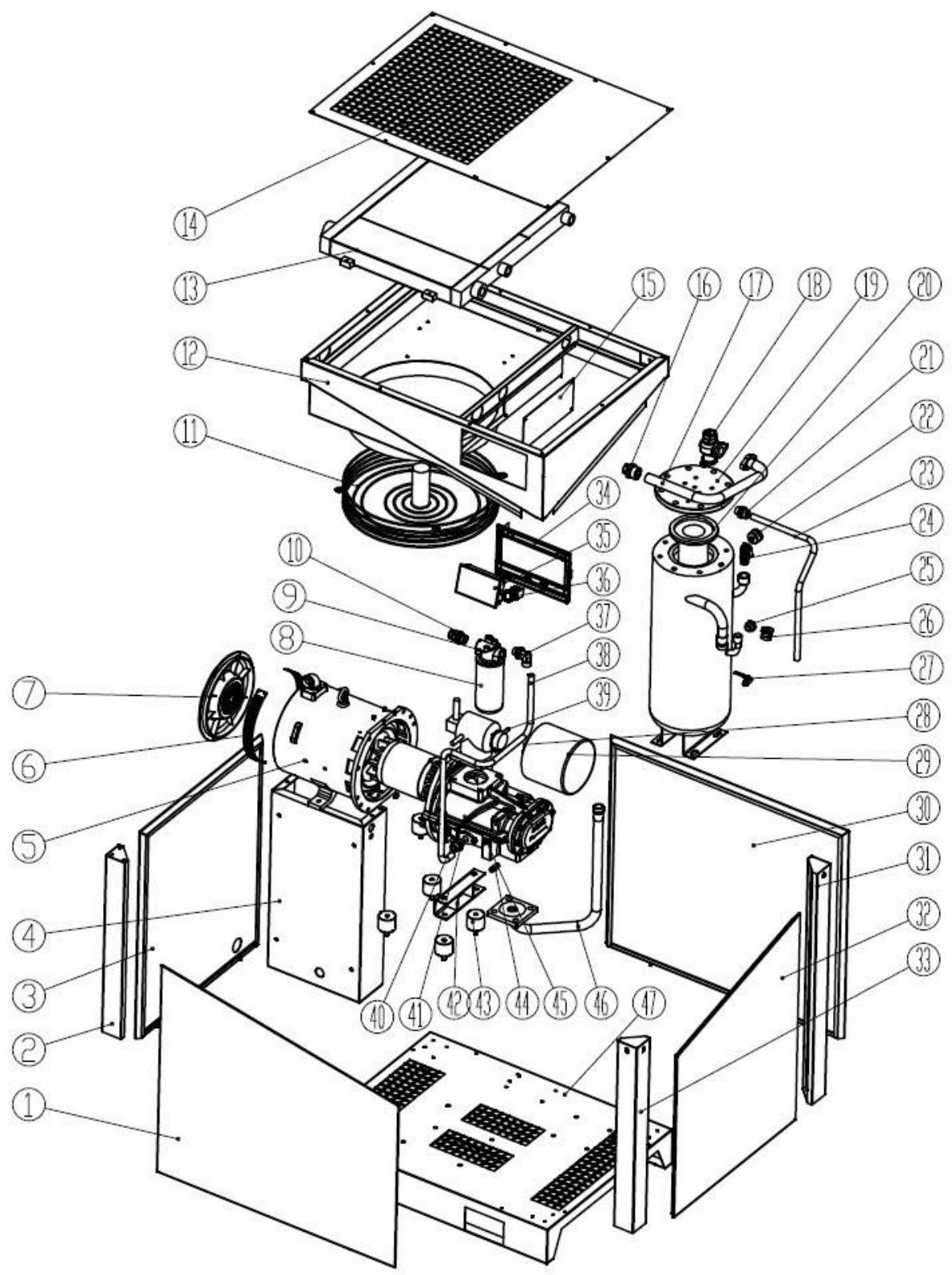
### 13. Conveyor- type screw machine



## List of Parts of All Cover Conveyor Type Screw Conveyor

S.N.	Name	Quantity	S.N.	Name	Quantity
1	Left shutter	1	27	Oil return pipe of oil and gas barrel	1
2	Digital display panel	1	28	Main return pipe of the head	1
3	Emergency "stop" button	1	29	The air filter assembly	1
4	Motor pulley	1	30	Oil filter	1
5	Motor	1	31	Oil filter joint	1
6	Electric control cabinet	1	32	Oil filter fixed board	1
7	Vertical shaft on left side of the front shutter	1	33	Oil filter exhausting tubing	1
8	Automatic tension spring of the conveyor	1	34	Oil inlet bend	1
9	Front shutter	1	35	Oil return bend	1
10	Anti-vibration platform	1	36	Exhaust shutters	1
11	The main base-plate	1	37	Head cover	1
12	Anti-vibration pad	4	38	Oil-gas cooler	1
13	Vertical shaft on right side of the front shutter	1	39	Exhaust bend	1
14	Shutter on the right side	1	40	The protective cover of the cooler-fan	1
15	Transportation fixed board	1	41	Cooling fan	1
16	Host frame	1	42	Control panel	1
17	Head exhaust pipe of hand piece	1	43	Belt	3
18	Oil-gas barrel	1	44	Hand piece of screw	1
19	Bend	1	45	Headpiece pulley	1
20	Vertical shaft on right side of the back shutter	1	46	A fine differentiating oil return pipe	1
21	Built-in oil-gas fine differentiator	1	47	Unloading pipe	1
22	Back shutter	1	48	Air intake valve	1
23	Deflation opening board	1	49	Oil-gas barrel pressure gauge	1
24	Exhausting pipe of oil and gas barrel	1	50	Refueling plug of Oil-gas barrel	1
25	Vertical shaft on left side of the shutter	1	51	Air intake pipe joints	1
26	Minimum pressure valve	1			

14. Directly-Connected Type Screw Machine



## List of the parts of directly-connected type screw machine

S.N.	Name	Quantity	S.N.	Name	Quantity
1	front shutter	1	25	Oil mirror	1
2	Vertical shaft on left side of the front shutter	1	26	Oil inlet plug of Oil-gas barrel	1
3	Left shutter	1	27	Ball valve	1
4	Electric control cabinet	1	28	Air filter element	1
5	Motor barrel	1	29	Air filter cover	1
6	Gridding plate	1	30	Back shutter	1
7	Motor barrel back cover	1	31	Vertical shaft on right side of the back shutter	1
8	Oil filter	1	32	Right shutter	1
9	Oil filter base	1	33	Vertical shaft on right side of the front shutter	1
10	adjustable straight connector	1	34	Plastic panel	1
11	Cooling fan	1	35	Display control panel	1
12	The protective cover of the cooler & fan	1	36	Emergency stop switch	1
13	cooler	1	37	90°adjustable connector	1
14	Head cover plate	1	38	Main return pipe of air end	1
15	Fan cover plate	1	39	Air inlet valve	1
16	Discharge pipe straight connector	1	40	Host machine	1
17	Discharge pipe of oil-gas barrel	1	41	Oil inlet straight connector	1
18	Minimum pressure valve	1	42	Air end support	1
19	Flange cover of oil-gas barrel	1	43	Rubber Anti-vibration foot	1
20	Built-in oil-gas fine differentiator	1	44	oil return valve	1
21	Oil return pipe straight connector	1	45	Temperature sensor	1
22	Pressure gauge	1	46	Discharge pipe of air end	1
23	Oil return pipe of oil and gas barrel	1	47	Main base plate	1
24	Safety valve	1			

# SCREW AIR COMPRESSOR CONTROL USER OPERATING MANUAL



## NOTICE



Please read instruction manual before usage



Installation of MAM—8\*\* can be performed only by professional technicians



Assembling position shall be considered carefully during mechanical installation in order to ensure good heat dissipation and reduce electromagnetism interferences



Wiring shall be performed respectively according to regulations for heavy and weak current to reduce electromagnetism interferences



Surge absorber must be communicated with inductive load such as AC contactor of output control of relay



Output wiring shall be inspected carefully before switch up



Earthing terminal of this body part shall be earthed correctly (the third type of earthing) to increase product's capacity of resisting signal noise.



Motor's rated current (current for stopping instrument automatically) shall be set according to rated current indicated on motor's name plate × overload current multiplication factor of motor/ 1.2

## Features:

- LCD Chinese / English display
- With control functions of starting, stopping and operation for motor.
- With protection functions of preventing reverse rotation of air compressor.
- Temperature measurement and control
- Automatic adjusting of rate of load and controlling of pressure balance
- Selections of remote and local control
- Selections of interlocking and independent
- Function of RS485 communication

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## Basic Operation

### 1. Button Explanation

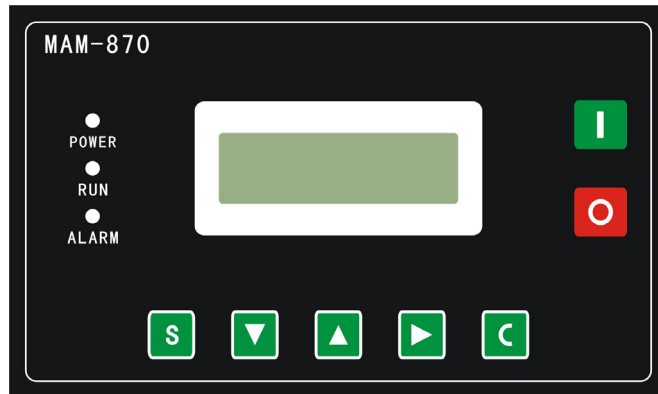


Figure 1.1.1

**I** — — Start Button: Press this button to start the compressor.

**O** — — Stop button: Press this button to stop the compressor.

**S** — — Set Button/ Loading / unloading Button: After modification, press this to confirm and save modified data; When the compressor is running ,press this button to load or unload under a certain pressure.

**▲** — — Move up button/increase button: Data at current position is increased by pressing this button when data are modified; Menu is moved upwards when menu is selected.

**▼** — — Move down button / Descending button: Data at current position is descended by pressing this button when data are modified; menu is moved downwards when menu is selected.

**▶** — — Shift button /Enter button: This button services as shift button when data are modified and services as enter button when menu is selected.

**C** — — Back button / Reset button: This button services as back button when operate menu to come back

Parent menu; resetting is carried out by pressing this button for a little long time when failure shutdowns

## 2. Indicator instructions

Power: After controller power on, power LED light

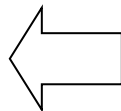
Run: Compressor operation, run LED light.

Alarm: Early warning, the fault light flashes; fault shutdown, fault lights lit, clear fault, reset off.

## 3. Display of status and operations

The display screen will be as follow when the units are powered on:

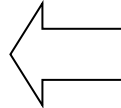
SCREW  
COMPRESSOR



After power on, screen show this page

After 5 seconds, the main page will show up as:

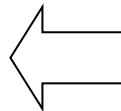
PRES: 0.60MPa  
SYS STOP C01



Main page

Press shift button, the main page will show up as:

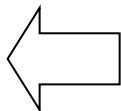
TEMP: 80°C  
SYS STOP C01



Main page

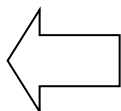
Press “Move down button” to enter into Menu Selection Interface:

RUN PARA.  
USER PARA.



Level 1 menu screen

FACTORY PARA.  
MOD PARAMETER



Level 1 menu screen

## 4. Operating parameters

Press “Move down button” or “Move up button” to move the black cursor to “RUN PARA.”, press enter button to pop up submenu:

MOTOR(A) A-0100  
B-0100 C-0100

Continuously press “Move down button” you can see run parameters and run state parameters as follows:

Fan current, Total run time, Total load time, This run time, This load time,  
Oil filter time, O-a filter time, Air filter time, Lube time, Grease time, Belt time...etc.



## 5. User Parameter (Customer Parameter):

In primary menu, press the move button to move the black slider to the "USER PARA." menu, press the shift button to switch to the following menu:

LOAD PRES:  
00.65MPa

on , Switch to the following interface requirements to enter a user password

PASSWORD:0\*\*\*

After showing this interface, The first bit data or password started flashing, press "increase button" or "descending button" to modify the flashing data equal to the first bit of password, Press the shift button, move the cursor to the next data bit, modify the current data is equal to the second password data, Accordance with the above, modify the third and fourth Finally, press the "Set button" to confirm the input, the system verify the password is correct, switch to the following interface:

LOAD PRES: \*  
00.65MPa

The upper right corner with "\*" prompt said the system has passed the password authentication

In as shown above interface, press "enter button", then the data of loading pressure start to flash, users can press "increase button" or "Descending button" to modify the present data. When finished, press "Set Button" to confirm and save. the controller prompt sends out the short voice to tip.

## 6. Customer Parameter and Functions

Parameters	Preset Value	Functions
LOAD PRES.	*. **MPa	LOADING PRESSURE VALUE
UNLOAD PRES.	*. **Mpa	UNLOADING PRESSURE VALUE
FAN START TEMP	***°C	Control the fan starting. This value will be set as "120°C" if there is no fan present or the fan is not required to be protected."
FAN STOP TEMP	***°C	Control the stopping of the fan
MOTOR DELAY T	0008S	When using the controller to protect the motor, it is required that the time set here will not meet the impulse starting current of the motor, the value here must be longer than the STAR DELAY TIME plus LOAD DELAY TIME
FAN DELAY T	0006S	When using the controller to protect the motor, it is required that the time set here will not meet the impulse starting current of the motor.
STAR DELAY TIME	0006S	Star pressure descending start delay time.
LOAD DELAY TIME	0002S	The loading delay time after star pressure descending.
EMPTY DELAY T	0020M	Load free continuous running time, the machine will automatically stop after this time

STOP DELAY TIME	0010S	The machine will not stop until the load free running status lasting till this time
START DELAY T	0100S	Machine can not be restarted before this set time after stopped or over time operation at load free state
START MODE	LOCAL/FAR	When the remote mode is set, both the button on the controller and the remote control button can turn on and off the machines; When the near mode is set, only the button on the controller can turn on and off the machines.
LOAD MODE	AUTO/MAN U	When the manual mode is set, the Load/Unload function can only be executed by pressing "load/unload" button
COM MODE	BAN/COMP. /BLOCK	When this is set as "BAN" the communication function is not available When this is set as "COMP." the Controller as a slave, in accordance with MODBUS protocol communications with external devices When this is set block, block control active
COM ADDRESS	0255	Communication address
SEQ STATE	SLAVE	Service as main or assistant air compressor during interlocking operation. The MAIN controls the SLAVE
TOGGLES TIME	9999 Hours	During interlocking operation, if one air compressor continuously operates for time period more than time set here and rest time of one air compressor in interlocking network has reached the time set here, alternative rest is achieved by starting the resting air compressor and stopping the operating air compressor
SEQ NUMER	0016	Number of air compressors in interlocking network during interlocking operation
SEQ LOAD PRES.	*.**MPa	The main air compressor searches for one device in the interlocking network for loading or starting when main air compressor's gas supply pressure is less than the value set here during interlocking operation
SEQ U.L. PRES.	*.**MPa	The main air compressor searches for one device in the interlocking network for unloading or stopping when main air compressor's gas supply pressure is more than the value set here during interlocking operation
SEQ DELAY	0030S	The least waiting time that the main air compressor needs to continuously send control commands two times
OIL FILTER	0000H	Reset time for the duration of oil filter changing
O/A FILTER	0000H	Reset time for O/G Separator changing
AIR FILTER	0000H	Reset time for gas filter changing
LUBE	0000H	Reset time for Lubricate Oil Changing
GREASE	0000H	Reset time for Lubricate Grease Changing
BELT	0000H	Reset time for Belt Grease Changing
OIL FILTER	9999H	Set this value to "0" will make the oil filter alarm not available

O/A SEPARATOR	9999H	Set this value to "0" to disable the O/G separator alarm function
AIR FILTER	9999H	Set this value to "0" to disable the alarm function of gas filter
LUB	9999H	Set this value to "0" to disable the time alarm of lub. oil
GREASE	9999H	Set this value to "0" to disable the time alarm of Lub. Grease
BELT	9999H	Set this value to "0" to disable the time alarm of belt.
LANGUAGE SEL	ENGLISH/C HINESE	Set this value to "EN" , Display text in English Set this value to "CH" , Display text in Chinese
USER PASSWORD	****	Customer could modify the user password

## 7. Factory Parameters

The factory parameters can be looked over and modified with manufacturer password, but its operation method is the same as that of user parameters. Please refer to following table for main functions and purposes.

PASSWORD : 0\*\*\*

Manufacturers enter the correct password, press set button, switch to the factory parameters of the interface as follows

MOTOR CURR:
\*

100.0A

Continuously press "Move down button" you can see factory parameters as follows:  
FAN CURR, PRE-ALARM TEM, STOP TEMP, STOP PRESS, MAX U.L. PRESS,  
TOTAL RUN TIME, TOTAL LOAD TIME, RESET FAULT.....ect.

Factory parameters "run time", "phase sequence protection," "Frequency Selection" and the time need check super password to changes.

## 8. Manufacturers and function

PARAMETER	Initial Value	Functions
MOTOR CURR	MAXIMUM OVERLOAD VAULE OF THE MOTOR /1.2	After the starting delay time, when the motor current is greater than 1.2 times of the set value and less than 4 times of the set value, the unit will jump as per overload feature.
FAN CURR	Maximum allowable fan motor overload value/1.2	Same as above
ALARM T.	105°C	Pre-alarm when the temperature reaches this set value
STOP T.	110°C	Alarm when the air exhausting temperature reaches this set value.
STOP P.	1.00MPa	Alarm and stop the machine when the air supply temperature reaches this set value
MAX U.L.	0.80MPa	The Unload Limit Pressure in the Customer

		Parameter must be set lower than this value.
RUN TIME	****Hours	The manufacturer can modify the total running time
LOAD TIME	****Hours	The manufacturer can modify the load running time
CLR FAULT	****	Input the history failure password to clear all the history failures.
CUR UN.BAL.	0006	When (the max. phase current / min. phase current) is not greater than (1+set value), the unbalance protection will stop the machine. If the set value is greater than 15, the unbalance protection will be unavailable.
LACK PAHSE	005.0	If set time of phase failure $\geq 20$ seconds, phase failure doesn't function; If unbalance protection is activated, it will stop operation.
DATA	****_**_**	The manufacturer input the product date of the unit.
SERIAL	*****	The manufacturer input the product No. of the unit
PHASE PRO.	ON/OFF	ON: Select sequence protection OFF: Not select sequence protection
POWER FREQ	50H	Set the power frequency
HIGH VOL.	****V	Controller detects the voltage higher than the set value, the shutdown protection, reported voltage is too high. Set this value to 0000, the high voltage function is no function
LOW VOL.	****V	Controller detects the voltage lower than the set value, the shutdown protection, reported voltage is too low. Set this value to 0000, the low voltage function is no function
LOW T PRO-	-48°C	Controller detects the temperature is lower than this value, display temperature is too low, not allowed to start the air compressor
TIME LIM	0000H	When the compressor run time is greater than TIME LIM set, the controller will stop the compressor and alarm ; If the value set as '0000' the function is disable.
ALM STOP	0010H	Warning time over here to set, compressor report "warning too long" and stop
COM SET PARA	ON/	
PARA1	****	

## 9. Calibration parameters

Calibration parameter used to set the controller data, Does not allow unauthorized users to view and modify

FACTORY PARA.
MOD PARAMETE

View calibration parameters as follows, Press the "Move down button", Move the cursor to

the “MOD PARAMETE” menu, then press “Enter button”, Verify the password, you can view the calibration parameters. The calibration parameter and functions as list

PARAMETER		Initial Value	Functions
M O T O R  A	TARGET CUR	0000	Enter the current value, the controller will detect user input value divided by the current to the current value, calculate the current coefficient
	COEF	1.000	Calibration current, the input coefficients. Controller displays the current value = sample value × COEF
	CUR	***.A	Displays the current controller sampling current values. This value is the real value can not be set.
M O T O R  B	TARGET CUR	0000	Enter the current value, the controller will detect user input value divided by the current to the current value, calculate the current coefficient
	COEF	1.000	Calibration current, the input coefficients. Controller displays the current value = sample value × COEF
	CUR	***.A	Displays the current controller sampling current values. This value is the real value can not be set.
M O T O R  C	TARGET CUR	0000	Enter the current value, the controller will detect user input value divided by the current to the current value, calculate the current coefficient
	COEF	1.000	Calibration current, the input coefficients. Controller displays the current value = sample value × COEF
	CUR	***.A	Displays the current controller sampling current values. This value is the real value can not be set.
F A N  A	TARGET CUR	0000	Enter the current value, the controller will detect user input value divided by the current to the current value, calculate the current coefficient
	COEF	1.000	Calibration current, the input coefficients. Controller displays the current value = sample value × COEF

	CUR	***.*A	Displays the current controller sampling current values. This value is the real value can not be set.
F A N B	TARGET CUR	0000	Enter the current value, the controller will detect user input value divided by the current to the current value, calculate the current coefficient
	COEF	1.000	Calibration current, the input coefficients. Controller displays the current value = sample value × COEF
	CUR	***.*A	Displays the current controller sampling current values. This value is the real value can not be set.
F A N C	TARGET CUR	0000	Enter the current value, the controller will detect user input value divided by the current to the current value, calculate the current coefficient
	COEF	1.000	Calibration current, the input coefficients. Controller displays the current value = sample value × COEF
	CUR	***.*A	Displays the current controller sampling current values. This value is the real value can not be set.

## 10. The operating authority and password

Controller provides multiple passwords and access management, according to different levels of passwords, providing different levels of operating authority, different levels of passwords and permissions as follows:

1. user's password: fixed as : \_\_\_\_\_  
Permissions: allows to modify the load pressure unload pressure, fan start temperature, fan stop temperature, start and stop mode, loading method, communication mode, communication address and linkage parameters.
2. User Password: set as: \_\_\_\_\_
3. Permissions: Allows to modify all user parameters.
4. manufacturers sales password: this password can be modify, set to : \_\_\_\_\_  
Permissions: Allows users to modify all the parameters, the user password, and the parameters of some manufacturers, manufacturers selling password.
5. manufacturers Password: factory fixed: \_\_\_\_\_  
Permissions: Allows users to modify all the parameters, the user password, and the parameters of some manufacturers, manufacturers selling password.
6. Calibration Password: set as: \_\_\_\_\_  
Permissions: allows you to modify the current parameters of the calibration parameters
7. Super Password: set as: \_\_\_\_\_

Permissions: Allows users to modify "run time " "phase sequence protection " "power frequency " "max run time"

## 2. Technical parameters and functions

- 1、Digital input: Digital input of 3# circuit; digital output of relay of 5# circuit;
- 2、Simulation quantity: Pt100 temperature input of 1# circuit; 4~20mA input of transducer of 1# circuit; two groups of three phase current input(CT provided);
- 3、Input voltage of phase sequence: three phase 380V/220V;
- 4、Controller's power supply: AC20V、 50Hz、 10VA;
- 5、Measurement range displayed:
  - ①、 Oil temperature:-50~150°C; precision:  $\pm 1^{\circ}\text{C}$ .
  - ②、 Air temperature:-50~150°C; precision: $\pm 1^{\circ}\text{C}$ .
  - ③、 Operation time: 0~999999 hours.
  - ④、 Measurement range displayed for current:0~999.9A.
  - ⑤、 Pressure: 0~1.60MPa. Precision: 0.01Mpa.
- 6、Phase-sequence protection: When protector inspects wrong phase, response time $\leq 2\text{s}$  (optional);
- 7、 Protection of motor: this controller has five basic protection functions for main motor and fan's motor

- ①、block protection: When working current reaches to from 4 times to 8 times of set current after finish starting, response time  $\leq 0.2\text{s}$ ;
- ②、 Short circuit protection: when testing current reaches above 8 times of set current, response time $\leq 0.2\text{s}$ ;
- ③、 Protection of phase failure: in case of phase failure of any one phase, operation time equals setup time;
- ④、 Unbalance protection: when currents of any two phase differ 60~75%,operation time equals set time;
- ⑤、 Protection characteristics of reverse time limit of overload (time unit: second), please see

following table (table 2.1.1),  $\text{multiple} = I_{\text{actual}} / I_{\text{set}}$

motor operates with delay time according to overload factors and operation time shown in following table (table 2.1.1) when motor's working current is larger or equal to from 1.2 times and 3.0 times of set current.

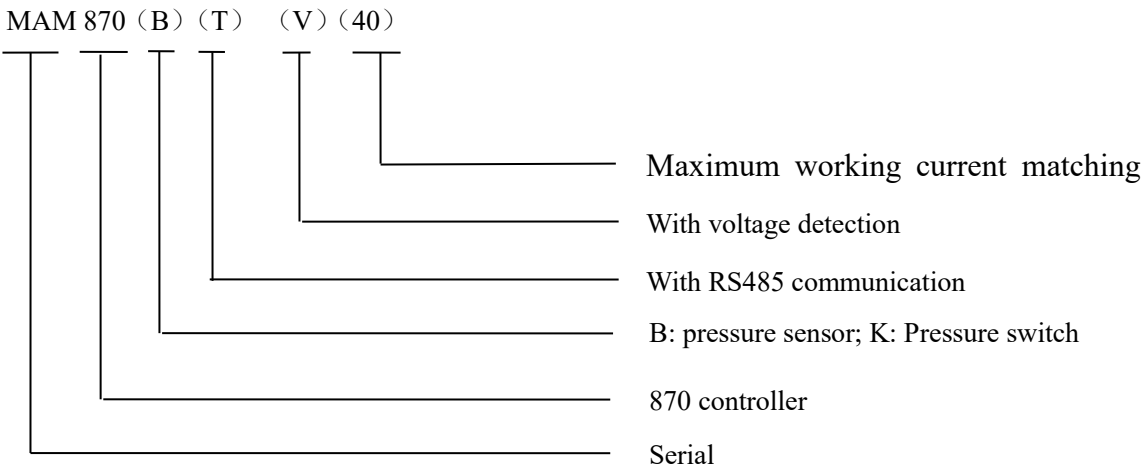
$I_{\text{actual}}/I_{\text{set}}$ Time parameters	$\geq 1.2$	$\geq 1.3$	$\geq 1.5$	$\geq 1.6$	$\geq 2.0$	$\geq 3.0$
Operation time (S)	60	48	24	8	5	1

Table 2.1.1 curve table of reverse time limit for protection of motor

- 8、Temperature protection: when actual temperature measured is larger than temperature set; response time $\leq 2\text{s}$ ;
- 9、Contact capacity of output relay: 250V,5A; Contact endurance 500000 times
- 10、Error of displayed current is less than 1.0%.
- 11、RS485 communication

### 3. Type and specification

#### 1. Instruction of type



#### 2. Specification table for power of suited motor

Parameter Specification	Current range (A)	Suited main motor power (KW)	Remark	Description
MAM870 (20)	8~20	4~10		Fan has three levels of current, such as 0.2-2.5A, 1-5A and 4-10A, determined according to fan's current
MAM870 (40)	16~40	8~20		
MAM870 (100)	30~100	15~50		
MAM870 (200)	80~200	40~100		
MAM870 (400)	160~400	80~200		
MAM870 (600/5)	100~600	50~300		

### 4. Installation

#### 1. Installation of transducer

The transducer shall be installed at place where motor's line current (rated current) can be measured, thus controller can be set according to instructions on motor's name plate, the detailed dimensions as followed:



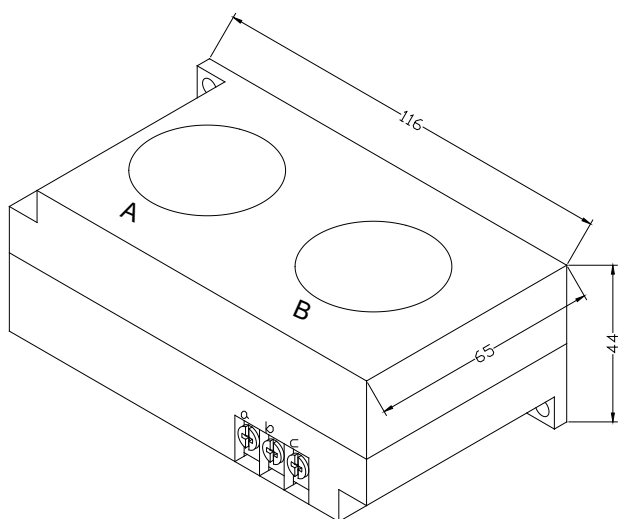


Figure 4.1.1. Structural dimensions of CT1 ( $\phi 36$  through hole)  
CT1

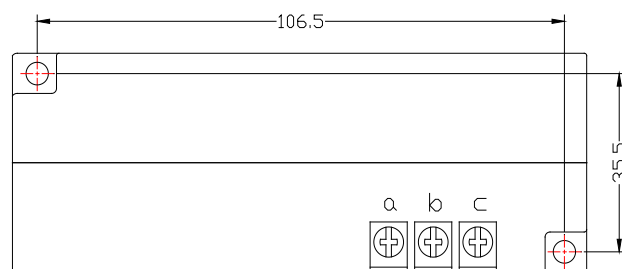


Figure 4.1.2. Install dimensions of  
CT1

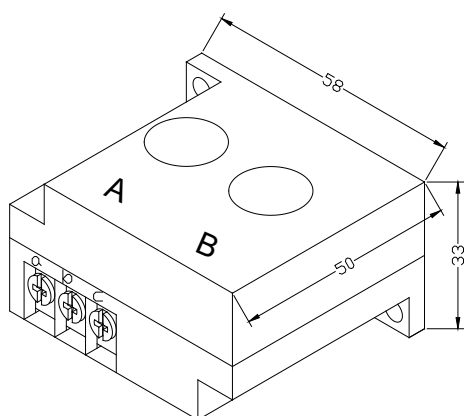


Figure 4.1.3. Structural dimensions of CT2 ( $\phi 10$  through hole)  
CT2

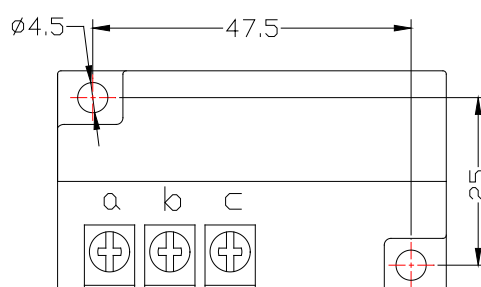


Figure 4.1.4. Install dimensions of  
CT2

## 2. Controller Installation

The controller is installed as plate. Room should be left around controller for wiring. The specific dimensions are as follows:

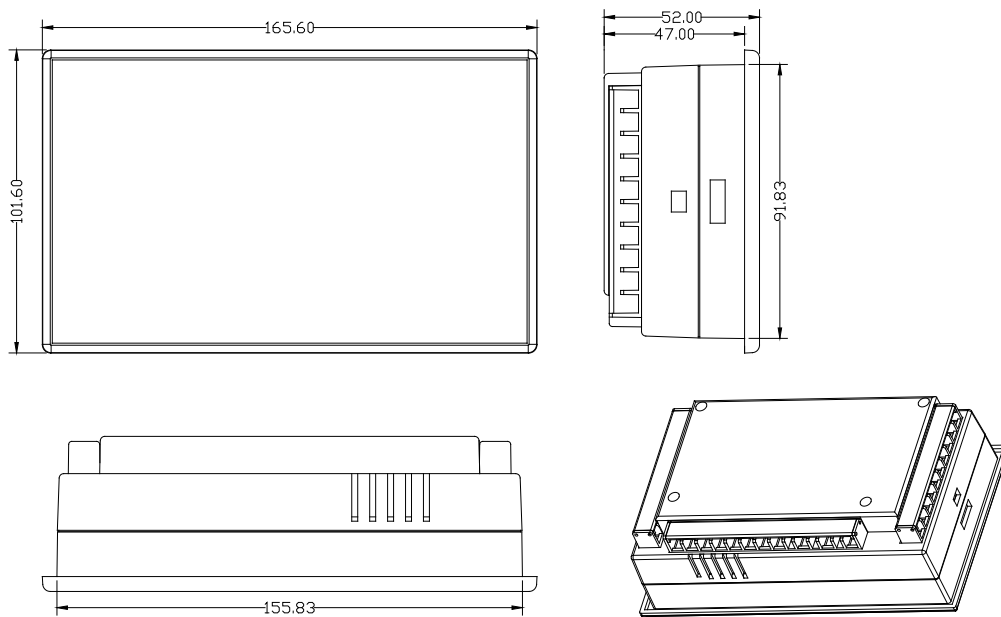


Figure 4.1.5 **Controller structure dimensions**

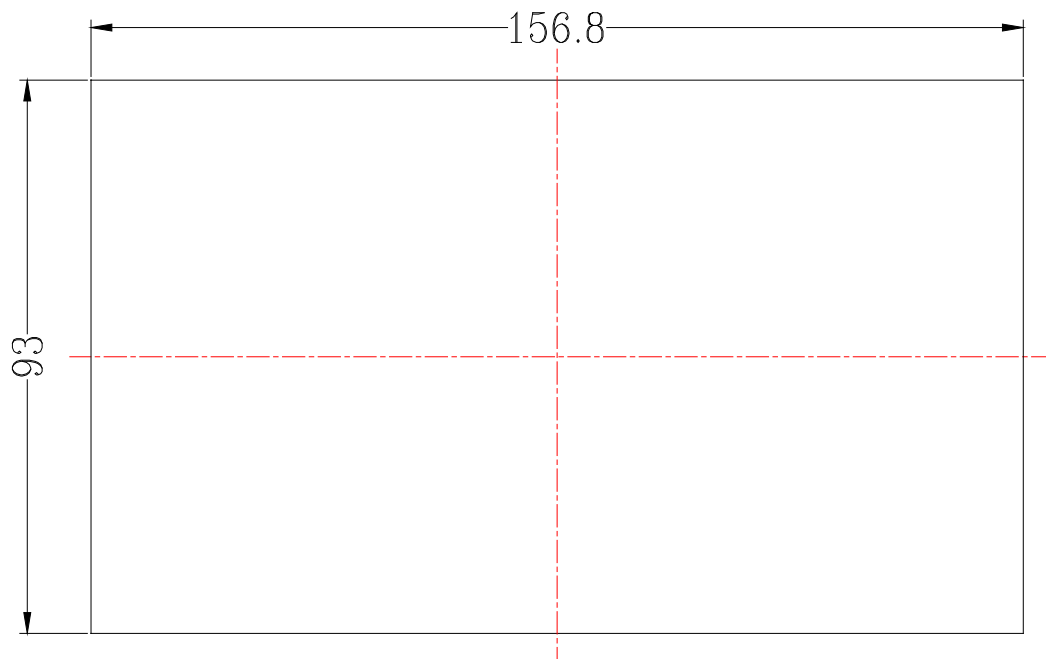


Figure 4.1.6 Hole size

### 3. Terminal arrangement diagram

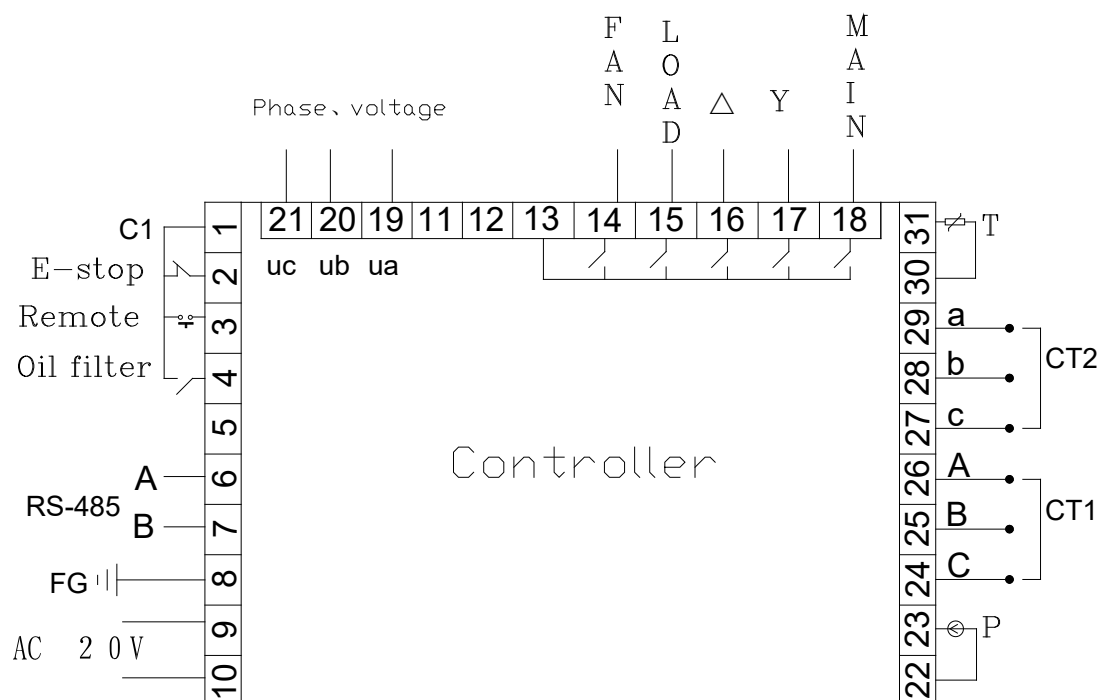


Figure 4.2.1 Terminal arrangement diagram

Terminal blocks of controller:

1 is common terminal COM1; 2 is input terminal for emergent stop signal; 3 is remotely controlled on/off signal input terminal; 4 terminal is used to detect oil filter blocked; 6 is RS485 A; 7 is RS485 B; 8 is the simulated ground (Earth); 17 and 18 are the AC20V power source; 22、23 terminals are Pressure Sensor signal input; 24、25、26 terminals are motor mutual inductor CT1 input; 27、28、29 terminals are Fan mutual inductor CT2 input; 30、31 terminals are Temperature Sensor signal input; 19、20、21 terminals Used to detect the phase sequence and voltage; 13 terminals is common terminal of output relay; 14 terminals controls fan; 15 terminals controls load valve; 16 terminals controls angle-shaped contactor; 17 terminals controls star-shaped contactor; 18 terminals controls main contactor.

**NOTE: Electromagnetism coil shall be connected with surge absorber during wiring, and dotted lines are extendable functions.**

### 5. Control principles

#### 1. Local Automatic control

①. Press down start button for starting: (Y-Δstart)

There is five seconds of self-test after controller is energized and it can not be started by pressing start

button .The air compressor starts by pressing start button after self-test finished. The course of compressor's start as followed: KM3 and KM2 are energized → Y-type status of start → delay time is reached (Y-Δchange-over time); KM3 is de-energized (KM1 and KM3 are interlocked) and KM1 is energized → motor operates with Δ type to finish start. During the course of starting, all electromagnetism valves are de-energized to achieve no load start.

②. Automatic operation control:

When the motor is started to running in Δ status and load the magnetic valve with power applied after a certain period of delay. Air compressor is loaded and pressure inside gas tank begins to increase. When increased air pressure is more than higher pressures limit (value of unload pressure), electromagnetism valve for loading is de-energized and electromagnetism valve for discharging is energized, meanwhile, the air compressor operates without load. If air pressure decreases to set lower pressure limits (value of load pressure), the electromagnetism valve for loading is energized again and electromagnetism valve for discharging is de-energized. Air compressor operates normally to increase pressure in air tank. If the unload run time exceeds the set delay time of non-load, the compressor will automatically stop motor's operation to achieve automatic shutdown after works without load for long time. Only when pressure decreases to lower pressure limits, the motor start operation according to course of starting, then circularly repeat this step.

③. Manual loading/unloading under automatic status

When compressor in automatically runs state and runs at unload operation, press down load or unloading button, the electromagnetism valve for loading joggles a little and comes back to unloading status; if the pressure is less than relief pressure, the electromagnetism valve for loading is energized and it returns to unloading status until gas supply pressure becomes larger than relief pressure and device is at loading status. Unloading is performed when press down unloading button “S”. If the pressure is higher than loading pressure, the electromagnetism valve for loading is de-energized and turns to status of loading until gas supply pressure is less than loading pressure. If pressure is less than loading pressure, the unloading button do not function.

④. Normal shutdown:

Press the button , the load magnetic valve will loss power and the unload magnetic will be applied with power, after a while of delay (stop delay), the motor contactor will loss power, the host and fan will stop running, after the restarting delay completed, the unload magnetic will loss power. Only pressing the button could restart the motor.

⑤. Control of preventing frequent starting

Press stop button to stop operation; Air compressor can not be started up immediately after shutdown due to operation without load for long time or failure shutdowns, and it can be started up again when remaining delay time is zero which the time display window of the controller in a variety of shutdown state shows.

## 2. Remote automatic control

Remote automatic control and local automatic control are basically same, but the difference is that starting up or stopping of devices can be achieved by means of control of remote switch.

## 3. Local manual control

Control of starting and stopping are same as automatic control, but device is in status of

unloading operation after finish starting up and loading is carried out by pressing down loading and unloading button to load. When gas supply pressure is more than relief pressure, the device unloads automatically. If doesn't press loading, unloading button, the device will operate with unloading until stops without load. During unloading, press loading and unloading button to load. During loading, press loading and unloading button to unload.

#### **4. Remote Manual Control**

The remote automatic control is almost the same as the local manual control, the only difference is that the start and stop of the unit is controlled by remote control.

#### **5. Network control**

- ①: When communication method is set "computer", network control between computer and controllers can be achieved
- ②: When communication method is set "interlocking", network control between controllers can be achieved, but the main air compressor only can service as 1# compressor.

#### **6. Temperature control of fan**

When exhausting temperature is higher than fan's starting temperature, fan operates; when exhausting temperature is lower than fan's stopping temperature, fan stops operation.

#### **7. Failure shutdown and emergency shutdown**

When electrical failure or high exhausting temperature appears during process of operation, the controller stops motor's operation immediately. Air compressor only can be started up after failure is eliminated. In case of emergency, press down emergency stop button to cut off power of controller and contactors

### **6. Early-warning and prompts**

#### **1. Indication of early warning of oil filter**

- ①. Early warning for blockage of oil filter

The controller can display the message on the text display to remind the operator that "the air filter is blocked" by checking the pressure difference switch operating state.

- ②. Set the running time alarm of the air filter

The Text displays "OIL FILTER LIFE END" when the using time of the oil filter terminates.

#### **2. Indication of early warning for air filter**

The Text displays "AIR FILTER LIFE END" when the using time of the oil filter terminates.

#### **3. Indication of early warning for oil separator**

The Text displays "O/A LIFE END" when the using time of the oil separator terminates.

## 4. Indication of early warning for lubricating oil

The Text displays “**LUBE LIFE END**” when the using time of the lube terminates.

## 5. Indication of early warning for grease

The Text displays “**GREASE LIFE END**” when the using time of the grease terminates.

## 6. Indication of early warning for belt

The Text displays “**BELT LIFE END**” when the using time of the belt terminates.

## 7. High air temperature warning

Controller detects the air temperature high, the text display “**HIGH TEMPERATURE**”

# 7. Controller protection

## 1. Motor protection

MAM-870 air compressor controller provides all-round protection functions of short-circuit, locking, phase failure, overload, imbalance for motor.

Electronic failure	Failure Display	Reason
Short circuit	Display failure “HOST/FAN SHORT”	Short circuit or rated current is set by mistake
Blocked	Display failure “HOST/FAN BLOCK”	Too large load, bearing wear and other mechanical failure
Overload	Display failure “HOST/FAN OVER CARRY”	Too large load, bearing wear and other mechanical failure
Phase failure	Display failure “HOST/FAN LACK PHASE”	Power supply, contactor and phase failure of motor
Unbalance	Display failure “HOST/FAN UNBLANCE”	Poor contact of contactor, inside open-loop of motor

## 2. Gas Exhaust Over-temperature Protection

When the Air exhaust temperature is higher than the upper limit of set temperature, the controller would be stopped, the display will show “**HIGHT T**”.

## 3. Non-reversing Protection of Air Compressor

When three-phase supply phase sequence connected to the air compressor is not the same with that set for the controller, the on-site failure is displayed as “**PHASE REVERSAL**”, as a result, the controller cannot start up the motor. Then just change any arbitrary two-phase power lines leading to check the rotation of motor.

## 4. Overpressure Protection of Pressure Supply

When the gas exhaust pressure is higher than the upper limit of set pressure, the controller would be stopped for warning, the on-site failure is displayed as “**HIGH P**”.

## 5. Malfunction Protection of Sensor

When pressure sensor or temperature sensor is disconnected, the controller would be stopped for warning. The on-site failure is displayed as “**\*\*\*SENSOR FAULT**”.

## 8. Removal of Common Failures

### 1. Failures Review

When a fault occurs, the controller in the main interface displays the current fault content. For example, when the pressure sensor failure, it displays the following interface:

STOP:  
P SENSOR FAULT

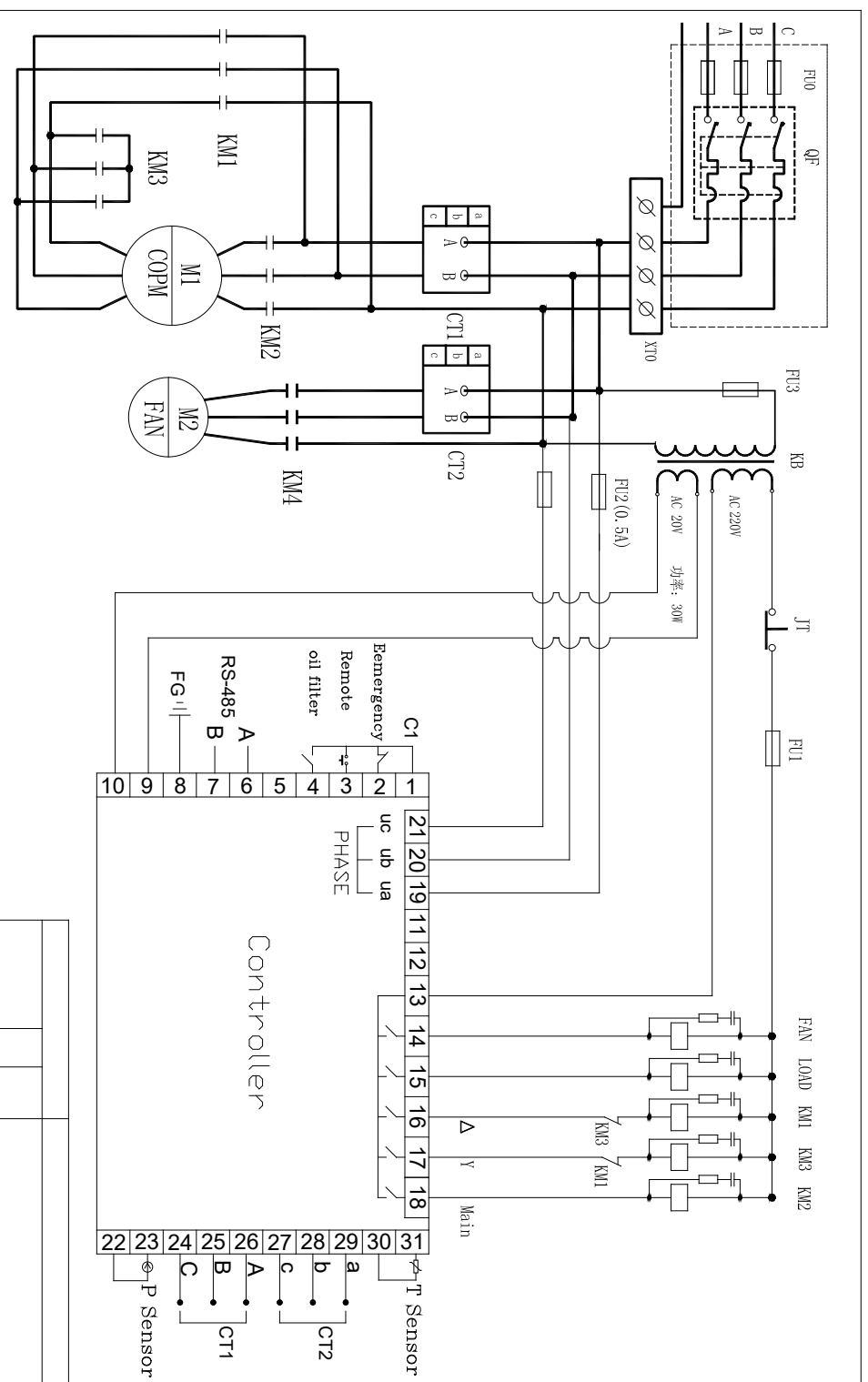
### 2. Common Failures and Causes

Failure	Reason	Disposal method
Air Exhaust Temperature too high	Bad vent condition, Oil lacking etc.	Check the vent condition and lubricant amount etc.
Temperature Sensor Failure	Cable off or PT100 damaged	Checking the wiring and PT100
Over Pressure	The pressure too high or the pressure sensor failure	Check the pressure and the pressure sensor
Pressure Sensor Failure	Cable off, Sensor damaged or the cable connected reversed	Check the wiring and sensor transformer
Lack Phase	Power phase lacking or the Contactor terminal damaged	Check the power and contactors
Overloaded	Voltage too low, tubes blocked, Bearing Wear off or other mechanical failure or wrong set data etc.	Check the set data, Voltage, bearings, tubes and other mechanical system.
Unbalance	Power unbalance, Contactor damaged or the internal open of the motor	Check the power, contactors and the motor
Rotor Lock	Voltage too low, tubes blocked, Bearing Wear off or other mechanical failure or wrong set data etc.	Check the set data, Voltage, bearings, tubes and other mechanical system.
Short Circuit	Wrong Wiring, Incorrect Data setting etc.	Checking the wiring and set the data correctly
Wrong Phase Sequence	Reversed Phase sequence or phase off	Check the wiring
Overload or Rotor locking during starting process	Host start time set to a valueless than the star angel time delay	Reset the host starting time to be longer than star angel delay + Load delay time

Main Contactor activate time to time	The emergency button loose	Check the wiring
Air Exhaust Temperature too high	Bad vent condition, Oil lacking etc.	Check the vent condition and lubricant amount etc.
Temperature Sensor Failure	Cable off or PT100 damaged	Checking the wiring and PT100
Over Pressure	The pressure too high or the pressure sensor failure	Check the pressure and the pressure sensor



## 9. Electrical diagram



## Air Dryer

### Notice item

- A place shall not to be installed.
- A place where the storm directly hit and moisture
- A place where dusty and corrosive gas
- A place a poorly ventilated or confined space
- A place where with shake and leaning
- A place where there is heat near the input wind
- A place where narrow and no maintenance and operations

The temperature should be below 38°C

#### (B) Installation

A horizontal position does not special installation of foundation

The power distribution should be according to the power、 voltage、 frequency on the nameplate

Install a separate power control switch

When two machines put together, it should be keep their distance, it must be to avoid the hot exhaust of a machine is another inhalation

#### (C) Stop and run

Stop running the machine, and then start running at least 3-5 minutes later

Low load or low temperature, the machine will stop and run interval. It is normal

### Air-cooled (MID -TEMP) air dryer flow diagram

- Exit and entrance
- Refrigerant pressure meter
- Evaporator
- Water separator
- Expansion valve
- Refrigerant filter
- Bypass valve
- Pressure controller
- Drainage
- Refrigerant compressor
- Condenser fan
- Condenser

### Air-cooled (MID -TEMP) air dryer type and technical data

Type, Air volume, Use condition

Entrance temp.  $\leq 45^{\circ}\text{C}$

B condition temp.  $38^{\circ}\text{C}$

Work pressure 0.3-1.0MPa (over pressure, accept custom)

Refrigerant

Other, accept custom

Motor power  
Power source  
Input/output dia  
Measurement  
Weight

## **The fault and exclude way of the dryer**

### **Cannot start**

Check the power supply voltage is normal or not; refrigerant pressure is normal or not (normal is stop state 5-12kg); 220V/12V transformer, 12V is normal or not; the start and stop button on the panel is normal or not, AC contactor coil of contact point is normal or not; the pressure switch, thermal relay is reset or not, the above fault is AC contactor can not pull

### **The AC contactor can pull but can not start and run**

Check the compressor connection line, the contact of wiring plug is normal or not, capacitor is damaged or decreased capacity, the overload protector is damaged or not; compressor coil is open or short circuit Above shall confirm the damaged parts and replace with the new parts

### **Can start but stop a little late**

Low pressure fault: not enough refrigerant, check the leak point, after confirm the leak point and repair it and then reevacuated and filling the refrigerant

High pressure fault, too dust on the condenser, or the condition temperature is too high, it should wash the condenser and improve the ventilation condition

### **The gas is reduced or not by the compressed air**

Ice block or too much dust, the reason of ice block: the load is reduced, the pressure controller to be failure. Remedy is to readjust the temperature controller or pressure switch., the method is: start, watching the pressure meter gauge, when reach 4 kg, the machine should be stopped, watch several times. If can not be adjusted. It should be replaced the dust should be cleaned.

Not cooling (the drainage has a long time without water discharge) but can hear the compressor running sound. Owing to the damage to the compressor valve plate, it should replace the compressor, it is not compress the refrigerant (the refrigerant pressure gauge pointer does not move)

### **The head frost**

Remedy should accord to the article 3 ice block fault (adjust the fan control switch)

### **Fault exclude**

The fault of air dryer and external factors, the way of fault exclude is as following  
The air pressure to be reduced too much

Feature	Reason	Fault Exclude
The pressure is too large between the operate condition and the press	The pipe valve is closed	Open the valve
	The small of pipe dia.	Enlarge the pipe dia.
	The pipe is too long, elbow, connector are too much	Redesign the pipe system
	The leaking in connector	Check and repair
	The filter is blocked	Replace the filter
Not enough air capacity	The using capacity is over the rate of air compressor	Replace the bigger rate air compressor
Evaporator iced	Pressure switch fault	Adjust the pressure or replace the switch
	The expansion valve blocked	Replace the expansion valve

#### Poor water removal

feature	reason	fault exclude
Site water	The bypass valve not closed tightly	Closed the bypass valve tightly
	The air is not through the air dryer	Open the dryer exit and entrance valve
	Air flowing and pressure too much	Replace the mach air dryer
	Drainage poor	Clean or replace
	The drain pipe is higher the auto-drainage	Redesign the pipe
	The air compressor is not mach the air dryer	Redesign the cleaning system
The evaporated high temperature indicate abnormal	The evaporated temperature too high	Check the air compressor air load
	The pollution air or poor ventilation	Select the position or improve the ventilation
	The expansion valve blocked	Replace the valve
	The refrigerant leaking	Check the leaking point and filling the refrigerant
	The meter damaged	Replace the meter

Feature	Reason	Fault Exclude
No power source	Fuse broken or fuse switch tripped	Confirm the power source leak of phase ,short circuit or not
		Check the fuse or closed the fuse switch
	Wire broken	Check the wire , repair
Power source normal but can not start	Power source abnormal or the dia. of wire too small	Select according to the rate voltage on the nameplate
	Switch poor	Replace the switch
	Connector poor	Replace connector
	Overload relay poor	Replace overload relay
	Capacitor poor	Replace capacitor
	Start relay poor	Replace start relay
	High-low pressure switch poor	Replace high-low pressure switch
	Temperature switch poor	Replace temperature switch
Switch normal but cannot start	Compressor poor	Replace compressor
	High-low voltage switch tip no reversion	Check and reset
	Electromagnetic no reversion	Check and reset
	High temperature no reversion	Check and reset
	Temperature setting poor errors	Reset or replace the switch
	Compressor poor	Replace compressor

Feature	Reason	Fault Exclude
Evaporated temperature indicate too low	Evaporate temperature meter poor	Replace the evaporator temperature meter
	Expansion valve blocked	Replace expansion valve
	Temp. switch or pressure switch setting too low	Adjust and reset
	Refrigerant leaking	Check the leaking point and filling the refrigerant
Evaporated temperature indicate too high	Condition temp. too high	Select the position and improve the ventilation
	Hot air bypass valve fault	Adjust or replace the bypass valve
	Condenser blocked	Clean
	Too air capacity	Redesign
	The compressor valve plate poor	Replace the compressor

**Poor after start**

Feature	Reason	Fault Exclude
High voltage tripped ,reversion but can not start	Shortly after start, wire short circuit ,charred taste	Chain control wire and switch reconfiguration
	Pressure switch poor	Replace pressure switch
	Fan poor	Replace fan
	Overload tripped	Find reason and check relay
	Condenser dusted	Clean
	Too much refrigerant	Reduction in refrigerant
	Too high position temp	Select the position and improve the ventilation
	Expansion valve blocked	Replace expansion valve
	Dry filter blocked	Replace dry filter
Overload relay tripped	Start relay poor	Replace start relay
	Capacitor poor	Replace capacitor
	Pressure switch poor	Replace pressure switch
	Compressor overload	Reduce the air capacity or replace the right dryer
	Too high temperature of position	Select the position and improve the ventilation
	Too low of relay current	adjust
	Relay connect poor	Adjust or replace
	Phase lack	Check the reason
	Connector poor or connect point poor	Clean or replace connector

**Auto drain system poor**

Feature	Reason	Fault Exclude
Drain poor	The drainage pressure low1.5kg/cm <sup>2</sup>	Use the pressure 2-10 kg/cm <sup>2</sup> drainage
	Drain valve damaged	Replace drain valve
	Drainage lean or damaged	Adjust or replace drain valve
	Drainage filter blocked	Clean or replace drainage filter
	Too high using pressure	Use rate pressure
	Outfall blocked	Clean





# Dryer Controller User Guide

## Technique Index

- Temperature display range: -20~100°C (The resolution is 0.1°C)
- Power supply: 220V±10%
- Temperature sensor: NTC R25=5kΩ,B(25/50)=3470K

## 1. Operating Guide

### 1.1 Meaning of the index lights on the panel

Index light	Name	Light	Flash
	Refrigeration	Refrigerating	Ready to refrigerate, in the state of compressor start delay pro
	Fan	Fanning	-
	Defrost	Defrosting	-
	Alarm	-	Alarm state

### 1.2 Meaning of the LED display

Alarm signal will alternate display temperature and warning code. (A    xx)

To cancel the alarm need recharge the controller. Display code as follow:

Code	Meaning	Explain
A11	External alarm	Alarm from external alarm signal, refer to the internal parameter code "F50"
A21	The dew-point sensor fault	The dew-point sensor broken-line or short circuit (The dew-point temperature display "OPE" or "SHr")
A22	Condensation sensor fault	The condensation broken-line or short circuit (Press "▼" will display "SHr" or "OPE")
A31	The dew-point temperature fault	If alarm occurred in the dew-point temperature higher than the set value, can choose whether closing down or not (F51). The dew-point temperature alarm will not occurred when compressor starts in five minutes.
A32	Condensation temperature fault	If alarm occurred in the condensation temperature higher than the set value, can choose whether closing down or not. (F52)

### 1.3 Temperature display

After power on self-test, the LED display the dew-point temperature value. When press on "▼", it will display the temperature of condenser. Reverse will back to display the dew-point temperature.

### 1.4 Cumulative working hours display

Pressing on the "▲ ▼" at the same time, will display the compressor accumulated operational time.

Unit: hours

### 1.5 Higher level operation

Long press "M" 5 seconds to enter parameter setting condition. If have set the command, will display word "PAS" to hint import the command. Using press "▲ ▼" to import the command. If the code is right,

it will display parameter code. Parameter code as followed table:

Category	Code	Parameter name	Setting range	Factory setting	Unit	Remark
Temperature	F11	dew-point temperature warning point	10 - 45	20	°C	It will warning when the temperature higher than the set value.
	F12	Condensation temperature warning point	42 - 70	65	°C	
	F18	Dew-point sensor amendment	-20.0 – 20.0	0.0	°C	Amend dew-point sensor error
	F19	Condensation sensor amendment	-20.0 – 20.0	0.0	°C	Amend condensation sensor error
Compressor	F21	Sensor delay time	0.0 – 10.0	1.0	Minute	
Fan/ Anti-freezing	F31	Start anti-freezing demand temperature	-5.0 – 10.0	2.0	°C	It will start when dew-point temperature lower than the set value.
	F32	Anti-freezing return difference	1 - 5	2.0	°C	It will stop when dew-point temperature higher than F31+F32.
	F41	The second way the output mode.	OFF 1-3	1	-	OFF: close fan 1. The fan under the control of condensation temperature. 2. Fan worked at the same time with compressor. 3. Anti-freezing output mode.
	F42	Fan start temperature	32 - 55	42	°C	It will start when condensation temperature higher than the set value. It will close when lower than set return difference.
	F43	Fan close temperature return difference.	0.5 – 10.0	2.0	°C	



Alarm	F50	External alarm mode	0 - 4	4	-	0: without external alarm 1 : always open, unlocked 2 : always open, locked 3: always closed, unlocked 4: always closed, locked
	F51	The way of dealing with dew-point temperature alarm.	0 - 1	0	-	0 : Only alarm, not close. 1: Alarm and close.
	F52	The way of dealing with condensation temperature alarm.	0 - 1	1	-	0 : Only alarm, not close. 1: Alarm and close.
System means	F80	Password	OFF 0001 -- 9999	--	-	OFF means no password 0000 System means clearing password
	F83	Switch machine state memory	YES - NO	YES	-	
	F85	Display the compressor accumulated operational time	-	-	Hou r	
	F86	Reset compressor accumulated operational time.	NO - YES	NO	-	NO: not reset YES: reset
	F88	Reserved				
Testing	F98	Reserved				
	F99	Test-self	<b>This function can attract all relays in turn, and please don't use it when the controller is running!</b>			
	End	Exit				

## 2. Basic Operating Principle

### 2.1 Compressor control

After controller powered on, the compressor will delay for a moment to protect itself (F21). The indicator light will flicker at the same time. If checked external input is alarming, the compressor will stop.

### 2.2 Fan control

Fan default under control of condensing temperature. It will open when temperature is higher than (including) set point (F42) , closed when lower than the set point - return difference (F43) . If condensation sensor fails, the fan output along with the compressor.

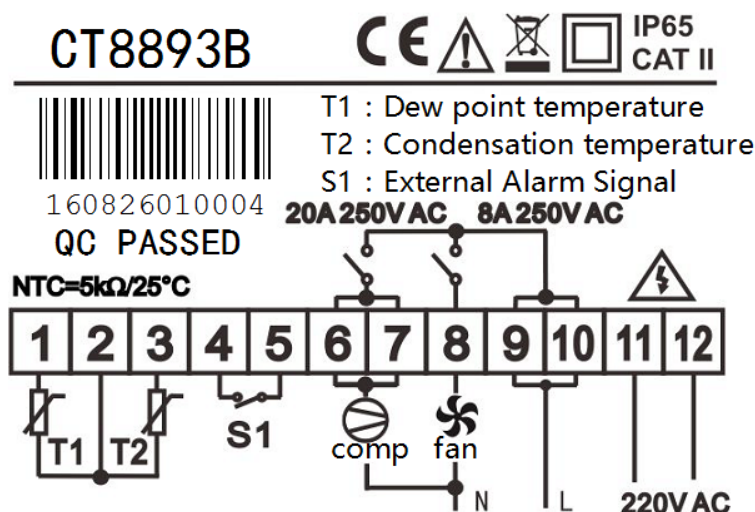
### 2.3 External alarm

When external alarm occurs, stop the compressor and fan. External alarm signal has 5 modes (F50): 0: without external alarm, 1: always open, unlocked, 2: always open, locked; 3: always closed, unlocked; 4: always closed, locked. "Always open" means in normal state, external alarm signal is open, if closed, the controller is alarm; "Always closed" is on the contrary. "Locked" means that when external alarm signal becomes normal, the controller is still in the alarm state, and it needs to press any key to resume.

### 2.4 Command

In order to prevent irrespective persons from changing the parameters, you can set a password (F80), and if you have set a password, the controller will hint you to enter the password after you press the key "M" for 5 seconds, you must enter the correct password, and then you can set the parameters. If you don't need the password, you can set F80 to "0000". Notice that you must remember the password, and if you forget the password, you cannot enter the set state.

## 3. Wiring Diagram



## 4. Notes

- Please use the temperature sensor allocated by our company.
- If compressor power is less than 1.5HP, can direct control by internal relay. Otherwise need to connect ac contactor.
- Fan loaded with no more than 200w.

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