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SAC-600A Air Compressor Controller

Integrated Power/Frequency

User Manual



Savch wechat service number

Shanghai Office

Room 1410-1411,4# Building, Yatai Plaza, Huaqiao international
business city
Tel:021/59275902 Fax:021/59275902

Quanzhou Factory:Quanzhou Sangchuan Electric Equipment Co.,Ltd

3# Zixin Road, Jiangnan Hi-Tech Industrial Park,
Quanzhou, Fujian, China
Tel:+86-0595/24678200 Fax:+86-0595/24678203

Business Hotline

North:+86-0595/2467 8266 +86-0575/8515 3392 +86-010/8085 4440
East:+86-0595/2467 8266 +86-0574/8711 8139 +86-0575/8515 3392
South:+86-0595/2467 8271 +86-0595/2467 8267
International:+86-0595/2467 8249
Fax:+86-0595/2467 8203

Savch Website:www.savch.net

E-mail:kelan@savch.net

Alibaba Website: www.savch.com.cn

Alibaba Store: <http://sanqidq.1688.com>



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SAVCH electric provide a full range of technical support for our customers. All users could contact with the nearest SAVCH office or service center, also could contact with our headquarters directly.

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Quanzhou Factory:

QUANZHOU SANGCHUAN ELECTRIC EQUIPMENT CO., LTD

Address: 3# Zixin Road, Jiangnan Hi-Tech Industrial Park, Quanzhou, Fujian, China

Tel: +86-595-24678200

Fax: +86-595-24678203

Shanghai Office:

SHANGHAI SAVCH ELECTRIC TECHNOLOGY CO., LTD

Room 1410-1411, 4# Building, Yatai square, Huaqiao international Business City

Tel: +86-21-59275902

Fax: +86-21-59275902

Service Hotline: 400-6161-619

Savch Website: www.savch.net

E-mail: kelan@savch.net

Alibaba Website: <https://cnsanch.en.alibaba.com/>

Alibaba Store: <http://sanqidq.1688.com>

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PREFACE

Thank you very much for choosing Savch air compressor controller! This manual includes instructions for operation and maintenance of the Savch air compressor controller.

To full use of the controller function and to ensure the safety of the users, please read the manual carefully. When you find any problems in your use and the manual cannot provide solutions for you, please contact the Savch regional distributor or our business staff, our professional staff will do the best to offer you the service. And please continue to adopt products of SAVCH, give valuable opinion and advice.

1. Reading Instructions

This controller is the power electronic products. For your safety, the mark of “danger”, “caution” and others reminds when in handling, installation, operation, the user should consider those inspects. Please use the controller safely.



Fault using may cause user hurt.



Fault using may cause controller or system damage.

DANGER

- The user is forbidden to wire when power on. The user is forbidden to check circuit board and signal when the controller is operating.
- The user is forbidden to depart, change wiring or replace part by self.

CAUTION

- Do not perform withstand voltage test on the internal components of the controller, so that semiconductor parts are easily damaged by high voltage.
- The CMOS IC on the controller board is susceptible to static electricity and damage. Do not touch the main circuit board.

1. SAFETY INSTRUCTIONS

1.1 Notes for Operation

Before power on

CAUTION

- The selected power supply voltage must be the same as the input voltage specification of the controller.
- Please use the correct phase sequence to access when using the power frequency, otherwise the phase sequence failure will not work.

Installation

DANGER

- Please mount the controller on non-combustible materials such as metal, do not install on or near flammable materials to prevent fire.
- Please confirm the strong and weak terminal labels, do not put strong power on the weak terminals, to prevent damage to the wrong controller.

Running

DANGER

- When running, please confirm whether the direction of the machine head is correct and prevent the head from being damaged.
- Do not remove the cover during the controller's power transmission to prevent injury to personnel.
- The function of the stop switch must be set valid. It is different from the use of the emergency stop switch. Please use it carefully.

Check and maintenance

CAUTION

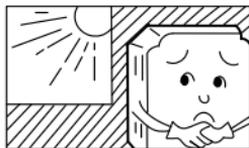
- The temperature around the controller should be used in a non-condensing environment at -10°C to +40°C 90%RH.

Scrapped

 **CAUTION**

- Electrolytic capacitors on printed boards may explode when incinerated, and toxic gases may be generated when plastic parts are burned. Please dispose of as industrial waste.

1.2 Notes for Operation Environment



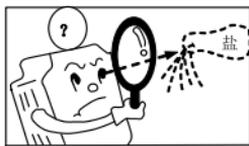
Direct sunlight



Corrosive gas or fluids



Oil



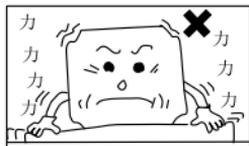
Salt or saline



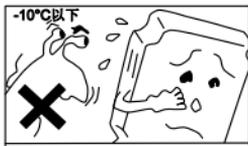
Rain, moisture



Iron chips and dust



Large impelling



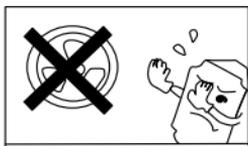
Extreme low temperatures



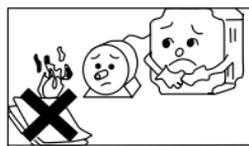
Extreme high ambient temperatures (above 40°C)



Electromagnetic waves and ultra high-angle rays
(For example: locations of welding machines and etc.)



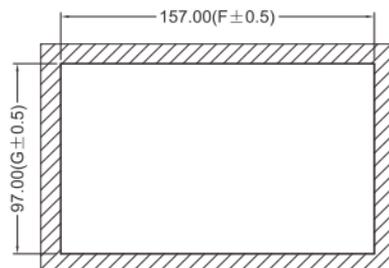
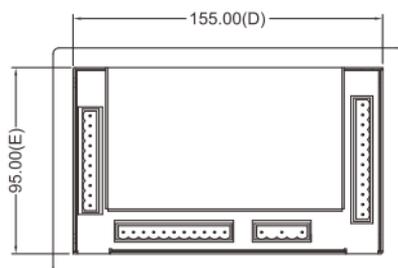
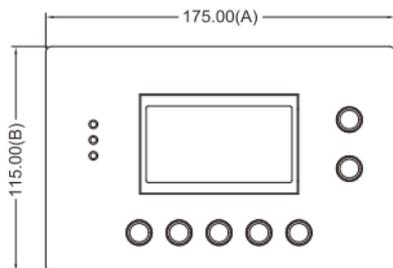
Radioactive materials



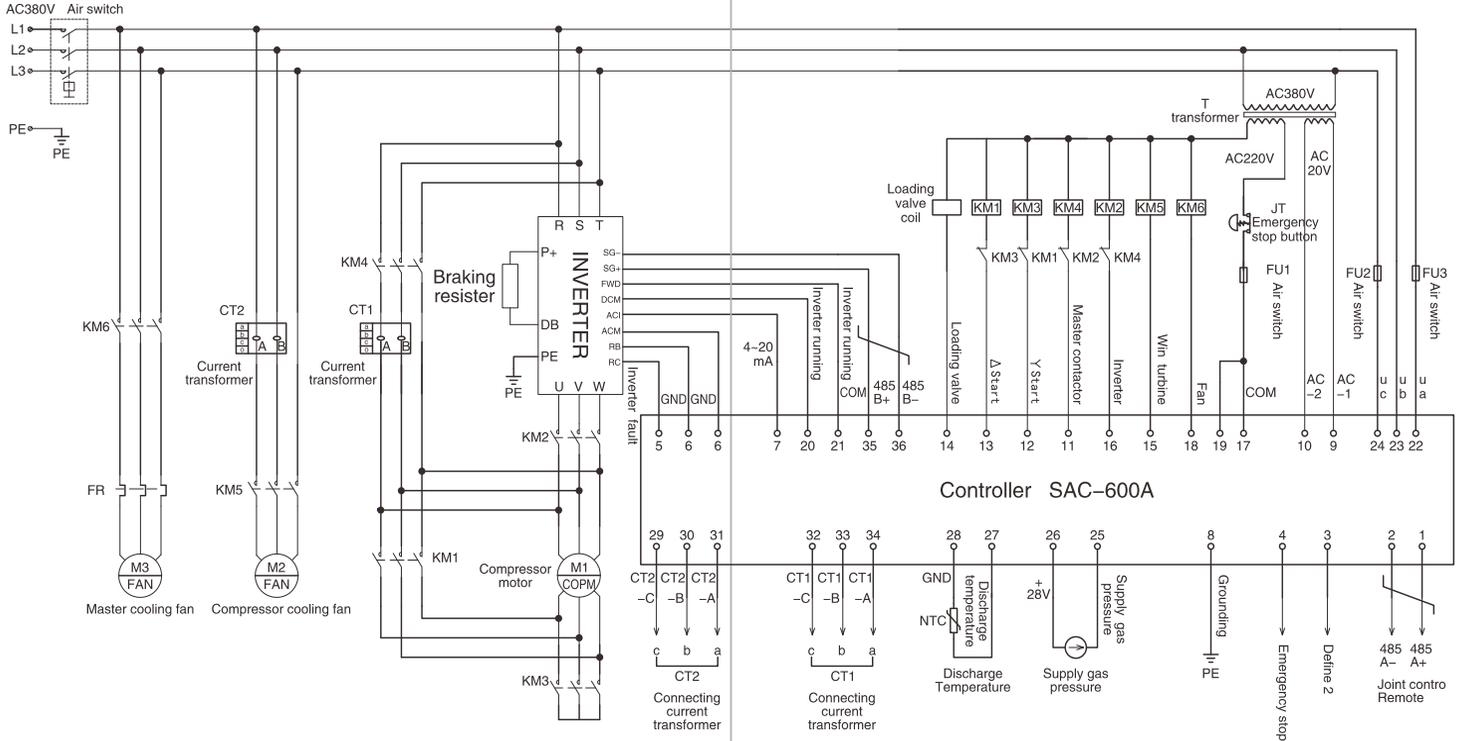
Locations of inflammable materials

2. ELECTRICAL DIMENSION DIAGRAM

2.1 External and Installation Dimension Diagram



2.2 Wiring Diagram



3. BASIC OPERATION

3.1 Key Operation



-  Run: When the air compressor is under standby mode, press this button to run the air compressor.
-  Stop: When the air compressor is in the running state, press this button to stop operation.
-  Menu/confirmation/ data modify/Jog:
On the main interface, press this button to enter the menu interface.
On the menu interface, press this button to enter the specified submenu interface.
On the parameter interface, after obtaining the relevant permission, press this button to modify parameter.
On parameter modification interface, press this button to change the confirmation.
After obtaining the relevant permission, in the debugging interface, this button has jog function.
-  Down/decline: Press this button to scroll down the scroll bar in the menu interface.
In the parameter modification interface this button is used to specify declination.

 Up/incline: Press this button to move up the scroll bar on the menu interface. In the parameter modification interface, this key is used to specify incline.

 Manual load (unload) /move: The key is used to manual load (unload) under the operation interface. The key is used to move under the parameter modification interface.

 Back/cancel/reset:
On the menu interface, press this button to back to the previous menu.
In the parameter modification interface, press this button to cancel the parameter modification.
On the operating interface, long press this button to reset the fault.

3.2 Indicator Light

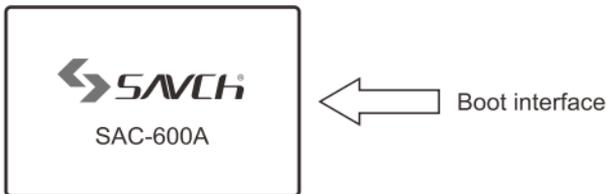
POWER: When the controller is on power, the light is on.

RUN: When the controller enters the running state, the light is on.

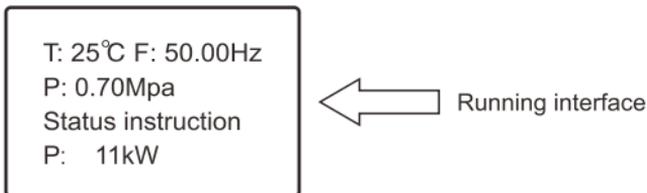
ALARM: When the controller is out of order, the light is on.

3.3 Status Display and Operation

When the controller is power on, the status display as below:



After 2s delay, enter the running interface:



Frequency conversion mode

T: 25°C power freq. mode
P: 0.70Mpa
Status instruction
P: 11kW

← Running interface

Power frequency mode

Press the "SET" to enter menu interface:

Status report
Measured PARM.
PARM. Setting
MAINT. Data
Failure Record
Equipment test

← Level one menu

Press "SET" to enter relevant submenu:

Status report

Factory date
ACCUM. Run Time
Current Run Time



Measured parameter

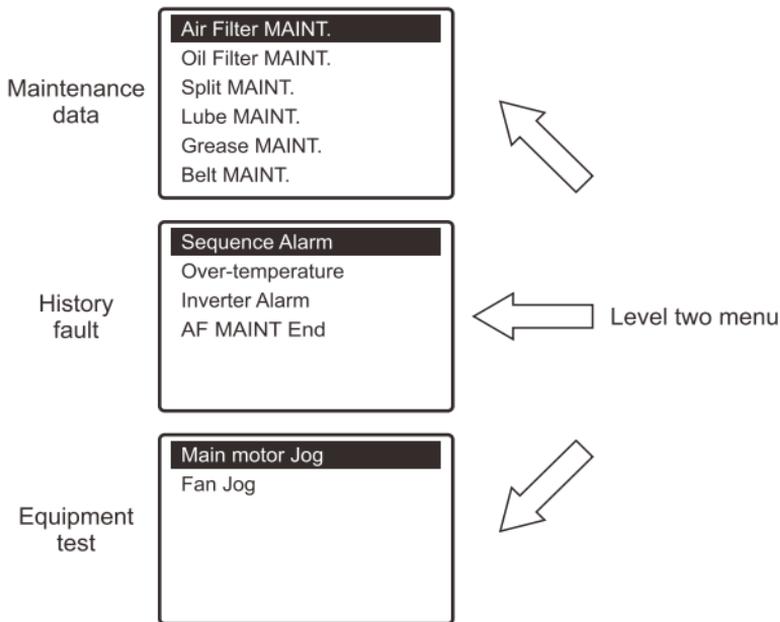
Phase sequence
M.Motor Current
Fan Current
I.Signal Status
O.Signal Status

← Level two menu

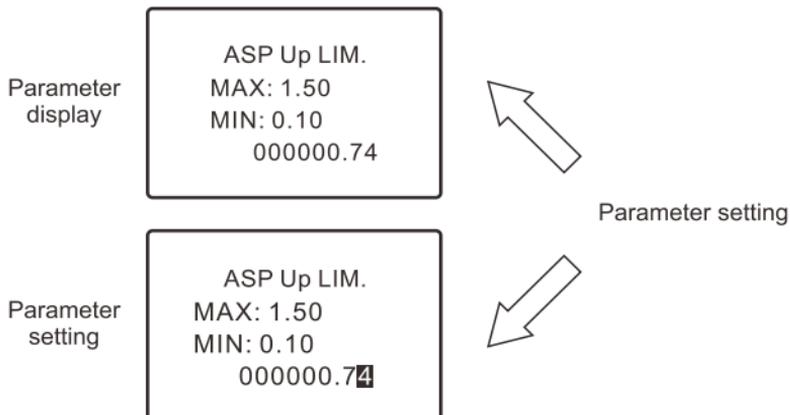
Parameter setting

User password
Vendor Password
Super password
Exit PWD. Login
User setting





3.4 Parameter Setting



3.5 Passwords Operation

Before entering correct passwords, the interface is as below:

Enter U.PWD
MAX: 999999
MIN: 0
00000000

After entering correcting passwords, the interface is as below:

Reset U.PWD
MAX: 999999
MIN: 0
00000000

If the permission needs to be removed, the user can enter the interface as below:

Exit PWD. Login
Long press
SET+▲ then exist

4. FUNCTION PARAMETER LIST

Note: Modify the parameters of the corresponding rights need to correctly log in the corresponding password, otherwise the permission parameters can only be viewed.

After the password is entered correctly, there is no key operation for 5 minutes and the password authority is quit.

Parameter	Default	Range	Function	Permission	Remark
User passwords	0	0~999999	Enter the correct password to get the appropriate permissions.	--	↗
Manufacturer passwords	0	0~999999	Enter the correct password to get the appropriate permissions.	--	↗
Super passwords	--	--	--	--	↗
Exit PWD. Login(Exist passwords login)	--	--	--	--	↗

User setting		↗ Set during running available			
Parameter	Default	Range	Function	Permission	Remark
ASP Setting (Air supply pressure setting)	0.70Mpa	0.10Mpa to upper limit	Set the air supply pressure when the variable frequency air compressor operates stably. When the pressure fluctuates near this pressure, the controller adjusts the frequency converter's operating frequency so that the air supply pressure approaches the set value.	User/manufacturer	↗
ASP Up LIM.(Upper limit of air supply pressure)	0.74Mpa	0.10Mpa to upper limit	After boot the controller, if the pressure is greater than seted value, the controller will control the air compressor to unload.	User/manufacturer	↗

User setting		↗ Set during running available			
Parameter	Default	Range	Function	Permission	Re-mark
ASP Low LIM. (Down limit of air supply pressure)	0.60Mpa	0.10Mpa to upper limit	When the air compressor is in automatic operation, is in the unloaded running state and the detected pressure is lower than the set value, the air compressor is automatically controlled to be loaded and operated. If the air compressor is at dormancy downtime, it detects that the pressure is lower than the set value, the controller controls the air compressor to start.	User/manufacturer	↗
Sleep judge time	180s	0~6000s	Running under the down limit after the dormant judge time, it enters dormant.	User/manufacturer	↗
MM Freq Up LIM. (Frequency converting upper limit of main engine)	50.00Hz	Frequency converting down limit of main engine~50.00Hz	In operation, the maximum operating frequency of the host.	User/manufacturer	↗
MM Freq Low LIM. (Frequency converting down limit of main engine)	5.00Hz	4.00~frequency converting upper limit of main engine	In operation, the minimum operating frequency of the host.	User/manufacturer	↗
Rev. Fan TEMP (Temperature of starting fan)	85℃	Temperature of stopping fan ~150℃	Frequency conversion control mode, fan startup temperature.	User/manufacturer	↗
Stop Fan TEMP (Temperature of stopping fan)	80℃	0℃~temperature of starting fan	Frequency conversion control mode, fan stop temperature.	User/manufacturer	↗

User setting						↗ Set during running available	
Parameter	Default	Range	Function	Permission	Re-mark		
Loading Delay	10s	1s~600s	After the air compressor is started, delay the set time here and load it.	User/manufacturer			
STOP Setup Time	60s	1s~360s	When it need the time to ready stopping before stop.	User/manufacturer			
Min. STOP Time (Shortest stopping time)	120s	1s~2000s	After stop, it need extending the shortest stopping time then boot again.	User/manufacturer			

Manufacturer setting						↗ Set during running available	
Parameter	Default	Range	Function	Permission	Re-mark		
Custom Input 1	0	0~10	Define input signal	Manufacturer			
Custom Input 2	0	0~10	Define input signal	Manufacturer			
Kp	2.00	1.00~20.00	The PID ratio value under the variable frequency control mode.	Manufacturer			↗
Ki	1.2s	0.1s~20.0s	The PID ratio value under the variable frequency control mode.	Manufacturer			↗
Conversion OPT.(Power frequency or variable frequency mode selection)	0	0~1	0 - Power frequency 1 - Variable frequency	User/manufacturer			
Inverter type	0	0~1	S2800/S5100 select	Manufacturer			

Manufacturer setting			↗ Set during running available		
Parameter	Default	Range	Function	Permission	Re-mark
ACCE. Time (Accelerat- ion time)	10.0s	1.0s~ 500.0s	Setting the acceleration time of variable frequency	Manufac- turer	
DECE. Time (Decelera- tion time)	10.0s	1.0s~ 500.0s	Setting the acceleration time of variable frequency	Manufac- turer	
Max. Frequency	50.00Hz	0.01Hz~ 100.00Hz	The permitted output max working frequency when air compressor is loading	Manufac- turer	
Min. Frequency	10.00Hz	0.01Hz~ 20.00Hz	The permitted output mini working frequency when air compressor is loading	Manufac- turer	
Motor power	7.5kW	5.5kW~ 1000.0kW	Main motor power	Manufac- turer	
Motor Rat- ed RPM (Motor rate rotate speed)	1440rpm	1rpm~ 9999rpm	Main motor rate rotate speed	Manufac- turer	
Motor Rat- ed CUR (Motor rated circuit)	15.0A	0.00A~ 655.00A	Main motor rated circuit	Manufac- turer	
Motor Rat- ed Freq (Motor rated frequency)	1.00Hz	0Hz~ 500.00Hz	Unloading motor circuit	Manufac- turer	
Star STRT. Time(Star booting time)	1.0s	0s~10.0s	It is converting time of wiring when start the power frequency of big power	Manufac- turer	

Manufacturer setting			↗ Set during running available		
Parameter	Default	Range	Function	Permission	Re-mark
Fan Rated CUR.(Fan rate circuit)	3.0A	1.00A~20.00A	After the start-up delay, when the motor current is greater than 1.2 times the set value and 4 times or less, it will delay the trip according to the overload characteristics.	Manufacturer	
OL.Check Delay (Delay of overload detection)	1.0s	0s~10.0s	Delay of fan circuit detection	Manufacturer	
OL.Protection(Overload protection)	1.2	1.2~5.0	Times protection of circuit overload	Manufacturer	
EXH EW TEMP. (Exhaust pre-warming temperature)	105℃	80℃~115℃	When the actual exhaust temperature is higher than set temperature, the warming works.	Manufacturer	
EXH STOP TEMP (Exhaust stopping temperature)	110℃	80℃~120℃	When the actual exhaust temperature is higher than this set temperature, alarm shutdown.	Manufacturer	
AS STOP Pressure (Stopping pressure of supplying air)	1.00mpa	0.50mpa~1.30mpa	When actual pressure of air supplying is higher than set pressure, the compressor stops.	Manufacturer	
M/C Press Up LIM (Upper limit of machine pressure)	0.88mpa	~1.50mpa	In the user parameter, the upper limit of the supply pressure can only be ≤ this setting value.	Manufacturer	
Factory Reset	—	—	Reset the factory parameter	User/manufacturer	

Manufacturer setting					↗ Set during running available
Parameter	Default	Range	Function	Permission	Re-mark
Language Option	0	0~1	Chinese and english convert	Manufacturer	
HST Alarm CLEAR (History fault clearance)	—	—	Clean the history fault	User/manufacturer	

Maintenance setting					↗ Set during running available
Parameter	Default	Range	Function	Permission	Re-mark
Air Filter MAINT. (Air filter maintenance)	2000h	100h~9999h	The longest time of using air filter	User/manufacturer	
Oil Filter MAINT. (Oil filter maintenance)	2000h	100h~9999h	The longest time of using air filter	User/manufacturer	
Split MAINT. (Segregator maintenance)	2000h	100h~9999h	The longest time of segregator maintenance	User/manufacturer	
Lube MAINT. (Lube maintenance)	2000h	100h~9999h	The longest time of lube maintenance	User/manufacturer	
Grease MAINT. (Grease maintenance)	2000h	100h~9999h	The longest time of grease maintenance	User/manufacturer	
Belt MAINT. (Belt maintenance)	2000h	100h~9999h	The longest time of belt	User/manufacturer	

Transformer setting					↗ Set during running available
Parameter	Default	Range	Function	Permission	Re-mark
M.M CTA Ratio (Host CTA turns ratio)	1000	1~9999	When calibrating the current, enter the coefficient. Controller display current value = sampling value × coefficient.	Manufacturer	
M.M CTB Ratio (Host CTB turns ratio)	1000	1~9999	When calibrating the current, enter the coefficient. Controller display current value = sampling value × coefficient.	Manufacturer	
M.M CTC Ratio (Host CTC turns ratio)	1000	1~9999	When calibrating the current, enter the coefficient. Controller display current value = sampling value × coefficient.	Manufacturer	
Fan CTA Ratio (Fan CTA turns ratio)	1000	1~9999	When calibrating the current, enter the coefficient. Controller display current value = sampling value × coefficient.	Manufacturer	
Fan CTB Ratio (Fan CTB turns ratio)	1000	1~9999	When calibrating the current, enter the coefficient. Controller display current value = sampling value × coefficient.	Manufacturer	
Fan CTC Ratio (Fan CTC turns ratio)	1000	1~9999	When calibrating the current, enter the coefficient. Controller display current value = sampling value × coefficient.	Manufacturer	

Factory information					↗ Set during running available
Parameter	Default	Range	Function	Permission	Re-mark
Model Logo	0	0~99999999	Factory identification	Manufacturer	
Factory Date	0	0~99999999	Factory date	Manufacturer	
Factory No.	0	0~99999999	Factory code	Manufacturer	

5. FAULT DESCRIPTION AND COUNTERMEASURE

5.1 Early Warning

Name	Reason	Solution
Air filter warning	The cumulative use time of the air filter reaches 90% of the set maintenance time.	Replace with the new air filter and enter the maintenance information to clear the cumulative use time.
Oil filter warning	The cumulative use time of the oil filter reaches 90% of the set maintenance time.	Replace with the new oil filter and enter the maintenance information to clear the cumulative use time.
Separator warning	The cumulative use time of the separator reaches 90% of the set maintenance time.	Replace with the new separator and enter the maintenance information to clear the cumulative use time.
Lubricant warning	The lubricating oil which was added last time, is up to 90% of the set maintenance time.	Add lubricating oil and enter the maintenance information to clear the cumulative use time.
Grease warning	After the last addition of grease, the use time reaches 90% of the set maintenance time.	Add grease and enter the maintenance information to clear the cumulative use time.
Belt warning	The cumulative use time of the belt reaches 90% of the set maintenance time.	Replace with the new belt and enter the maintenance information to clear the cumulative use time.
External warning	External alerts for custom input are valid.	Confirm the relevant protection detected by the external warning and exclude it.
Exhaust temperature warning	The exhaust temperature reaches the exhaust warning temperature setting.	Increase cooling heat treatment.

5.2 Alarm

Name	Reason	Solution
Sequence Alarm	Check if phase is missing or not.	Enter the correct three-phase power.
	Check if the phase sequence is correct or not.	Reverse any two phases in the input power supply.
Air Filter Alarm	User-defined Air filter fault is effective.	Confirm the related protection detected by air filter failure and remove it.
Oil Filter Alarm	User-defined Oil filter fault is effective.	Confirm the related protection detected by the oil filter fault and remove it.
Separator Alarm	User-defined Splitter fault is effective.	Confirm the related protection detected by the Splitter fault and remove it.
Inverter Alarm	External Inverter fault is effective.	Check the inverter fault prompts and follow the inverter instructions for troubleshooting.
Over-temperature	Exhaust temperature reaches alarm temperature setting.	Stop or increase cooling and heat treatment.
Air filter maintenance expires	The cumulative use time of the air filter reaches the set maintenance time.	Replace with the new air filter and enter the maintenance information to clear the cumulative use time.
Oil filter maintenance expires	The cumulative use time of the oil filter reaches the set maintenance time.	Replace with the new oil filter and enter the maintenance information to clear the cumulative use time.
Splitter maintenance expires	The cumulative use time of the separator reaches the set maintenance time.	Replace with the new separator and enter the maintenance information to clear the cumulative use time.
Lubricant maintenance expires	The cumulative use time of the lubricating oil has reached the set maintenance time after added lubricating last time.	Add lubricating oil, and enter the maintenance information to clear the cumulative use time.
Grease maintenance expires	The cumulative use time of the grease has reached the set maintenance time after added grease last time.	Add Grease, and enter the maintenance information to clear the cumulative use time.

Name	Reason	Solution
Belt maintenance expired	The accumulated belt usage time reaches the set maintenance time.	Replace with the new belt and enter the maintenance information to clear the cumulative use time.
Fan overload	The operating current of the fan exceeds the overload current for a certain period of time.	Check if the fan motor is blocked or there is no foreign matter on the blade.
Supply pressure is too high	Gas cylinder pressure reaches limit	Stop to deflating
Temperature sensor fault	Temperature sensor is not connected, broken, damaged.	Correctly connect or update new sensors.
Pressure sensor fault	Pressure sensor is not connected, broken, damaged.	Correctly connect or update new sensors.
Host overload fault	The operating current of the host exceeds the overload current for a certain period of time.	The host is blocked or the host selection is too small.
External Error	User-defined external fault	Confirm the related protection detected by air filter fault and remove it.
Emergency Stop	User-defined Emergency stop	Only when the safety is confirmed, can the emergency stop be lifted.