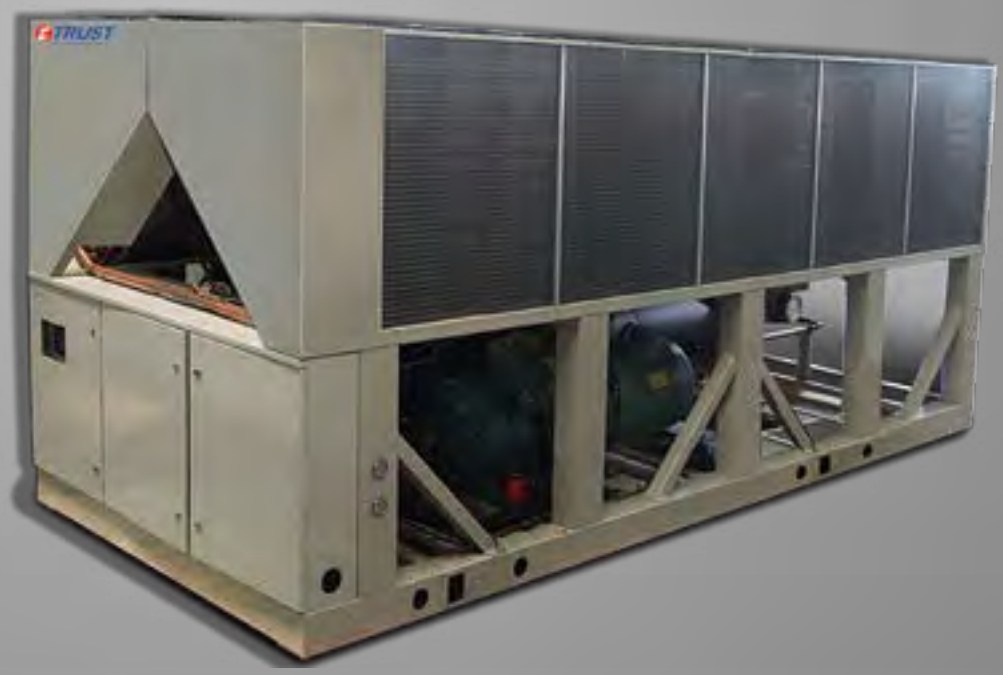
TRUST
Air Conditioners

AIR-COOLED SCREW CHILLER



TRUST AIR CONDITIONING EQUIPMENT CO.
Prepared By: Engineering & R & D Department.

Shiraz- AUG 2015

Installation

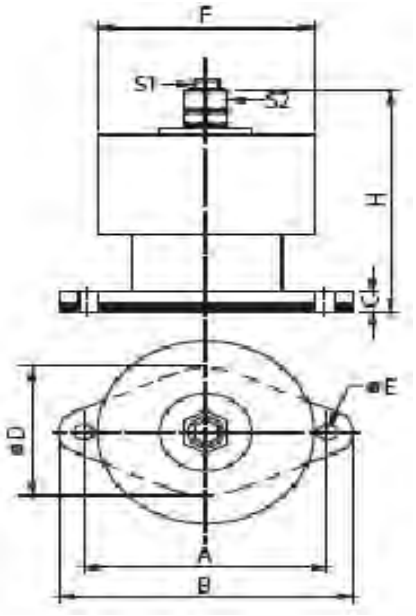
1. Installation Dimensions & Vibration Isolators

Vibration isolators are recommended for all roof mounted installations or wherever vibration transmission is a consideration.

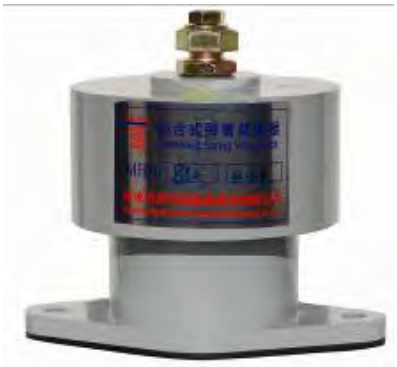
Neoprene Isolation is optional, it is recommended for normal installations and provides good performance in most applications for the least cost.

Spring isolators are level adjustable, spring and cage type isolators, mounted under the unit base rails. Deflection may vary slightly by application.

Isolator model	Trust code	Brand
Spring isolator MHD-850	202502301043	Mei Huan (Yan Cheng City)
Spring isolator MHD-1050	202502301044	Mei Huan (Yan Cheng City)



The housing of MHD series with aluminum-magnesium alloy material could prevent the vibration isolator from rustiness forever and enlarge the use life. The structure also has new improvement with an anti-side-force function for better stability and safety of unit. It can be freely adjusted as per balancing situation of unit to guarantee its work under all situations.

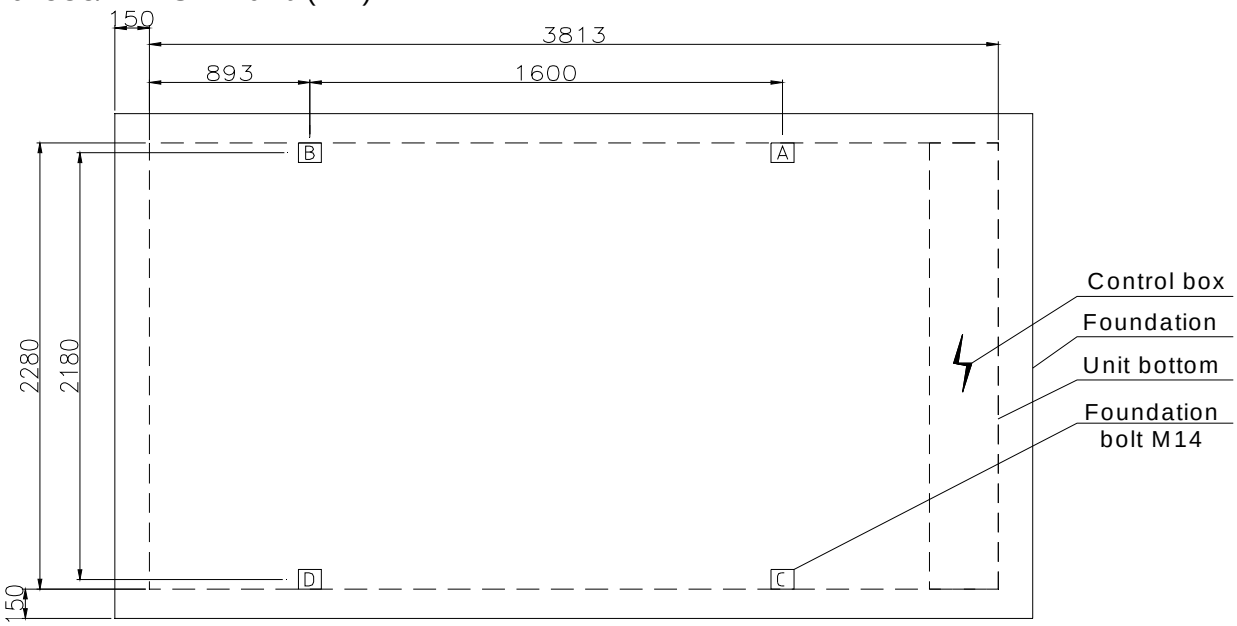


Technical Date of MHD

MODEL	LOAD (kg)	LOAD (N)	DEFLECTION (mm)	VERTICAL (kg/mm)
MHD-850	850	8330	25	34.00
MHD-1050	1050	10290	25	42.00

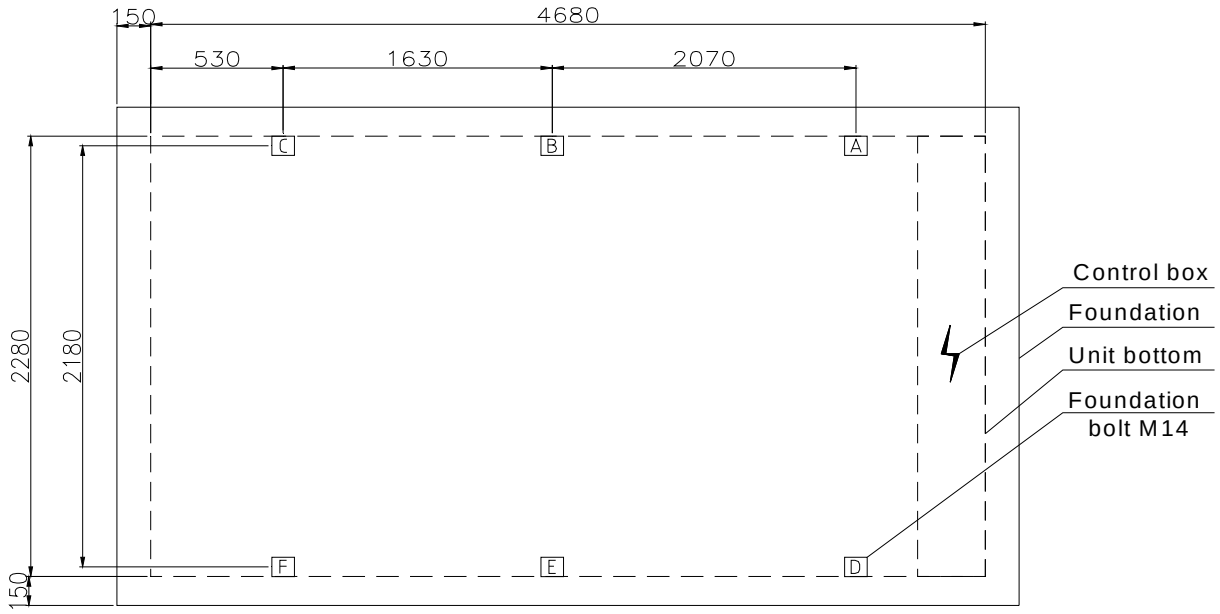
MODEL	OUTER SIZE (mm)								
	A	B	C	ΦE	F	H	S1	S2	ΦD
MHD-850	165	200	13	12.5	147	165	M12*25	M20*60	104
MHD-1050	165	200	13	12.5	147	165	M12*25	M20*60	104

(1) 376B3O3/1AT1SB unit (mm)



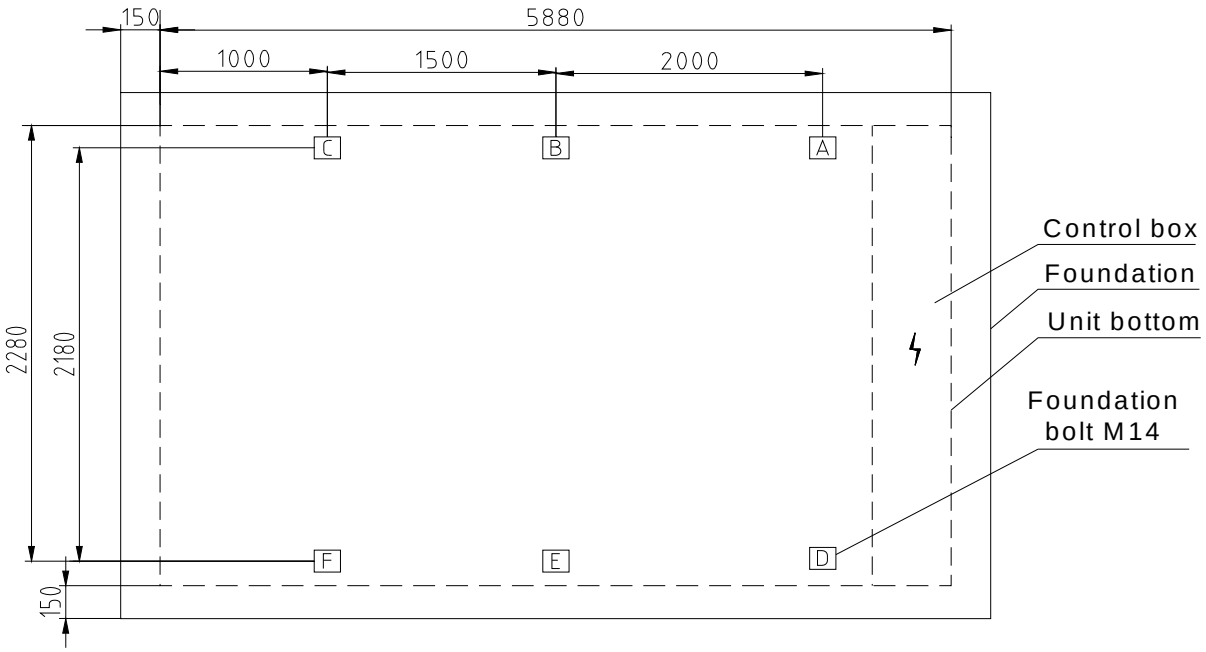
Model	Weight to be supported by spring isolator(kg)			
	A	B	C	D
376B3O3/1AT1SB	864	896	864	896

(2) 496B3O3/1AT1SA unit (mm)



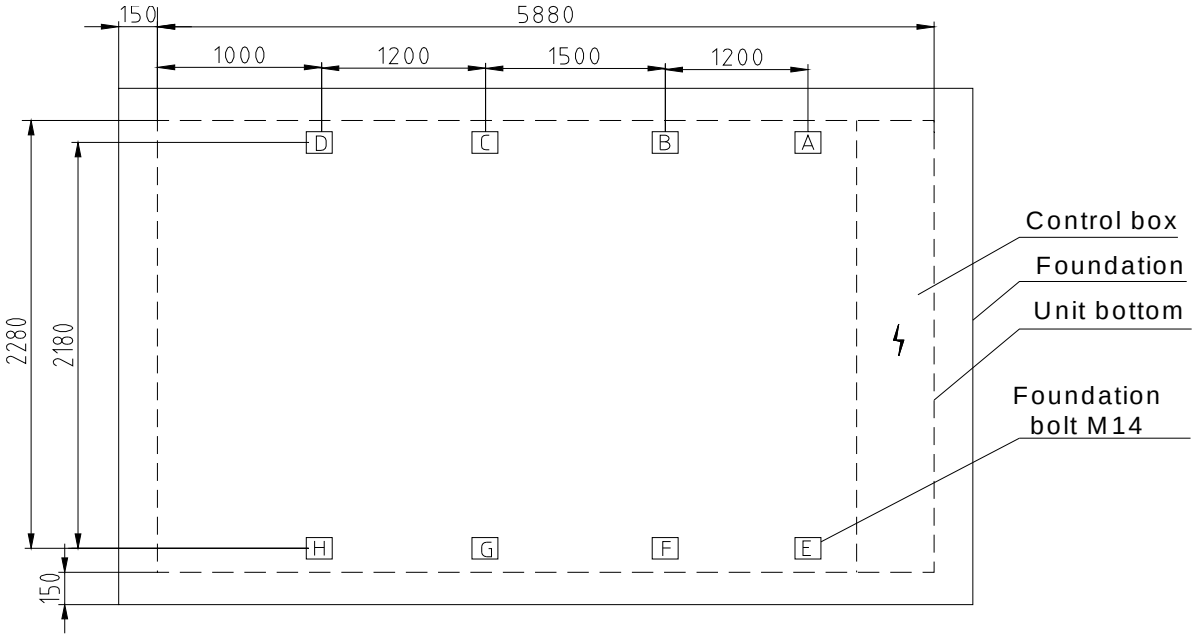
Model	Weight to be supported by spring isolator(kg)					
	A	B	C	D	E	F
496B3O3/1AT1SA	614	837	814	614	837	814

(3) 594B3O3/1AT1SA unit (mm)



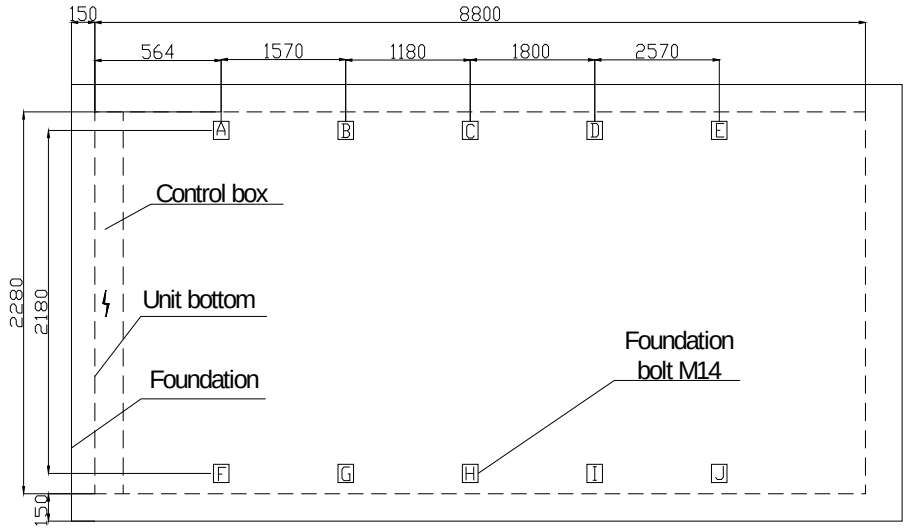
Model	Weight to be supported by spring isolator(kg)					
	A	B	C	D	E	F
594B3O3/1AT1SA	742	934	921	742	934	921

(4) 720B3O3/1AT1SB unit (mm)



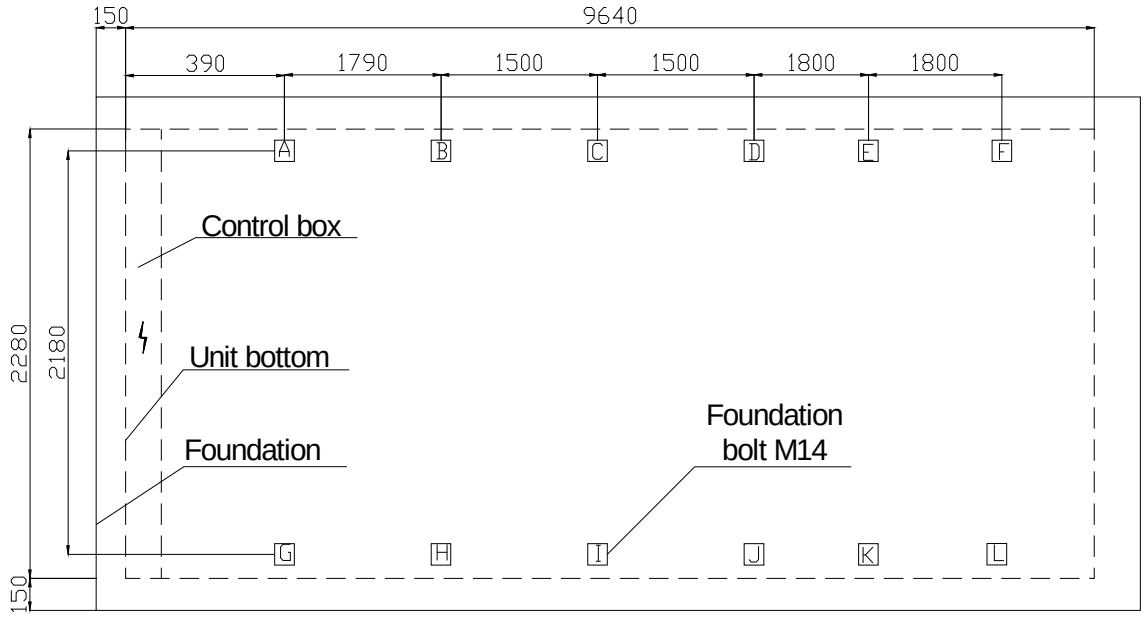
Model	Weight to be supported by spring isolator(kg)							
	A	B	C	D	E	F	G	H
720B3O3/1AT1SB	647	725	760	718	647	725	760	718

(5) 880B3O3/1AT1SB unit (mm)



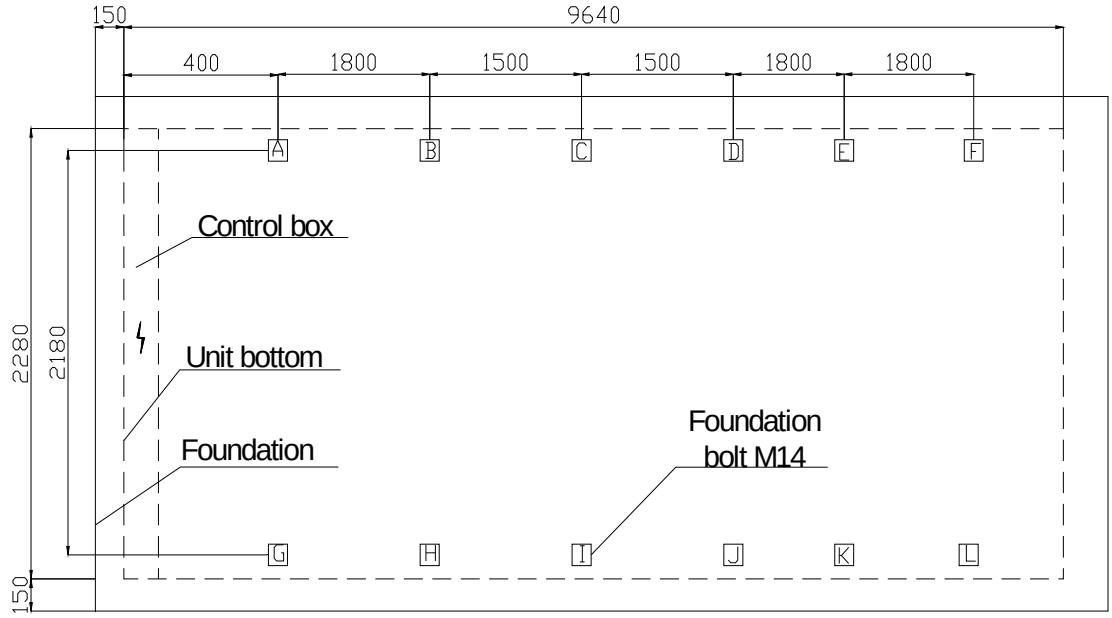
Model	Weight to be supported by spring isolator (kg)									
	A	B	C	D	E	F	G	H	I	J
880B3O3/1AT1SB	781	912	915	715	701	781	912	915	715	701

(6) 996B3O3/1AT1SA unit (mm)



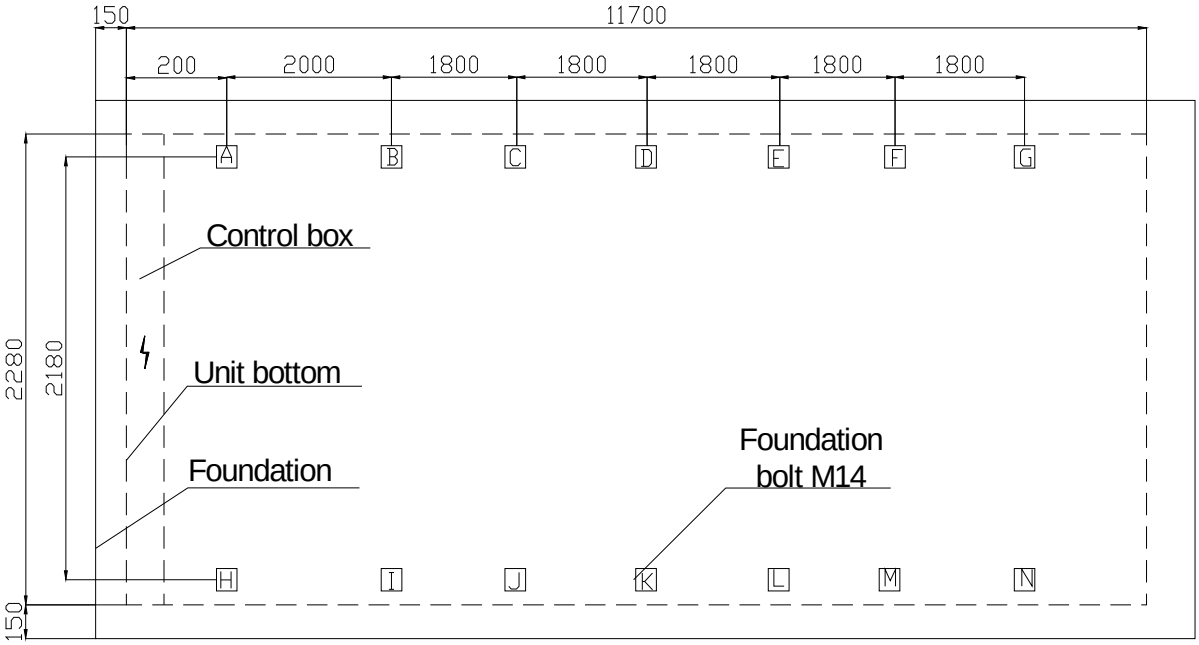
Model	Weight to be supported by spring isolator (kg)											
	A	B	C	D	E	F	G	H	I	J	K	L
996B3O3/1AT1SA	701	887	892	707	706	707	701	887	892	707	706	707

(7) 1203B3O3/1AT1SB unit (mm)



Model	Weight to be supported by spring isolator (kg)											
	A	B	C	D	E	F	G	H	I	J	K	L
1203B3O3/1AT1SB	731	912	905	721	716	715	731	912	905	721	716	715

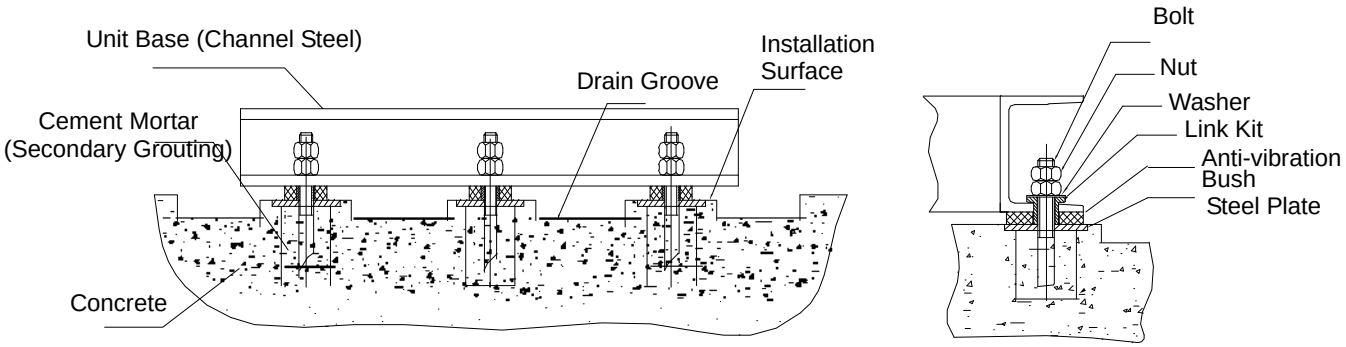
(8)1419B3O3/1AT1SB(mm)



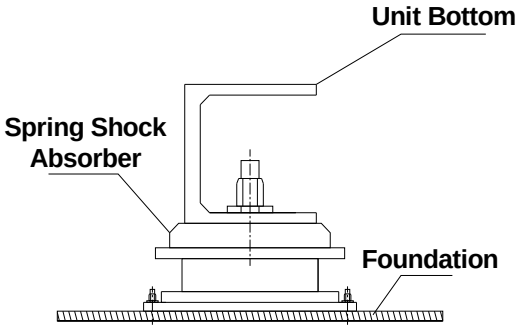
Model	Weight to be supported by spring isolator (kg)													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1419B3O3/1AT1SB	717	925	954	936	724	722	722	717	925	954	936	722	722	724

2. Installation Foundation

1) The installation foundation shall be designed by professionals according to the site conditions.
2) The installation foundation of the unit must be of a cement or steel structure, and shall bear the operating weight of the machine, and this face must be horizontal.
3) Please refer to the Diagram for Installation Foundation of Unit, place the steel plate and anti-vibration bush on the foundation accurately, and execute secondary grouting after installing the unit and foundation bolts together. The foundation bolts are generally 60 mm higher than the installation surface .



4) T If the unit will be installed on the top of the building which vibration level should be restricted. It is recommended to use spring isolators as absorber, please refer to following diagram:



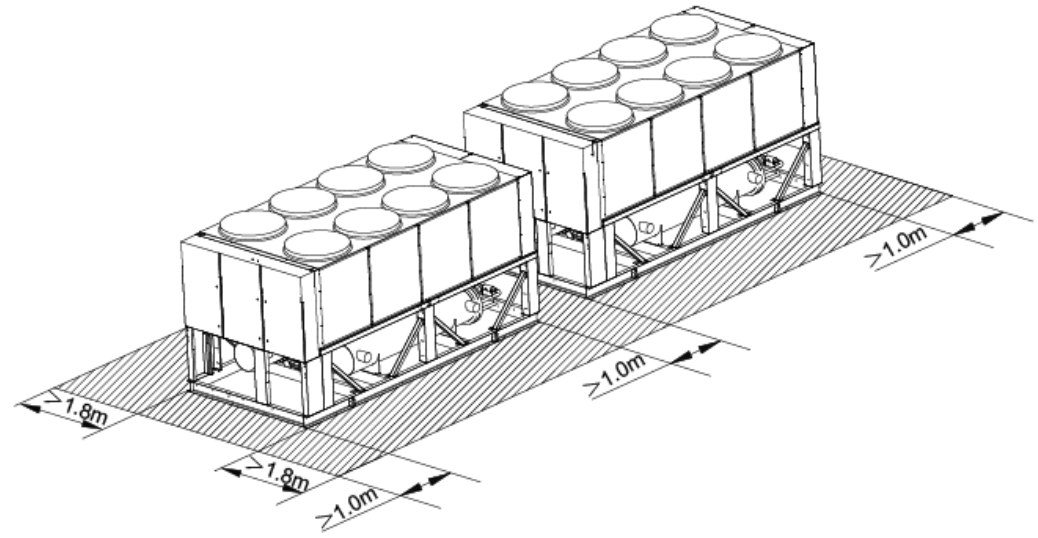
3. Installation Spaces

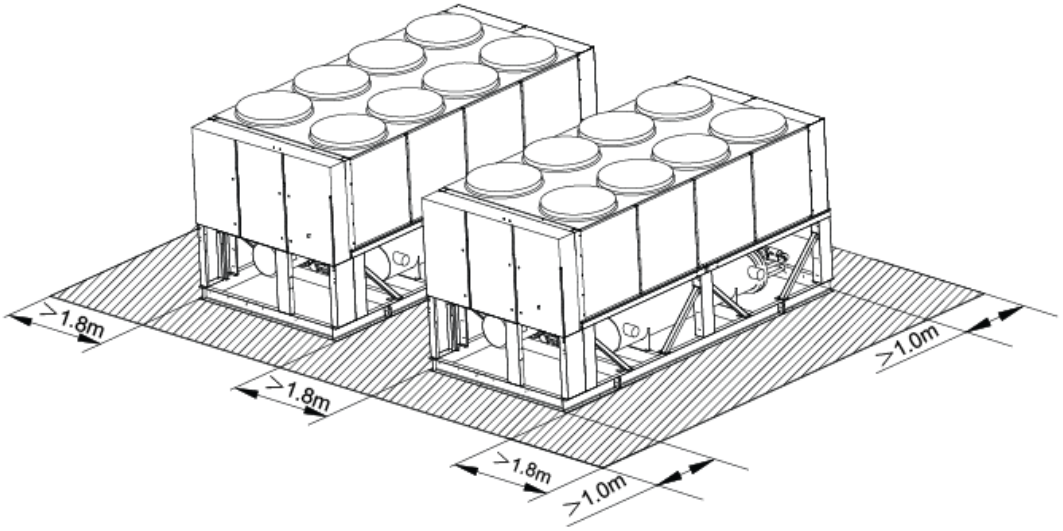
1) Reserve the spaces required for unit installation, operation and maintenance.
2) The installation place of the unit shall be free from the effects of fire, inflammables, corrosive gas or waste gas as much as possible; the ventilation space shall be reserved there; proper measures shall be taken to reduce noise and vibration whenever possible.
3) When the units are installed on the horizontal plane without obstacles, the longitudinal distance between the units shall be kept above 1m, the transverse distance between the units shall be kept above 1.8 m, and such distances shall be as large as possible; if there are obstacles at both sides of the unit, the distance between the unit and obstacles shall be kept above 1.8 m; if there are obstacles above the unit, the distance between the unit and obstacles shall be kept above 2.5 m.

4) The removable post for compressor service access must not be blocked at either side of the unit.

6

5) There must be no obstruction under the fans.



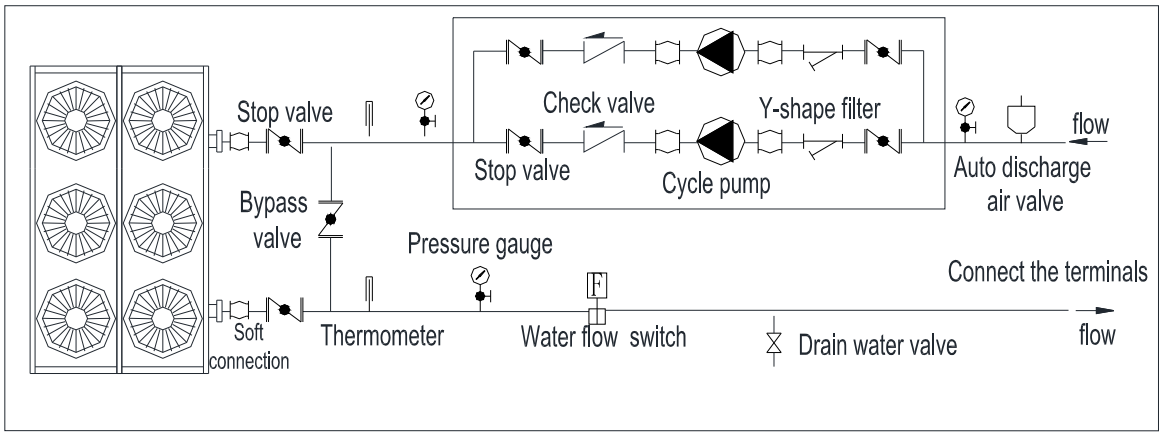


4. Installation of Water Pipeline System

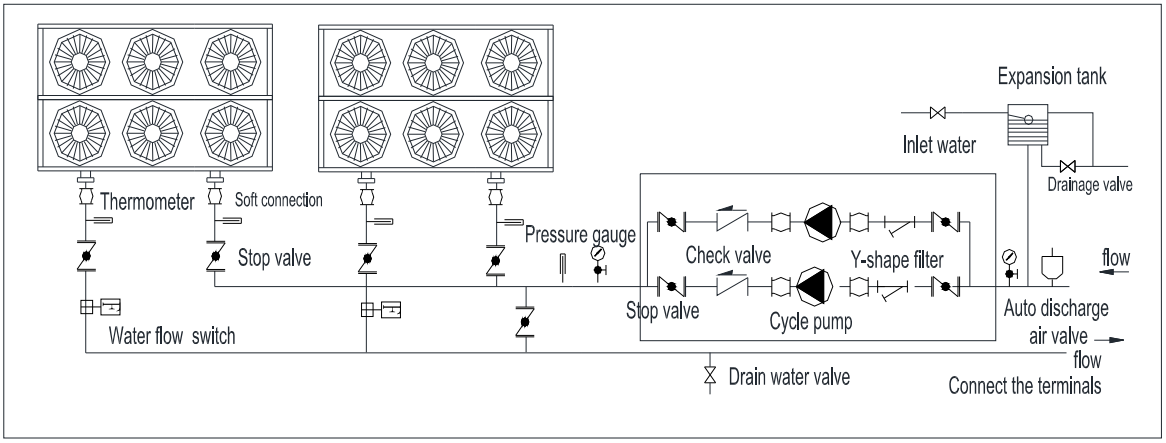
Due to the variety of piping practices, it is advisable to follow the recommendations of local authorities. The installation and insulation of the water pipelines of the air conditioning system shall be designed and guided by design professionals, and confirm to the corresponding provisions of the HVAC installation specifications.

Basically, the piping should be designed with a minimum number of bends and changes in elevation to keep system cost down and performance up.

Single unit:



Parallel connection of units:



1) The water inlet pipeline and drain pipeline shall be connected according to the requirements of markings on the unit. Generally, the refrigerant pipe side of the evaporator is the chilled water outlet side.
2) The chilled water pipeline system must be provided with the soft connection, thermometer, pressure gauge, water filter, electronic scale remover, check valve, target flow controller, discharge valve, drain valve, stop valve, expansion tank, etc.
3) The water system must be fitted with the water pump with appropriate displacement and head, so as to ensure normal water supply to the unit. The soft connection shall be used between the water pump, unit and water system pipelines, and the bracket shall be provided to avoid stress on the unit. Welding work for installation shall avoid damage to the unit.

   (1) Determination of water pump flow:

   Flow (m3/h) = (1.1 ~ 1.2) * Unit Cooling Capacity (kW)/5.8

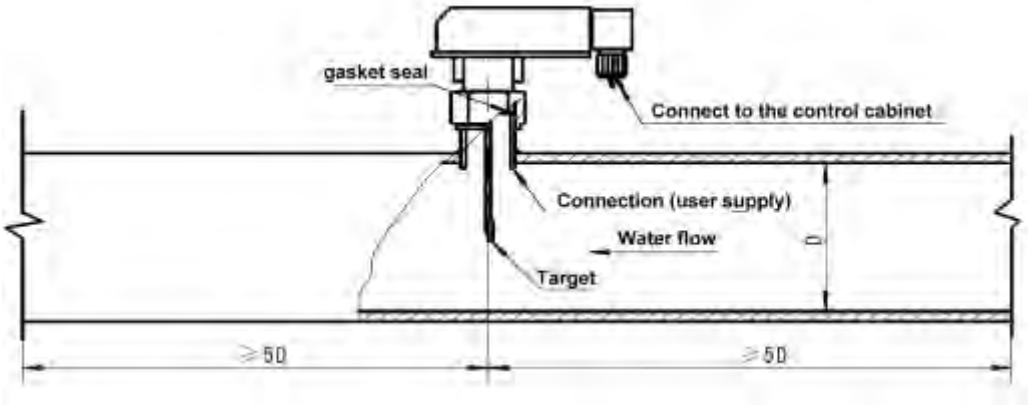
   (2) Determination of water pump head:

   Head (m) = (Unit Resistance (see product parameters) + Resistance at Maximum End of Pressure Drop (see product parameters) + Pipeline Resistance (length of the least favorable loop pipe * 0.05) + Local Resistance (length of the least favorable loop pipe * 0.05 * 0.5)) * (1.1 ~ 1.2)
4) The flow switch must be arranged on the drain pipe of the evaporator. The flow switch shall be interlocked with the input contact in the control cabinet. Its installation requirements are as

follows:

(1) The flow switch shall be installed on the pipe vertically.

(2) The straight pipe section at each side of the flow switch shall have a length that is at least 5 times the pipe diameter; do not install it near the elbow, orifice plate or valve.



The installation of the flow switch is unsatisfied.

The straight pipe section for installation of the flow switch is satisfied.

(3) The direction of the arrow on the flow switch must be consistent with the direction of water flow.

(4) In order to prevent vibration of the flow switch, remove all air in the water system.

(5) Adjust the flow switch to keep it in open state when the flow is lower than the minimum flow (the minimum flow is 70% of the design flow). When the water flow is satisfied, the flow switch shall keep in closed state.

5) The water filter must be installed before the water inlet pipeline of the unit, which shall be provided with a 25-mesh screen. This will aid in preventing foreign material from entering and decreasing the performance of the evaporator.

6) A strainer should be placed for enough upstream to prevent cavitation at the pump inlet (consult pump manufacturer for recommendations). The use of a strainer will prolong pump life and help maintain high system performance levels
7) The flushing and insulation of the water pipelines shall be carried out before it is connected with the unit, so as to prevent dirt from damaging the unit.
8) The design water pressure of the water chamber is 1.0Mpa. Use of the water chamber shall be not exceeding this pressure in order to avoid damaging the evaporator.
9) The expansion tank shall be installed 1~1.5m higher than the system, and its capacity accounts about 1/10 of the water amount in the whole system.
10) The drain connection is arranged on the evaporator cylinder. The drain outlet has been equipped with a 1/2'' plug.
11) The auto discharge air valve is arranged between the high point of the pipeline and the expansion tank.
12) The thermometer and pressure gauge are arranged on the straight pipe sections of the water inlet pipeline and drain pipeline, and their installation places shall be far away from the elbows. The pressure gauge installed shall be vertical to the water pipe, and the installation of the thermometer shall ensure that its temperature probe can be inserted into the water pipe directly.
13) Each low point shall be fitted with a drain connection so as to drain the remaining water in the system. Before operating the unit, connect the stop valves to the drain pipeline, respectively near the water inlet connection and drain connection. The by-pass pipeline shall be provided between the water inlet pipe and drain pipe of the evaporator, convenient for cleaning and maintenance. Use of flexible connections can reduce vibration transfer.
14) The chilled water pipeline and expansion tank shall be subjected to insulation treatment, and the maintenance and operation part shall be reserved on the valve connections.
15) After the air-tightness test is carried out, and the insulation layer is applied on the pipeline, so as to avoid heat transfer and surface condensation; the insulation layer shall be covered by moisture-proof seal.
16) Any water piping to the unit must be protected to prevent freezing. There are reserved terminals for the auxiliary electrical heater. Logic in PLC will transmit ON/OFF signal by checking the leaving evaporator water temperature.

Note: The unit only supply ON/OFF signal, but not the 220V power. If a separate disconnect is

used for the 220V supply to the cooler heating cable, it should be clearly marked so that it is not accidentally shut off during cold seasons

17) If the unit is used as a replacement chiller on a previously existing piping system, the system should be thoroughly flushed prior to unit installation and then regular chilled water analysis and chemical water treatment is recommended immediately at equipment start-up.

18) Power on the chilled water pump, and inspect its rotation direction. The correct rotation direction shall be clockwise; if not, re-inspect the wiring of the pump.

19) Start the chilled water pump to circulate water flow. Inspect the water pipelines for water leakage and dripping.

20) Commission the chilled water pump. Observe whether the water pressure is stable. Observe the pressure gauges at the pump inlet and outlet, and the readings of the pressure gauges and the pressure difference between the inlet and outlet change slightly when the water pressure is stable. Observe whether the operating current of the pump is within the range of rated operating current; inspect whether the resistance of the system is too large if the difference between the operating current and rated value is too big; eliminate the system failures until the actual operating current is satisfied.

21) Inspect whether the water replenishing device for the expansion tank is smooth, and the auto discharge air valve in the water system enables auto discharge. If the discharge air valve is a manual type, open the discharge valve of the chilled water pipeline to discharge all air in the pipeline.

22) Adjust the flow and inspect whether the water pressure drop of the evaporator meets the requirement of the unit's normal operation. The pressure at the chilled water inlet and outlet of the unit shall be kept at least 0.2MPa.

23) The total water quantity in the system should be sufficient to prevent frequent "on-off" cycling. A reasonable minimum quantity would allow for a complete water system turnover in not less than 15 minutes.

Electrical Data

1. Field Wiring

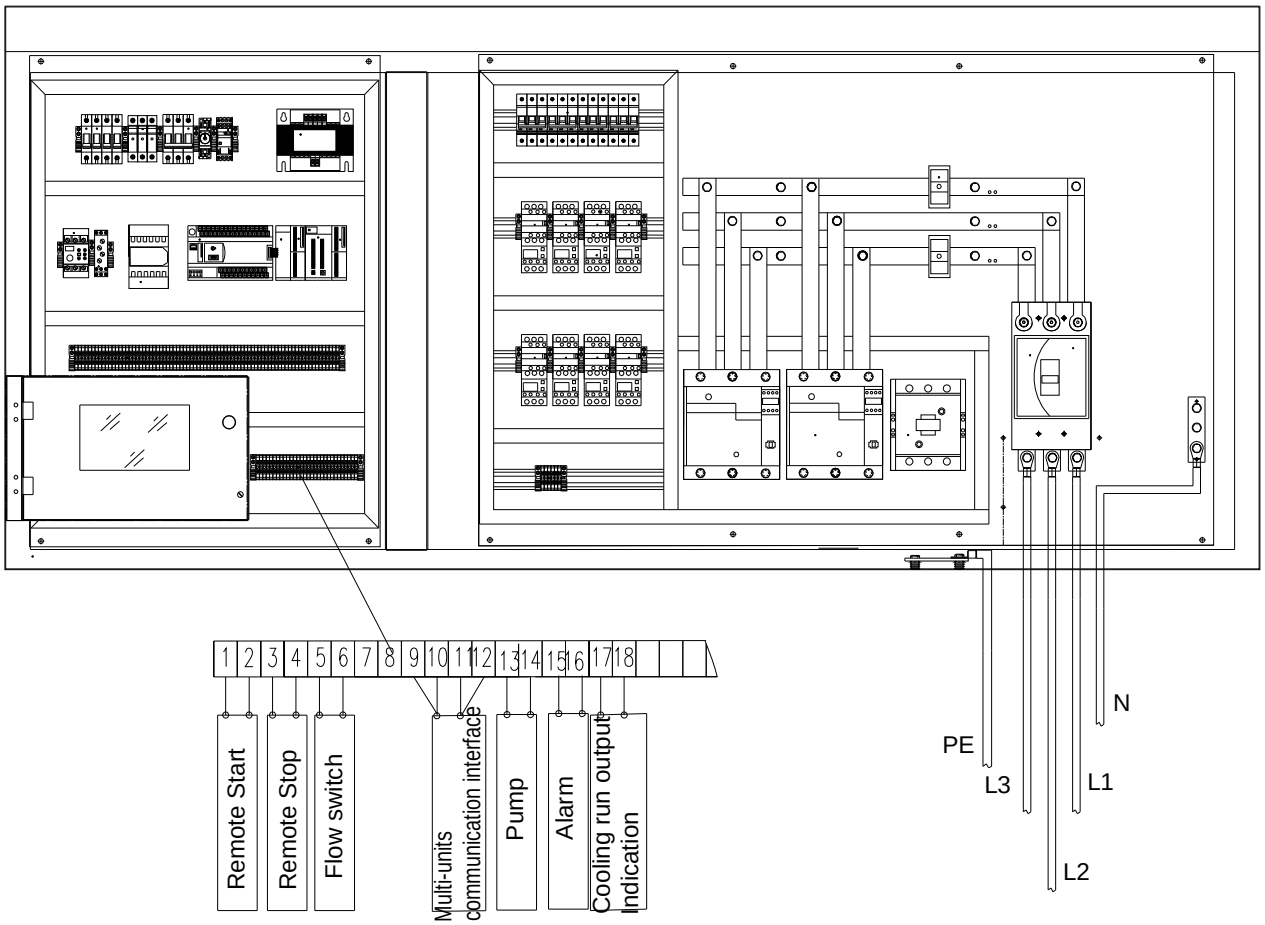
WARNING: In order to prevent any accident of injury and death during the site wiring, the power supply shall be cut off before the line is connected to the unit.

Wiring must comply with all applicable codes and ordinances. Warranty is voided if wiring is not in accordance with specifications. An open fuse indicates a short, ground, or overload. Before replacing a fuse or restarting a compressor or fan motor, the trouble must be found and corrected.

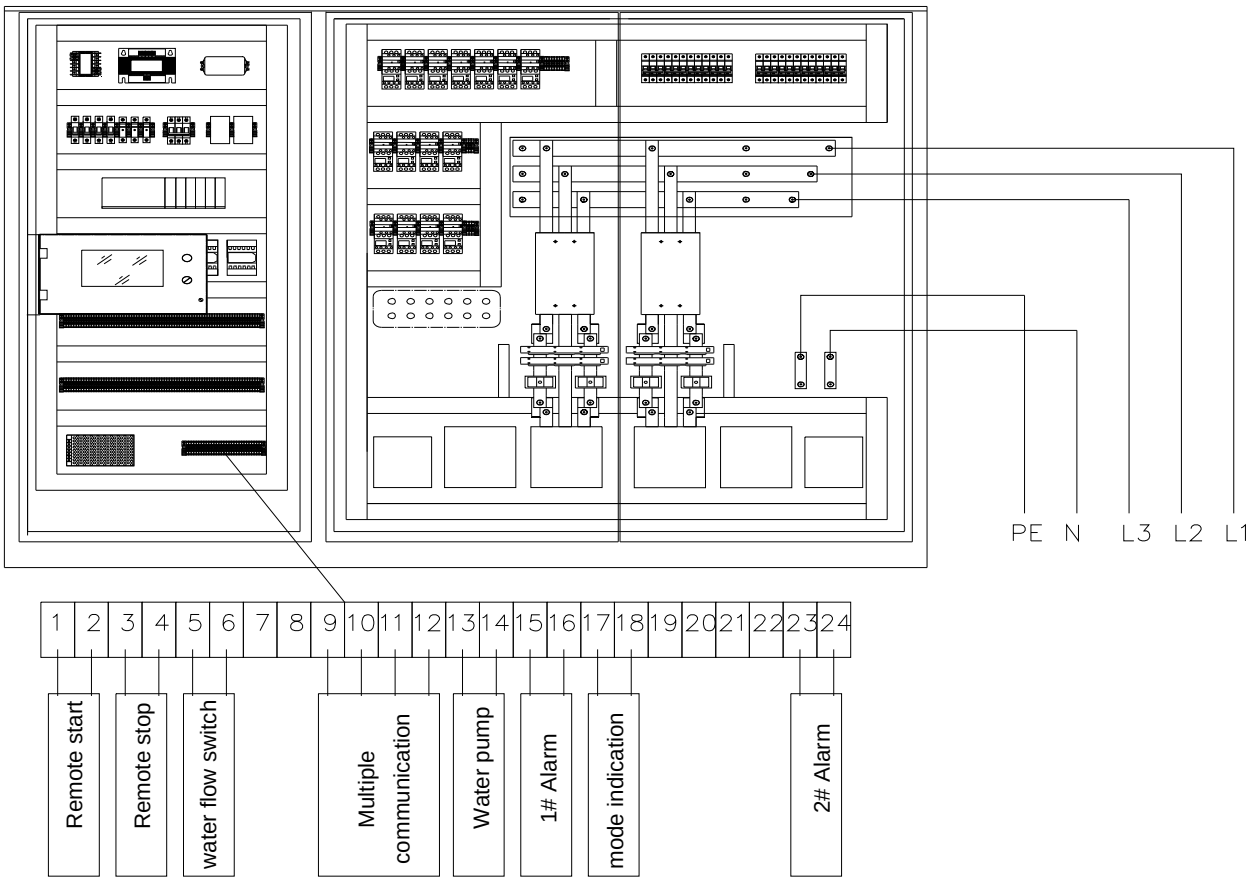
(1) Copper wire is required for all supply lines in field connection to avoid corrosion and overheat at the connection of terminals. The lines and control cables shall be separately paved and equipped with protective pipes to avoid intervention of supply line in control cable.

(2) Power section: It is required to connect the power supply cable to the control cabinet of the unit, when it arrives at the jobsite. The power supply cable is connected to the terminals of L1, L2, L3, N and PE and the terminals need to be fixed again after 24h running (the minimum allowed time). Please seal the entering wiring hole after users installed the main power wires, in order to avoid the dust entering into electric control cabinet.

Caution: it is suggested that to use appropriate tools to make sure there is a enough height to install the main power wires if the basement is higher than 200 mm.

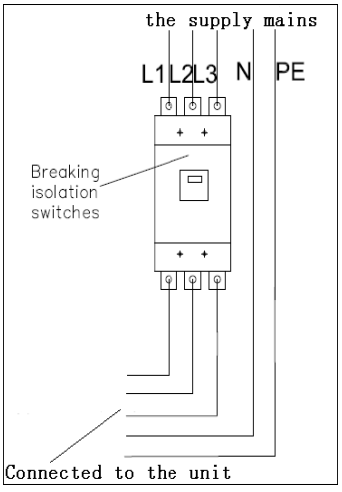


[Diagram for External Wiring of 376B3O3/1AT1SB 496B3O3/1AT1SA 594B3O3/1AT1SA 720B3O3/1AT1SB Unit]



[Diagram for External Wiring of 880B3O3/1AT1SB 996B3O3/1AT1SA 1203B3O3/1AT1SB 1419B3O3/1AT1SB Unit]

(3) Breaking isolation switches should be added between the power cord of users and the unit. The capacities of the breaking isolation switches recommended are as follows.



BVR：Copper core PVC insulated soft wire					
Domestic model	Conductor material	Insulator material	Nominal section area (MM ²)	UL model	Note
BVR70	Cu	PVC	70	2/0	The electric cable must be copper core.
BVR95	Cu	PVC	95	4/0	
BVR120	Cu	PVC	120	250	
BVR150	Cu	PVC	150	300	
BVR185	Cu	PVC	185	400	
BVR240	Cu	PVC	240	500	
BVR300	Cu	PVC	300	600	
BVR400	Cu	PVC	400	800	

Model	Recommended Cable	Recommended breaker	Note
376B3O3/1AT1SB	BVR120*4+BVR70*1	330A	The electric cable must be copper core. If units are used in high temperature conditions, the breaker needs larger capacity.
496B3O3/1AT1SA	BVR240*4+BVR120*1	500A	
594B3O3/1AT1SA	BVR240*4+BVR120*1	500A	
720B3O3/1AT1SB	2*(BVR185*4+BVR120*1)	630A	
880B3O3/1AT1SB	(BVR185*4+BVR120*1)+ (BVR240*4+BVR120*1)	830A	
996B3O3/1AT1SA	2* (BVR240*4+BVR120*1)	1000A	
1203B3O3/1AT1SB	(BVR240*4+BVR120*1)+ (BVR300*4+BVR150*1)	1000A	
1419B3O3/1AT1SB	2* (BVR400*4+BVR240*1)	1260A	

(4) Attention: refrigerant selection: the previous software settings are replaced by the current hardware settings to avoid the possibility of improper operation of the software leading to wrongly selected refrigerant and damage to the unit.

(5) Short circuit 1X：35/1X：36 on the wiring terminal 1X in the cabinet and set R22 refrigerant for the unit, or, R134a is used for the unit.

(6) In order to avoid wrong control in field connection, the liquid control circuit (24 V) shall not be in the same conduit with the lead wire of the voltage higher than 24 V.

(7) The control circuits of various units are all 220 V, and for the wiring ways of the control circuits, please refer to the wiring diagrams supplied along with the units.

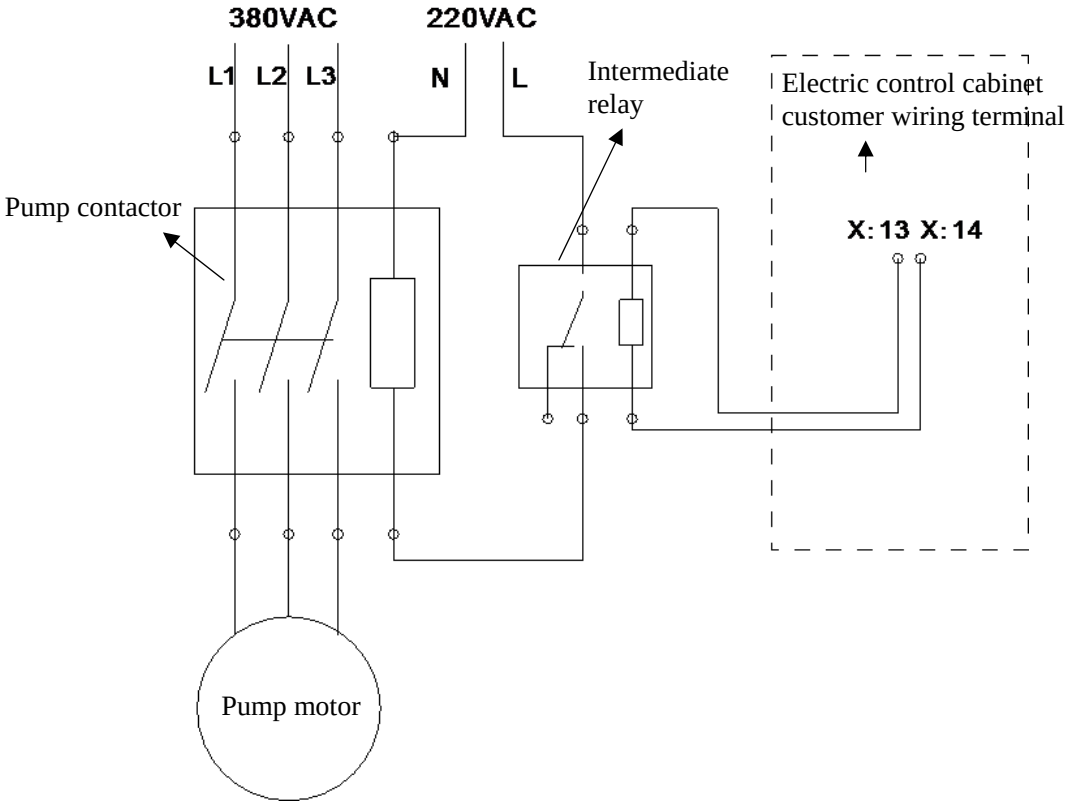
(8) A unit consists of master compressor and slave compressor communicating via shield wire protected by sleeve and separated from supply line.

(9) The control output cable to be connected on site shall be AC250V-1mm2, and 0.75mm2 shield wire (24 V) shall be used for control signal line.

(10) Attentions: Read the electrical wiring principle diagram and connect the wires strictly according to the wiring terminal diagram. Three-core shield cable (RVVP3×0.75mm2) shall be used for the connection of the temperature sensor. Common two-core cable (RVV2×0.75mm2) shall be used for the connection of flow switch to connect to the NO contact of the switch, i.e. the opening point when waterless. Two buttons can be connected to the external of remote start and stop.

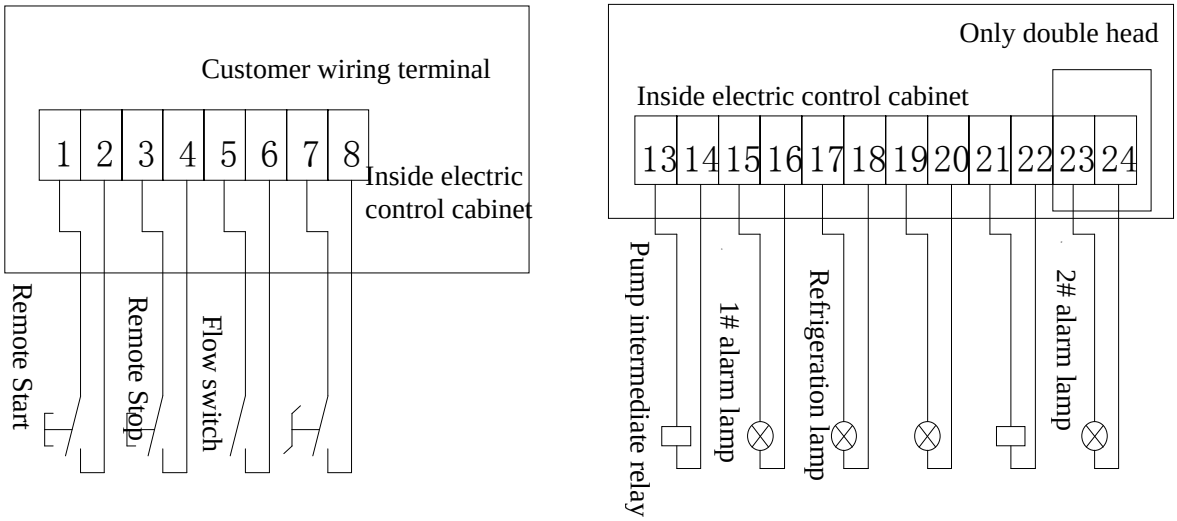
(11) If the customer desires the linked control of the water pump, connect the water pump as shown in the diagram, where an intermediate relay is required. If the function of linked control of water pump is not needed, ensure that the water pump is started before starting the machine.

CAUTION: An independent power supply box needs to be equipped with the power supply of the water pump.



[Diagram for Wiring of Water Pump Linked Control]

(12) The wiring ports for remote start/stop, flow switch, cool/warm switch, water pump linked control, alarm indication, etc. are reserved in the electrical cabinet of the unit, with the numbers shown in the diagram below.



[Numbers of Functional Ports Reserved in Electrical Cabinet]

(13) Passive inching button is used for remote start and stop, and the flow switch must be connected to the NO contact, or the machine cannot be started.

Passive holding switch is used for cool/warm switch, e.g. common selection switch. Controls of

large power electrical appliances such as water pump and user electric heating must be interfaced with a relay, or the PLC might be burned. Other outputs can be directly connected to indicator lamps or alarms.

2. Electric parameter table

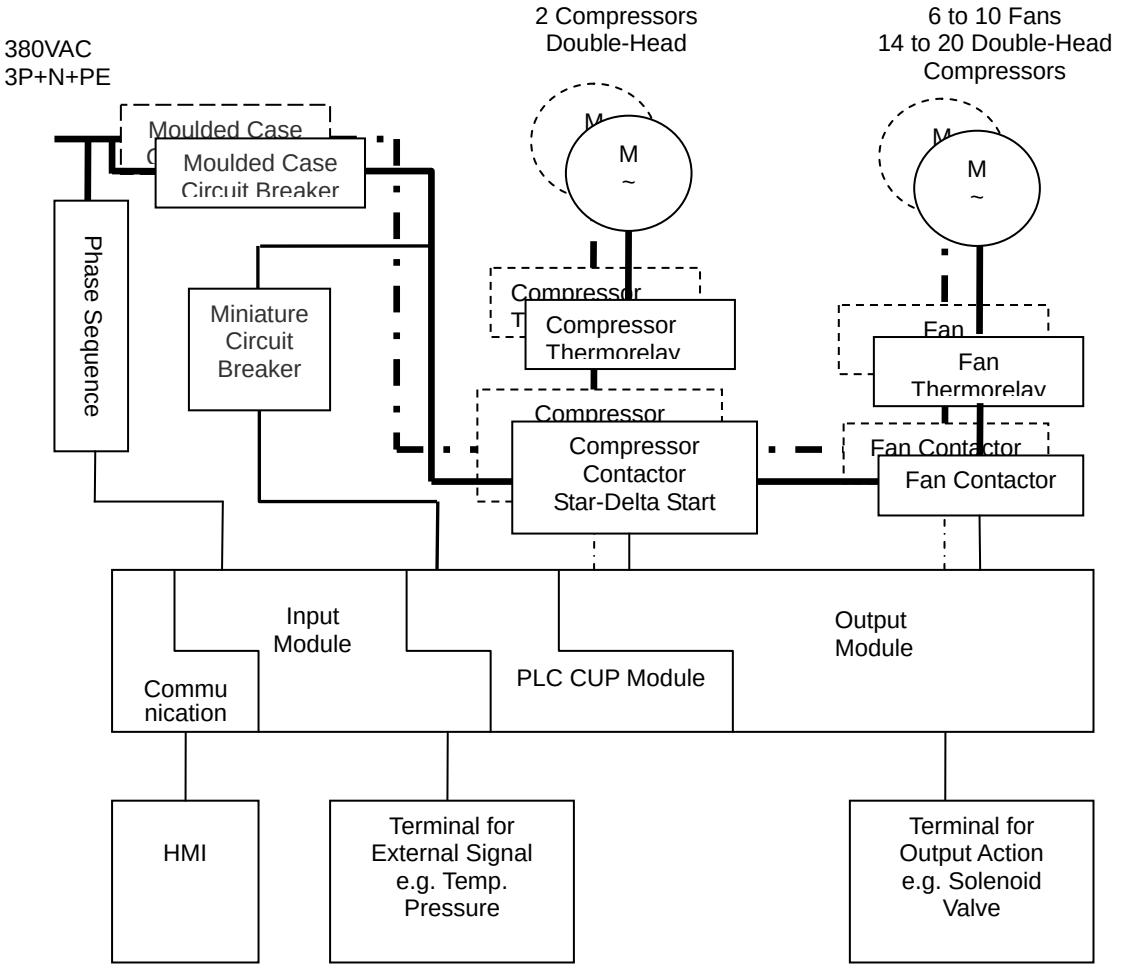
(1) Power Table

Model	Main power		Power Range		Max. allowed running current/A
	V	Hz	Highest/+%	Lowest/-%	
376B3O3/1AT1SB	380	50	+10	-10	261.6
496B3O3/1AT1SA	380	50	+10	-10	375
594B3O3/1AT1SA	380	50	+10	-10	395
720B3O3/1AT1SB	380	50	+10	-10	507
880B3O3/1AT1SB	380	50	+10	-10	636.6
996B3O3/1AT1SA	380	50	+10	-10	750
1203B3O3/1AT1SB	380	50	+10	-10	790
1419B3O3/1AT1SB	380	50	+10	-10	1014

(2) Compressor & fan

Model	Compressor					Fan		
	Quantity	Start current/ A	Max. running current/ A	Rated current/ A	Rated power/ KW	Fan quantity	Rate of fan /RPM	Rated current/ A
376B3O3/1AT1SB	1	586	228	227.4	124	6	940	5.6
496B3O3/1AT1SA	1	805	340	280.3	159	8	940	5.6
594B3O3/1AT1SA	1	805	340	326.7	187	10	940	5.5
720B3O3/1AT1SB	1	917	507	408.8	234	10	940	5.6
880B3O3/1AT1SB	2	Refer to 380 /C+ 500/C				14	940	5.6
996B3O3/1AT1SA	2	Refer to 500/C				16	940	5.6
1203B3O3/1AT1SB	2	Refer to 600 /C+ 600/C				16	940	5.6
1419B3O3/1AT1SB	2	Refer to 720 /C				20	940	5.6

3. Control Flow Chart



✧ Guidance of common electric problems treatment:

1) Phase sequence protector:

a) Protective condition: anti-phase, phase lack, overvoltage, undervoltage or imbalance of three-phase voltage of power input terminal of phase sequence protector;

b) Results of action execution: power module failure lamp is ON, touch screen displays power failure and fails to be started;

c) Processing mode: see the power module, exchange any two unit incoming lines if it is anti-phase;

Please do not start until power gets right with failure removed in case of other failures.

Notes: this module has the important action of compressor protection. The imbalance rate of voltage of current is usually specified by compressor manufacturers, and burn-down due to overheating will be resulted from long-time operation under abnormal working voltage.

2) Miniature Circuit Breaker:

a) Protective condition: current passing the miniature circuit breaker exceeds its numerical

protection value;

b) Results of action execution: power-fail of corresponding circuit, failure of start, circuit breaker switch positioned in the OFF terminal

c) Processing mode: inspect there is burn-down of component(s) or short-circuit between circuits. If any, please replace the component(s) or modify wiring;

You may attempt to set the circuit breaker to ON terminal, if it immediately trips once again, it indicates that there is always a condition of short circuit, in this case, inspect the line and components until normal pull-in is available.

Notes: Before inspection, please switch on the breaker once without electricity. The existence of heavy current shock may result the damage of the miniature circuit breaker. At this moment, switch-on without electricity is also impossible. When switch-on is successful, please test with a multimeter whether the circuit is conducted. If not, you can sure that mechanical mechanism is normal but electric mechanism is damaged. In such case, please replace the miniature circuit breaker, and inspect the above steps.

3) Fan Thermorelay

a) Protective condition: fans current overload or phase lack;

b) Results of action execution: units stop, display of fans overload on touch screen, thermal overload relay trip, failure of start.

c) Processing mode: inspect whether there are fans wiring loose. Inspect whether the value of fans protection is in a proper position. Inspect whether fins are fouled. Please reset the thermorelay manually, if needed.

Notes: Because the motor and the thermal overload relay have different thermal inertias, the temperature of motor is still very high while the thermorelay can be reset. Please inspect whether the temperature of motor is too high when you can’t sure the failure clearly. Immediate resetting is impossible in the case of overload trip. You have to wait until the thermal effect of the thermorelay is over.

4) Moulded Case Circuit Breaker

a) Protective condition: there exists too heavy current or short circuit in the units

b) Results of action execution: the unit shuts down and power down.

c) Processing mode: inspect whether the electric control part of units and insulation of loads are normal, if yes, power on and start the units again, and measure whether the working current of compressors and system pressure are normal

5) Compressor thermorelay

a) Protective condition: too heavy compressor current or existence of short circuit failure

b) Results of action execution: units stop, display of compressor overload on touch screen,

thermal overload relay trip, failure of start.

c) Processing mode: inspect whether the compressor part and insulation of loads are normal, inspect the pressure value when an alarm is given, and balance the pressure if it exceeds the running range. Please monitor the current of compressors in real time to ensure whether it is within normal running after the compressor thermorelay is reset.

6) Sensor Failures

Sensor failures include short circuit and open circuit of the temperature sensor and the pressure sensor (transformer). The current transformer is also included according to the stepless type unit.

a) Protective condition: any sensor failure

b) Results of action execution: stop of units, display of corresponding sensor failure on touch screen, failure of start.

c) Processing mode: inspect whether the wiring of faulty sensor is proper and firm, and whether the sensor itself is normal.

4. Control Screen Operation

Initial Startup

- Before power up for the first time，make sure that the wiring is firm between the control box and the main switch ， the insulation resistances reach the requirements ,and the earth wire has been properly installed.
- The wiring might be loose due to the factors such as long-distance transport. Carry out complete inspection for the bolts of all wiring terminals for looseness 。
- Be sure that the distribution capacity is compliant with the power of the unit and the diameter of the selected cable can bear the maximum working current of the unit.
- Inspect whether the red emergency stop button on the control box is in natural state.

4.1 Introduction of Control Screen:

【Home Page】

1) Power indicator (yellow), which is on when display is powered on; it is off when powered off.

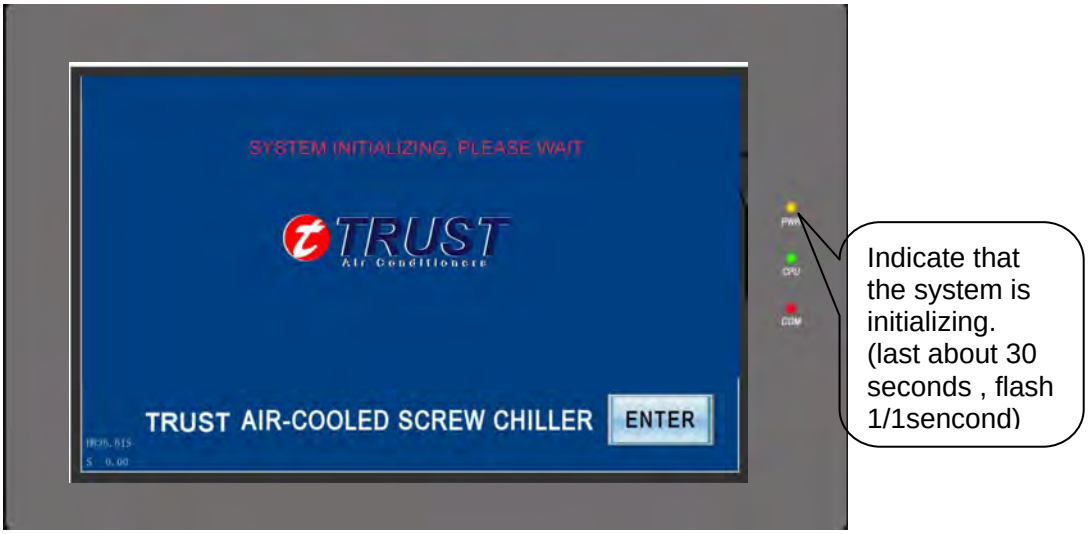
2) Status indicator (green), which flashes at low frequency when display is normally operative,

otherwise it is off.

3) Communication indicator (red), which flashes at high frequency when display and PLC communicate normally, otherwise it is off.

4) PLC and touch screen procedure version: showing the number of PLC and touch screen procedure version used by the current unit.

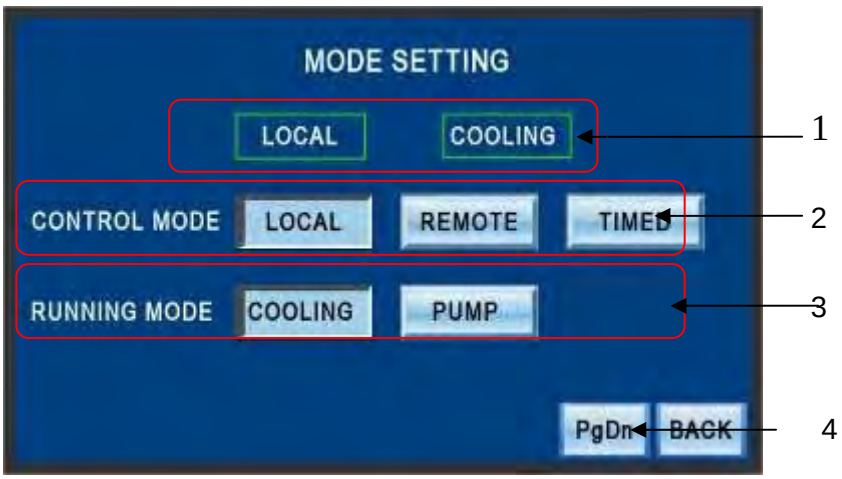
4.2 Basic Interface and Operations:



After the system initializing is completed, please clink on ENTER button, and the “Password Input” dialog will be popped up, please input the User Password(58806) or User Manage Password (40828),and click “ENTER” into the next interface (Mode Setting Page)

Password Input Page

✧ **Mode Setting Page**



【Mode Setting Page】

Control mode and working mode are to be set in this page:

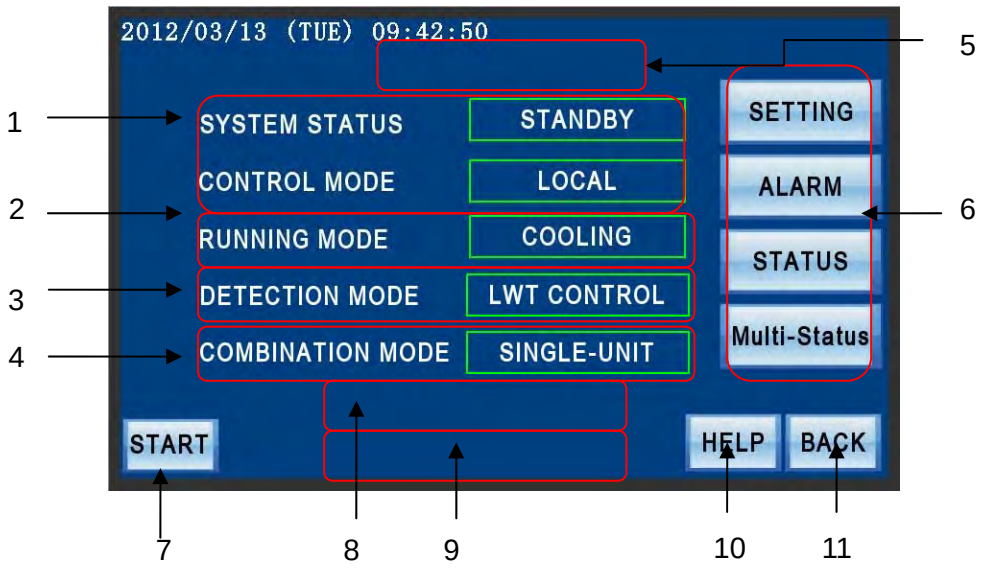
1. Control mode and running mode which have been selected currently for units are displayed here, and this position will correspondingly vary according to the choices of customers when selection of modes is changed.
2. Selection of unit control modes, including three modes: “LOCAL”, “REMOTE”, “TIMED”, i.e. local control, remote control, timing control.
3. Selection of unit operation modes, including three modes: “PUMP”, “COOLING”, i.e. pump mode, cooling mode.
4. Click on “PgDn” to enter the next page (Main Page).
5. Click on “BACK”, return to the homepage of units.

Note:

① The control mode and running mode can be selected optionally in standby status, while only the control mode can be switched in running status.

② Control Mode: The selection of the ways of Unit starting/stopping. “LOCAL” indicates you can only start or stop the unit through “Start/Stop” button in touch screen. “REMOTE” indicates you can only achieve the unit starting or stopping though the “Remote Start” and “Remote Stop” hardware interfaces; “TIMED” indicates the unit can achieve timing start/stop according to the time set by the user.

✧ **Main Page**



【Main Page】

1. System Status: Current system status of units is displayed here. The status of system possibly displayed is as follows:

1) Standby status: in normal condition, displaying “Standby status” after the unit is powered on.

2) Running status: indicating that starting of unit compressors has been finished (entering the running status after double-head Start of one compressor), and it has entered the process of automatic energy adjustment from this point.

3) Pause status：The unit enters “Pause” status when the current detection water temperature (chilled outlet water temperature in single-unit or chilled inlet water temperature in Multi-units) is lower than the setting temperature of unit pause. The compressor start to run until the current detection temperature is higher than the setting temperature of compressor start, then the unit enter “Running” status.

4) Shutting down status: the status display “shutting down” after the unit has been confirmed to execute shutdown action. After finished, the unit enters “Standby” Status.

5) Protection status: indicating that the unit is in a failure status currently, click on "alarm information" to see alarm details.

2. Control mode and running mode: the current mode will be displayed here. For example, the current page displays that the unit is in a “LOCAL MODE”, and the running mode is “PUMP MODE”.

3. Detection Mode: Leaving water control is by default only in the single-unit mode, with entering water control not allowed; entering water control is by default in the multi-units combination mode, with setting of leaving water control not allowed。

4. Combination Mode: indicates “Single-unit” when the unit isn’t in the case of multi-combination control and indicates “Multi-Units” when the unit is in Multi-combination control. (Note: When the system has only one unit, please don’t set to multi-unit control)

5. This position is the unit alarm display area, and alarm information of failure content will be displayed here in a mobile mode in case of any failure in units.

6. Functional key area of units. It has the functional keys of “SETTING”, “ALARM”, “STATUS” and

"Multi-Unit" through which different operating interfaces are accessible. Introduction of their functions will be detailed hereafter.

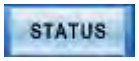
7. Start is required upon completion of unit set-up, directly click on "START" button on the lower left, and the following dialog box will be popped up at this moment: click on "CANCEL" if you don't expect to execute the start.

【Ensure unit start-up】

8. The sign "Failure to start, please check the status" will appear when the conditions of compressor stating can't be required.
9. There is a rotate button with a key beside the touch screen. When the units need to be maintained by the user or after sale service personnel while expecting to see parameters from the touch screen, the user may rotate the button to the service point, and "System under maintenance, please don't start up!" will be displayed below main page at that moment. Start operation is not allowed at this moment. Any action of maintenance or power operation shall not be taken in the absence of personnel who have been specially trained and certified!
10. Help information, abbreviation of words in units will be explained in detail in help interface.
11. Click on "BACK", return to previous page of units------mode selection interface.

Note:

button disappear when the combination mode is "Single-unit". Click



button to query the current unit status.

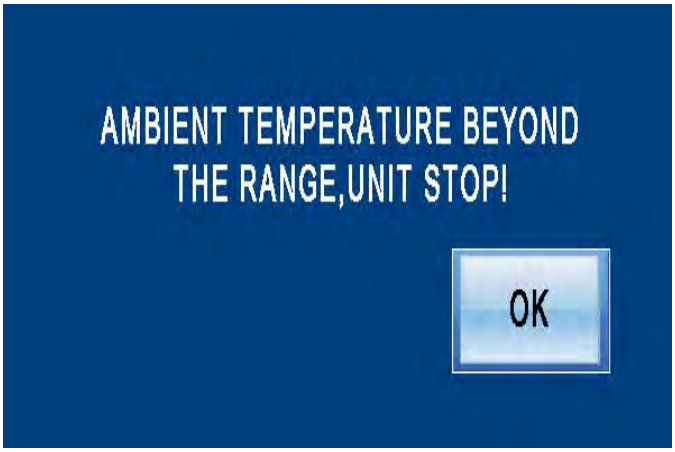
Starting Operation

The system is in pause state when the water pump has been completed to open, but the compressor is unable to start because some other factors can't satisfy the condition of compressor starting, the interface indicates "Failure to start, please check the status". The starting conditions include oil heating time 、restart delay、the temperature of compressor starting. In this case, only when all of the conditions have been meet, the unit starts to operate the compressor, otherwise the sign "Failure to start, please check the status" will keep displaying in the main page.

Note: Clicking on 

button is invalid when the unit is in failure. The unit can start normally only when all of the alarm have been eliminated and reset manually on the touch screen interface.

When the current ambient temperature is beyond the allowed running range, the below page will be popped up:



If the current temperature return to the rage, click to the "OK" and the unit will start to run normally.

Shutting down Operation

Click on 

button , and the "Confirm Shutdown" dialog will be popped up. Click on "Confirm" if you ensure execution of Shutdown action, the system status indicates "Shutting down". (Note: The system status indicates "shutting down" even the requirements of shutting down the compressor are not meet. The unit will execute shutdown action automatically after all of the requirements have been satisfied.)

The action of 4 functional keys in main page will be detailed in subsequent sections:

✧ **Setting**

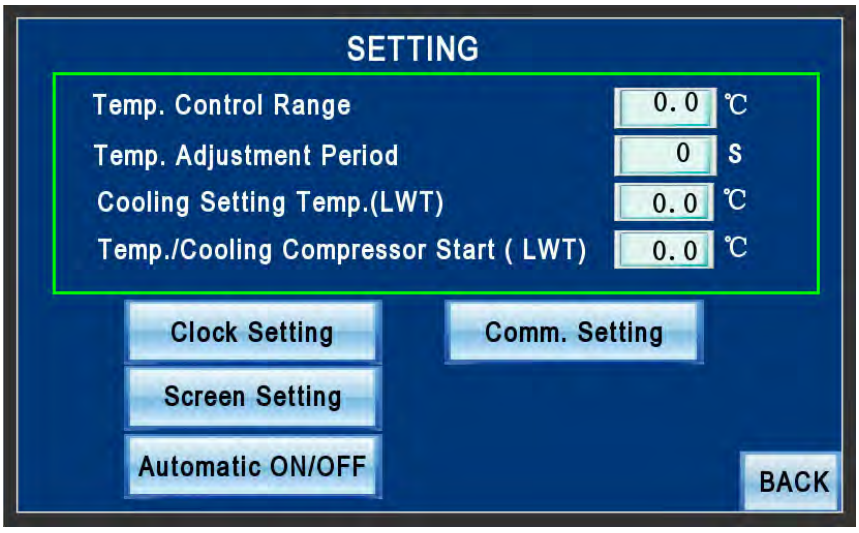
Click on 

in main page to enter the password page. Click on the dialog box of password input, an input keyboard will be popped up in the interface, input user manage password "40828", then click on "Enter" in numeric keyboard, the dialog box disappears, click on "ENTER" to enter "User Parameter Setting Page".

【User Parameter Setting Page 】

Password Error Page

"Password Error Page" will be popped up when the password is wrong, click on Confirm button to return "Password Input Interface", input the password again to enter the next page.



Note:

① "Max" in the upper left indicates the upper limit of the setting parameter; "Min" in the upper right indicates the lower limit.

② "Automatic On/Off": Only displaying under Timed mode.

Explanation:

① Target Temp. (Chilled Leaving Water): The target temperature of the chiller leaving water

② Temp. / Compressor start (Chilled Leaving Water): One of the compressor starting conditions required to be achieved for the chilled leaving water temperature. The compressor can start only at the current chilled leaving water temperature ＞ the setting value in cooling mode, or the current chilled leaving water temperature ＜ the setting value in heating mode.

③ Temp. Adjustment Period: The time interval between two temperature detections.

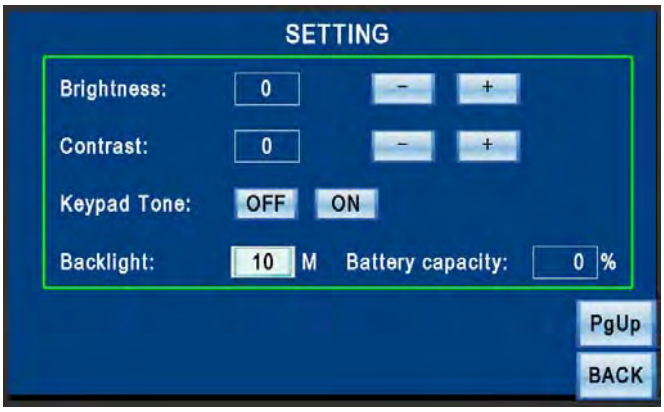
✧ **Clock Setting**

Clock Setting

Click on the numerical box, the numeric keyboard will appear, input the time, click “ENT” to save and take effect. Click “ESC” to cancel the input value.

Note: Please pay special attention in setting of time and date to the fact that setting of non-existent date or time is not allowed, and we assume no liability or responsibility for setting of non-existent date or time and consequence resulting from this setting.

✧ **Adjust Screen**



User can increase and reduce the brightness and contrast of screen by clicking on “+”and “-” in this page.

User can also open and close the keypad tone of screen by clicking on “ON” and “OFF”.

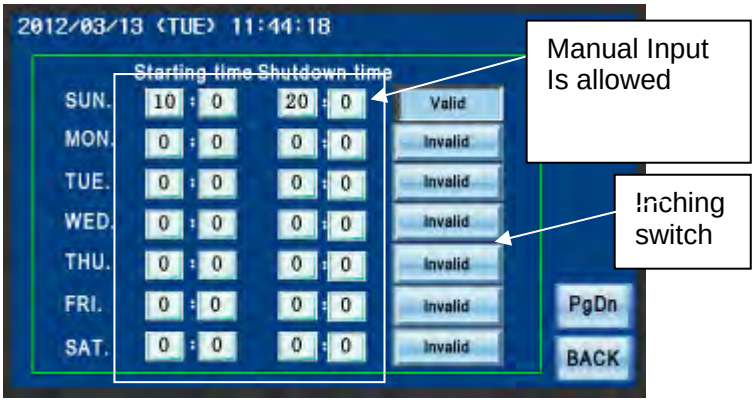
User can modify the time of backlight by clicking on the numeric box following the time of backlight.

Electric control capacity displays the battery capacity of PLC whose battery is used for supplying power for PLC interior time in the case of failure to engage PLC. Reset of PLC interior event will be resulted

from too long power-fail time of PLC module without battery.

✧ **Automatic On/Off**

If the automatic on/off function is needed, please switch to “TIMED” mode in control mode (as shown in Picture 2) firstly, then enter user parameters setting page, click on Automatic On/Off button to enter the following page ,and set the starting times and shutdown times.



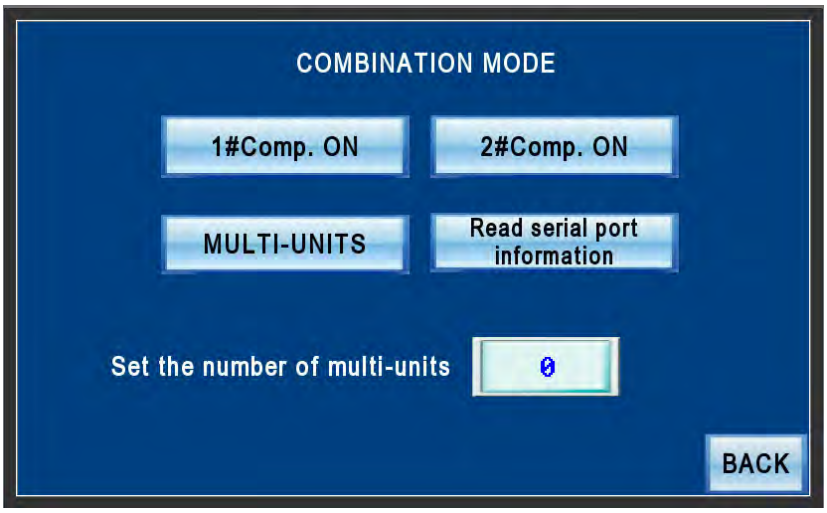
Automatic On/Off Setting

Any time every day in a week can be selected, and the units will be started or stopped at the time points. When a period of continuous running time (for example from 10:00 Tuesday to 16:00 Thursday) is necessary, you can set the time 10:00 in starting time and 0:00 in shutdown time on Tuesday and click on “Invalid to switch to Valid, set the time 0:00 in starting time and 16:00 in shutdown time on Thursday and click on “Invalid to switch to Valid,all of the others time buttons are Invalid . Pay attention to that the starting time must be before the shutdown time.

Since system interior time is used for timing start / stop, please draw attention to check whether the time of the system is correct when you are using this function.

✧ **Comm. Setting**

Click on Comm. Setting to enter the below page:



Note: “1#Comp. ON” “2#Comp. ON” only appear in dual-compressors units.

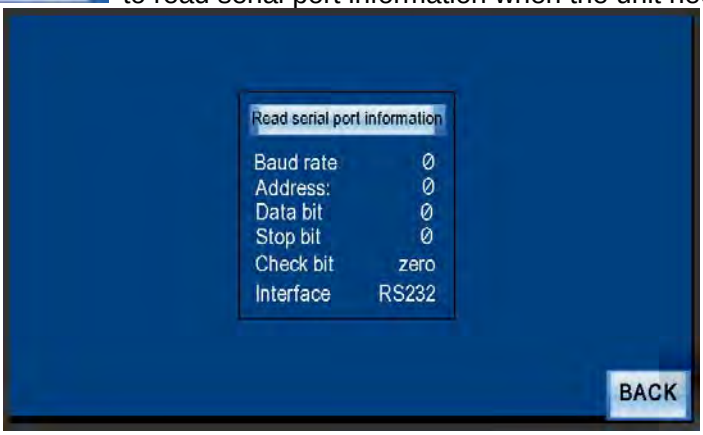
① Mult-Units: When the unit need to be multiple controlled, please contact the after-sale service

engineers to do settings of the unit. After setting well, press the Single unit button, it will turn to Multi units, then the number of multi units should be set according to the practical situation.

② "1#comp. on" "2#comp. on": No.1 or No.2 compressor can be selected to work or not, when the compressor meet the conditions it will shut down refer to the stop progress if user want to stop one compressor.

Read serial pot information

Click on Read serial port information to read serial port information when the unit need to be multiple controlled.



✧ **Status**

Click on STATUS in main page to check the current unit status information.

Status Information

The upper left in the page display the refrigerant type; the upper right display the station number address, the station number of master is set to 1.

Note:

To start up, following conditions are required:

① "Restart Delaying" need to display "NO" ,if "YES", it indicates the delaying period has not achieved.

② "Water Temp. Allow Compressor Start" need to display "YES", if "NO", it indicates the current temperature is not able to meet the compressor starting condition.

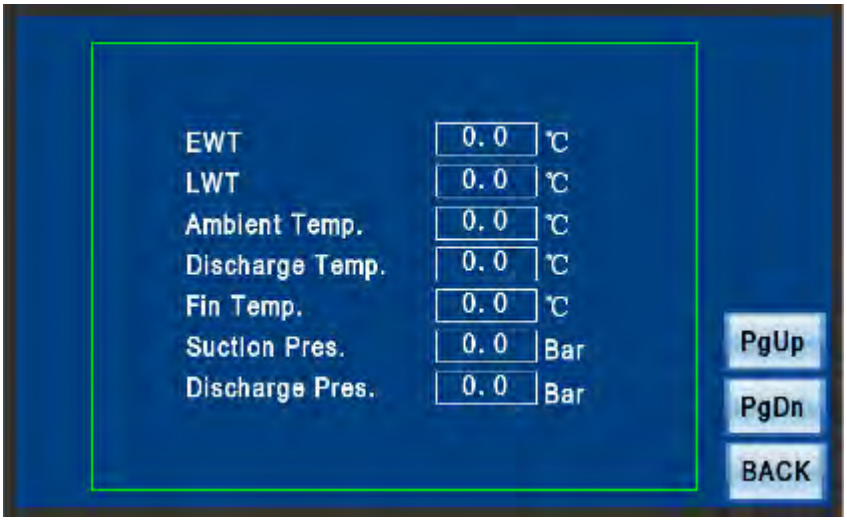
③ "Remaining Oil Heating Time" need to display "0", if more than 0, it indicates the oil heating is in process.

To shut down, the following condition is required:

① ”Min. Running Time Elapsed” need to display “YES”, if ‘NO’, it indicates the shortest running period has not achieved.

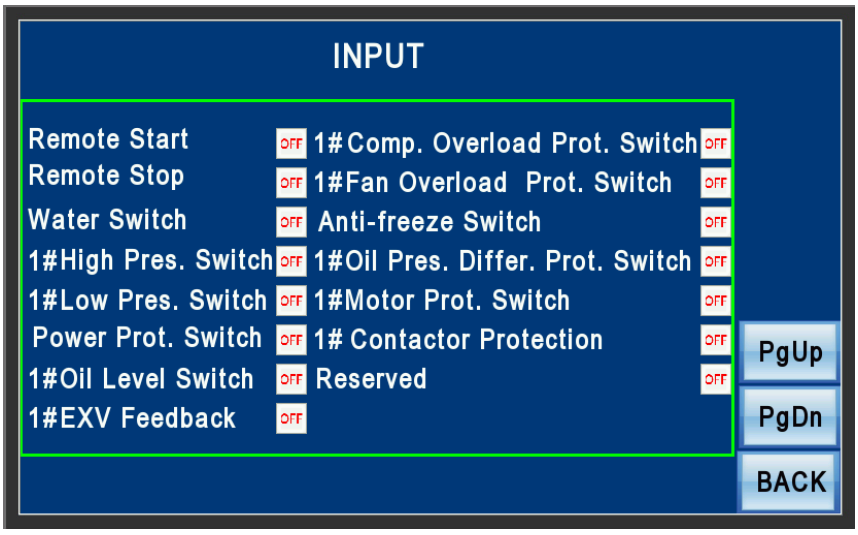
Current Data Display

Please click on PgDn button to enter the current data interface, the interface indicates current detection data. User can enter this interface to query the temperature information when there are alarms such as temperature too high or too low.



Current Data Display

Input



Input Status

“ON” as displayed indicates the input point is closed; “OFF” as displayed indicates the input point is open.

Note:

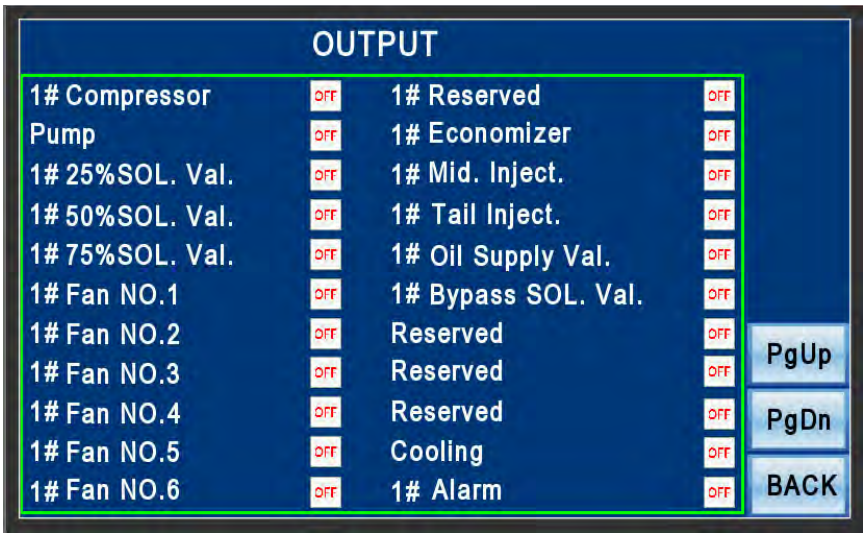
① “Remote Start/Stop” is available only under REMOTE mode.

② “Water Switch”: indicating that current water flow status of chilled water system. “OFF” displayed in no water flow state, otherwise “ON”.

③ “Contactor Protection”: indicating that when the compressor start to run, the contactor act normally, “OFF” switch to “ON”.

④ All of protection switch is “ON” in normal condition and “OFF” in failure status.

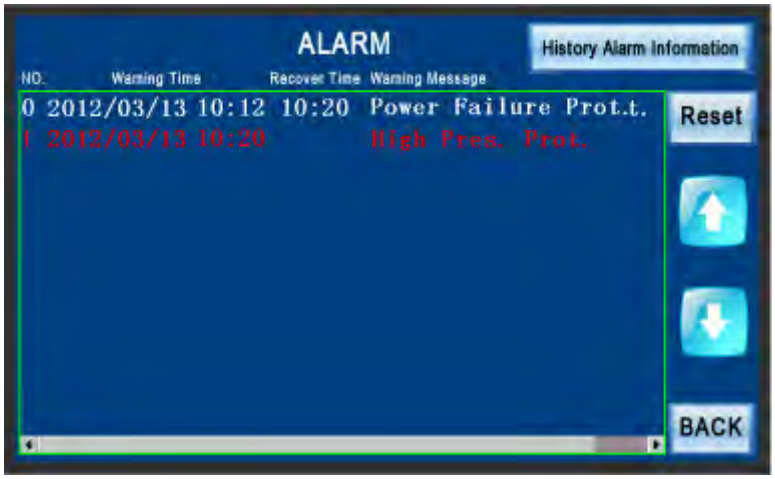
Output Status



Output

“ON” as displayed indicates the output point is energized; “OFF” as displayed indicates the output point is de-energized.

✧ **Alarm**



Alarm Information Page

Click on 

button in Main Page to enter the alarm information page.

If there is any alarm, the unit will execute alarm procedure action. The unit alarm status can’t be removed until all of the alarms have been eliminated and alarm shutdown process has been finished. Click on 

button and “Fault” in main page disappear, the unit returns to normal. If the warning message is more, please click on  to check. These in red color indicate the alarms which have not been eliminated; these in white color indicate the alarms which have been eliminated.

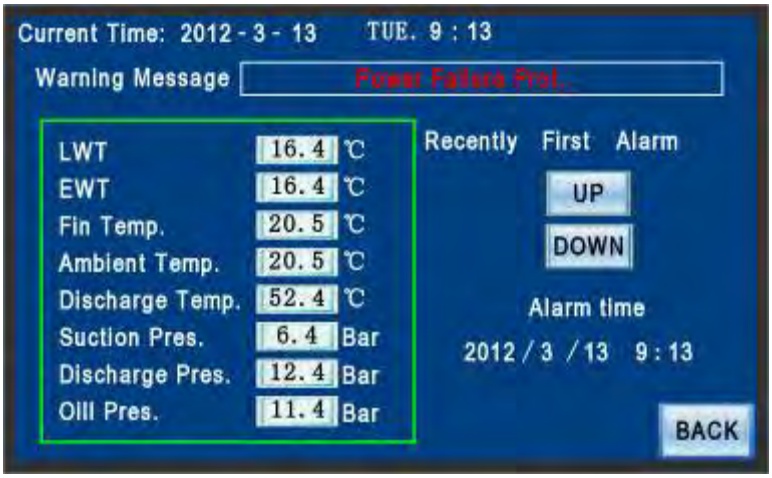
Note:

1. High-Pressure Protection is unable to reset in alarm information page, manual reset in the high pressure switch (installed in the discharge pipe) is needed.
2. Compressor and fan overload protection are unable to reset automatically, please check the

relevant thermal relay in the control box to reset manually.

History Alarm Information

Click on History Alarm Information button in Alarm Page to enter history alarm information query information, as shown in Picture 8.2. Max.5 warning messages can be recorded meanwhile. The messages will be updated automatically if there are more messages.



History Alarm Information Query

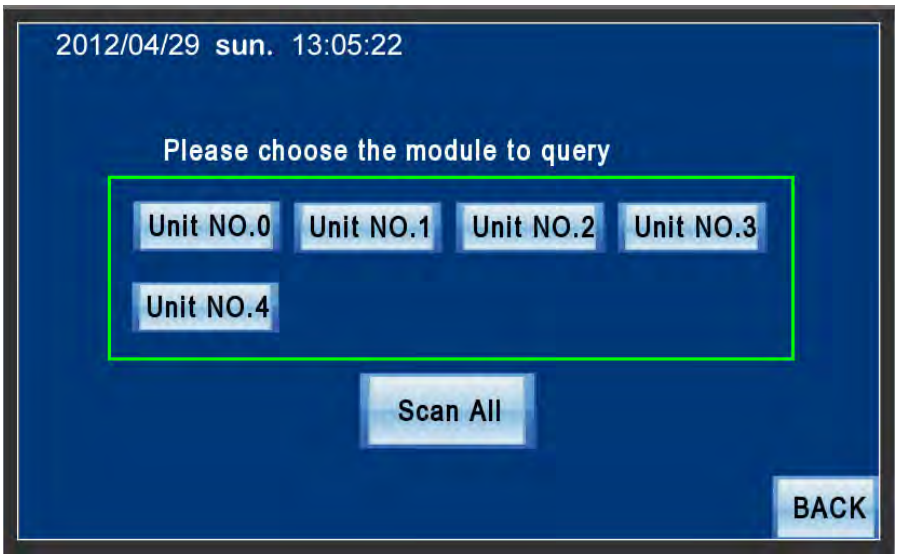
Note:

1. The history alarm information record the unit operating parameters when there happen unit alarms during the compressor running.

Content of Failure	Content of Failure
Water flow fault	2# Suction pressure failure
Anti-freeze Protection	2# Discharge pressure failure
1# High-pressure protection	1# High discharge temp. protection
1# Low-pressure protection	1# High Fin temp. protection
1# Compressor Motor Protection	1# Differential pressure protection
1# Low Oil Level Protection	1# Low Suction Pressure protection
1# Contactor protection	2# High discharge pressure protection
1# Oil differential pressure protection	1# Mode switch failure
1# Compressor overload	Mode water temp. protection
1# Fans overload	1# EXV module failure
Power Failure Protection	2# High pressure protection
Entering water temp. sensor failure	2# Low pressure protection
Leaving water temp. sensor failure	2# Compressor motor protection
Ambient temp. sensor failure	2# Oil level protection
1# Fin temp. sensor failure	2# Contactor protection
1# Discharge temp. sensor failure	2# Oil differential pressure protection
2# Fin temp. sensor failure	2# Compressor overload
2# Discharge temp. sensor failure	2# Fans overload
1# Suction pressure failure	2# High discharge temp. protection
1# Discharge pressure failure	2# High Fin temp. protection

Content of Failure	Content of Failure
2# Differential pressure protection	2# Mode switch failure
2# Low Suction Pressure protection	2# EXV module failure
2# High discharge temp. protection	Invalid Address Number

✧ **Multi-Units Status**



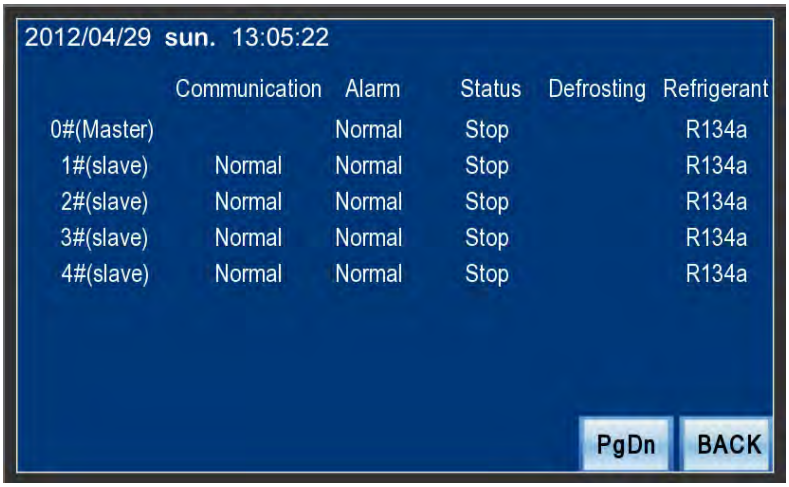
Multi Units Status

In this page, you can query the status of different modules through choosing the corresponding module button, also can check the status of all modules meanwhile through master-monitoring.

Master-Monitoring Page

Click on 

to enter the next page, it will show the information of all connected units as following: The communication, alarm information, status, refrigerant type of each unit can be inquired in the following pages.



Click on 

to enter the next page.

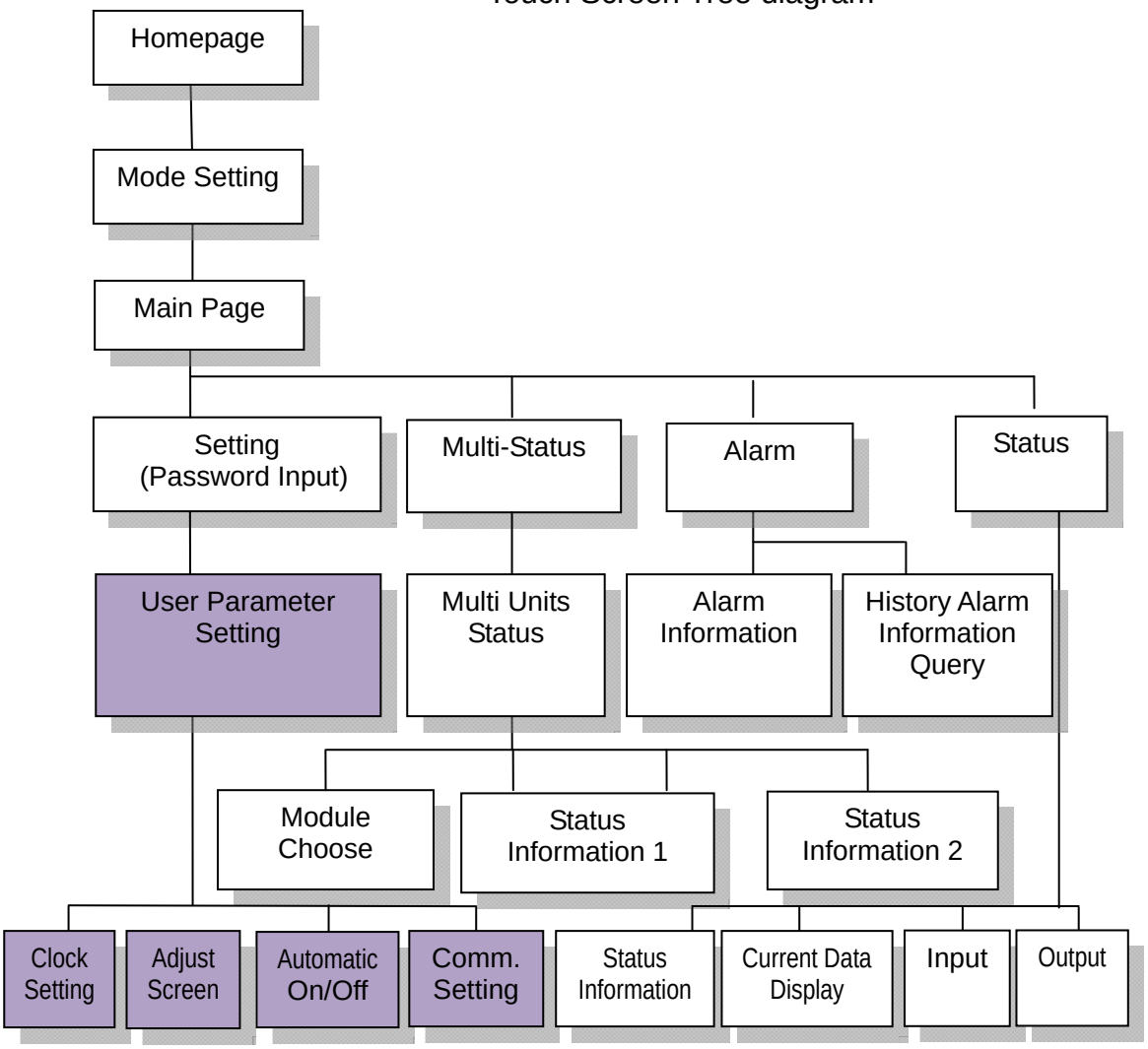
Note:

① Max.8 units can achieve combination control, the unconnected unit can access the combination control system at any time as long as the unit is powered on and connected with the system by communication cable.

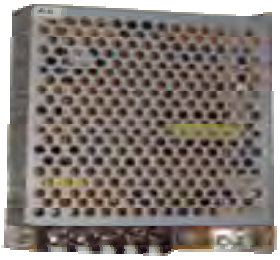
② The “Status” displays “Run” until the unit finish the starting action and enter the process of automatic energy adjustment, otherwise displayed “shutdown”

5. Control Screen Menu Structure

Touch Screen Tree diagram



6. Introduction of Major Electric Components

Programmable Logic Controller (PLC)		Collect all digital quantities and analog quantities on units as well as inputs of quantities and touch screen commands, and realize different outputs by judgment of procedures to meet the requirement or normal and safe running of units.
Touch Screen Human-Machine Interface (HMI)		Communicate with PLC to display the running status of units, set the running mode of units and control the running parameters of units.
Switch Power Supply		Achieve AC220V/DC24V to provide power supply for touch screen, also for PLC and intermediate relay in some tailor-made products.
Time Relay		An element necessary for achieving compressor contactor star-delta switchover. The time set above is defined as the star running time (3 to 6S)
EXV Control Module		Work out the suction superheat in the running process of compressors through the temperature sensor (NTC) and the pressure sensor connected to the module, and regulate the opening of EXV through the suction superheat to enable units to run in a stable status of energy-saving
Thermal Overload Relay		Heat will be generated when current passes through a conductor. Heat effects are different due to different types of current passing through thermal sheet metal inside the thermorelay. When the heat effects are accumulated to certain degree, the thermal sheet metal will be deformed so as to switch off front and rear parts of the thermorelay forcibly to achieve the purpose of protection.

Power Protection Module	  (for CE)	Detect the quality of power supplied to units by the user, detect the voltage range of the power, the imbalance rate of three-phase voltage, phase sequence and phase lack, and protect the units by inspecting the quality of power.
Isolating Transformer		Transform the electrical system applied by the user into AC220V for supplying power to the control circuit. It can isolate harmonic disturbance between circuits and increase control accuracy.
Moulded Case Circuit Breaker		The moulded case circuit breaker acting as a main circuit switch with circuit protection is generally applied for newly developed units.
Intermediate Relay		The intermediate relay has the major action of separating control circuit from power circuit to avoid heavy current of the latter from returning to control circuit in case of any failure and burning down PLC and other important components.
Miniature Circuit Breaker		Control on/off of circuit, and also has the action of short circuit protection on control circuit.
Current Transformer		Transform main incoming current into low current to be accessed to the thermal overload relay to enable the thermal overload relay to judge whether the current is too heavy so as to play a role of current protection.

TRUST

Air Conditioning Systems

Cooling & Heating

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