

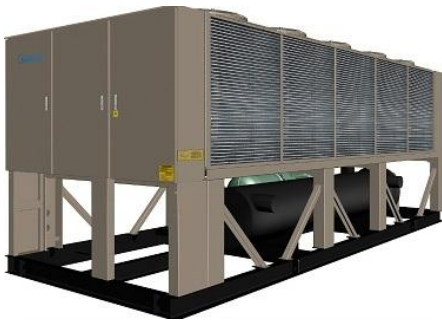
### 3). External appearance



LSBLGW380/C module



LSBLGW500/C module



LSBLGW600/C LSBLGW720/C module



LSBLGW900/C module



LSBLGW1000/C LSBLGW1200/C module



LSBLGW1420/C module

## 2. Feature

### ✚ Environmental care

#### ■ R134a refrigerant

Refrigerant of the HFC group with zero ozone depletion potential.

It is environmentally safe and does not have a phase-out date.

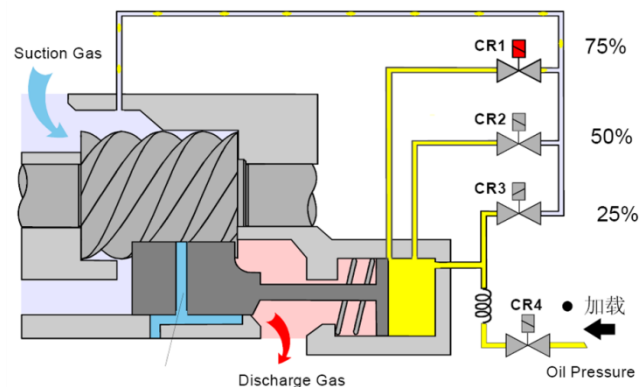


### ✚ Economical operation cost

■ Extremely high full load and partial load energy efficiency. New twin-rotor screw compressor equipped with a high-efficiency motor and a variable capacity valve that can adjust the capacity of 25%, 50%, 75% and 100% in 4 stages (Stepless control is optional) and permits exact matching of the cooling capacity to the actual load.

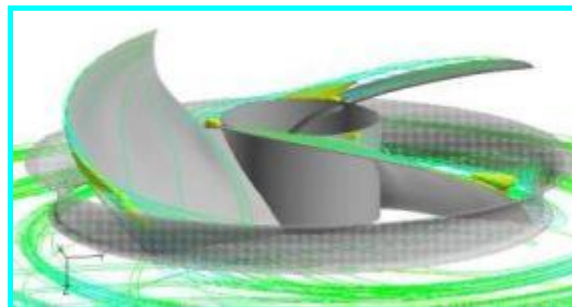
■ Electronic expansion device permits the operation at a lower condensing pressure and improve the utilization of the evaporator heat exchange surface (superheat control).

■ Economizer system with electronic expansion device for increases the cooling capacity. Automatic scheduling of the Chiller's compressors allows the chiller to match the fluctuating cooling load and conserve energy with each unit running at its peak efficiency.



### ✚ Lower operating noise

■ The twin-screw compressor adopts the strong points of gapless-loss, high-efficiency cubage, low-noise, few easy workout parts. Double-wall structure not only compensates the pressure, but also significantly reduces the noise. Cast iron structure of the compressor casing and oil separator can reduce the noise significantly.



■ Low-noise fans, made of a composite material are now even quieter and do not generate intrusive low-frequency noise. Rigid fan mounting avoids start-up noise.

Multiple direct drive dynamically balanced propeller fans operate at low tip speeds for maximum

efficiency and minimum noise and vibration. A heavy-gauge vinyl-coated fan guard protects each fan.

#### ✚ **Outstanding reliability**

- Full factory testing of all the units ensures a trouble free start-up. Extensive test makes certain that each safety and operating control is properly adjusted, and operates correctly. The unit has passed full factory test before being delivered to ensure the reliable working on the site.
- Transport simulation test in the laboratory on a vibrating table.

#### ✚ **Simple structure, easy Installation**

- The unit can be placed in service after being connected with power supply and water supply during field installation .Standard flange connection and wire mesh to the electrical panel make the installation easy and simple.



#### ✚ **State of technique, accuracy control**

- The sensors related to control and other assemblies are equipped by factory and strictly tested  
 Intelligent control: The unit is controlled by micro-controller and has the automatic control functions of fault diagnosis, energy management and anti-freezing monitoring, which ensures the high-efficiency operation of the unit, and more convenient in use. The unit with RS485 open protocol communication interface. BMS compatible. The startup and shutdown of each unit is controlled by the host computer, reducing the running cost to the lowest.
- Complete and safe control system: All electrically control elements are designed and selected with stable quality and reliable function; The unit designed with multiple security measures ensure the safe and reliable running witch including high and low pressure protection, oil pressure difference protection, anti-freezing protection, water flow protection, power protection, overload protection etc.

### 3. Specification

#### Single compressor:

LSBLGWXXX/C		380	500	600	720
Cooling capacity	kW	376	496	594	720
Power input	kW	124	159	187	234
COP	kW/kW	3.03	3.12	3.17	3.07
<b>Semi-hermetic screw compressor</b>					
Circuit A	Quantity	1	1	1	1
Circuit B	Quantity	--	--	--	--
Oil recharge	Type	BSE170	BSE170	BSE170	BSE170
Circuit A	L	30	30	30	32
Circuit B	L	--	--	--	--
Refrigerant	Type	R134a	R134a	R134a	R134a
Circuit A	kg	76	90	105	140
Circuit B	kg	--	--	--	--
Control type		EXV	EXV	EXV	EXV
Evaporator	Type	Shell and tube heat exchanger(DX)			
Water content	L	222	308	340	520
Water flow	m <sup>3</sup> /h	65.4	86	103.2	123.8
Pressure drop	kPa	39	54	56	58
Max. design pressure	MPa	1	1	1	1
Pipe connection type		Victaulic Coupling			
Water inlet/outlet pipe dim.	mm	125	125	125	150
Condenser	Type	Fin-coil	Fin-coil	Fin-coil	Fin-coil
Fan	Quantity	6	8	10	10
Total air flow	m <sup>3</sup> /h	23000*6	23000*8	23000*10	23000*10
Fan speed	rpm	940	940	940	940
Unit length	mm	3810	4865	5800	5800
Unit width	mm	2280	2280	2280	2280
Unit height	mm	2370	2370	2370	2370
Shipping weight	kg	3320	4330	5000	5500
Running weight	kg	3540	4640	5340	6020

Safety protection device	The following safety devices are equipped as standard.
	High pressure protection; Low pressure protection;
	Compressor overload protection;
	Fans overload protection;
	High discharge temp. protection;
	Power failure protection; Contactor protection;
	Water flow protection; Motor protection;
Low oil level protection; Differential pressure protection;	

#### Note:

1) Nominal cooling capacities are based on the following conditions:

Chilled water inlet/outlet temp: 12°C/7°C; Outdoor temp (DB/WB):35°C/24°C.

2) The applicable ambient temperature range of R134a air-cooled screw units is 15°C ~ 43°C.

3) Water side fouling factor: 0.086m<sup>2</sup>·°C/kW.

**Dual compressors:**

LSBLGWXXX/C		900	1000	1200	1420
Cooling capacity	kW	902	996	1203	1419
Power input	kW	285	318	381	466
COP	kW/kW	3.16	3.13	3.15	3.04
Semi-hermetic screw compressor					
Circuit A	Quantity	1	1	1	1
Circuit B	Quantity	1	1	1	1
Oil recharge	Type	BSE170	BSE170	BSE170	BSE170
Circuit A	L	30	30	30	32
Circuit B	L	30	30	30	32
Refrigerant	Type	R134a	R134a	R134a	R134a
Circuit A	kg	76	90	105	140
Circuit B	kg	90	90	105	140
Control type		EXV	EXV	EXV	EXV
Evaporator	Type	Shell and tube heat exchanger(DX)			
Water content	L	620	600	770	910
Water flow	m <sup>3</sup> /h	154.8	172	206.4	244.2
Pressure drop	kPa	74	75	71	69
Max. pressure	MPa	1	1	1	1
Pipe connection type		Victaulic Coupling			
Water inlet/outlet pipe dim.	mm	150	150	200	200
Condenser	Type	Fin-coil	Fin-coil	Fin-coil	Fin-coil
Fan	Quantity	14	16	16	20
Total air flow	m <sup>3</sup> /h	23000*14	23000*16	23000*16	23000*20
Fan speed	rpm	940	940	940	940
Unit length	mm	8800	9640	9640	11700
Unit width	mm	2280	2280	2280	2280
Unit height	mm	2370	2370	2370	2370
Shipping weight	kg	7750	8900	9100	11100
Running weight	kg	8370	9500	9870	12010

Safety protection device

The following safety devices are equipped as standard.  
 High pressure protection; Low pressure protection;  
 Compressor overload protection;  
 Fans overload protection;  
 High discharge temp. protection;  
 Power failure protection; Contactor protection;  
 Water flow protection; Motor protection;  
 Low oil level protection; Differential pressure protection;

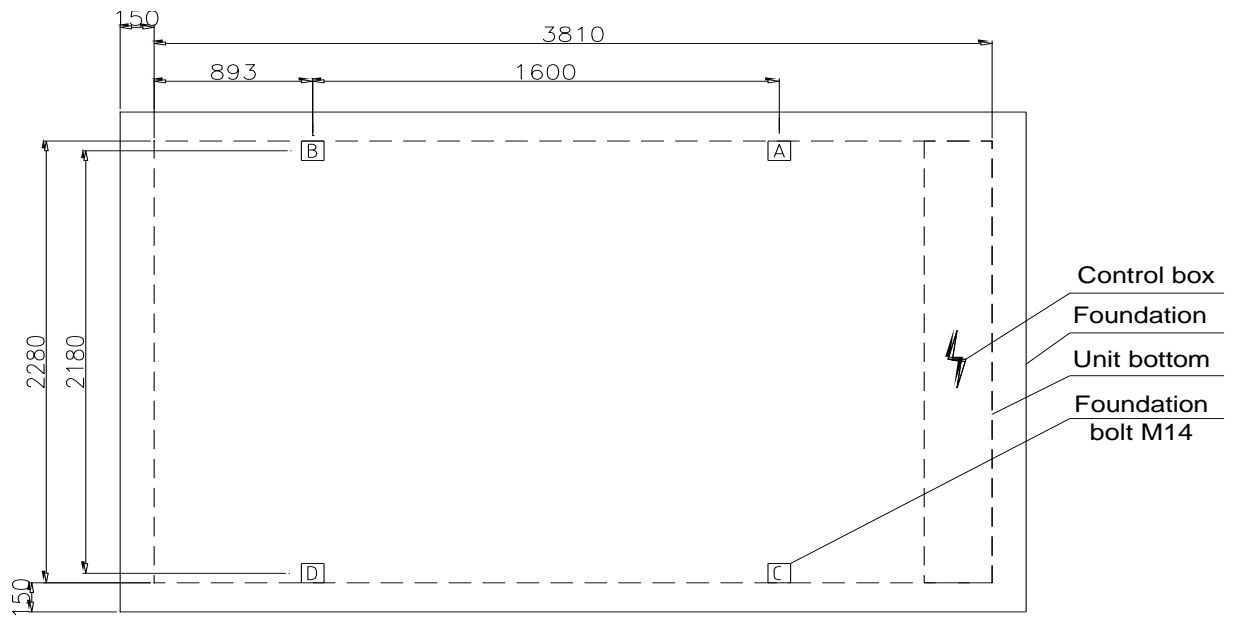
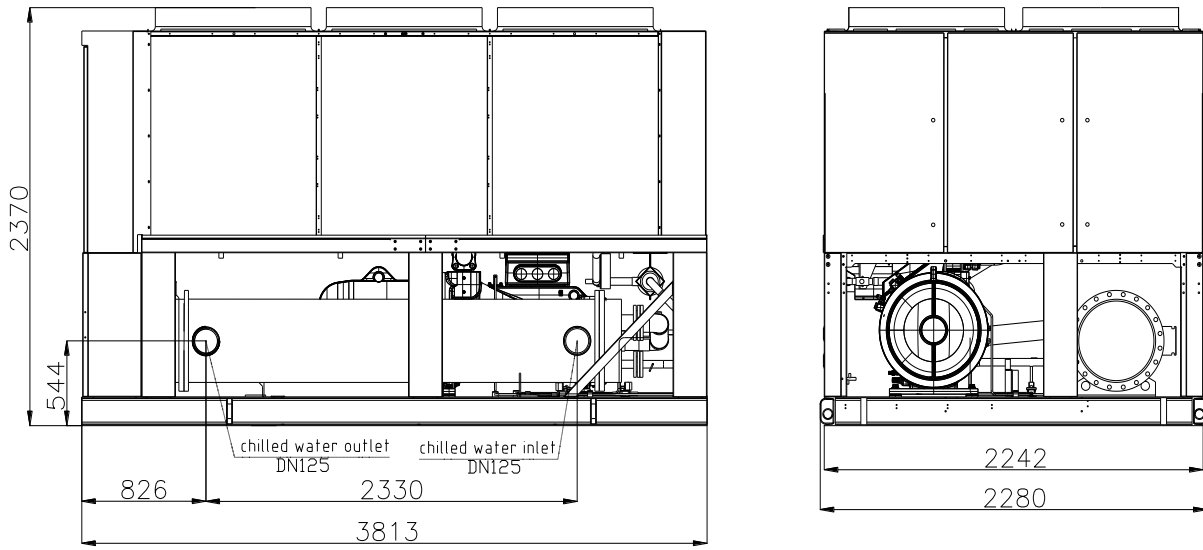
**Note:**

- 1) Nominal cooling capacities are based on the following conditions:  
 Chilled water inlet/outlet temp: 12°C/7°C; Outdoor temp (DB/WB):35°C/24°C.
- 2) The applicable ambient temperature range of R134a air-cooled screw units is 15°C ~ 43°C.
- 3) Water side fouling factor: 0.086m<sup>2</sup>·°C/kW.

**4. Outline dimension**

(1) LSBLGW380/C

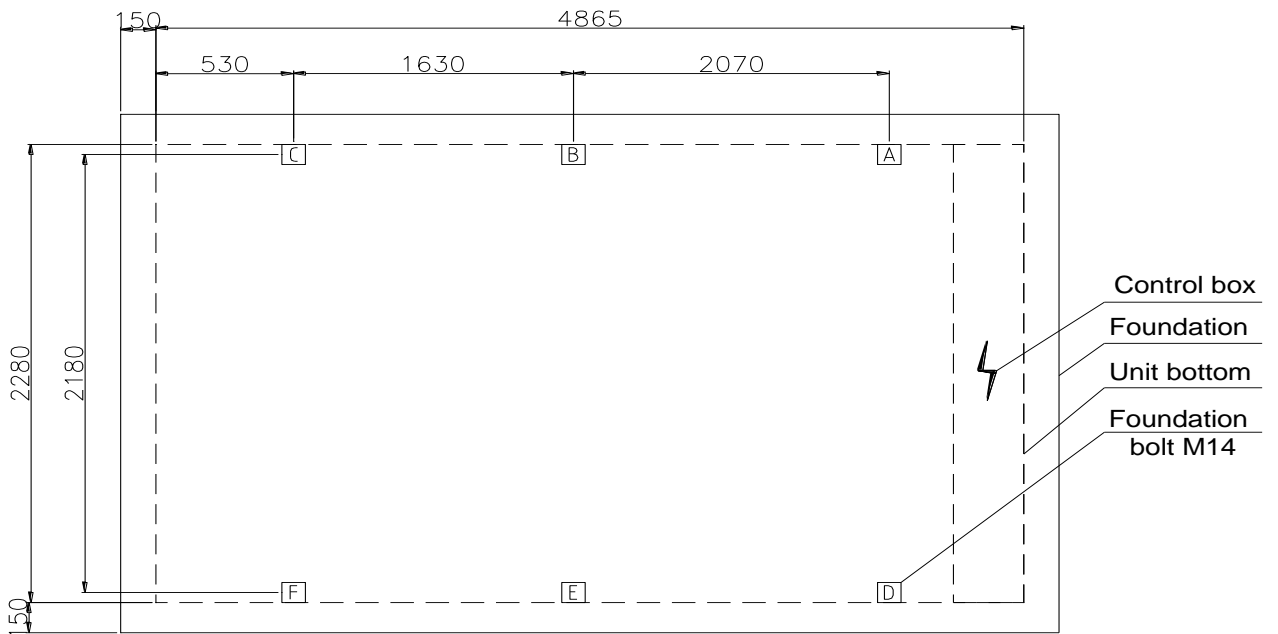
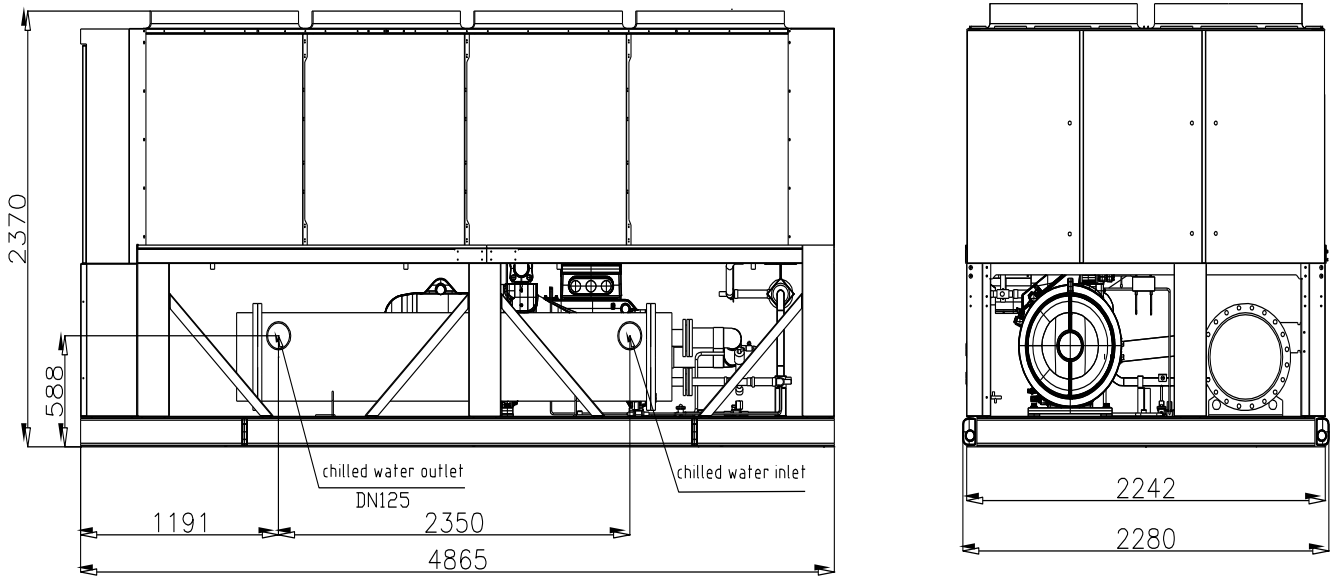
Unit (mm)



Model	Weight to be supported by spring isolator(kg)			
	A	B	C	D
LSBLGW380/C	869	901	869	901

(2) LSBLGW500/C

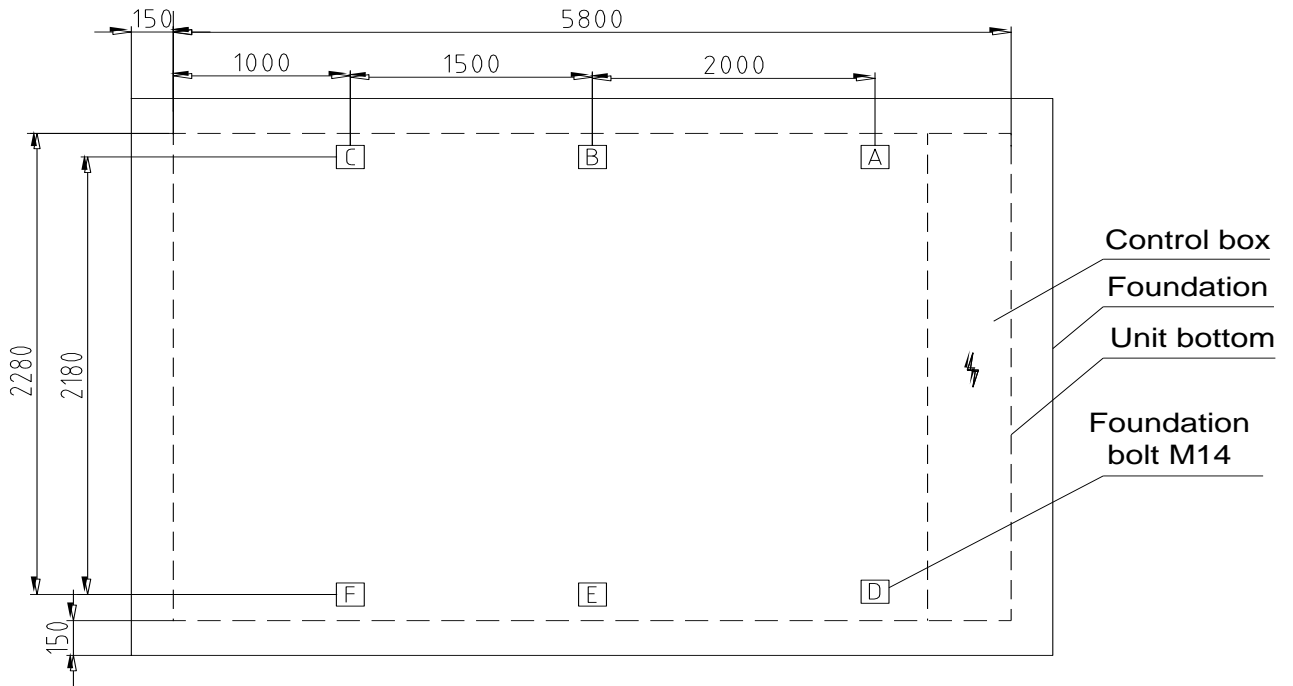
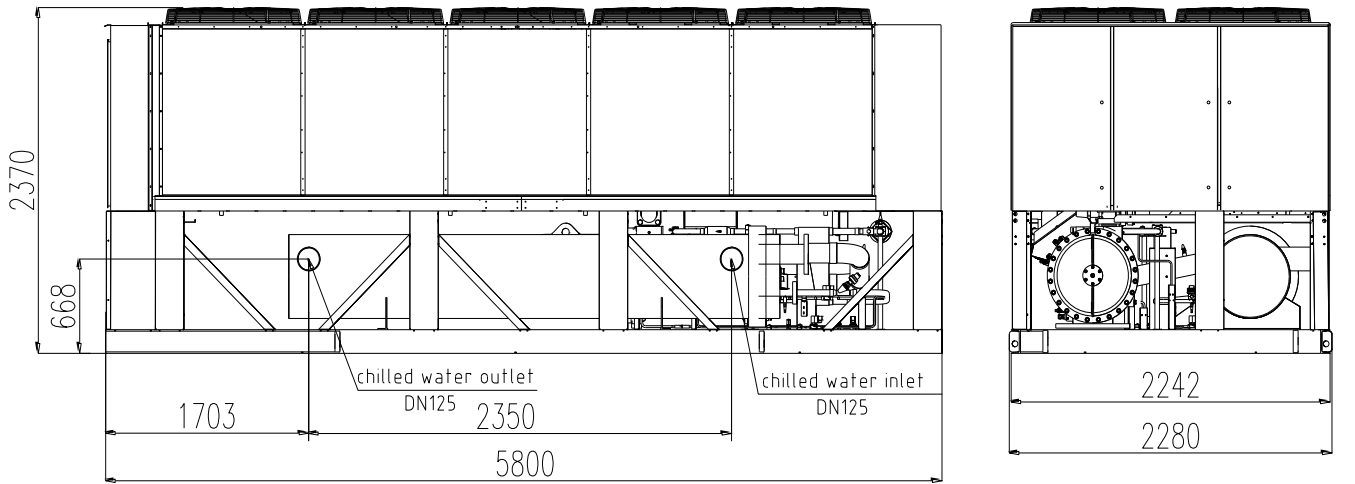
Unit (mm)



Model	Weight to be supported by spring isolator(kg)					
	A	B	C	D	E	F
LSBLGW500/C	633	855	832	633	855	832

**(3) LSBLGW600/C**

Unit(mm)

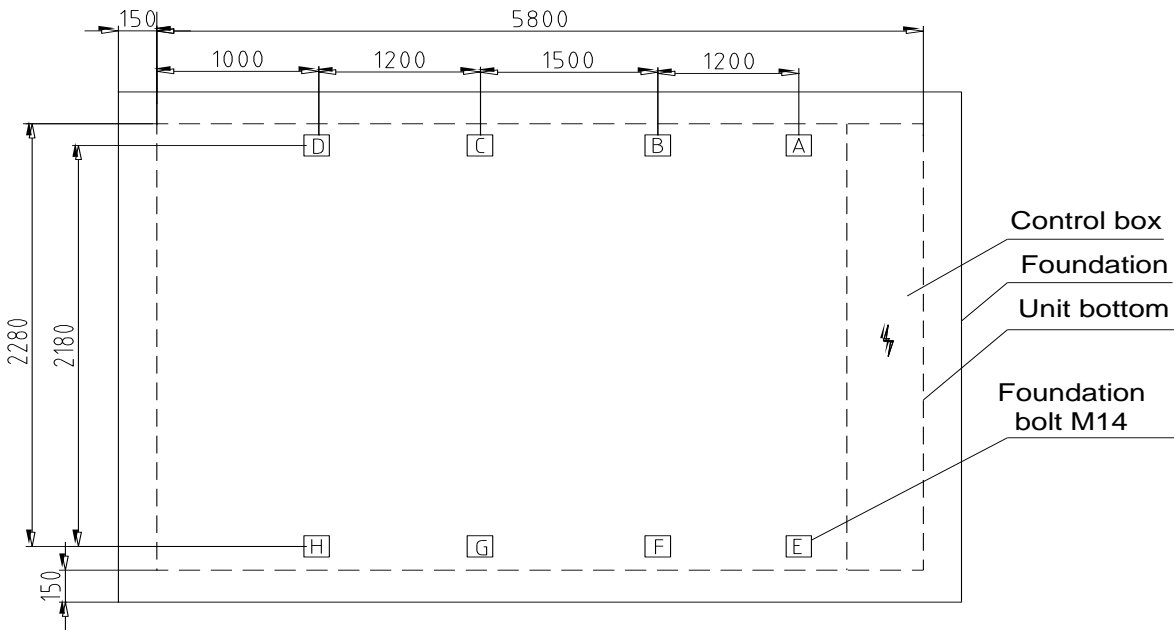
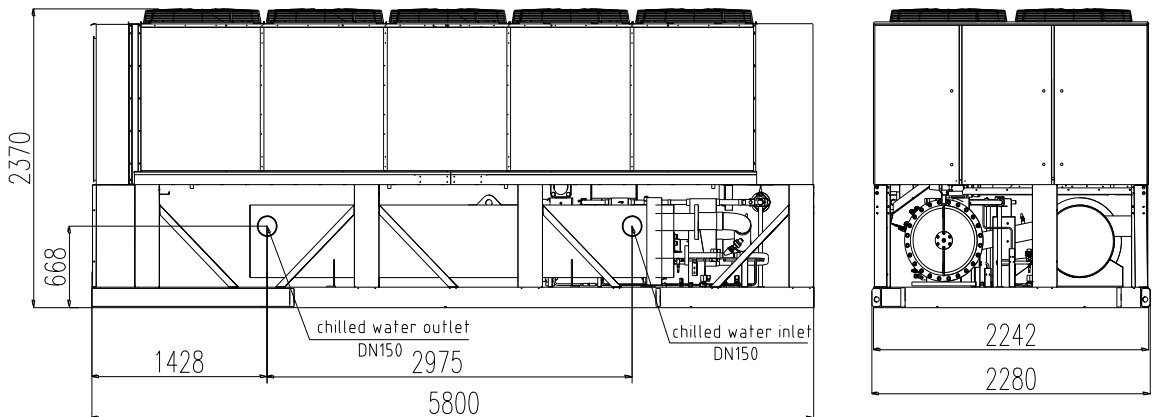


Model	Weight to be supported by spring isolator(kg)					
	A	B	C	D	E	F
LSBLGW600/C	815	934	921	815	934	921



(4) LSBLGW720/C

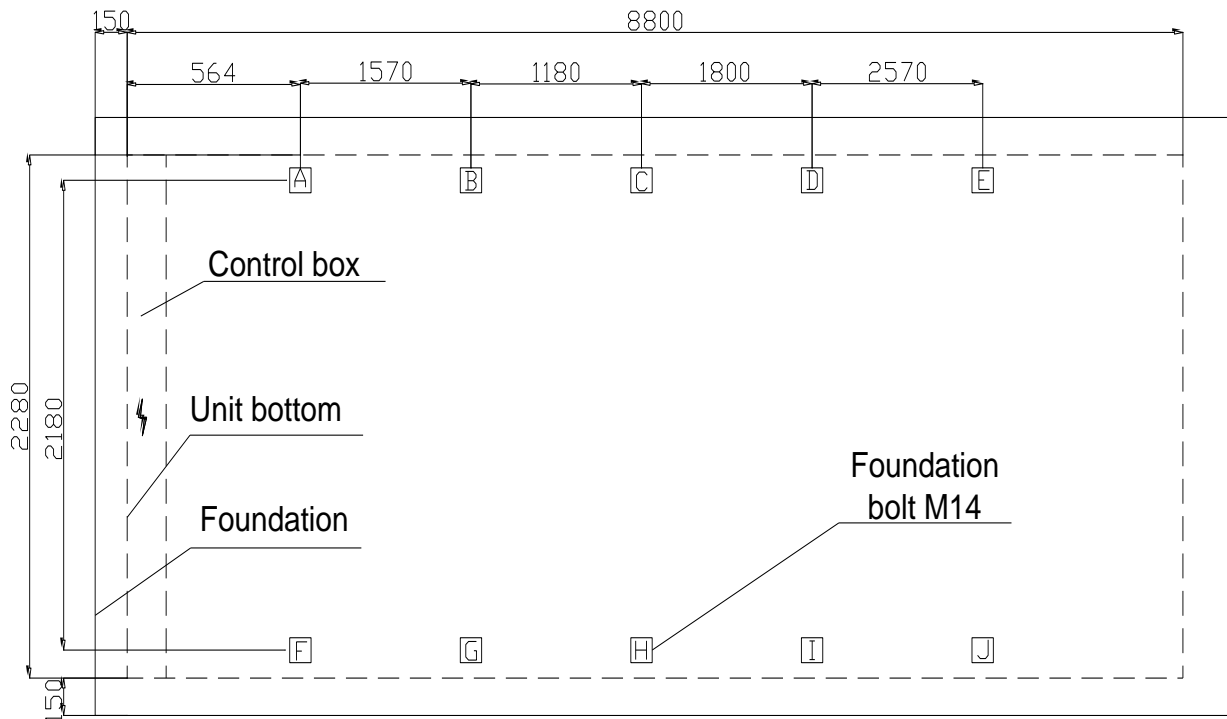
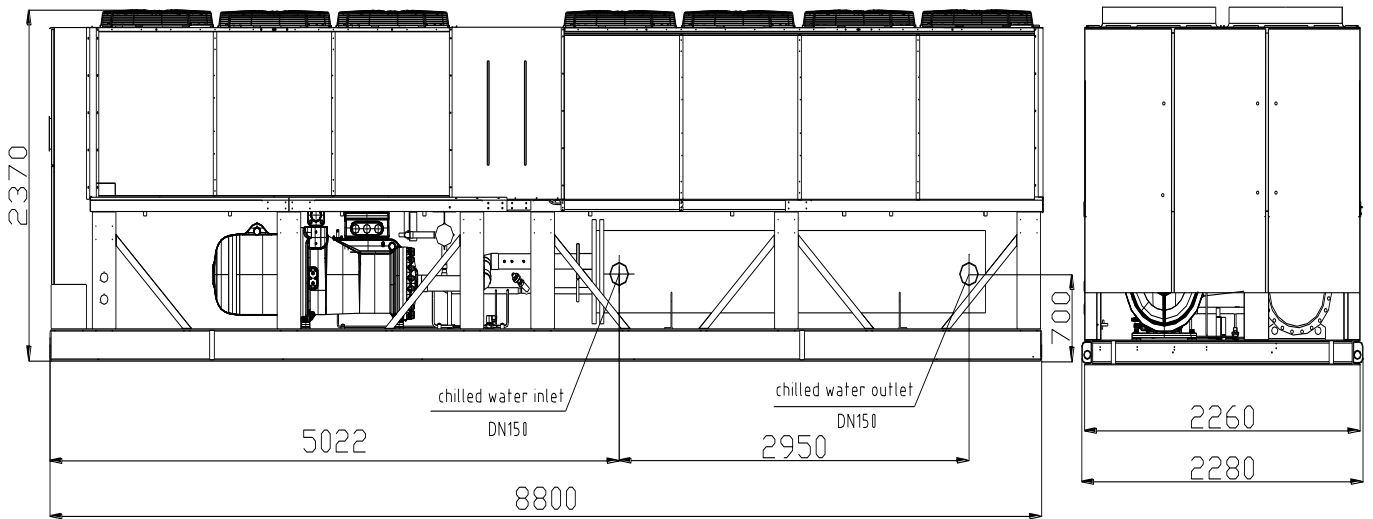
Unit(mm)



Model	Weight to be supported by spring isolator(kg)							
	A	B	C	D	E	F	G	H
LSBLGW720/C	687	765	800	758	687	765	800	758

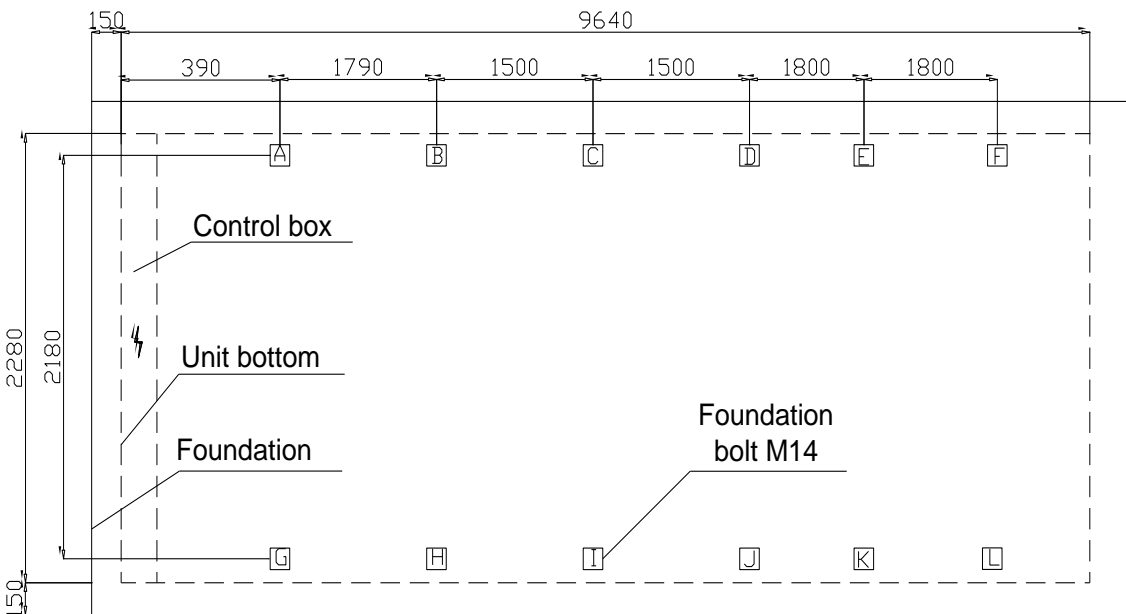
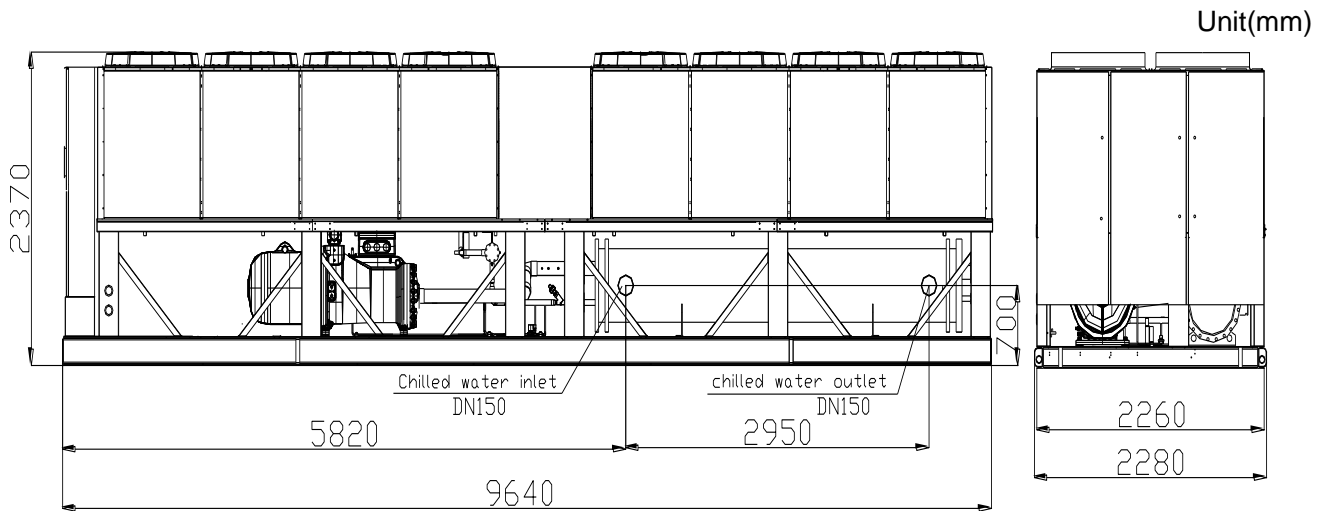
(5) LSBLGW900/C unit

Unit(mm)



Model	Weight to be supported by spring isolator ( kg )									
	A	B	C	D	E	F	G	H	I	J
LSBLGW900/C	814	944	947	747	733	814	944	947	747	733

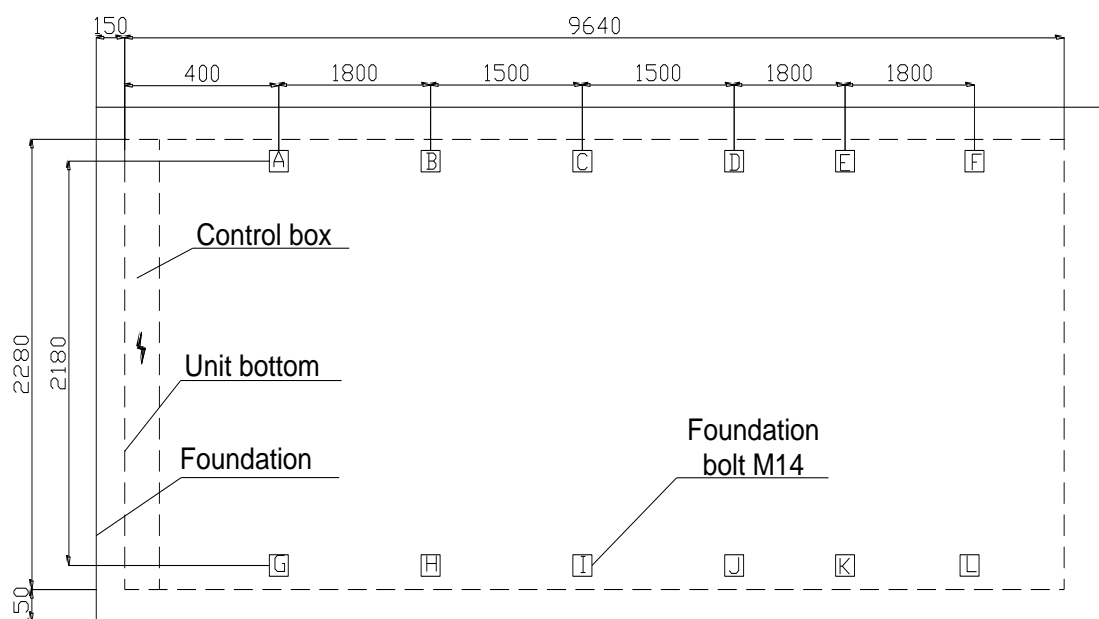
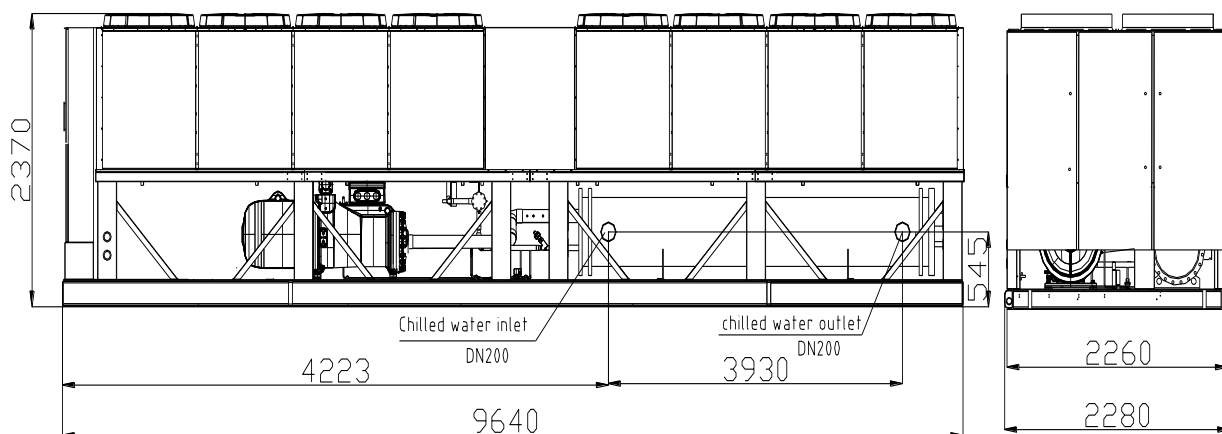
(6) LSBLGW1000/C



Model	Weight to be supported by spring isolator ( kg )											
	A	B	C	D	E	F	G	H	I	J	K	L
LSBLGW1000/C	726	912	917	732	731	732	726	912	917	732	731	732

(7) LSBLGW1200/C

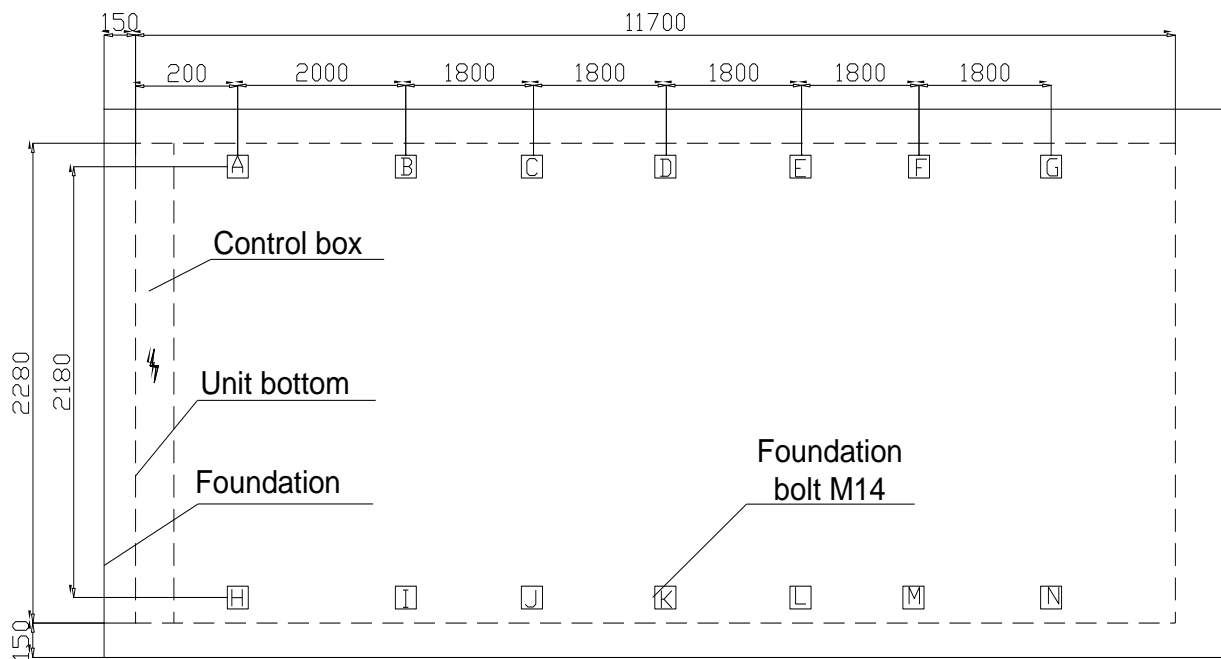
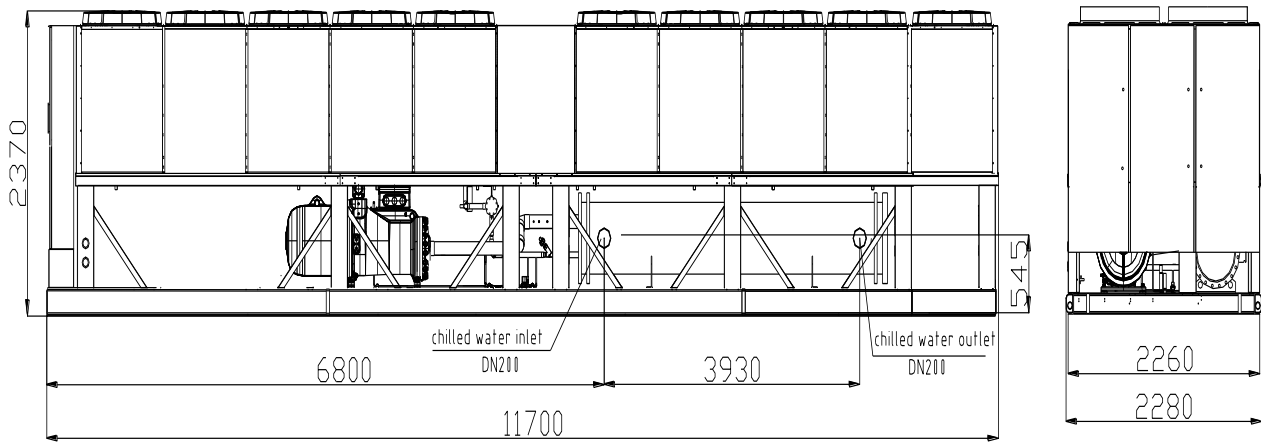
Unit(mm)



Model	Weight to be supported by spring isolator ( kg )											
	A	B	C	D	E	F	G	H	I	J	K	L
LSBLGW1200/C	789	912	905	779	777	773	789	912	905	779	777	773

**(8) LSBLGW1420/C**

Unit(mm)



Model	Weight to be supported by spring isolator ( kg )													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
LSBLGW1420/C	794	925	954	936	800	798	798	794	925	954	936	800	798	798

## 7. Application

### 1).Operating Range

Content	Running range
Ambient Temp.	15°C~43°C(T1)
Leaving water Temp.	5°C~15°C
Water flow volume	Rating flow volume±20%
Max inlet/outlet water Temp. difference	8°C
Fouling factor (m <sup>2</sup> ·°C/kW)	0.086
Voltage tolerance	Rating Voltage±10%
Phase tolerance	±2%
Power supply frequency	Rating frequency±2%
Evaporator max working pressure on water side	1.0MPa
Compressor max. start count	4 times/h
Environment quality	High corrosive environment and high humidity should be avoided.
Drainage system	The height of water drainage should not be higher than the base of the unit on the spot
Storage and transport temperature	-25°C~55°C
RH(relative air humidity)	In + 40°C does not exceed 50%, + 25°C no more than 90%
Applicable altitude range:	No more than 1000m

### 2).Water Flow – Water Drop Pressure Curve

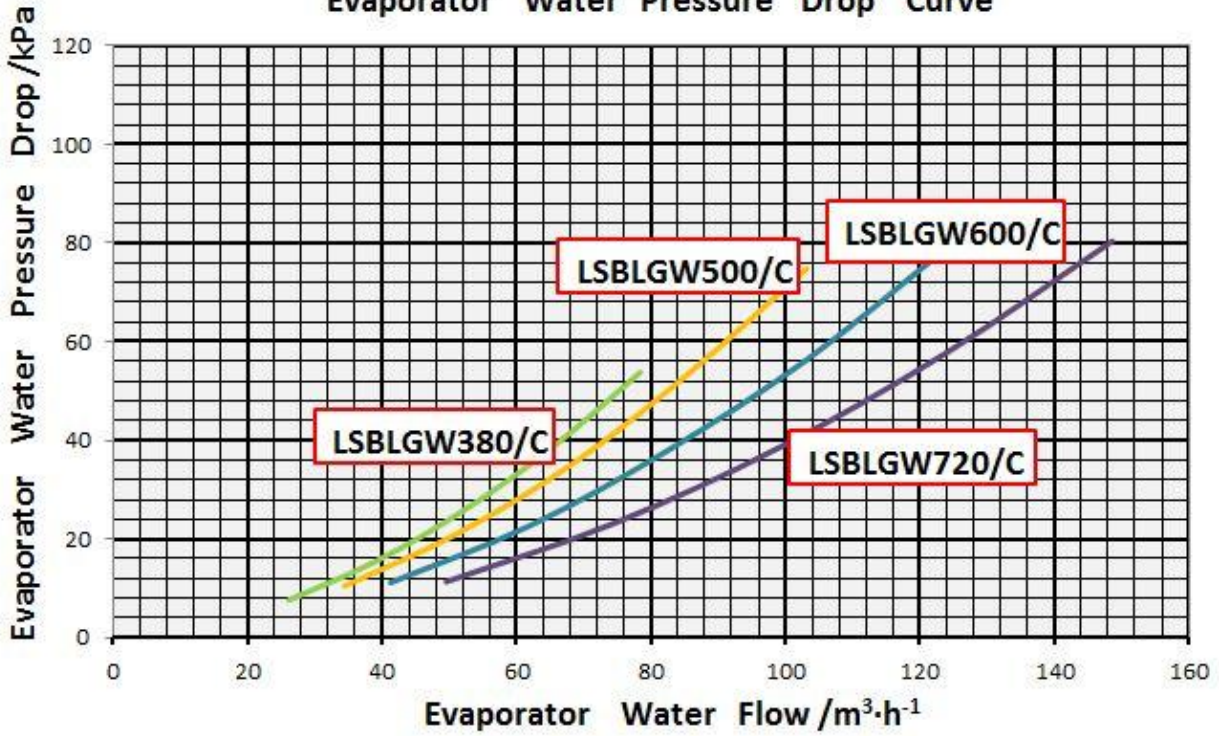
Balance the chilled water flow through the evaporator. The flow rates must fall between the minimum and maximum values shown in the below table. Flow rates below the minimum values shown will result in laminar flow which will reduce efficiency, cause erratic operation of the electronic expansion valve and could cause low temperature cutouts. On the other hand, flow rates exceeding the maximum values shown can cause erosion on the evaporator water connections and tubes, even piping breaking.

Variable chilled water flow through the evaporator while the compressor(s) are operating is not recommended. The chiller control set points are based upon a constant flow and variable temperature.

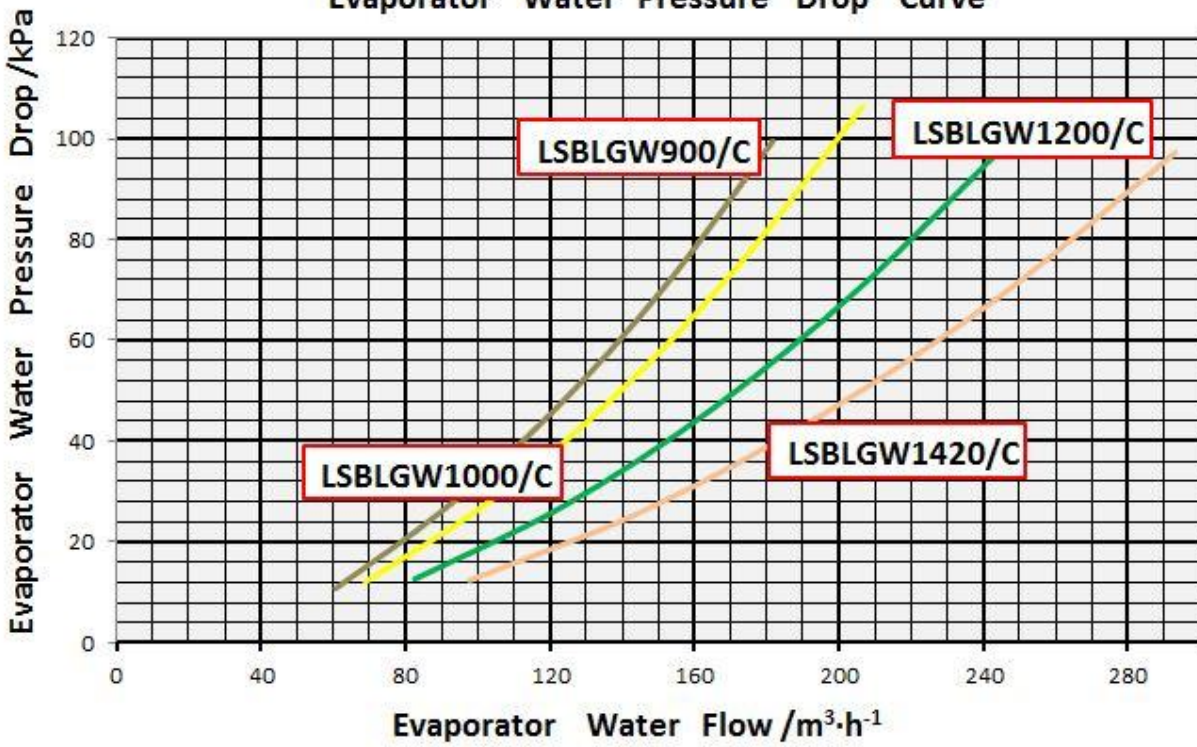
Unit Model SIZE	MIN. FLOW RATE		MAX. FLOW RATE	
	m <sup>3</sup> /h	GPM	m <sup>3</sup> /h	GPM
LSBLGW380/C	53	233	79	348
LSBLGW500/C	69	304	104	458
LSBLGW600/C	83	365	124	546
LSBLGW720/C	99	436	149	656
LSBLGW880/C	124	546	186	819
LSBLGW1000/C	138	608	207	912

LSBLGW1200/C	165	727	248	1092
LSBLGW1420/C	196	863	293	1290

**Evaporator Water Pressure Drop Curve**



**Evaporator Water Pressure Drop Curve**



### 3).Minimum volume in pipeline system

How to calculate minimum volume in pipeline system:

$$W=QgT/CP\Delta t$$

W — Minimum water volume (kg) ;

Qg — Total cooling/heating capacity of the terminal (kW) ;

T — Thermal stability time requirement, Take (8~10) ×60s;

CP — Water specific heat at constant pressure, 4.187kj/ (kg·°C) ;

$\Delta t$  — Water temperature fluctuation required value, take 5°C.

For system, Qg is calculated according to the lowest load so that it operates steadily.

It can also calculated according to 0.5Q(50%). T takes 8 minutes, the shortest time that the unit running.

That is 480s. Cp=4.18kj/kg,  $\Delta t$  =5°C

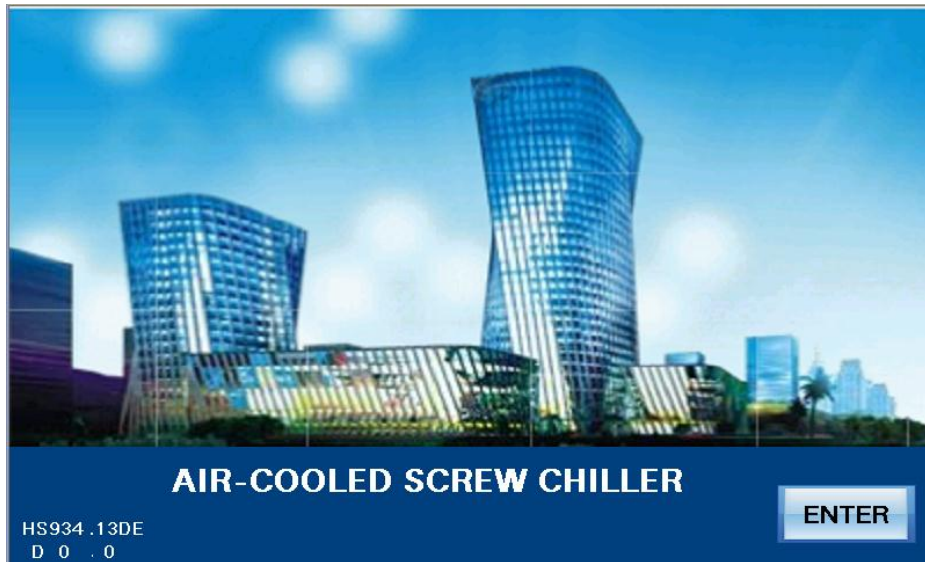
According to the above formula, the result is as following:

$$W=0.5Q*480/ (4.18*5) =11.48Q \text{ kg}$$

**Note:**

The above formula is only for reference, different factor should be adopted to suit for different condition.





**【Home page】**

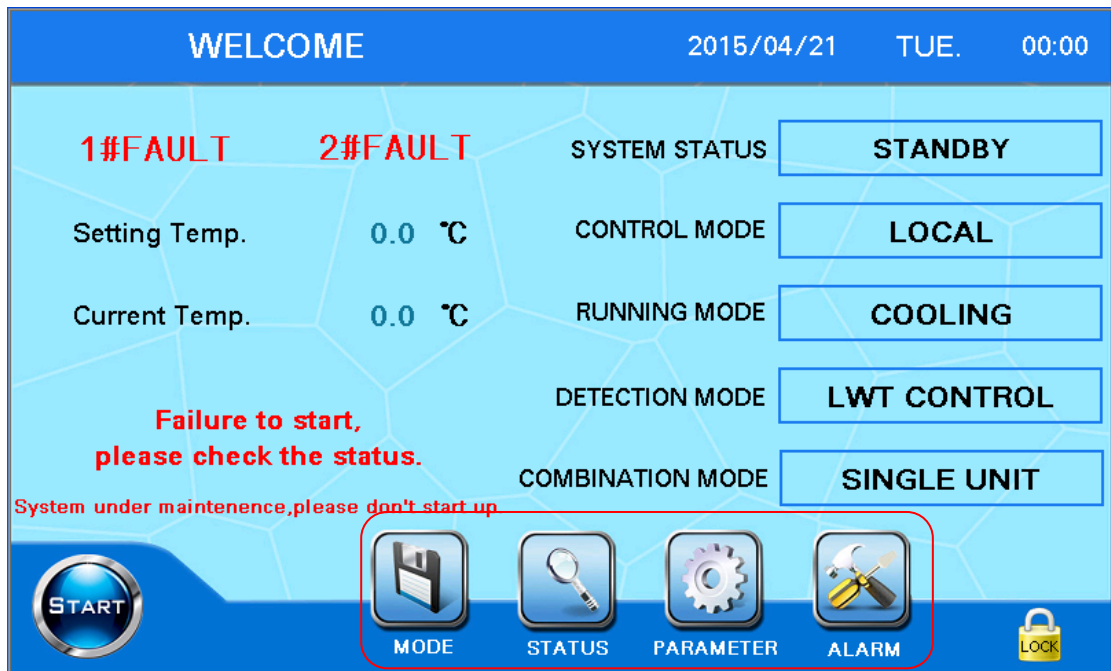
- 1) Power indicator (yellow), which is on when display is powered on; it is off when powered off.
- 2) Status indicator (green), which flashes at low frequency when display is normally operative, otherwise it is off.
- 3) Communication indicator (red), which flashes at high frequency when display and controller communicate normally, otherwise it is off.
- 4) Controller and touch screen procedure version: showing the number of controller and touch screen procedure version used by the current unit.

**Basic Interface and Operations:**



After the system initializing is completed, please click 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)

✧ **Mode setting page**



### 【Mode setting page】

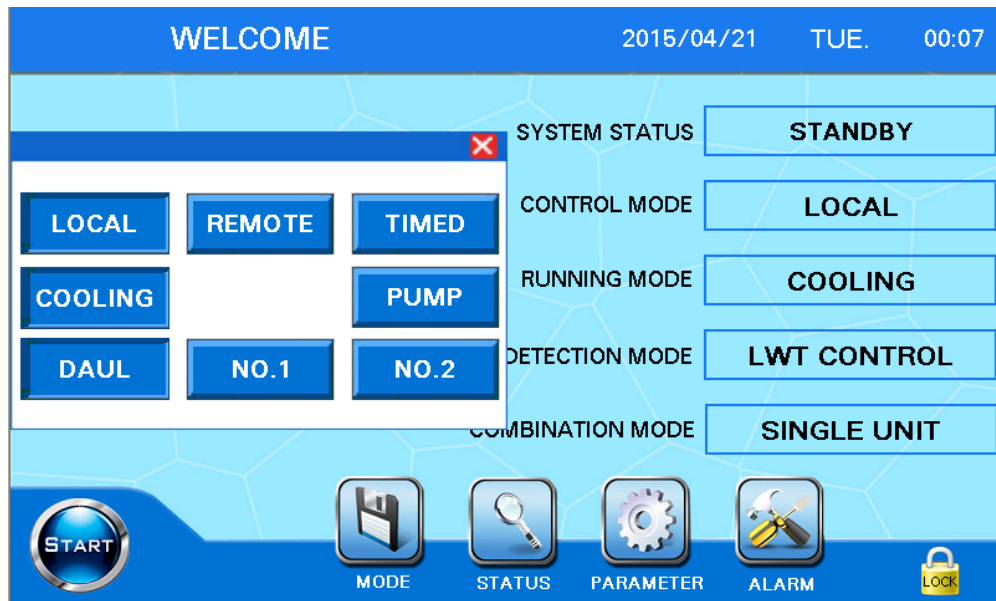
Control mode and working mode are to be set in this page:

- 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.

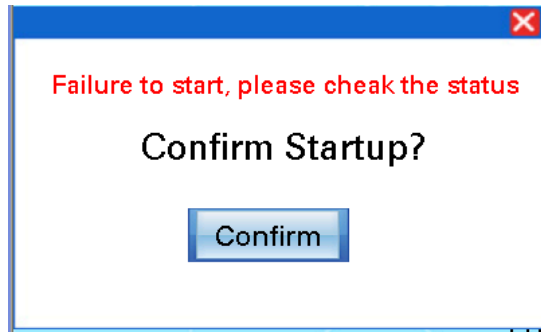
✧ **Main Page**



### 【 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, if the



conditions are not met ,the following dialog box will be popped up at this moment.



【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.

Note:

 button disappear when the combination mode is “Single-unit”. Click  button to query the current unit status.


### Starting Operation

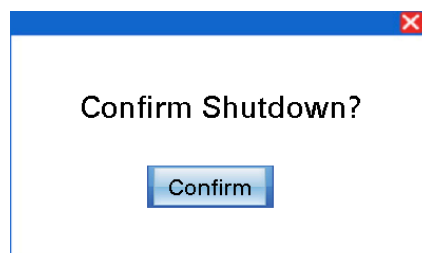
The system is in pause state when the water pump has been completed to open, but the compressor is unable to start because some other factors can’t satisfy the condition of compressor starting, the interface indicates “Failure to start, please check the status”. The starting conditions include oil heating 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.



### Shutting down operation

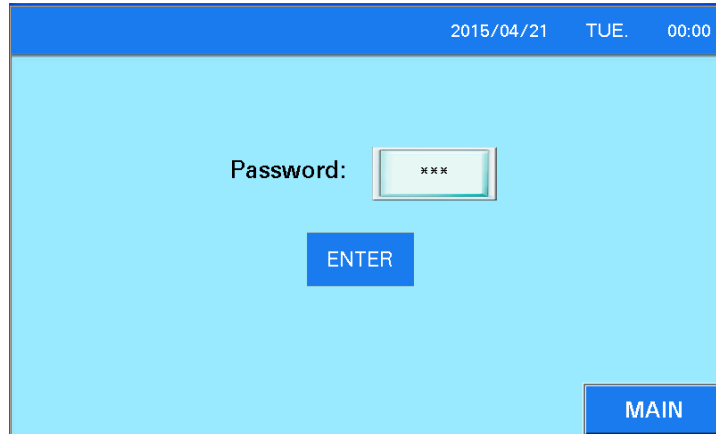
Click on  button , and the “Confirm Shutdown” dialog will be popped up. Click on “Confirm” if you ensure execution of Shutdown action, the system status indicates “Shutting down”. (Note: The system status indicates “shutting down” even the requirements of shutting down the compressor are not meet. The 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 **SETTING** 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”.

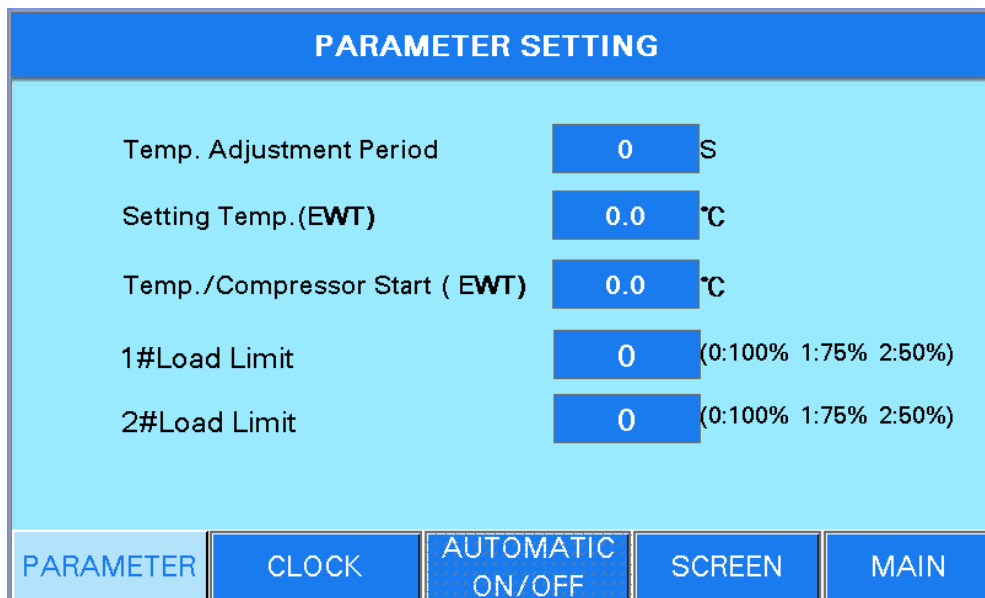


【 User parameter setting page 】



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.



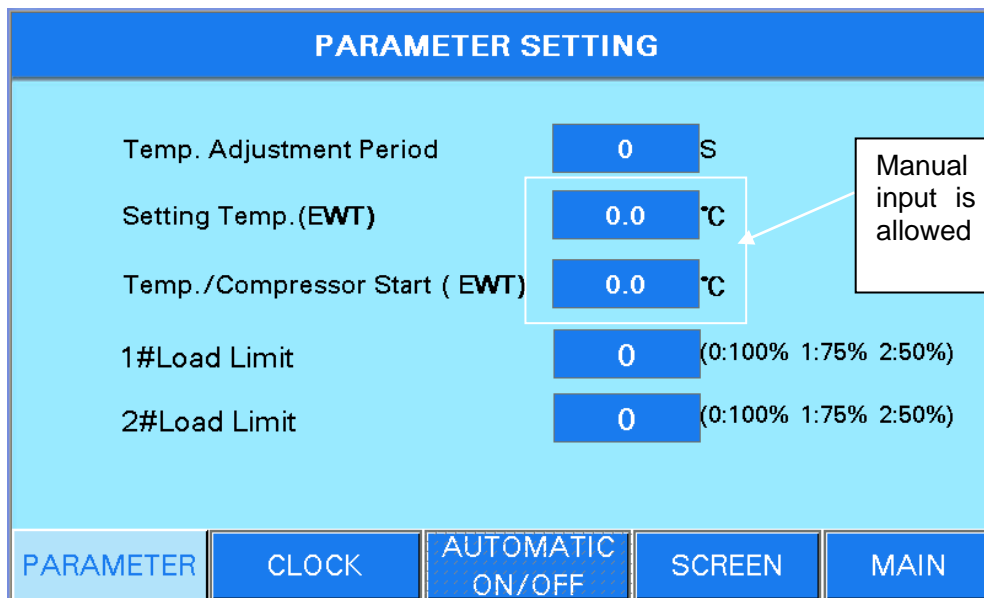
Note:

- 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**

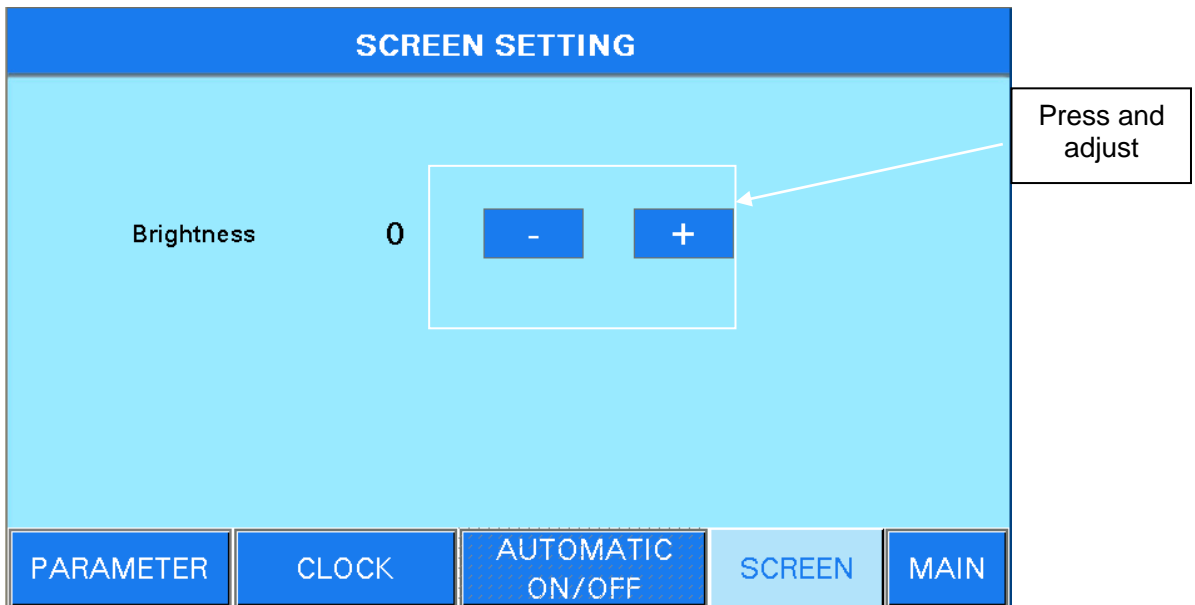


Clock setting

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.

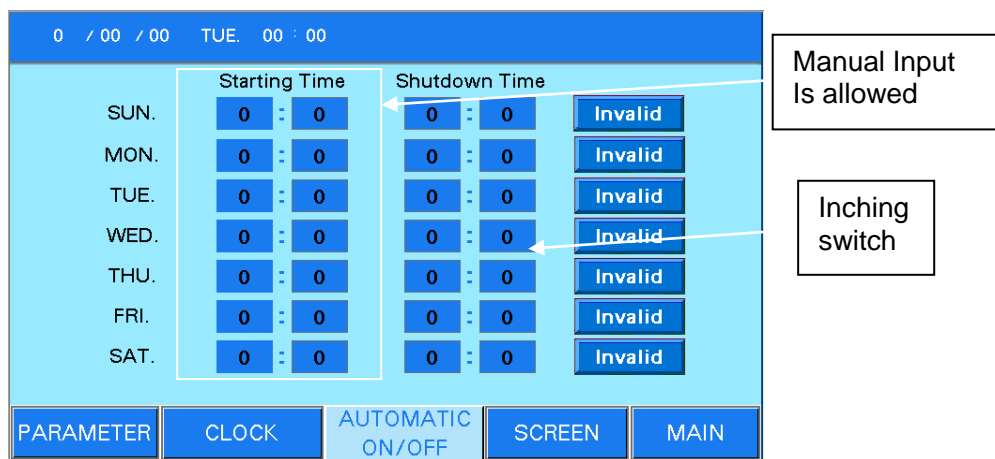
✧ **Adjust screen**



User can increase and reduce the brightness and contrast of screen by clicking on “+”and “-” in this page. User can 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 user wants to use timer function of start or shutdown, it needs to choose “timer” in control mode of the figure 2 and enters user setting. Press **AUTOMATIC ON/OFF** as below:



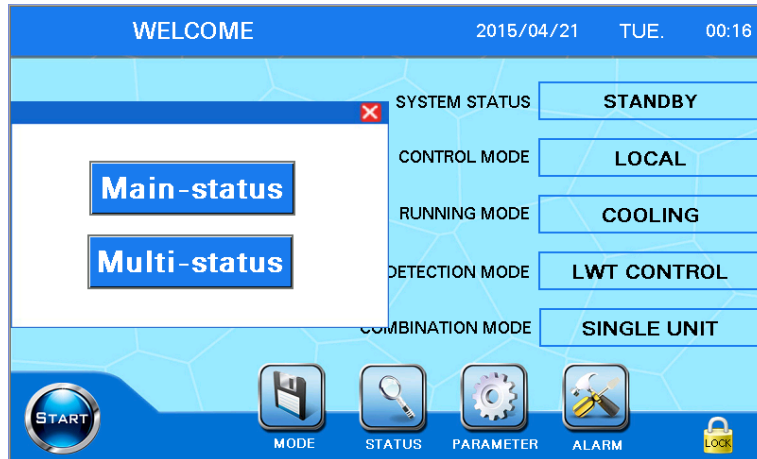
Automatic On/Off setting

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 **Multi-status** to enter the below page:



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

- ① **Multi-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.

✧ **Status**

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

R134a		STATUS			
1#Comp. Running	0	H	2#Comp. Running	0	H
1#Times for Comp. Start	0		2#Times for Comp. Start	0	
Pump Running	0	H	Remaining Oil Heating	0.0	H
1#Load State	0	%	2# Load State	0	%
1#Alarm	NO		2# Alarm	NO	
1#Restart Delaying	YES		2# Restart Delaying	YES	
1#Min. Running Time Elapsed	NO		2# Min. Running Time Elapsed	YES	
1#Load Limited	NO		2# Load Limited	NO	
Water Temp. Allow Compressor Start		NO			

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  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.

TEMP. / PRES.			
EWT	0.0	℃	
LWT	0.0	℃	
Ambient Temp.	0.0	℃	
1# Discharge Temp.	0.0	℃	
1# Suction Pres.	0.0	Bar	
1# Discharge Pres.	0.0	Bar	
1# Saturated Temp.of Suction	0.0	℃	
1# Saturated Temp. of Discharge	0.0	℃	
1#		2#	
STATUS	TEMP./PRES.	INPUT	OUTPUT
MAIN			

Current data display

**Input**

INPUT			
Remote Start	ON	1# Motor Prot. Switch	ON
Remote Stop	ON	1# Contactor Prot.	ON
Water Switch	ON	2# High Pres. Switch	ON
Power Prot. Switch	ON	2# Low Pres. Switch	ON
1# High Pres. Switch	ON	2# Oil Level Switch	ON
1# Low Pres. Switch	ON	2# Comp. Overload Prot. Switch	ON
1# Oil Level Switch	ON	2# Fan Overload Prot. Switch	ON
1# Comp. Overload Prot. Switch	ON	2# Motor Prot. Switch	ON
1# Fan Overload Prot. Switch	ON	2# Contactor Prot.	ON
STATUS	TEMP./PRES.	INPUT	OUTPUT
MAIN			

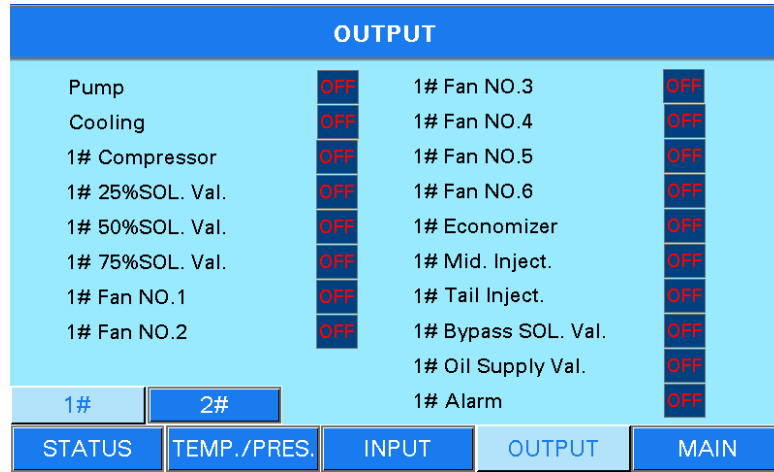
Input status

"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.

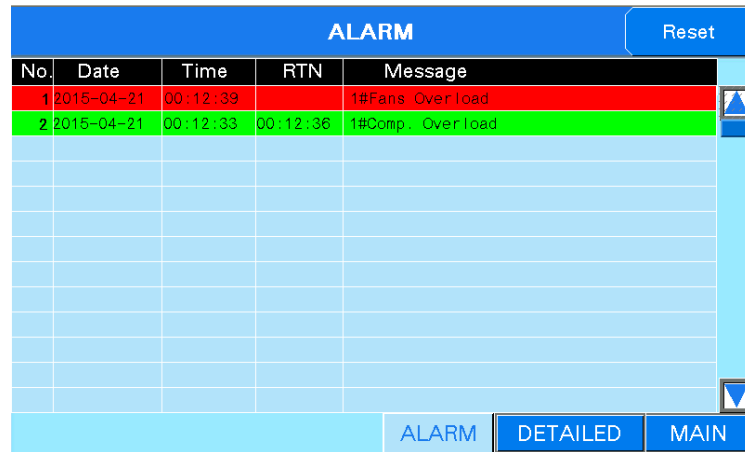
**Output status**



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 **ALARM** 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 **Reset** 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.

Message		Alarm	
Time	2000 / 00 / 00 00 : 00	UP	NEXT
LWT	0.0 °C		
EWT	0.0 °C		
Ambient Temp.	0.0 °C		
1# Discharge Temp.	0.0 °C	2# Discharge Temp.	0.0 °C
1# Suction Pres.	0.0 Bar	2# Suction Pres.	0.0 Bar
1# Discharge Pres.	0.0 Bar	2# Discharge Pres.	0.0 Bar

TEMP.PRES. 1#IN/OUT 2#IN/OUT ALARM DETAILED MAIN

History alarm information query

Note:

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

NO.	Interface in English
1	Water flow fault
2	Anti-freeze Protection
3	1# High-pressure protection
4	1# Low-pressure protection
5	1# Compressor Motor Protection
6	1# Low Oil Level Protection
7	1# Contactor protection
8	1# Oil differential pressure protection
9	1# Compressor overload
10	1# Fans overload
11	Power Failure Protection
12	Entering water temp. sensor failure
13	Leaving water temp. sensor failure
14	Ambient temp. sensor failure
15	1# Fin temp. sensor failure
16	1# Discharge temp. sensor failure
17	2# Fin temp. sensor failure
18	2# Discharge temp. sensor failure
19	1# Suction pressure failure
20	1# Discharge pressure failure
21	2# Suction pressure failure
22	2# Discharge pressure failure
23	1# High discharge temp. protection
24	1# High Fin temp. protection
25	1# Differential pressure protection
26	1# Low Suction Pressure protection
27	2# High discharge pressure protection
28	1# Mode switch failure
29	Mode water temp. protection
30	1# EXV module failure
31	2# High pressure protection

32	2# Low pressure protection
33	2# Compressor motor protection
34	2# Oil level protection
35	2# Contactor protection
36	2# Oil differential pressure protection
37	2# Compressor overload
38	2# Fans overload
39	2# High discharge temp. protection
40	2# High Fin temp. protection
41	2# Differential pressure protection
42	2# Low Suction Pressure protection
43	2# High discharge temp. protection
44	2# Mode switch failure
45	2# EXV module failure
46	Invalid Address Number

✧ **Multi-units status**

Communication Status	Run Status	Prot. Status	Running Time	
1# Host	Running	Normal	0	H
2# Connected	Running	Normal	0	H
3# Connected	Standby	Fault	0	H
4# Unconnected				
5# Unconnected				
6# Unconnected				
7# Unconnected				
8# Unconnected				

Check  # Adress Message MAIN

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.

Communication Status	Run Status	Prot. Status	Running Time	
1# Host	Running	Normal	0	H
2# Connected	Running	Normal	0	H
3# Connected	Standby	Fault	0	H
4# Unconnected				
5# Unconnected				
6# Unconnected				
7# Unconnected				
8# Unconnected				

Check  # Adress Message

Click on  to enter the next page.

PARAMETER SETTING	
Temp. Adjustment Period	<input type="text" value="0"/> S
Setting Temp.(EWT)	<input type="text" value="0.0"/> °C
Temp./Compressor Start ( EWT)	<input type="text" value="0.0"/> °C
1#Load Limit	<input type="text" value="0"/> (0:100% 1:75% 2:50%)
2#Load Limit	<input type="text" value="0"/> (0:100% 1:75% 2:50%)
Set The Number of Multi Units	<input type="text" value="0"/>

Note:

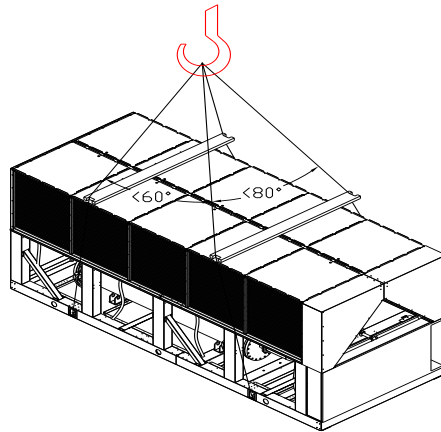
- ① Max.8 units can achieve combination control, the unconnected unit can access the combination control system at any time as long as the unit is powered on and connected with the system by communication cable.
- ② The “Status” displays “Run” until the unit finish the starting action and enter the process of automatic energy adjustment, otherwise displayed “shutdown”

## V. Installation

### 1. Unit installation

#### 1) Lifting

- ⊕ Hoist the unit according to the following chart strictly. The steel rope shall wind the lifting hook one circle to prevent steel rope slipping and causing danger when the weight is unbalanced.
- ⊕ Must use enlargement pole prevent sling damage to the unit
- ⊕ Security guard circle should be set up when hoist the unit, and also abide by the local safety regulations when hoist the unit. Prohibit non-staff from entering the security guard circle or staying under the unit and the hoisting crane.

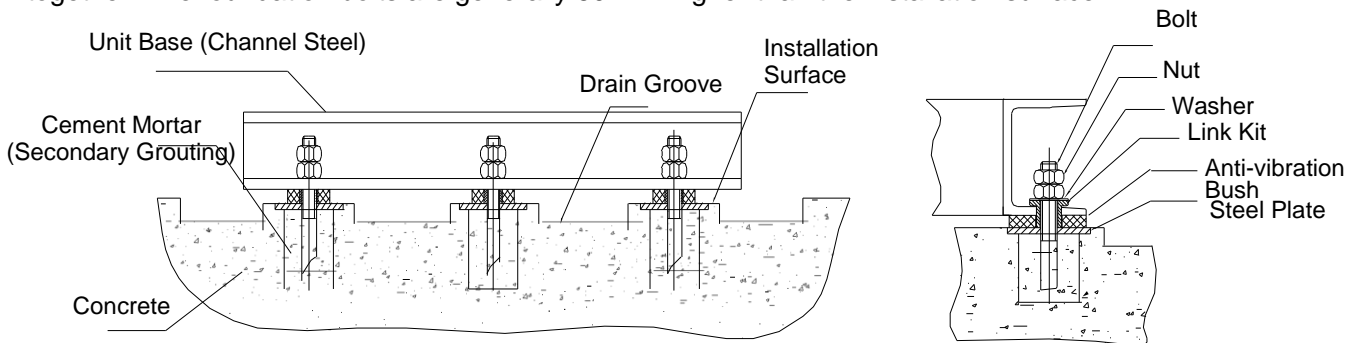


#### 2) Foundation

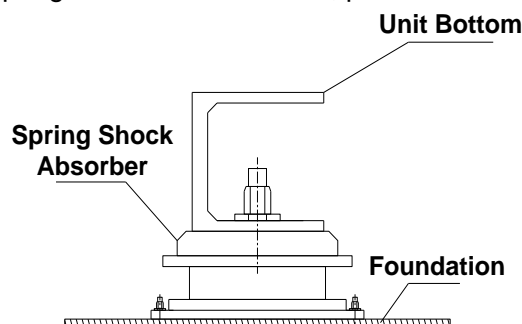
The installation foundation shall be designed by professionals according to the site conditions.

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.

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.



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) Dimensions & Vibration Isolators

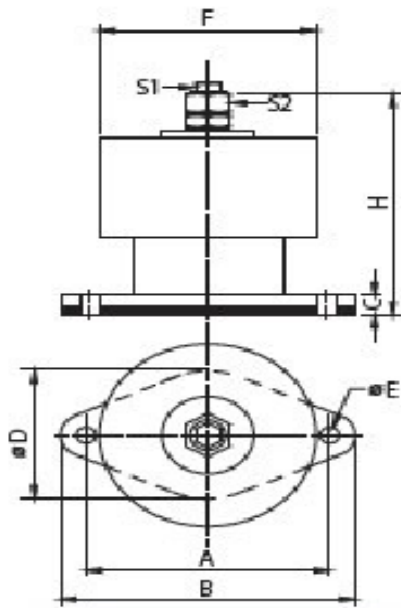
Vibration isolators are recommended for all roof mounted installations or wherever vibration transmission is a consideration.

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

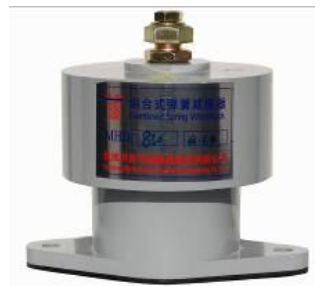
Spring isolators are level adjustable, spring and cage type isolators, mounted under the unit base rails.

Deflection may vary slightly by application.

Isolator model	Midea 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 data 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

#### 4). Spaces

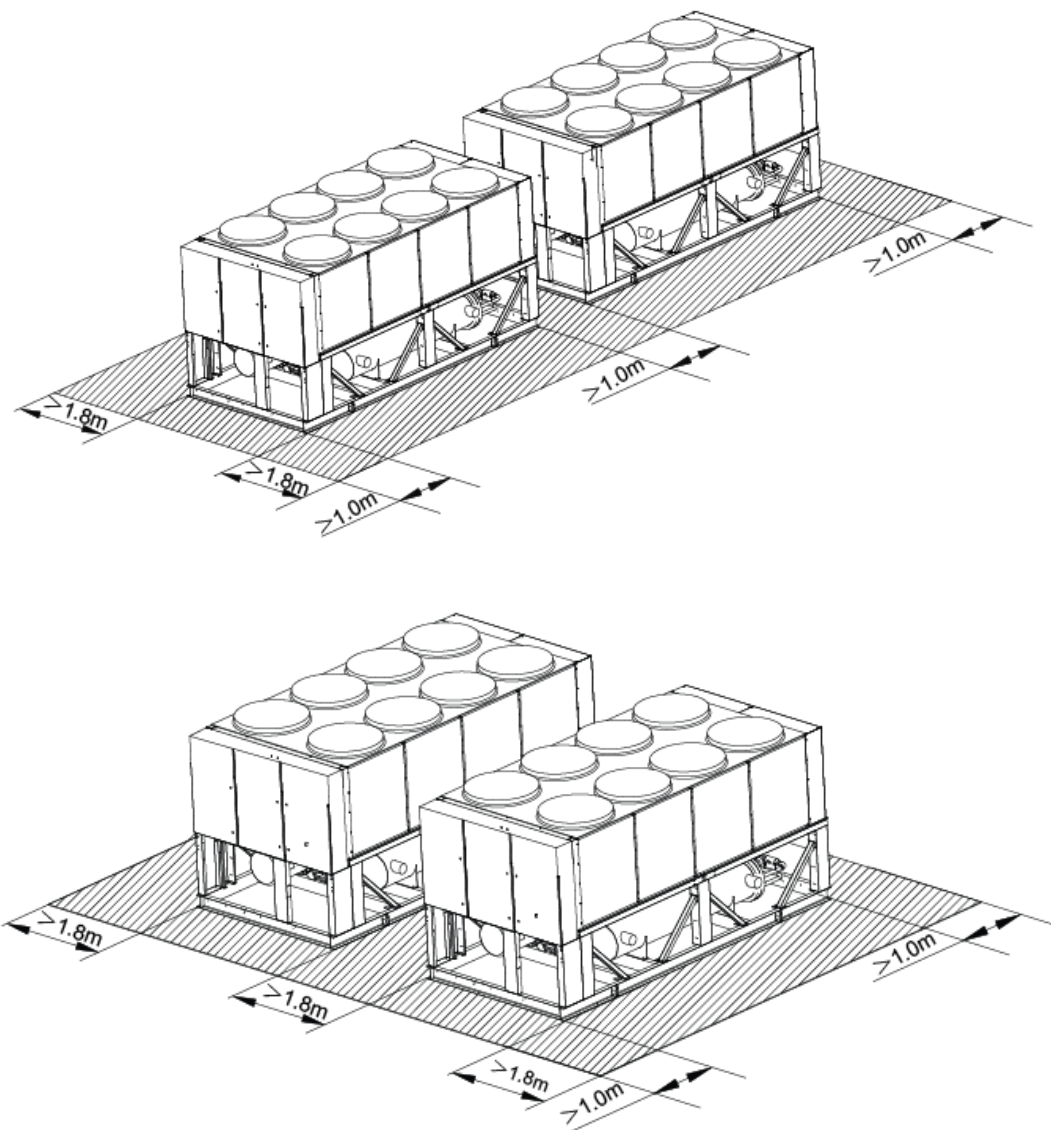
Reserve the spaces required for unit installation, operation and maintenance.

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.

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.

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

There must be no obstruction under the fans.





## 2. Water pipeline system installation

### 1) Water quality control

When industrial water is used as chilled water, little furring may occur; however, well water or river water, used as chilled water, may cause much sediment, such as furring, sand, and so on. Therefore, well water or river water must be filtered and softened in softening water equipment before flowing into chilled water system. If sand and clay settle in the evaporator, circulation of chilled water may be blocked, and thus leading to freezing accidents; if hardness of chilled water is too high, furring may occur easily, and the devices may be corroded. Therefore, the quality of chilled water should be analyzed before being used, such as PH value, conductivity, concentration of chloride ion, concentration of sulfide ion, and so on.

#### ※ Applicable standard of water quality for the unit

PH value	Total hardness	Conductivity	Sulfide ion	Chloride ion	Ammonia ion	Sulfate ion	Silicon	Iron content	Sodium ion	Calcium ion
7~8.5	<50ppm	<20 $\mu$ V/cm(25 $^{\circ}$ C)	No	<50ppm	No	<50ppm	<30ppm	<0.3ppm	No requirement	<50ppm

### 2) Performance adjustment factors

The antifreeze must be required according to anyone condition as following:

1. The outlet water temperature is below 5 $^{\circ}$ C;
2. The ambient temperature is below 0 $^{\circ}$ C;
3. Don't start up the unit for a long time.
4. The power supply was cut off and needn't change the water in system.

#### Ethylene and Propylene Glycol Factors

A glycol solution is required when the unit with condition as mentioned. The use of glycol will reduce the performance of the unit depending on concentration.

##### Ethylene Glycol

Quality of glycol (%)	modification coefficient				Freezing point $^{\circ}$ C
	Cooling capacity modification	Power modification	Water resistance	Water flow modification	
0	1.000	1.000	1.000	1.000	0
10%	0.993	0.997	1.013	1.019	-4
20%	0.984	0.994	1.149	1.051	-9
30%	0.975	0.989	1.343	1.092	-16
40%	0.969	0.984	1.624	1.145	-23
50%	0.961	0.978	2.026	1.213	-35

##### Propylene Glycol

Quality of glycol (%)	Modification coefficient				Freezing point $^{\circ}$ C
	Cooling capacity modification	Power modification	Water resistance	Water flow modification	
0	1.000	1.000	1.000	1.000	0
10%	0.99	0.992	1.029	1.013	-3
20%	0.979	0.983	1.167	1.035	-7
30%	0.964	0.975	1.364	1.063	-13
40%	0.95	0.967	1.648	1.098	-21
50%	0.925	0.96	2.056	1.145	-33

Units operating with glycol solutions are not included in the ARI Certification Program.

#### Altitude correction factors

Performance tables are based at sea level. Elevations other than sea level affect the performance of the

unit. The decreased air density will reduce condenser capacity and reduce the unit's performance. For performance at elevations other than sea level refer to below table Maximum allowable altitude is 1800meters.

**Evaporator temperature drop factors**

Performance tables are based on a 5°C temperature drop through the evaporator. Adjustment factors for applications with temperature ranges from 3°C to 6°C in follow table. Temperature drops outside this range can affect the control system's capability to maintain acceptable control and are not recommended.

**Fouling Factor**

ALTITUDE (m)	Fouling Factor							
	0.018m2 °C /kW		0.044m2 °C /kW		0.086m2 °C /kw		0.172m2 °C /kw	
	C	P	C	P	C	P	C	P
Sea level	1.042	1.028	1.029	1.020	1.000	<b>1.000</b>	0.977	0.995
600	1.027	1.037	1.014	1.029	0.986	1.009	0.964	1.004
1200	1.014	1.050	1.001	1.041	0.973	1.021	0.951	1.016
1800	1.000	1.060	0.987	1.052	0.960	1.031	0.938	1.026

C--Cooling capacity

P—Power

**3) Design of the store tank in the system**

a. kW is the unit for cooling capacity, L is the unit for (G) minimum water flow volume in the formula.

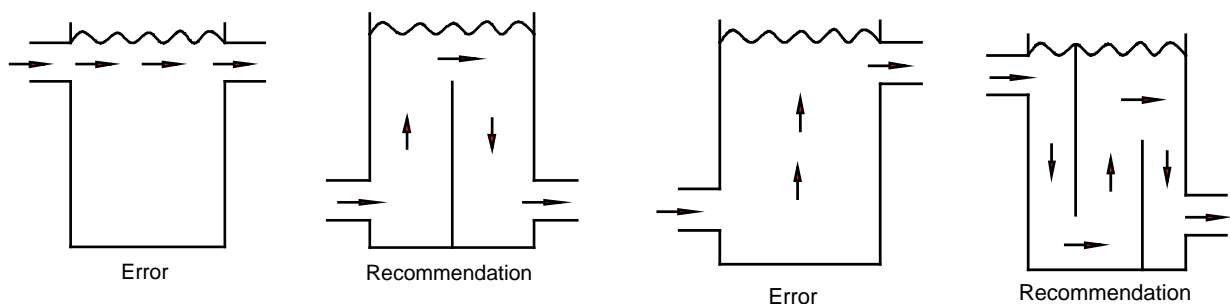
Comfortable type air conditioner

G= cooling capacity×2.6L

Process type cooling

G= cooling capacity×7.4L

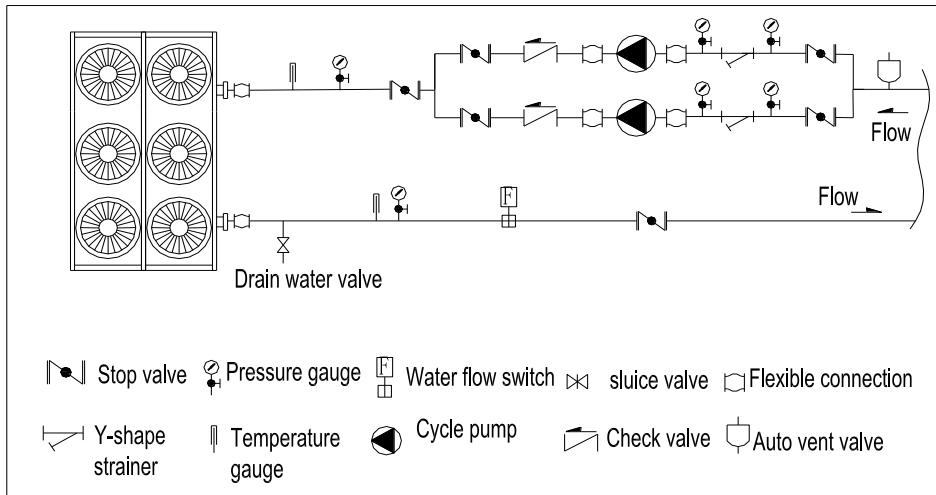
b. In certain occasion (especially in manufacture cooling process), for conforming the system water content requirement, it's necessary to mount a tank equipping with a cut-off baffle at the system to avoid water short-circuit, Please see the following schemes:



**4) Water pipeline installation**

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.

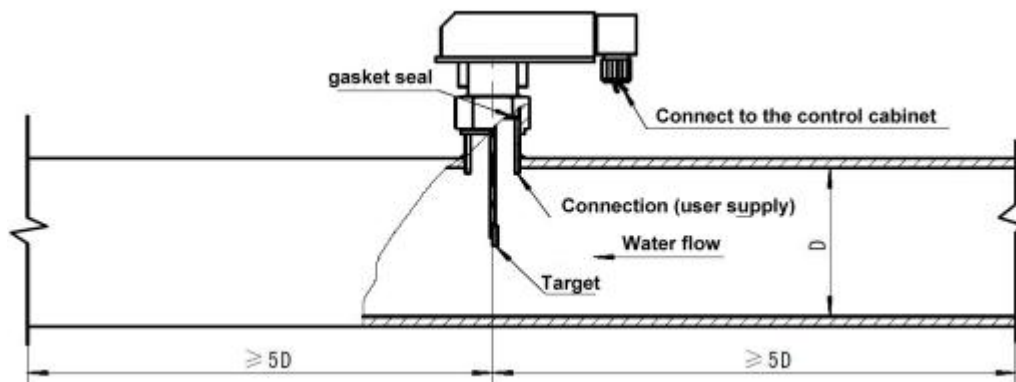
Basically, the piping should be designed with a minimum number of bends and changes in elevation to keep system cost down and performance up.



- 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:  

$$\text{Flow (m}^3/\text{h)} = (1.1 \sim 1.2) * \text{Unit Cooling Capacity (kW)} / 5.8$$
  - (2) Determination of water pump head:  

$$\text{Head (m)} = (\text{Unit Resistance (see product parameters)} + \text{Resistance at Maximum End of Pressure Drop (see product parameters)} + \text{Pipeline Resistance (length of the least favorable loop pipe} * 0.05) + \text{Local Resistance (length of the least favorable loop pipe} * 0.05 * 0.5)) * (1.1 \sim 1.2)$$
- 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.



- (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.

### 3. Wiring installation

#### **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