GREE
Change for life

Modular Air-cooled Scroll Chiller

Engineering Data

GREE ELECTRIC APPLIANCES, INC.OF ZHUHAI

CONTENTS

1. Product

1.1 Product Lineup

Series	Product Model	Product Code	Cooling Capacity (kW/Ton)	Heating Capacity (kW/Ton)	Power	Refrigerant	Pictures
D	LSQWRF65M/D-M	EL01500490	61/17.35	68/19.34	380-415V 3Ph 50HZ	R22	
	LSQWRF80M/D-M	EL01500470	75/21.33	85/24.17			
	LSQWRF130M/D-M	EL01500480	123/34.98	140/39.81			
	LSQWRF160M/D-M	EL01500540	145/41.23	165/46.92			

Note:1Ton =12000Btu/h = 3.517kW

1.2 Nomenclature

LS	QW	R	F	130	M	/	Na	D	-	M
1	2	3	4	5	6		7	8		9

Code	Description	Options
1	Product Type	LS—Chiller
2	Compressor Type	QW—Hermetic scroll compressor
3	Function Type	Default—Cooling only R—Heat pump
4	Cooling Type	F—Air-cooled
5	Cooling Capaicty	65:61kW= 17.35 TR 80:75kW= 21.33 TR 130:123kW=34.98 TR 160:145kW=41.23 TR
6	Combination Mode	M—Modular
7	Refrigerant	Default—R22 Na—R410A
8	Design Code	—
9	Power	M–380-415V 3Ph 60Hz F–380-415V 3Ph 60Hz

1.3 Features

1.3.1 General

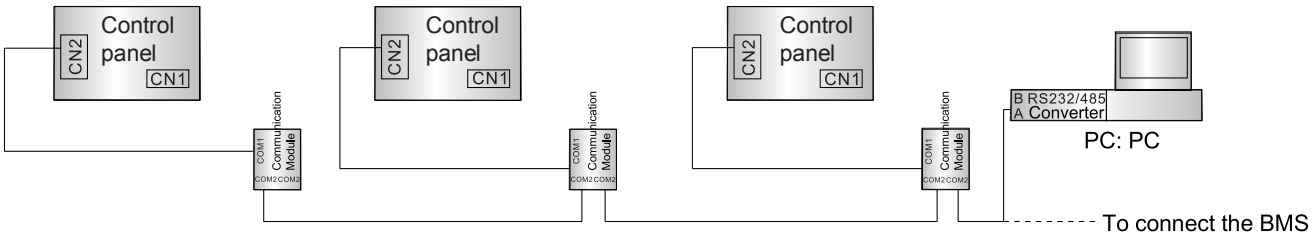
D series modular air-cooled scroll chillers are well-developed products incorporated with multiple advanced technologies. It features the low noise level, compact structure, easy operation, reliable running, and convenient installation and service, widely used at newly built or retrofitted industrial and civil buildings in various sizes, such as, hotels, apartments, restaurants, office buildings, shopping malls, theaters, gyms, workshops, hospitals and other places where there are high requirements on noise level and air quality and it is troublesome to install the cooling tower.

D series modular air-cooled scroll chillers are constructed of one or up to 16 single units which may vary in structure and in cooling capacity. The 65 and 80 units have two independent refrigeration cycles and the 130 and 160 units have four. The modular design is able to realize the modular system with the cooling capacity ranging from 61 to 1200kW.

1.3.2 Features

D series modular air-cooled scroll chillers work outstandingly by virtue of their major features stated below.

- **High energy efficiency:** it is initially certified as one of the energy-saving chiller products in China.
- **Free master unit design:** any single unit can operate as the master once connected with the control panel. It overcomes the problem which would occur to the product of other manufacturer that the whole system would fail to work properly when the fixed master unit malfunctions.
- **Excellent compatibility:** each chiller is constructed of up to 16 single 65/80 units or up to 8 single 130/160 units.
- **Hermetic scroll compressor:** compared with other type of compressor under the same cooling load, it has few movable components, smaller rotating torque, lower noise and vibration and higher reliability and efficiency.
- **Super protection:** it is equipped with the top-end microcomputer control system which is capable of providing full protection and self-diagnosis, such as high/low pressure protection, freeze protection, over-temperature protection, compressor overload protection, phase loss/reversal protection, water flow switch protection, etc.
- **High reliability:** it is constructed of well-designed refrigeration parts for multiple refrigeration cycles, adequately guaranteeing the reliable operation.
- **Compact structure:** the modular design enables the compact structure, reduced volume, light weight, easy handling and shipping and flexible installation.
- **Low noise:** the unit runs with low noise and vibration, widely applicable for various projects.
- **Quiet mode:** the unit is allowed to run in the quiet mode based on the user's requirement, which can not only save energy but also create a comfortable and pleasant living environment.
- **Economy mode:** the unit can run in the economy mode without lessening the air conditioning effect so as to cut down the electricity consumption.
- **Equilibrium running:** it indicates each compressor will run alternately so as to extend their service life.
- **User-friendly design:** when the running temperature is out of the allowed range, a friendly warning will come out on the display.
- **Powerful remote monitoring:** with RS485 communication, the universal BACnet protocol as well as standard BACnet interfaces, Gree centralized air conditioning system can be perfectly integrated to the BMS or Gree remote monitoring system.



Wiring Diagram of Groups of Communication Modules

- **Intelligent Start/Stop of the Compressor:** according to the load change of the terminals, the D series modular units are able to start/stop the compressor by controlling the entering water temperature and rate of the water temperature rise so as to make the operating capability perfectly match with the required load. However, it won't allow frequent start or stop but save as much energy as possible and ensure there is no remarkable fluctuation of the water temperature.

1.4 Product Data

1.4.1 Normal Working Conditions

Model		Heat Pump	LSQWRF65M/D-M	LSQWRF80M/D-M	LSQWRF130M/D-M	LSQWRF160M/D-M
		Product Code	EL01500490	EL01500470	EL01500480	EL01500540
Capacity Control		%	0-50-100	0-50-100	0-25-50-75-100	0-25-50-75-100
Cooling Capacity		kW	61	75	123	145
		Ton	17.35	21.33	34.98	41.23
Heating Capacity		kW	68	85	140	165
		Ton	19.34	24.17	39.81	46.92
Rated Power for Cooling		kW	21.4	26.7	42.1	52.0
Rated Power for H eating		kW	21.9	27.5	43.7	55.0
EER		W/W	2.85	2.81	2.92	2.79
COP		W/W	3.10	3.09	3.20	3.00
Supply Power		—	380-415V 3Ph~ 60Hz			
Control		—	Microcomputer automatic control, running state display, alarms of abnormities			
Safety		—	High/low pressure protection, high discharge protection, freeze protection, overcurrent protection, phase loss/reversal protection, water loss protection, compressor internal protection			
Compressor	Type	—	Hermetic scroll			
	Start	—	Direct start			
	Quantity	—	2	2	4	4
Refrigerant		—	R22			
Water System	Heat Exchanger	—	Dry evaporator			
	Water Flow	m^3/h	10.5	12.9	21.2	24.9
		GPM	46	57	93	110
	Resistance Head	kPa	15	20	30	35
		ft.WG	4.9	6.6	9.8	11.5
	Max Bearing Pressure	MPa	1			
	Inlet/Outlet Flange	mm	DN65	DN65	DN80	DN80
Air System	Heat Exchanger	—	High-efficiency fined coil			
	Blade Type/Quantity	—	Axial Fan/2	Axial Fan/2	Axial Fan/4	Axial Fan/4
	Airflow Rate	m^3/h	2.7×10^4	3.0×10^4	5.4×10^4	6.0×10^4
		L/s	0.75×10^4	0.83×10^4	1.50×10^4	1.67×10^4
		CFM	1.59×10^4	1.76×10^4	3.18×10^4	3.53×10^4
	Rated Fan Power	kW	0.65×2	0.95×2	0.65×4	0.95×4
Noise		dB(A)	70	71	72	74
Outline Dimensions	W	mm	2040	2040	2226	2226
	D	mm	1000	1000	1650	1650
	H	mm	2230	2230	2230	2230
Net Weight		kg	690	750	1240	1440
Running Weight		kg	759	825	1364	1584
E-heater Power (Ref.)		kW	15	15	30	30
Loading Quantity	40'GP/40'HQ	—	10/10	10/10	6/6	6/6

Notes:

a. It is designed, manufactured and tested strictly in accordance with GB/T18430.1-2007.

b. See the nameplate for exact product parameters.

c. Height of the outline dimensions includes the height of the rubber pad which is about 70mm.

d. Please contact the local sales representatives for special sales orders. We are targeted to serve all your requirements.

1.4.2 Normal Working Temperature

Item	Water Side		Air Side	
	Water Flow Rate $m^3/(h \cdot kW)$	Leaving Water Temp (℃)	DB (℃)	WB (℃)
Cooling	0.172	7	35	—
Heating		45	7	6

1.4.3 Working Temperature Range

Item	Water Side		Air Side
	Leaving Water Temp (℃)	Entering Water Temp (℃)	DB Temp (℃)
Cooling	5 ～ 15	2.5 ～ 6	15 ～ 48
Heating	40 ～ 50	2.5 ～ 6	-15 ～ 24

Note: please contact us when the working conditions are out of the range stated in the table above.

1.4.4 Electric Data

Model	Power Supply	Compressor			Fan		Air Switch	
		Qty	MRC Each (A)	NRC Each (A)	Qty	NRC Each (A)	MRC (A)	NRC (A)
LSQWRF65M/D-M	380-415V 3Ph 60Hz	2	31	17.6	2	1.71	63	37.2
LSQWRF80M/D-M	380-415V 3Ph 60Hz	2	35	25.6	2	2.5	80	56.0
LSQWRF130M/D-M	380-415V 3Ph 60Hz	4	31	17.6	4	1.71	125	74.4
LSQWRF160M/D-M	380-415V 3Ph 60Hz	4	35	25.6	4	2.5	160	107.0

Notes:

MRC: Max Running Ampere (A).

NRC: Nominal Running Ampere (A)

1.4.5 PERFORMANCE CORRECTION

Performance Correction Value					
Leaving Chilled Water (℃ / ℉)	Ambient Temperature (℃ / ℉)				
	25(77)	30(86)	35(95)	40(104)	45(113)
5(41.0)	1.07	1.00	0.94	0.84	0.81
6(42.8)	1.10	1.03	0.97	0.87	0.83
7(44.6)	1.14	1.07	1.00	0.91	0.86
8(46.4)	1.17	1.10	1.03	0.94	0.88
9(48.2)	1.20	1.13	1.06	0.98	0.91
10(50.0)	1.23	1.16	1.09	1.01	0.93
11(51.8)	1.27	1.19	1.12	1.04	0.96
12(53.6)	1.31	1.23	1.15	1.07	0.99
13(55.4)	1.34	1.26	1.17	1.09	1.01
14(57.2)	1.37	1.29	1.20	1.12	1.03
15(59.0)	1.41	1.32	1.23	1.14	1.06

Performance Correction Value						
Hot Water Outlet (℃ / ℉)	Ambient Temperature (℃ / ℉)					
	-10(14)	-5(23)	0(32)	5(41)	10(50)	15(59)
30(86)	0.70	0.77	0.86	0.96	1.07	1.21
35(95)	0.68	0.76	0.85	0.96	1.07	1.19
40(104)	0.67	0.75	0.85	0.95	1.06	1.18
45(113)	0.66	0.74	0.84	0.95	1.05	1.18
50(122)	0.64	0.74	0.84	0.94	1.05	1.17

1.4.6 FREEZE PROTECTION

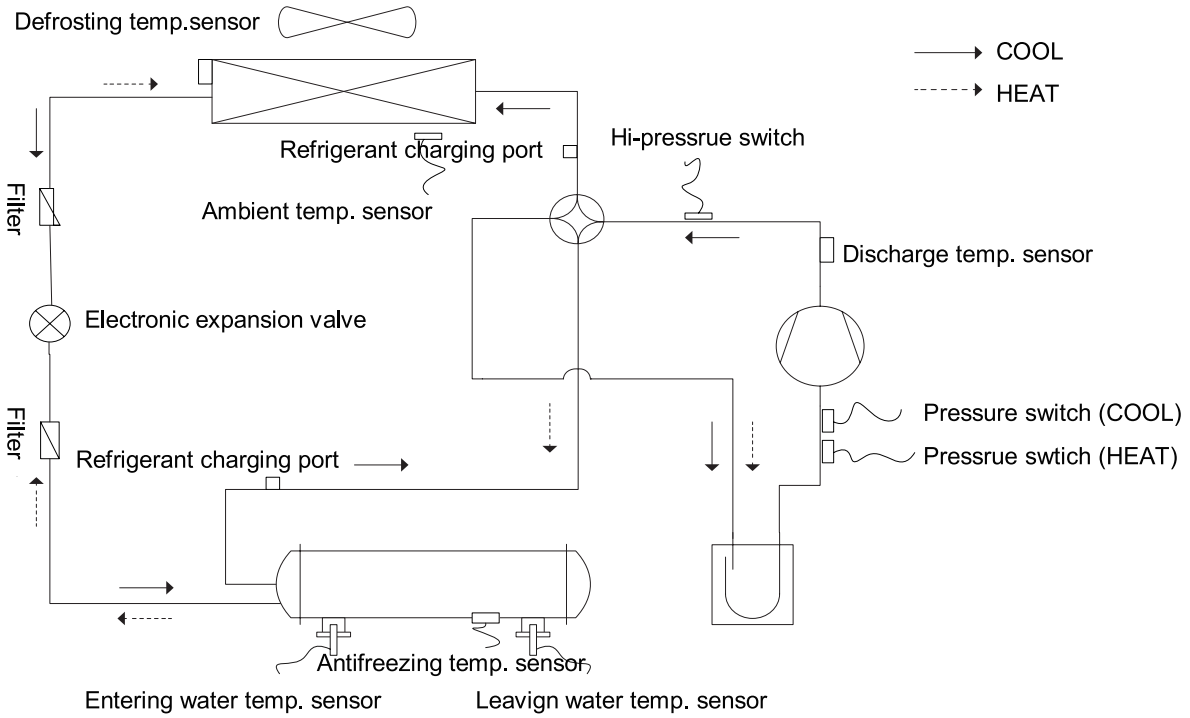
When the flow passage of the shell-and-tube heat exchanger is frozen up, it would cause serious damage to the heat exchanger, such as cracking and leakage which are out of warranty, therefore, the user should take measures stated below for freeze protection.

- Under subzero conditions, it is necessary to shut down the chiller installed outdoor and then drain the evaporator completely.
- Failure of the chilled water flow switch and the anti-freezing temperature sensor will cause the tube frozen up, so the flow switch shall be interlocked with the chiller.
- When charging or recovering the refrigerant, the evaporator would crack because of frostbite provided the refrigerant pressure inside the evaporator is under 0.4MPa. Therefore, be sure to keep the water flow continually inside the evaporator or drain it completely.

1.5 Working Principles

1.5.1 Schematic Diagram

Each circuit of the modular chiller is independent and identical. Therefore the schematic diagram of only a circuit is taken for example herein.



1.5.2 Schematic Diagram

- **Refrigeration Cycle:** The low-pressure superheated refrigerant vapor from the evaporator is drawn into the compressor through which the low-pressure vapor is compressed to hi-temperature and hi-pressure refrigerant vapor. Then, the refrigerant vapor passes the condenser and turns to saturated or sub-cooled refrigerant liquid. And then, it passes the throttling device and flows into the evaporator where it evaporates by absorbing heat from the second refrigerant and then is drawn into the compressor again. The second refrigerant is then transferred to where air cooling is required continuously.
- **Reverse Refrigeration Cycle:** During the reverse refrigeration cycle, a 4-way valve is used to make the refrigerant flow in a reverse direction as stated below. The hi-temperature and hi-pressure refrigerant vapor coming out from the compressor directly releases heat to the secondary refrigerant and turns to the refrigeration liquid. Then, the refrigerant vapor passes the throttling device and flows into the air-cooled exchanger where it evaporates by absorbing heat from the surrounding environment and then is drawn into the compressor again. The second refrigerant which has approached the temperature set point is then transferred to where air heating is required continuously.

1.6 Noise Correction

Sound levels can be as important as unit cost and efficiency. The inherently quiet scroll compressors used in D series modular air-cooled scroll chillers are coupled with precision engineering for industry-leading sound levels.

The sound data is presented with both sound pressure and sound power levels. These values have been measured and/or calculated in accordance with JB/T 4330 Standard.

Sound pressure is the sound level that can be measured at some distance from the source. Sound pressure varies with distance from the source and depends on the surroundings. For example, a brick wall (a reflective surface) located 10 feet away from a unit will affect the sound pressure measurements differently than a brick wall at 20 feet. Sound pressure is measured in decibels (dB). All sound pressure data in the following pages are considered typical of what can be measured in a free field with a handheld sound meter, in the absence of any nearby reflective surfaces except the floor under the unit. Sound pressure levels are measured at 100% load and standard conditions of 95°F (35°C) ambient air temperature and 44°F (7°C) leaving evaporator water temperatures for air-cooled units.

Sound power is a calculated quantity and cannot be measured directly like sound pressure. Sound power is not dependent on the surrounding environment or distance from the source, as is sound pressure. It can be thought of as basic sound level emanating from the unit without consideration of distance or obstructions. Measurements are taken over a prescribed area around the unit and the data is mathematically calculated to give the sound power, dB. Acoustical consultants sometimes use sound power octave band data to perform a detailed acoustical analysis.

1.6.1 Test Method of Noise

1.6.1.1 Definitions

Testing Surface: an imaginary surface with the area S. which envelopes the sound source and whose test point is on the surface of an imaginary parallelepiped

Reference body: an imaginary minimal-sized parallelepiped which envelopes the sound source and terminates at one or more reflective planes.

Testing Distance: the vertical distance between surfaces of the reference body

1.6.1.2 Selection of the Testing Surface:

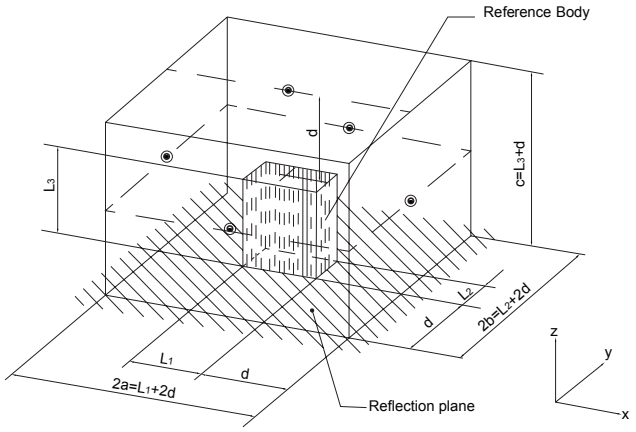
In order to determine the location of the microphone on the testing surface, it is necessary to assume a reference body, regardless of the important noise energy which emanates from the sound source but does not radiate. The reference testing distance is 1m and should be 0.15m at least. Other options include: 0.25m, 0.5m, 0.5m, 1m, 2m, 4m and 8m.

1.6.1.3 Testing Surface and Location of Microphones of the Parallelepiped

The testing surface is such an imaginary surface with the area S, enveloping sound source and distance d with the reference body, of which each side is parallel to the corresponding side of the reference body. See the figure below for the location of the microphones at the testing surface of the parallelepiped.

$$S=4(ab+bc+ac),a=0.5L_1+d,b=0.5L_2+d,c=0.5L_3+d$$

Where L_1, L_2 and L_3 indicate the length, width and height of the reference body respectively.



Testing Surface and Location of Microphones of the Parallelepiped

1.6.2 Calculation Method of Noise

1.6.2.1 Calculation of the A-weighted Noise Pressure

For the unit Class B which is taking the noise test under the rated conditions, follow the equation below to calculate it A-weighted noise pressure.

$$\overline{L}_{PA} = \overline{L}'_{PA} - K_{1A} - K_{2A}$$

Where:

$\overline{L}_{PA}$—A-weighted noise pressure of the unit

$\overline{L}'_{PA}$—A-weighted noise pressure of the testing surface

K_{1A}—corrected value of the backgroud noise

K_{2A}—corrected value of the test environment

$\overline{L}'_{PA}$ is calculated with the equation below, where $\overline{L}'_{PAi}$ is the A-weighted noise pressure measured at the microphone no.i.

$$\overline{L}'_{PA}(dB)=10\lg\left[\frac{1}{N}\sum_{i=1}^{N}10^{0.1\overline{L}'_{PAi}}\right]$$

See Section 1.6.2.2~1.6.2.4 for calculation of each parameter in this equation.

1.6.2.2 Calculation of the Average A-weighted Noise Pressure

A-weighted noise pressure and average A-weighted noise pressure of the testing surface can be calculated with the following equations:

$$\overline{L}'_{PA}(dB)=10\lg\left[\frac{1}{N}\sum_{i=1}^{N}10^{0.1\overline{L}'_{PAi}}\right]$$

$$\overline{L}''_{PA}(dB)=10\lg\left[\frac{1}{N}\sum_{i=1}^{N}10^{0.1\overline{L}''_{PAi}}\right]$$

Where:

$\overline{L}'_{PA}$—average A-weighted noise pressure of the testing surface of the tested sound source, dB

$\overline{L}''_{PA}$—average A-weighted background noise pressure of the testing surface, dB

$\overline{L}'_{PAi}$—A-weighted noise pressure measured at the microphone no.i, dB

$\overline{L}''_{PAi}$—Average A-weighted background noise pressure pressured at the testing surface located at the microphone no.i.,dB.

N—number of microphones

1.6.2.3 Correction of Background Noise

The corrected value K_{1A} is calculated with the following equation.

$$K_{1A}(dB)=-10\lg(1-10^{-0.1\Delta L_A})$$

Where

$$\Delta L_A = \overline{L}'_{PA} - \overline{L}''_{PA}$$

a: if $>\Delta L_A$10dB, the corrected value is not needed.

b: if $3<\Delta L_A<10$dB, calculate the corrected value with the above equation.

c: $0<\Delta L_A<3$dB, take the maximum corrected value 3dB.

Note: the above principles don't apply when $\Delta L_A<3$dB, as the precision would be dropped down. The allowable maximum correction value is 3dB. In this case, it should also be described in the test report, saying "no back ground noise is applicable to the requirement of this standard".

1.6.2.4 Correction of the Test Environment

The correction factor K_{2A} which reflects effects from room boundaries (wall, ceiling, floor) or reflecting objects around the sound source is the radio of the testing surface area to the sound absorption area of the test room, and has little relation with the location of the sound source in the test room.

$$K_{2A}(dB)=10\lg[1+4(S/A)]$$

Where:

A: equivalent sound absorption area of the 1KHz test room, m^2.

S: testing surface area, m^2.

$$A=a.S_V$$

Where:

a—average A-weighted sound absoprtion coefficient

S_V—total area of the test room boundaries (wall, ceiling ,floor), m^2

Approximate Values of the Average Sound Absorption Coefficient a

Average Sound Absorption Coefficient	Applicable Location
0.05	Almost empty room and glossy walls made of concrete, bricks, compo or tiles.
0.1	Partically empty room and glossy walls.
0.15	Room with furniture; Rectangular worshop; Rectangular industrial plant
0.2	Irregular room with furniture; Irregular worshop or industrial plant.
0.25	Room with decorative furniture and there is a little of sound-absorbing material in the ceiling or walls.
0.35	There is sound-absorbing material in the ceilng and walls.
0.5	There is plenty of sound-absorbing material in the ceiling and walls.

Qualification Requirements on the Test Room.

When the testing surface area of the test room meets the test requirements, the ratio of the sound absorption area to the testing surface area will be or larger than 1, that is, A/S≥1, the larger the ratio is, the better. When it does not, another testing surface should be selected. The new testing surface area is small but it still should be located out of the approximate field, or the test method herein will fail to meet the required precision.

1.6.3 Effects on Noise Caused by Distance

The distance between a source of sound and the location of the sound measurement plays an important role in minimizing sound problems. The equation below can be used to calculate the sound pressure level at any distance if the sound power is known.

Another way of determining the effect of distance is to work from sound pressure only. "Q", the directionality factor, is a dimensionless number that compensates for the type of sound reflection from the source. For example, a unit sitting on a flat roof or ground with no other reflective surfaces or attenuation due to grass, snow, etc. ,between source and receiver: Q=2.

Sound pressure can be calculated at any distance from the unit if the sound power is known, using the equation:

$$L_P=L_W-20\log r+10\log Q-11$$

Where:

L_P=sound pressure

L_W=sound power

r=distance from unit in meter

Q=directionality factor

With Q=1, Unit suspended in space (theoretical condition), the equation is simplified to:

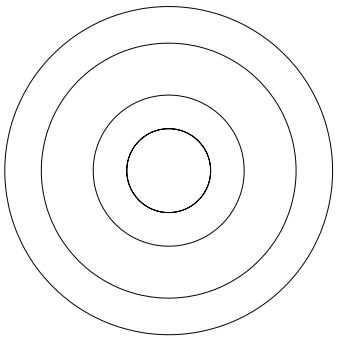
$$L_P=L_W-20\log r-1$$

With Q=2, for a unit sitting on a flat roof or ground with no adjacent vertical wall as a reflective surface, the equation is simplified to:

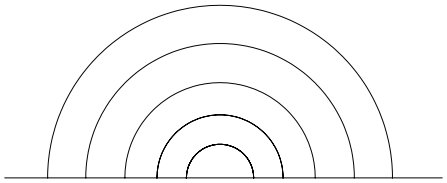
$$LP=LW-20\log r-8$$

With Q=4 for a unit sitting on a flat roof or ground with one adjacent vertical wall as a reflective surface, the equation is simplified to:

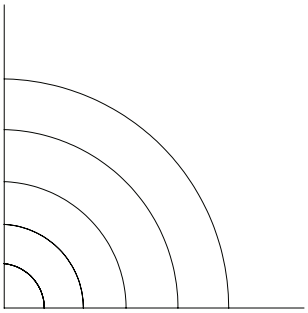
$$L_P=L_W-20\log r-5$$



Uniform Spherical Radiation
Q=1 no reflecting surface



Uniform Hemispherical Radiation
Q=1 single reflecting surface



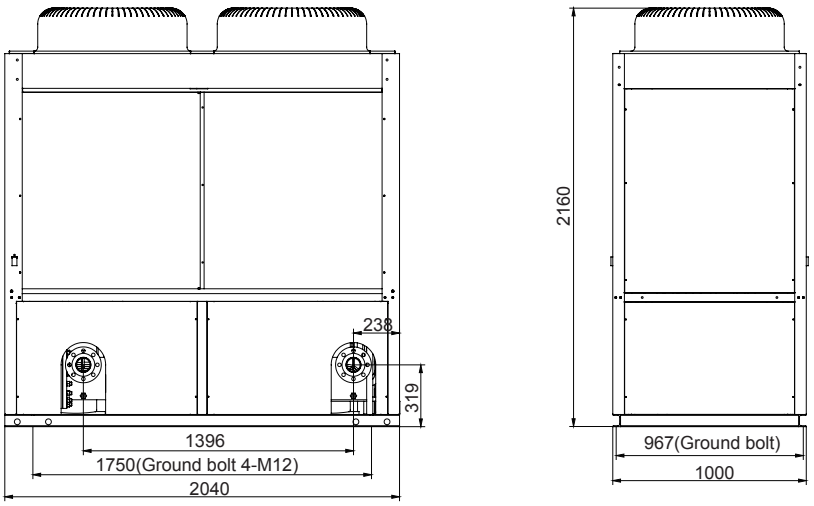
Uniform Radiation over of sphere
Q=1 single reflecting surface

The equations are reduced to the table form for various distances and the two most usual cases of "Q" type of location. Results for typical distances are tabulated in the table below.

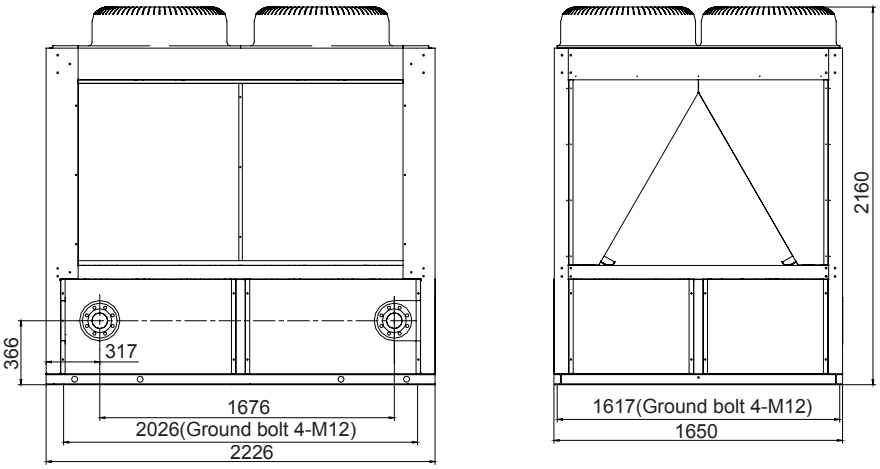
Distance from Sound Source(m)	DB Reduction from Sound Power at the Source to Sound Pressure at Referenced Distance	
	Q=2	Q=4
5	22.0	19.0
10	28.0	25.0
15	31.5	28.5
20	34.0	31.0
25	35.9	32.9

2. Outline Dimensions

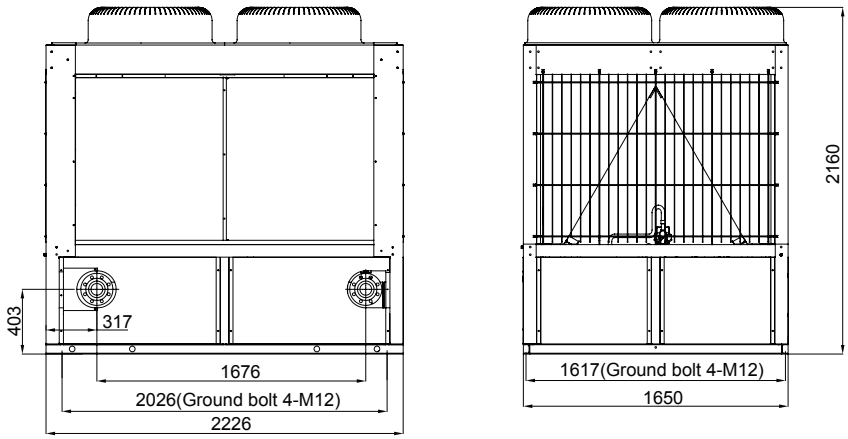
(1). Graph for the shape and size for LSQWRF65M/D-M, LSQWRF80M/D-M Unit:mm



(2). Graph for the shape and size for LSQWRF130M/D-M Unit:mm



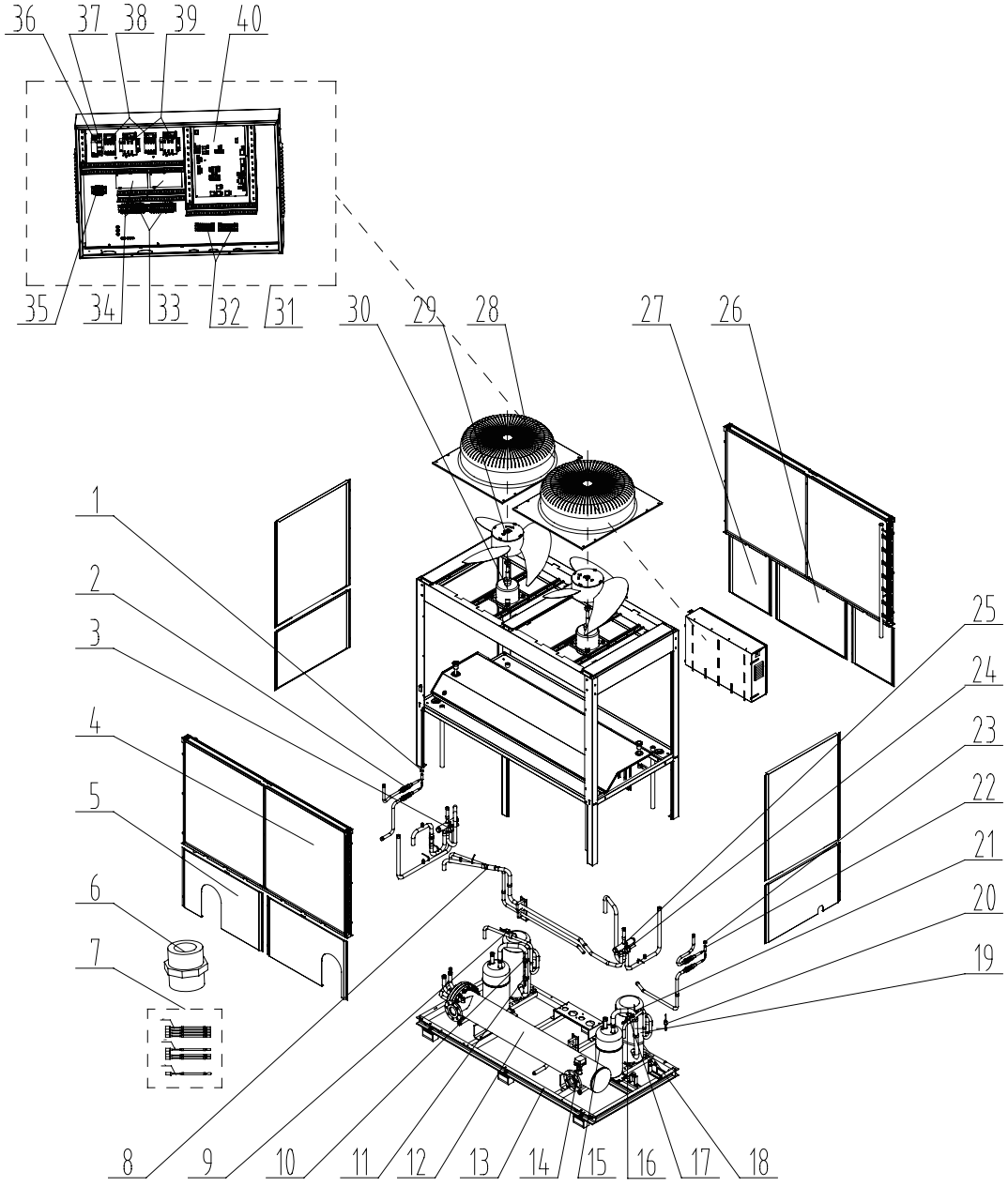
(3). Graph for the shape and size for LSQWRF160M/D-M Unit:mm



Note: Height of the outline dimensions includes the height of the rubber pad which is about 70mm.

3. Explosive Views and Parts List

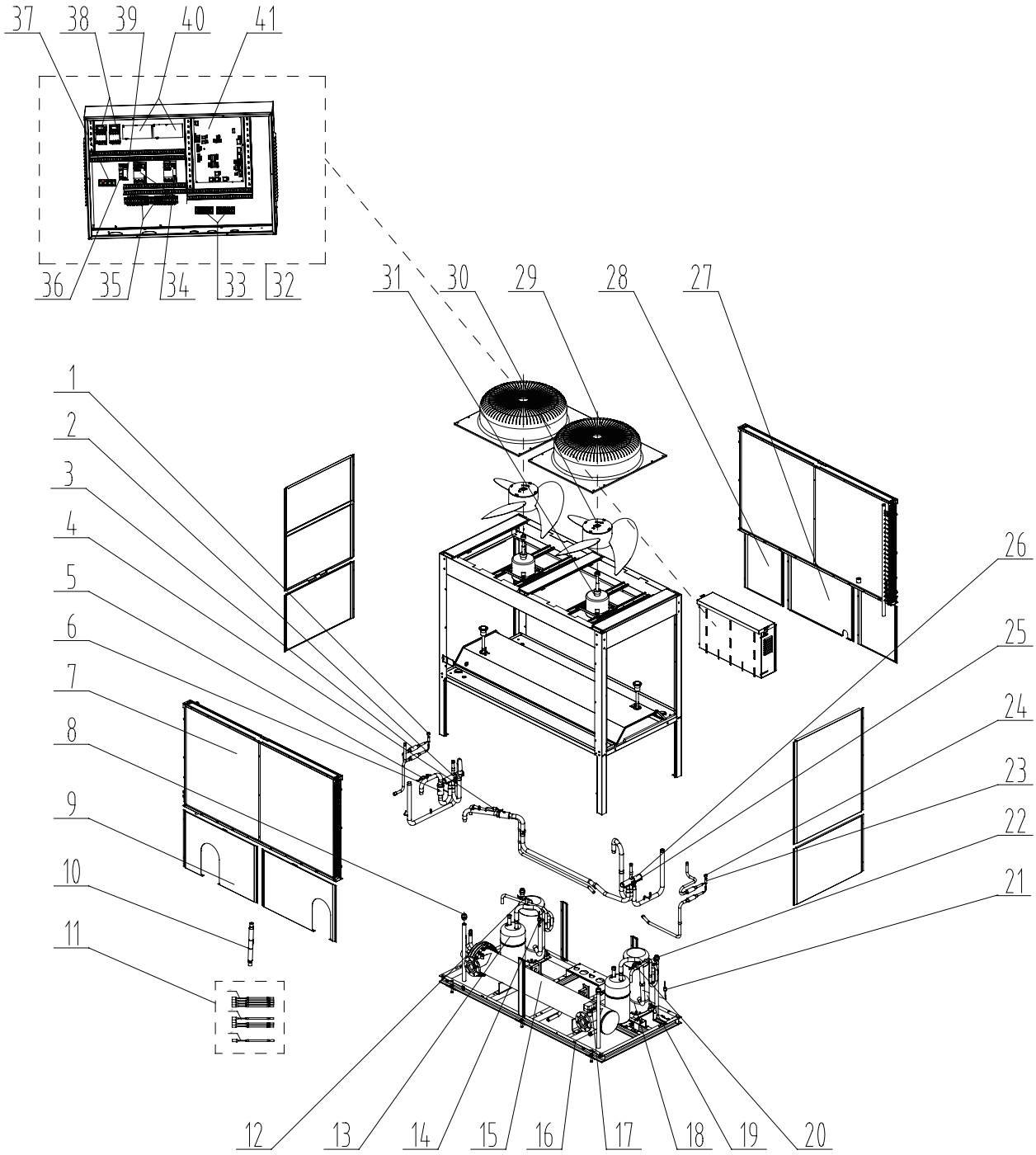
(1). Explosive View of LSQWRF65M/D-M



Parts List: LSQWRF65M/D-M for EL01500490

No.	Name of part	Part code
1	Electric Expand Valve Fitting	4304413214
2	Filter	07218603
3	Magnet Coil	4300040064
4	Condenser Assy	0112110000301
5	Rear Panel	0154110000101P
6	pipe connector	06128301
7	Sensor Sub-assy	39008000004G
8	Strainer	07210037
9	Pressure Protect Switch	4602001566
10	Pressure Protect Switch	4602001568
11	Pressure Protect Switch	4602001567
12	Dry Evaporator	01058800029
13	Base Frame Assy	01281100012P
14	Steam current Switch	45028209
15	Gas-liquid Separator	07424148
16	Compressor Gasket	02118049
17	Pressure Protect Switch	4602001563
18	Electrical Heater	76515211
19	Compressor and fittings	00201100003
20	Pressure Protect Switch	4602001564
21	Pressure Protect Switch	4602001565
22	Electronic Expansion Valve	07331139
23	Electric Expand Valve Fitting	4304413213
24	Magnet Coil	4300040048
25	4-Way Valve	430004061
26	Front Panel	01541100003P
27	Front Panel	01541100002P
28	Streamlined Dome	22265801
29	Centrifugal Fan	10355801
30	Fan Motor	1570110000101
31	Electric Box Assy	01391100029
32	Terminal Board	42018452
33	Terminal Board	42011135
34	Over Current Protector	46020113
35	Terminal Board	42011051
36	Phase Reverse Protector	46020054
37	Single-phase Air Switch	45020203
38	AC Contactor	44010235
39	AC Contactor	44010229
40	Main Board	30222000002

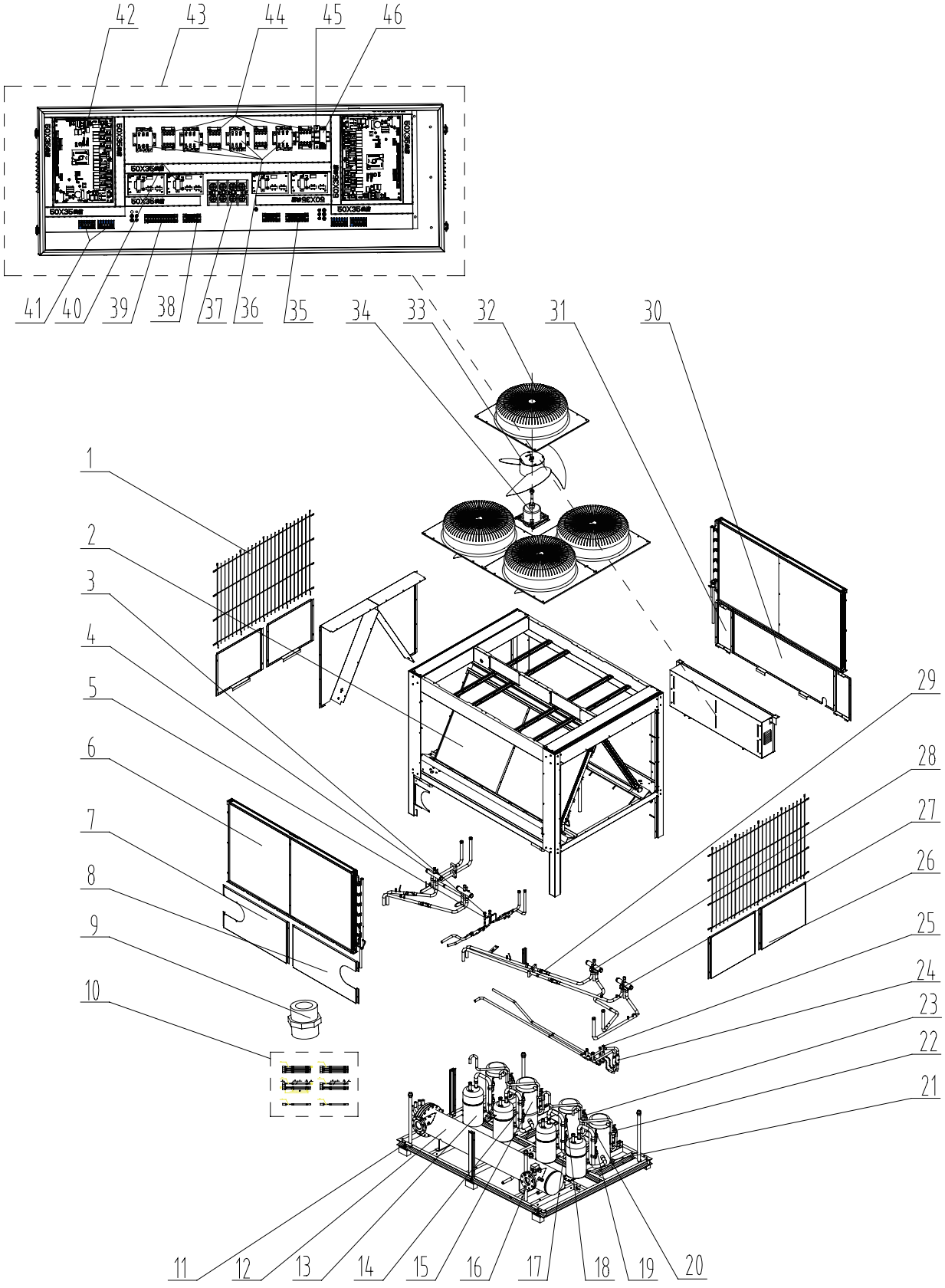
(2). Model: LSQWRF80M/D-M



Parts List: LSQWRF80M/D-M for EL01500470

No.	Name of part	Part code
1	Electric Expand Valve Fitting	4304413214
2	Magnet Coil	4300040064
3	Strainer	07210037
4	Pressure Protect Switch	4602001565
5	Pressure Protect Switch	4602001568
6	Filter	07414118
7	Condenser Assy	0112110000701
8	pipe connector	06128301
9	Rear Panel	01541100001P
10	One way Valve	07332224
11	Sensor Sub-assy	39008000004G
12	Pressure Protect Switch	4602001566
13	Gas-liquid Separator	07424148
14	Pressure Protect Switch	4602001567
15	Dry Evaporator	01058800016
16	Base Frame Assy	01281100019P
17	Steam current Switch	45028209
18	Electrical Heater	76515211
19	Compressor and fittings	00205215
20	Pressure Protect Switch	4602001563
21	Pressure Protect Switch	4602001564
22	Compressor Gasket	02118049
23	Electronic Expansion Valve	07331139
24	Electric Expand Valve Fitting	4304413213
25	Magnet Coil	4300040048
26	4-way Valve	43000329
27	Front Panel	01541100003P
28	Front Panel	01541100002P
29	Streamlined Dome	22265801
30	Centrifugal Fan	10355801
31	Fan Motor	15701100003
32	Electric Box Assy	01391100034
33	Terminal Board	42018452
34	AC Contactor	44010229
35	Terminal Board	42011135
36	Single-phase Air Switch	45020203
37	Terminal Board	420102471
38	AC Contactor	44010240
39	Phase Reverse Protector	46020054
40	Over Current Protector	46020120
41	Main Board	30222000002

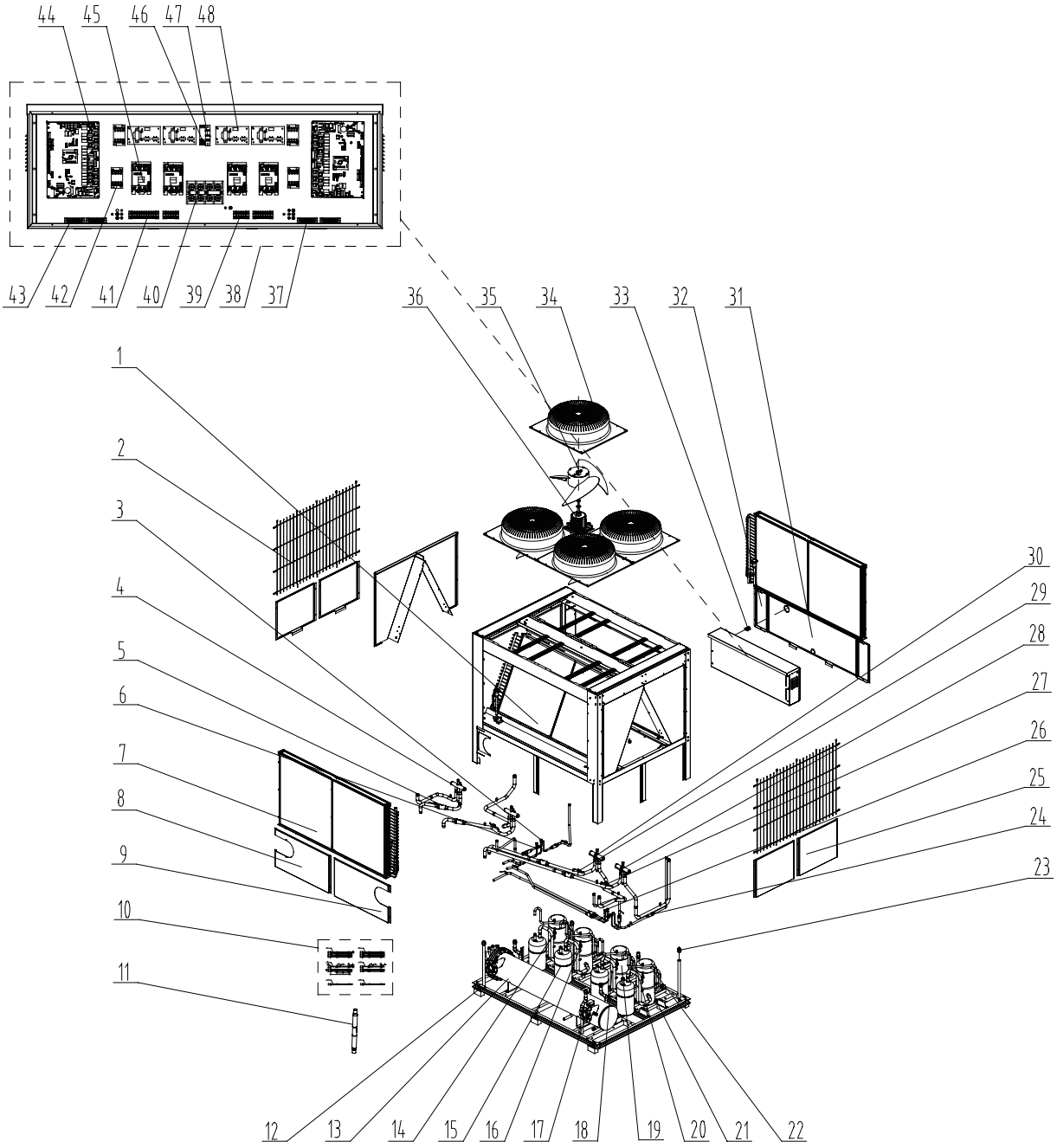
(3). Model: LSQWRF130M/D-M



Parts List: LSQWRF130M/D-M for EL01500480

No.	Name of part	Part code
1	Rear Grill	01571100001
2	Condenser Assy 1	0112110000101
3	Electric Expand Valve Fitting	4304413214
4	4-Way Valve	430004061
5	Electronic Expansion Valve	07331139
6	Condenser Assy	0112110000201
7	Lower panel	01541100006P
8	Lower panel	01541100007P
9	pipe connector	06128301
10	Sensor Sub-assy	39008000003G
11	Chassis Sub-assy	01191100004P
12	Dry Evaporator	01058800004
13	Gas-liquid Separator	07424148
14	Electrical Heater	76515211
15	Compressor and fittings	00201100003
16	Steam current Switch	45028209
17	Pressure Protect Switch	460200153
18	Pressure Protect Switch	4602001512
19	Pressure Protect Switch	4602001568
20	Pressure Protect Switch	4602001567
21	Compressor Gasket	02118049
22	Pressure Protect Switch	4602001566
23	Pressure Protect Switch	4602001522
24	Filter	07218603
25	Electric Expand Valve Fitting	4304413213
26	Lower panel	01541100005P
27	Magnet Coil	4300040048
28	Magnet Coil	4300040049
29	Strainer	07210037
30	Lower panel	01541100004P
31	Side Plate	01311100006P
32	Streamlined Dome	22265801
33	Centrifugal Fan	10355801
34	Fan Motor	15701100001
35	Terminal Board	420111251
36	AC Contactor	44010235
37	Terminal Board	42010247
38	Terminal Board	42010254
39	Terminal Board	42011135
40	Over Current Protector	46020113
41	Terminal Board	42018452
42	Main Board	30222000002
43	Electric Box Assy	01391100035
44	AC Contactor	44010229
45	Single-phase Air Switch	45020203
46	Phase Reverse Protector	46020054

(4). Model: LSQWRF160M/D-M



Parts List: LSQWRF160M/D-M for EL01500540

No.	Name of part	Part code
1	Condenser Assy 2	0112110000901
2	Rear Grill	01571100001
3	Electric Expand Valve Fitting	4304413214
4	4-way Valve	43000329
5	Filter	07414118
6	Electronic Expansion Valve	07331139
7	Condenser Assy 1	0112110000801
8	Lower panel	01541100046P
9	Lower panel	01541100047P
10	Sensor Sub-assy	39008000046G
11	One way Valve	07332224
12	Chassis Assy	01191100011P
13	Dry Evaporator	01058800025
14	Pressure Protect Switch	4602001567
15	Gas-liquid Separator	07424148
16	Pressure Protect Switch	4602001575
17	Steam current Switch	45028209
18	Electrical Heater	76515211
19	Compressor and fittings	00203008
20	Pressure Protect Switch	4602001574
21	Compressor Gasket	02118049
22	Pressure Protect Switch	4602001566
23	pipe connector	06128301
24	Strainer	07210037
25	Lower panel	01541100067P
26	Electric Expand Valve Fitting	4304413213
27	Pressure Protect Switch	4602001568
28	Magnet Coil	4300040048
29	Pressure Protect Switch	4602001565
30	Magnet Coil	4300040049
31	Lower panel	01541100053P
32	Side Plate	01311100006P
33	Scram switch	45010024
34	Streamlined Dome	22265801
35	Centrifugal Fan	10355801
36	Fan Motor	1570110000301
37	Terminal Board	420111251
38	Electric Cabinet Assy	01391100068
39	Terminal Board	42010254
40	Terminal Board	42010247
41	Terminal Board	42011135
42	AC Contactor	44010229
43	Terminal Board	42018452
44	Main Board	30222000002
45	AC Contactor	44010240
46	Phase Reverse Protector	32214101
47	Single-phase Air Switch	45020203
48	Over Current Protector	46028000008

4. Supply Scope

S=Standard O=Field Supplied P=Optional

Supply Scope	Heat Pump
Modular Unit	S
Four-wired Line (8 meter)	S
Accessory CF 58	S
Electric Cabinet	O
Auxiliary Electric Heater	O
Power Line	O
Control Line	O
Flexible Joint	O
Thermometer	O
Manometer	O
Water Tank	O

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