inventor

Your-conditions

AIR-COOLED SCROLL CHILLER C SERIES

TECHNICAL SALES GUIDE

CAPACITY RANGE : 60 - 1216kW

R410A

Contents

1 MODELS LIST

Nominal Capacity	Model		Power Supply
TR	Refrigerant	Model Name	Ph, V, Hz
17	R410A	IWCQWRF65MG/NaC-M IWCQWF65MG/NaC-M	3，380，50
22		IWCQWRF80MG/NaC-M IWCQWF80MG/NaC-M	3，380，50
34		IWCQWRF130MG/NaC-M IWCQWF130MG/NaC-M	3，380，50
43		IWCQWRF160MG/NaC-M IWCQWF160MG/NaC-M	3，380，50
17		IWCQWRF65MG/NaC-F IWCQWF65MG/NaC-F	3，220，60
22		IWCQWRF80MG/NaC-F IWCQWF80MG/NaC-F	3，220，60
34		IWCQWRF130MG/NaC-F IWCQWF130MG/NaC-F	3，220，60
43		IWCQWRF160MG/NaC-F IWCQWF160MG/NaC-F	3，220，60

2 NOMENCLATURE

IWC QW R F 80M G/Na C -F		
Model	Model Description	Options
IWC	Water Chiller	———
QW	Scroll Compressor	———
R	Heat Pump	Default- Cooling only R-Heat pump
F	Air Cooled	———
80	**Nominal Cooling Capacity**	65=60kW= 17 TR 80=76kW= 22 TR 130=120kW=34 TR 160=152kW=43 TR
M	Module	———
G	**Product number**	———
Na	Refrigerant	Na–R410A
C	Series number	———
F	Voltage	F 208~230V 3N~ 60Hz M 380~415V 3N~ 50Hz

3 FEATURES

3.1 Brief Introduction

The units with multi refrigerant circuits from 60 to 152 kW have outstanding benefits that make this product effective for a variety of applications. The units are shipped from the factory completely ready for installation and use. Each unit is pressure-tested, evacuated, and fully charged with R410A, and has an initial oil charge. After assembly, a complete operation test is performed with water flowing through the cooler to assure that the refrigeration circuit operates correctly.

The units can be installed on the rooftop, ground outside and so on instead of being equipped within a special machine room. It can be widely applied in new built or reconstructed industry and civil-building project, such as hotel, apartment, restaurant, office building, shopping mall, theater, gymnasium, hospital and so on, as well as supplies required cooling water for factories in technical process of producing, so it's especially suitable for some special locations around where there are high-level requirements for noise and environments and cooling tower are difficult to install.

3.2 Standard Specifications

High Efficiency Full Load Operation

Utilizing new scroll compressor technology, the chillers meet or exceed the performance requirements of ASHRAE 90.1. All system components are selected for optimum performance, including the condenser coil areas and evaporator sizes.

Excellent Part Load Performance

By using multi compressors on each chiller, unloading characteristics and part load performance are outstanding. Integrated part load value (IPLV) is a part load performance indicator as outlined in ARI Standard 550/590-1998. The IPLV rating compares the performance of different chillers under identical conditions. When the IPLV is listed in EER (Energy Efficiency Ratio), a higher EER will indicate that the chiller's overall performance is better.

Compact Design with Small Footprint

The chillers have a reputation for a compact design and small footprint. A small footprint can save installation costs by minimizing the size of the concrete mounting pad or reduces the amount of structural steel if the unit is mounted on the rooftop.

Quiet Operation

The chillers are designed with quiet scroll compressors. Fans are selected for good performance and lower sound levels. The attention to detail with sound is critical in the design. Small issues such as refrigerant piping, supports for piping, securing components to the structure are all important to making a quiet product. We proudly publish our sound performance.

Superior Controls

INVENTOR has provided the latest technology in controlling the chillers. The new controller provides a "user friendly" environment for the operator. The control logic is designed to provide maximum efficiency, to help provide continuing operation in unusual operating conditions through proactive controls, and to provide a history of conditions to aid in problem resolutions. Perhaps the greatest benefit is the Protocol for integrating with your building automation system (BAS).

Compressors

These rugged hermetic compressors are constructed with an integral cast iron frame, cast iron scrolls, three Teflon impregnated bearings, and three oil filtration devices for each compressor. One to thity-two compressors can run, depending on the load of the system, resulting in excellent Part-load efficiency. Each refrigerant circuit has specially designed oil and gas equalization lines to control oil migration.
The design also offers radial and axial compliance, a large internal volume for liquid handling, a removable suction screen, and a rotary dirt trap and oil screen. In addition, the compressor is self-compensating for wear, handles moderate liquid slugging, and inherently yields high efficiency.

This well protected compressor includes a solid-state motor protection module, 4 individual motor winding sensors, a patented internal discharge temperature probe, and a patented shutdown feature that prevents reverse rotation. An internal discharge check valve helps prevent shutdown noise and comes standard with high and low pressure taps with Schrader valves, a sight glass, an oil level adjustment valve, and an off cycle crankcase heater.

Evaporator

The evaporator is direct expansion, shell-and-tube type with water flowing in the baffled shell side and refrigerant flowing through the tubes. Two independent refrigerant circuits within the evaporator serve the module's dual refrigerant circuits. The evaporator has a carbon steel shell and seamless high efficiency copper tubes roller expanded into a carbon steel tube sheet. Refrigerant heads are carbon steel with multi-pass baffles to provide oil return . For water removal, 10mm vent and drain plugs are provided on the top and bottom of the shell. An ambient air thermostat controls the heater cable. The fitted and glued in place insulation has a K factor of 0.28. The refrigerant side maximum working pressure is 4400 kPa. The water side working pressure is 1048 kPa. Each evaporator is designed, constructed, inspected, and stamped according to the requirements of the ASME Boiler and Pressure Vessel Code.

Condenser

Condenser coils have internally enhanced seamless copper tubes arranged in a staggered row pattern. The coils are mechanically expanded into flat aluminum fins with full fin collars. A variety of optional coil material and coatings are available for corrosive atmospheres.
Fans-The condenser fans are composed of corrosion resistant aluminum hub and glass-fiber-reinforced polypropylene composite blades molded into a low noise airfoil section. They are designed for maximum efficiency and are statically and dynamically balanced for vibration-free operation. They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed of heavy-gauge, rust-resistant, coated steel. All blades are statically and dynamically balanced for vibration-free operation.
Motors-The fan motors are totally enclosed air-wver, squirrel-cage type. They feature ball bearings that are double-sealed and permanently lubricated.

3.3 Standard Accessories

Unit on-off switch: ON-OFF switch is provided for manually switching the unit control circuit.
Indicator lights: LED lights indicate power on to unit, running state and fault indications due to safety devices.
Filter: Refrigeranting circuits are kept free of sludge, acid and oil contamination with it.
Under voltage and phase protection: Protects against low incoming voltage as well as single phase, phase reversal.
Liquid line solenoid valve: IT coses when the compressor is off to prevent any liquid refrigerant from accumulating in the evaporator.

3.4 Standard Control & Safety Devices

The chiller's Unit Control Module is an innovative, modular microprocessor control design. It coordinates the actions of the chiller in an efficient manner and provides stand-alone operation of the unit. A Human Interface Panel is a standard component of the Chiller. Access to all unit controls is via the Human Interface Panel.
Safety valve: Protects the unit against high discharge pressure.
Compressor In-built protection device: Motor winding temperature, discharge gas temperature and phase reversal for direction of rotation.
Crankcase heaters: Protects the unit against refrigerant migration, oil dilution and potential compressor failure.
High pressure switch: Provides protection in case of excessive discharge press-ure.
Low pressure switch: Provides protection in case of unsafe low suction pressure.

4 PRODUCT DATA

4.1 Ratings

Model Name	KW/TR	EER
IWCQWRF65MG/NaC-M IWCQWF65MG/NaC-M	60 / 17	9.4
IWCQWRF80MG/NaC-M IWCQWF80MG/NaC-M	76 / 22	9.4
IWCQWRF130MG/NaC-M IWCQWF130MG/NaC-M	120 /34	9.4
IWCQWRF160MG/NaC-M IWCQWF160MG/NaC-M	152 / 43	9.4
IWCQWRF65MG/NaC-F IWCQWF65MG/NaC-F	60 / 17	9.4
IWCQWRF80MG/NaC-F IWCQWF80MG/NaC-F	76 / 22	9.4
IWCQWRF130MG/NaC-F IWCQWF130MG/NaC-F	120 /34	9.4
IWCQWRF160MG/NaC-F IWCQWF160MG/NaC-F	152 / 43	9.4

EER=Energy Efficiency Ratio at full load-the cooling capacity in Btu's per hour(Btu/h) divided by the power input in watts, expressed in Btu/h per watts((Btu/h)/watt).

4.2 UNIT APPLICATION DATA

Voltage Variation Min./Max.	342/420(50Hz) 198/242(60Hz)
Ambient Air on Condenser coil Min./Max.℃(℉)	-15/46 (41/115)

4.3 SPECIFICATION

Model			IWCQWF_MG/NaC-M				IWCQWRF_MG/NaC-M			
			65	80	130	160	65	80	130	160
Rated cooling capacity		kW	60	76	120	152	60	76	120	152
Input power for cooling		kW	21.8	27.6	43.6	55.3	21.8	27.6	43.6	55.3
Rated heating capacity		kW	/	/	/	/	65	80	130	160
Heating input power		kW	/	/	/	/	21.7	26.7	43.3	53.3
Noise		dB(A)	67	68	69	70	67	68	69	70
Power supply		—	380~415V 3N~50Hz							
Operating control		—	Microcomputer control, operating status display and abnormal status alarm							
Safety protection devices		—	High and low voltage switches, freeze prevention switch, over-current protection switch, phase lacking protector, compressor overheat protection device and software delay starting compressor protection							
Compressor	Type	—	Totally enclosed flexible scroll compressor							
	Starting mode	—	Direct starting							
Refrigerant	Type	—	R410A				R410A			
	Control	—	Electronic expansion valve				Electronic expansion valve			
Water side heat exchanger	Type	—	Efficient shell and tube heat exchanger							
	Water flow	m³/h	10.3	13.1	20.6	26.1	10.3	13.1	20.6	26.1
	Water resistance loss	kPa	30	35	30	35	30	35	30	35
	Maximum bearing pressure	MPa	1							
	Diameter of water pipes	mm	DN 50		DN 150		DN 50		DN 150	
Air side heat exchanger	Type	—	Efficient finned coil tube exchanger							
	Fan Motor input power	kW	0.7*3	0.7*3	0.7*6	0.7*6	0.7*3	0.7*3	0.7*6	0.7*6
Outline dimension	Width	mm	1100	1100	2200	2200	1100	1100	2200	2200
	Depth	mm	2265	2265	2265	2265	2265	2265	2265	2265
	Height	mm	2214	2214	2214	2214	2214	2214	2214	2214
Package dimension	Width	mm	1180	1180	2280	2280	1180	1180	2280	2280
	Depth	mm	2345	2345	2345	2345	2345	2345	2345	2345
	Height	mm	2214	2214	2214	2214	2214	2214	2214	2214
Net weight		kg	900	1000	1780	1980	950	1050	1880	2080
Gross weight		kg	910	1010	1800	2000	960	1060	1900	2100

Model			IWCQWF_MG/NaC-F				IWCQWRF_MG/NaC-F			
			65	80	130	160	65	80	130	160
Rated cooling capacity		kW	60	76	120	152	60	76	120	152
Input power for cooling		kW	21.8	27.6	43.6	55.3	21.8	27.6	43.6	55.3
Rated heating capacity		kW	/	/	/	/	65	80	130	160
Heating input power		kW	/	/	/	/	21.7	26.7	43.3	53.3
Noise		dB(A)	67	68	69	70	67	68	69	70
Power supply		—	208~230V 3N～60Hz							
Operating control		—	Microcomputer control, operating status display and abnormal status alarm							
Safety protection devices		—	High and low voltage switches, freeze prevention switch, over-current protection switch, phase lacking protector, compressor overheat protection device and software delay starting compressor protection							
Compressor	Type	—	Totally enclosed flexible scroll compressor							
	Starting mode	—	Direct starting							
Refrigerant	Type	—	R410A				R410A			
	Control	—	Electronic expansion valve				Electronic expansion valve			
Water side heat exchanger	Type	—	Efficient shell and tube heat exchanger							
	Water flow	m³/h	10.3	13.1	20.6	26.1	10.3	13.1	20.6	26.1
	Water resistance loss	kPa	30	35	30	35	30	35	30	35
	Maximum bearing pressure	MPa	1							
	Diameter of water pipes	mm	DN 50		DN 150		DN 50		DN 150	
Air side heat exchanger	Type	—	Efficient finned coil tube exchanger							
	Fan Motor input power	kW	0.7*3	0.7*3	0.7*6	0.7*6	0.7*3	0.7*3	0.7*6	0.7*6
Outline dimension	Width	mm	1100	1100	2200	2200	1100	1100	2200	2200
	Depth	mm	2265	2265	2265	2265	2265	2265	2265	2265
	Height	mm	2214	2214	2214	2214	2214	2214	2214	2214
Package dimension	Width	mm	1180	1180	2280	2280	1180	1180	2280	2280
	Depth	mm	2345	2345	2345	2345	2345	2345	2345	2345
	Height	mm	2214	2214	2214	2214	2214	2214	2214	2214
Net weight		kg	900	1000	1780	1980	950	1050	1880	2080
Gross weight		kg	910	1010	1800	2000	960	1060	1900	2100

The operation weight of the unit is equal to 110% of its net neight.

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)
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

Water side			Air side
Item	Outlet water temp. (℃)	Difference of the in/outlet water temp. (℃)	Ambient temp. Db (℃)
Cooling	5~15	2. 5 ~8	5~46
Heating	40~50	2. 5 ~8	-15 ~24

6 ANTIFREEZE

Ethylene Glycol Factors

The units can operate with a leaving chilled fluid temperature from of20℉ to 60℉(-6℃ ~16℃) A glycol solution is required when leaving chilled fluid temperature is below4.5 ℃.The use of glycol will reduce the performance of the unit depending on concentration.

% by Weight	10	20	30	40	50
Freezing Point ℃（℉）	-3.3(26)	-7.8(18)	-13.9(7)	-21.7(-7)	-33.3(-29)
Ambient Temperature ℃（℉）	8.3(47)	-1.7(29)	-6.7(20)	-16.7(2)	-26.7(-16)
Cooling Capacity Correction Factor	0.998	0.993	0.987	0.980	0.973
Water flow Correction Factor	1.036	1.060	1.092	1.132	1.182
Pressure Drop Correction Factor	1.07	1.10	1.18	1.24	1.30

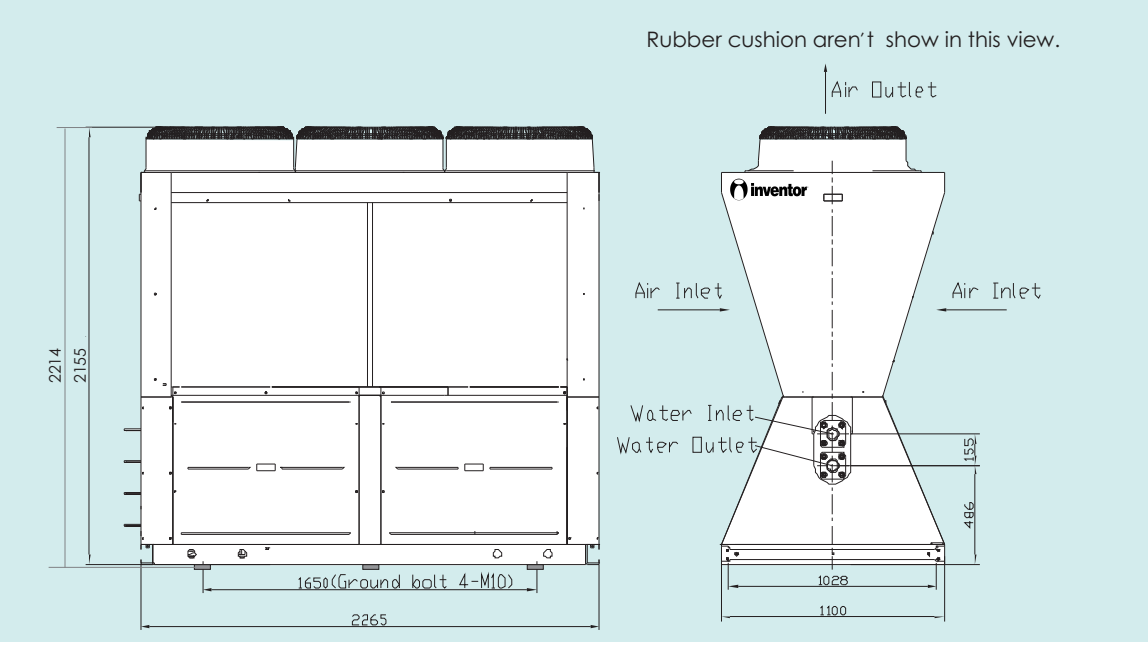
NOTE: Ethylene and propylene glycol ratio is the scope of Standard ARI 550/590-98 certification program.

7 INSTALLATION

7.1 Dimensions

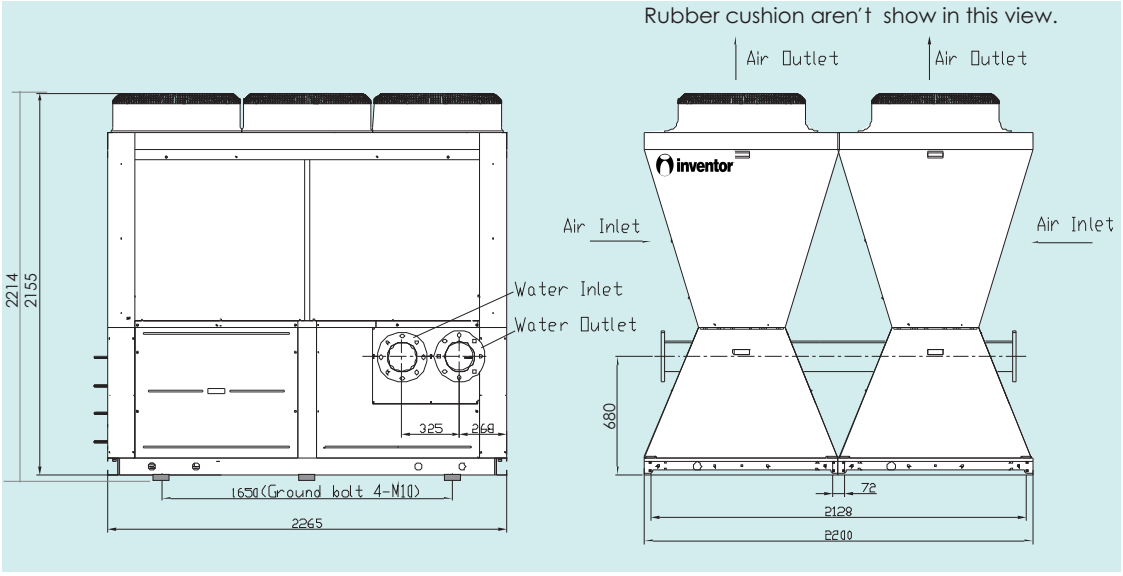
a、Graph for the shape and dimensions for

IWCQWRF65MG/NaC-M, IWCQWF65MG/NaC-M, IWCQWRF80MG/NaC-M, IWCQWF80MG/NaC-M
IWCQWRF65MG/NaC-F, IWCQWF65MG/NaC-F, IWCQWRF80MG/NaC-F, IWCQWF80MG/NaC-F



b、Graph for the shape and dimensions for

IWCQWRF130MG/NaC-M, IWCQWF130MG/NaC-M, IWCQWRF160MG/NaC-M, IWCQWF160MG/NaC-M,
IWCQWRF130MG/Na-F, IWCQWF130MG/NaC-F, IWCQWRF160MG/NaC-F, IWCQWF160MG/NaC-F.



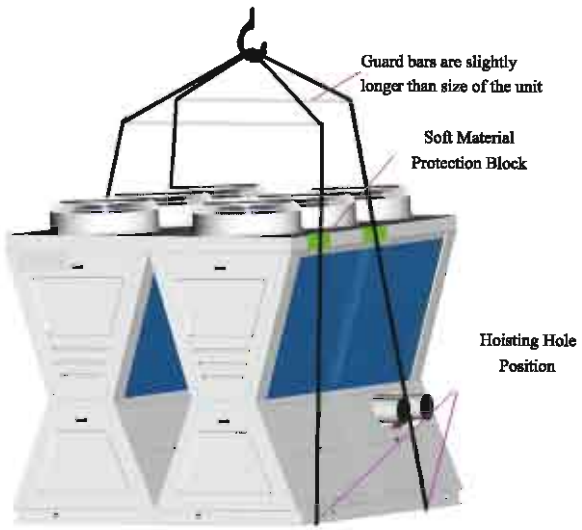
7.2 Rigging Instruction

Caution

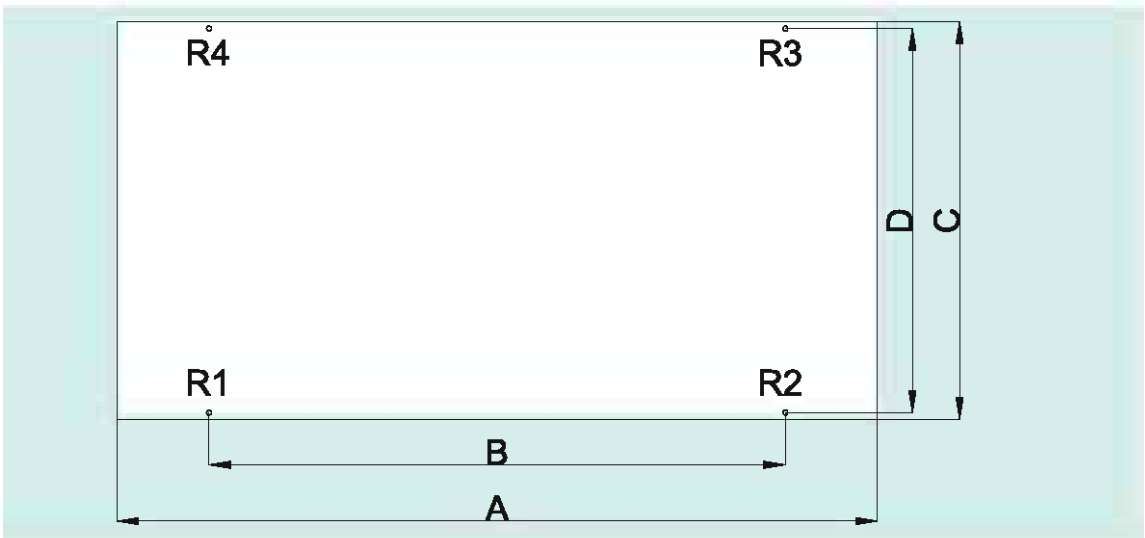
Strict inspection and test have been made to every unit before it is delivered out of factories to ensure the performance and quality. Therefore, please be careful during assembly and mobilization. Don't damage control system and pipe components.
Mobilize the unit to the nearest assembly location before removing the package. Keep the unit upward, carry the removed unit and assemble according to the following approach:

a. Move the unit with roller rod: Put three roller rods with the same size at the bottom of the unit. Each of the rods shall be 1/5 longer than the width of the unit. Keep balance.

b. Lifting (reference to the following Graph).



7.3 Mounting Location

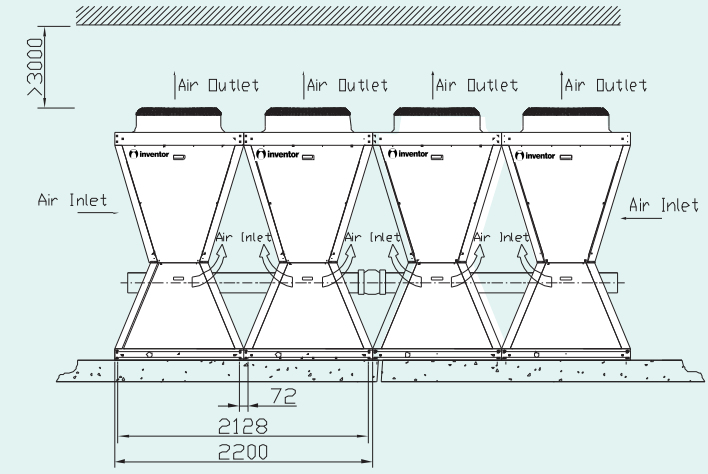


7.3 Mounting Location

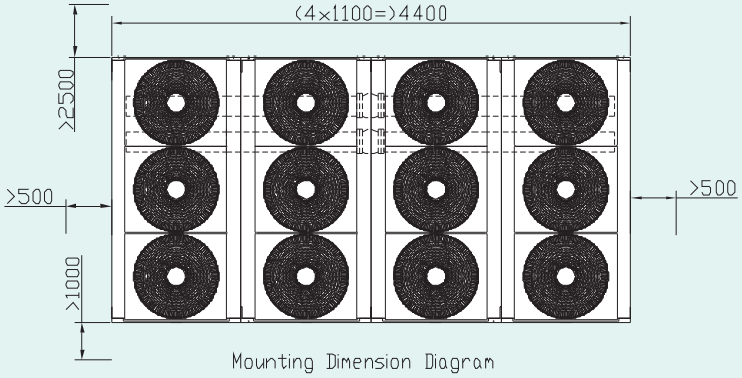
Model	A	B	C	D
IWCQWRF65MG/NaC-M IWCQWF65MG/NaC-M	2265	1650	1100	1028
IWCQWRF80MG/NaC-M IWCQWF80MG/NaC-M	2265	1650	1100	1028
IWCQWRF130MG/NaC-M IWCQWF130MG/NaC-M	2265	1650	2200	2128
IWCQWRF160MG/NaC-M IWCQWF160MG/NaC-M	2265	1650	2200	2128
IWCQWRF65MG/NaC-F IWCQWF65MG/NaC-F	2265	1650	1100	1028
IWCQWRF80MG/NaC-F IWCQWF80MG/NaC-F	2265	1650	1100	1028
IWCQWRF130MG/NaC-F IWCQWF130MG/NaC-F	2265	1650	2200	2128
IWCQWRF160MG/NaC-F IWCQWF160MG/NaC-F	2265	1650	2200	2128

7.4 Installation Interspace

Room for unit assembly shall be open with free ventilation and without short circuit of air flow. Specific assembly sizes are shown in the graph with unit of mm.



Rubber cushion pad shall be attached under the unit base which shall be fixed on the foundation with bolts.



Mounting Dimension Diagram

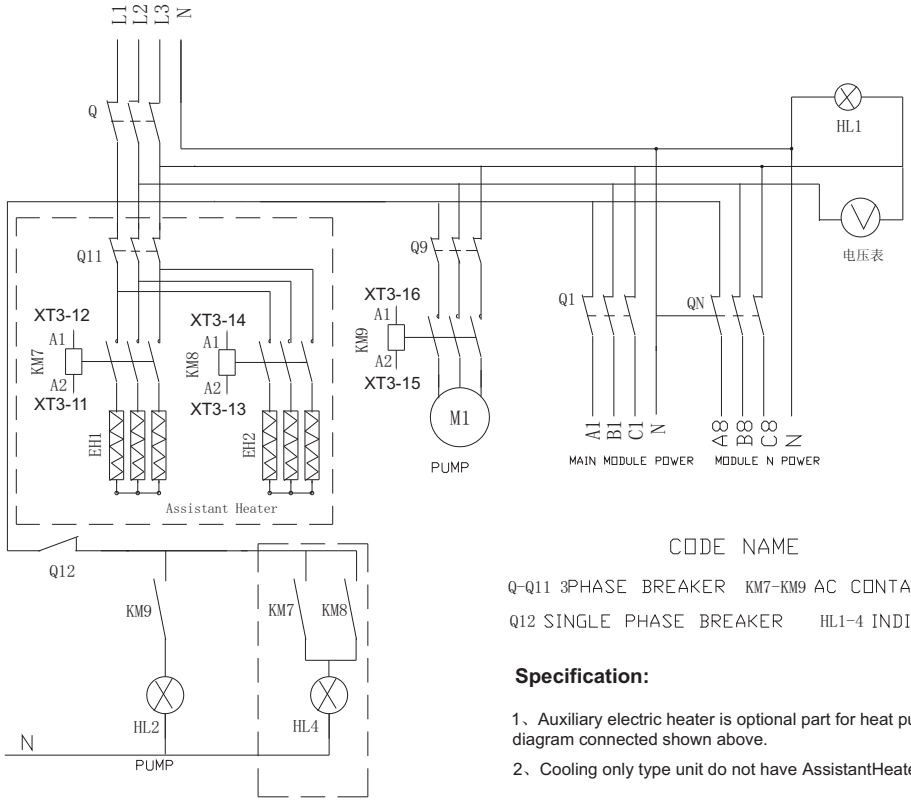
8 ELECTRICAL DATA

Power cable specifications and air switch types in the following list are recommended for selection.

Unit Model	Air switch capacity	Min. sectional area of grounding cable	Min. sectional area ofpower cable
	(A)	(mm²)	(mm²)
IWCQW(R)F65MG/NaC-M IWCQW(R)F65MG/NaC-F	63	16	25
IWCQW(R)F80MG/NaC-M IWCQW(R)F80MG/NaC-F	100	25	50
IWCQW(R)F130MG/NaC-M IWCQW(R)F130MG/NaC-F	125	35	70
IWCQW(R)F160MG/NaC-M IWCQW(R)F160MG/NaC-F	180	50	95

9 FIELD WIRING DIAGRAM

9.1 FIELD WIRING DIAGRAM



CODE NAME

Q-Q11 3PHASE BREAKER KM7-KM9 AC CONTATCOR

Q12 SINGLE PHASE BREAKER HL1-4 INDICTOR LIGHT

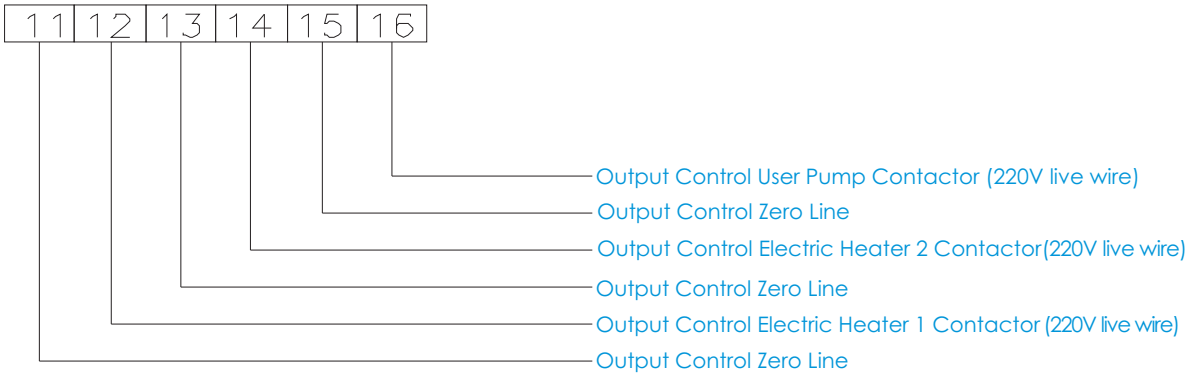
Specification:

1、Auxiliary electric heater is optional part for heat pump unit.The diagram connected shown above.

2、Cooling only type unit do not have AssistantHeater,KM7,KM8,HL4.

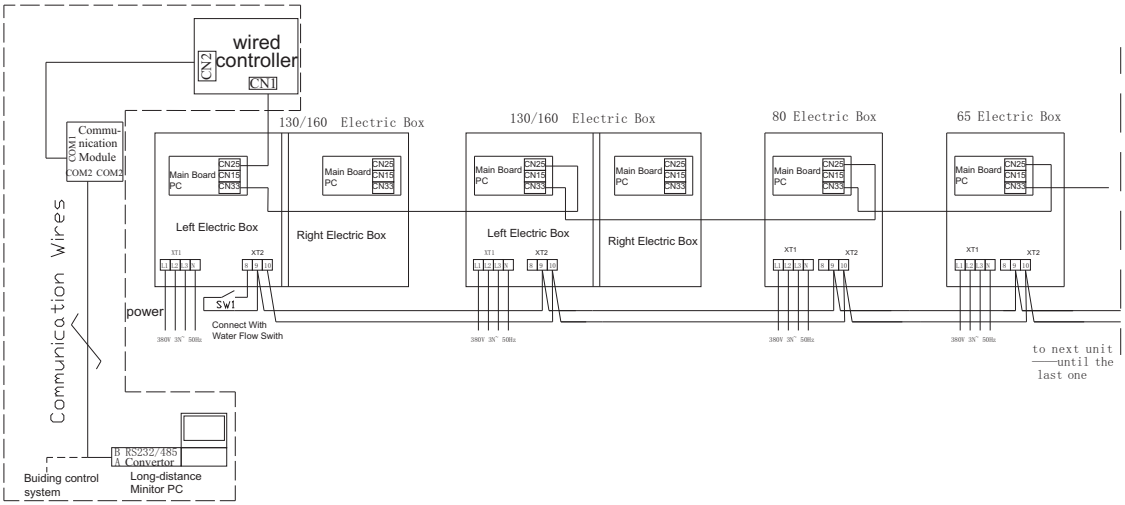
9.2 WIRING FOR EXTERNAL CONTROL USERS

Connection for External Control User



marks: Auxiliary electric heater 1 and 2 and AC contactor output control line of user's pump can be connected to 11,12,13,14,15and 16 of the terminal (XT3)of any module.

9.3. The Modules are connected as follow:



1.Use the 4-core communication wires to connect each module between CN33、CN25. Ues a 3-core(2×1mm^2) signal wiresto connect the terminal 9,10 between each modules.Referrence with the diagram shown above.

2. Use a 3-core(2×1mm^2)signal wires to connect the Water Flow Switch with the terminal 8,9 in one of the units.

3. Use a 4-core(4×25mm^2～95mm^2) wires to connect each module terminal XT1 L1,L2,L3,Ntogether.Referrence with the diagram shown above.

4.130/160means:
WCQW(R)F130MG/NaC-M WCQW(R)F160MG/NaC-M WCQW(R)F130MG/NaC-F WCQW(R)F160MG/NaC-F; (two modules in each one)

80 means： WCQW(R)F80MG/NaC-M、WCQW(R)F80MG/NaC-F;(one module in each one)

65 means： WCQW(R)F65MG/NaC-M、WCQW(R)F65MG/NaC-F (one module in each one)

10 MICROPROCESSOR CONTROLLER

1. Automatic control of compressor start/stop, condenser fans, evaporator pump, evaporator heater, unit alarm contacts, and chiller operation from 5℉ to 115℉ (-15℃ to 46 ℃) ambient. Automatic reset to normal chiller operation after power failure.

2. Software stored in non-volatile memory.

3. Liquid Crystal Display, descriptions in English, numeric data in Metric unit. Sealed keypad with sections for On/Off Switch, Reset, Up, Down, Exit and Entry.

4. Programmable set-points (within Manufacturer limits):chilled liquid temperature set-point and range, evaporate heater on/off temperature set-point and range, daily schedule/holiday for start/stop.

5. Display Data: Return and leaving liquid temperatures, outdoor air temperature, discharge temperature, suction temperature, compressor run status, fan run status, day, date and time, compressor starts/operating hours.

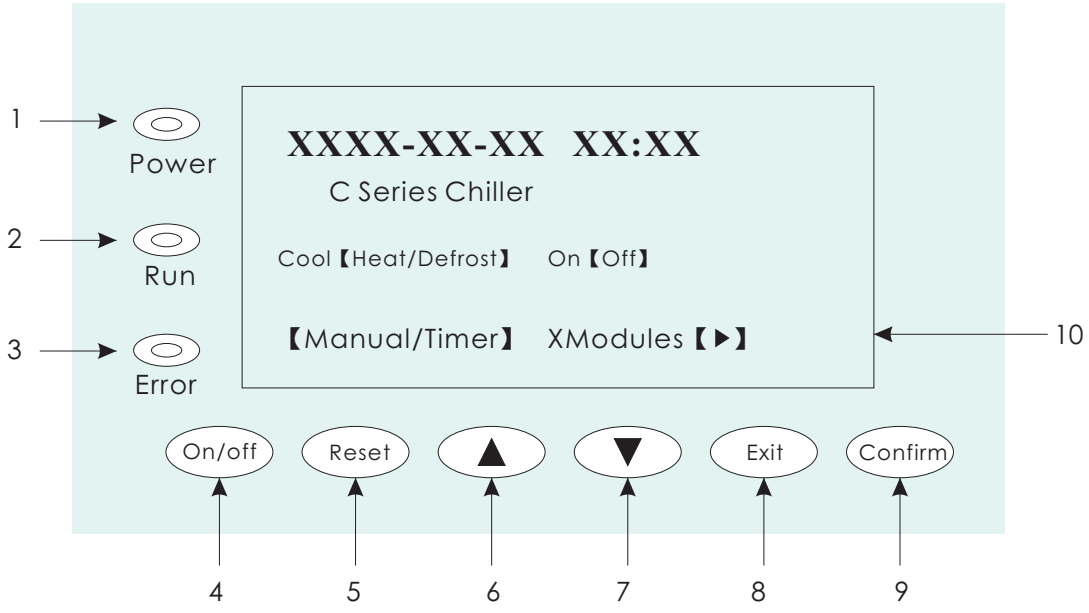
6. System Safeties: Shall cause individual compressor systems to perform auto shut down. Manual reset required after the third trip of low pressure switch in 60 minutes. Manual reset required after every trip. Includes: high discharge temperature, high pressure switch. Compressor motor protector shall protect against damage due to high input current or thermal overload of windings.

7. Unit Safeties: Shall be automatic reset and cause compressors to shut down if low leaving chilled liquid temperature, and flow switch operation. Contractor shall provide flow switch and wiring per chiller manufacturer requirements.

8. Alarm Contacts: low leaving chilled liquid temperature, high discharge temperature, high pressure, low pressure.

11 WIRED CONTROLLER

11.1 Operation View



1.Power indicator（red）: the indicator is on when the wired controller is powered on, or otherwise it is off.

2. Run indicator（green）: the indicator is on when the wired controller is started, or otherwise it is off.

3. Error indicator（red）: The indicator is on when the unit is at fault, or otherwise it is off.

4. On/Off button: For controlling unit conversion between start and stop, press the button (for 3 seconds)in stop state to start the unit and press the button (for 3 seconds) in operation state tostop the unit.

5. Reset button: Press the button to clear fault and relieve the air discharge temperature sensor locking.

6. Up selection button: in menu selection, press the button to move the cursor upward or leftward; and indata modification mode, press the button to increase the value.

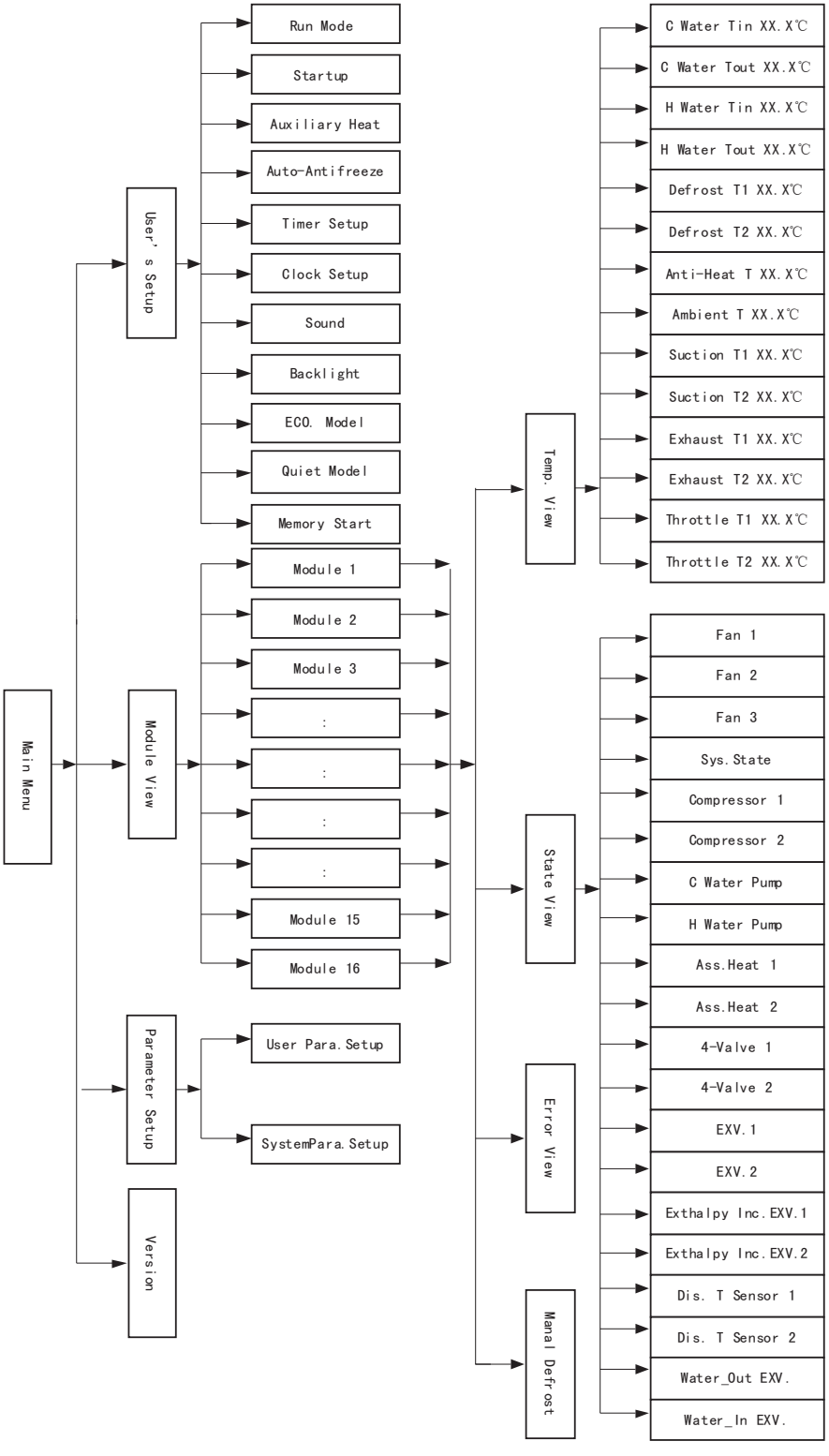
7. Down selection button: In menu selection, press the button to move the cursor downward or rightward; and in data modification mode, press the button to decrease the value.

8. Exit button: Press the button to go back to the previous menu.

9. Confirm button: In menu selection, press the button to confirm the selected item; and in data modification mode, press the button to confirm the parameter and move the cursor.

10. IWCD: Information display zone.

11.2 Menu Structure of Controller



12 ACCESSORIES

S=Standard
O=Optional
F=Field supply

Model	Accessories Name	Cooling only	Heat pump
1	Module unit	S	S
2	wired controller (necessary)	O	O
3	Four-core control connection cord (3 meters)	S	S
4	Three-core signal cable (3 meters)	F	F
5	Water flow switch	S	S
6	Electric control box	F	F
7	Auxiliary electric heater	----	O
8	Power connection wire	F	F
9	Control connection cord	F	F
10	Flexible joint	F	F
11	Thermometer	F	F
12	Pressure gauge	F	F
13	Water tank	F	F

13 APPLICATION DATA

Unit Location

The chillers are designed for outdoor installation. When selecting a site for installation, be guided by the following conditions:

1. For outdoor locations of the unit, select a place having an adequate supply of fresh air for the condenser.
2. Avoid locations beneath windows or between structures where normal operating sounds may be objectionable.
3. Installation sites may be either on a roof, or on the ground.
4. The condenser fans are the propeller-type, and are not recommended for use with duct work in the condenser air stream.
5. When it is desirable to surround the unit(s), it is recommended that the screening be able to pass the required chiller CFM without exceeding 0.1" of water external static pressure.
6.Recommended clearances for units are given in DIMENSIONS. When the available space is less, the unit(s) must be equipped with the discharge pressure transducer option to permit high pressure unloading in the event that air recirculation were to occur.

Foundation

The unit should be mounted on a flat and level foundation, ground or roof, capable of suppo-rting the entire operating weight of the unit.. Operating weights are given in the Dimensions.

For ground level installations, precautions should be taken to protect the unit from being tamp-ered by or injuring to unauthorized persons. Screws on access panels will prevent casual tam-pering; however, further safety precautions, such as unit enclosure options, a fencedin enclos-ure, or locking devices on the panels may be advisable. Check local authorities for safety regu-lations.

Chilled Liquid Piping

The chilled liquid piping system should be laid out so that the circulating pump dis ch arges into the cooler. The inlet and outlet cooler liquid connections are given in Dimensions.

Delivery and Handling

A. Unit shall be delivered to job site fully assembled, and charged with refrigerant and oil by the Manufacturer.

B. Unit shall be stored and handled according to the Manufacturer’ s instructions.

Leveling Unit

Unit must be leveled when installed to ensure proper oil return to the compressors.

Fluid Temperature

Maximum leaving chilled fluid temperature for unit is 59 ℉ (15℃). For conti-nuous operation, it is recommended that inlet fluid temperature does not exceed 86 ℉ (30℃) (If continuous ope-ration is required for inlet water temperature above 86℉ (30℃), please refer to INVENTOR factory).

Minimum leaving chilled fluid temperature for standard unit is 38 ℉ (3.3℃) (For lower leaving temperature contact INVENTOR factory).

Cooler Flow Range:

Chiller ratings and performance data pertain to cooling temperature rise of 10 ℉ (-12.4℃). Chillers maybe suitable for operation in a range from 5.4 to 14.5 ℉ (-15~-9.9 ℃)temperature rise without adjustment, provided flow limits are not exceeded. High flow rate is limited by pressure drop that can be tolerated (for any high flow rate value larger than values in performance tables, please refer to INVENTOR factory).
Minimum Cooler Flow: Minimum cooler flow will be based on the maximum permissible AT across the cooler 14.5℉ (-9.9℃).

Maximum Cooler Flow

It Will be based on Minimum permissible AT across the cooler 5.4℉ (-15℃).

Cooler protection

A protection against low ambient freeze-up is required for ambient temperatures below 32℉ (0℃) . Protection should be in the form of: Inhibited ethylene glycol or any other suitable glycol .

Condenser Airflow

Any restrictions on units fan airflow will affect unit capacity, condenser head pres-sure, and compressor power input. Such restrictions (i.e. not providing vertical clear-ance or lateral clearance, insufficient unit-to-unit clearance) will cause warm air rec-irclation or coil starvation. Minimum required operational and maintenance clearan-ces around the unit are shown in the figure below.