

Modular Air Cooled Inverter Chiller Heat Pump

Heat Pump UAL-ER5

Cooling only UAL-E5



DAIKIN INDUSTRIES, LTD.

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Note: Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.

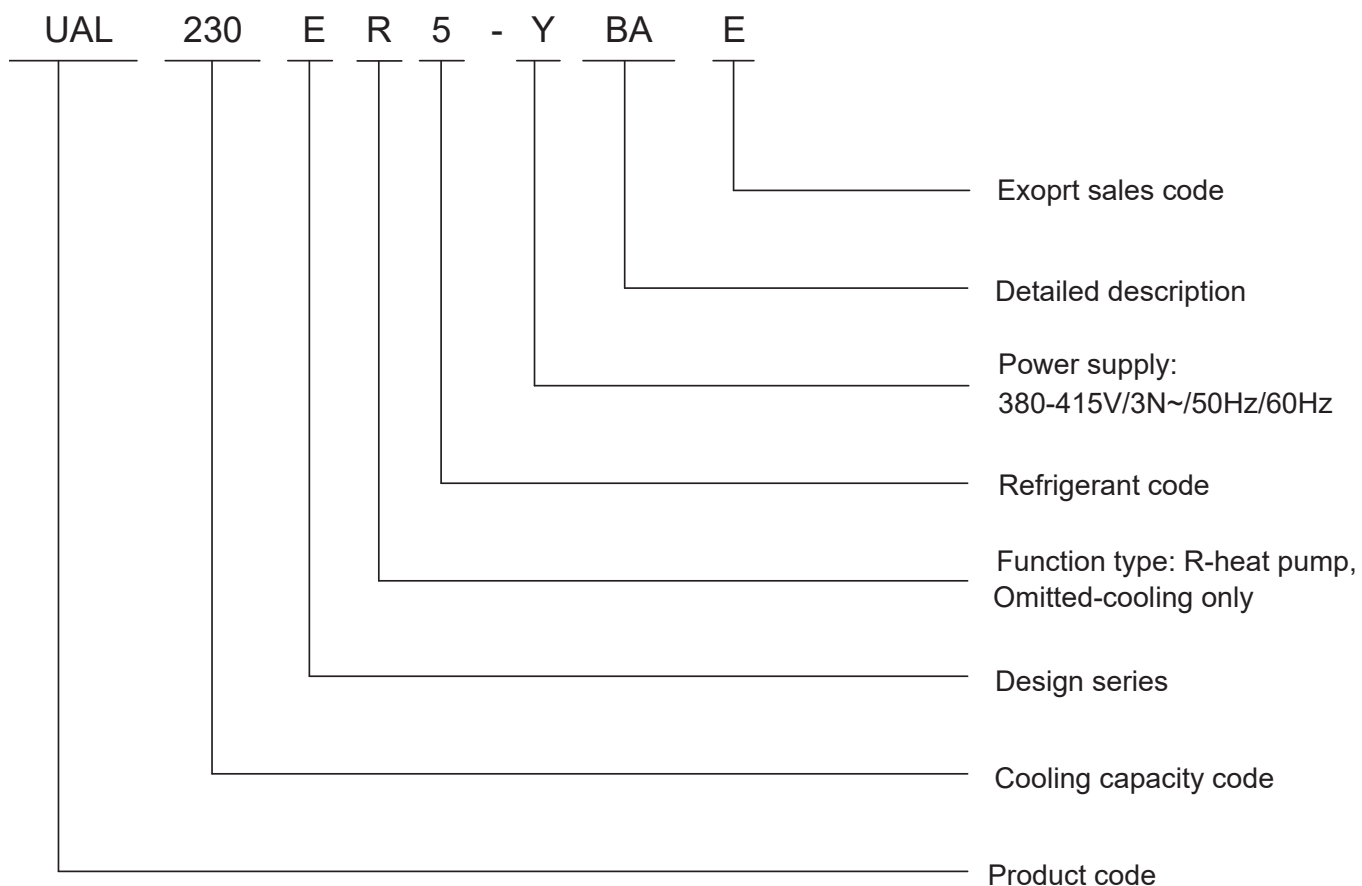
Caution: Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

Warning: Moving machinery and electrical power hazard may cause severe personal injury or death. Disconnect and lock off power before servicing equipment.

Model Series

Series	Model	Cooling capacity	Heating capacity	Max Combination qty
Cooling only	UAL230E5-Y	65kW	-	16
Heat pump	UAL230ER5-Y	65kW	70kW	16
Cooling only	UAL450E5-YA	130kW	-	16
Heat pump	UAL450ER5-YA	130kW	140kW	16

Nomenclature



Features

Energy-saving & Environmental friendly

1.1 Super-high IPLV, Impetus for building energy saving

UAL-E series modular air cooled inverter unit adopts advanced full inverter technology which improves part load operation efficiency and features a higher IPLV than that common modular air cooled units.

1.2 Leading energy-saving inverter technology

The excellent energy efficient of the unit owes to the application of cutting-edge inverter technology.

The mainstream inverter motor adopted in the unit compressor and fan motor drive can keep the unit operating under the optimal condition by adjusting the capacity output according to the load change in real time. Combining the variable-frequency compressor and variable-frequency fan motor, the unit also adopts advanced inverter technology.

1.3 Efficient components after optimal match

Besides for the high-end inverter technology, the unit also has quality and efficient components configured in other parts. All the efficient components of the unit integrated with the optimized control system and form a perfect energy-saving product.

1.3.1 High-efficiency plate heat exchanger

The water side heat exchanger in operation mode adopts efficient stainless steel brazed plate heat exchanger, which is small in size and efficient in heat exchange.

1.3.2 Electronic expansion valve

The unit adopts 480-steps electronic expansion valve based on the precision throttling technology. By dynamically adjustment of the Refrigeration system, the unit operates at optimal condition.

1.3.3 G shape heat exchanger

The air side heat exchanger in operation mode adopts G shape fin-tube heat exchanger, which makes the air flow more smooth, reduces frosting and improves heat exchange capacity. The heat exchanger with threaded copper tube enlarges the heat exchange area and improves the perturbation of the refrigerant.

1.4 Stepless Capacity Control with High Precision

Common constant-speed modular unit can adjust energy in 2~4 steps. In contrast, UAL-E series modular inverter unit implements stepless capacity control with precise low-load, low-output and low energy consumption.

1.5 Energy-saving, emission-reducing, harmless to the ozone layer

As a leader of HVAC industry, Daikin plays an important role in promoting energy saving globally and assumes a high sense of responsibility and commitment, which has made significant contribution to the cause of environment protection.

1.5.1 Reduce the emission of greenhouse gases

The unit saves energy for the user and reduces the emission of CO₂ for the society, thus alleviating the greenhouse effect. Compared with constant-speed modular air cooled unit the unit can reduce the emission of CO₂ by approximately 19%. Assume that there are ten thousand units in operation each year, we can reduce the emission of CO₂ by over 60,000 tons for the environment.

1.5.2 Harmless to the ozone layer

Daikin UAL-E series modular air cooled inverter unit adopts environmental refrigerant R410A. Compared with traditional refrigerant R22, refrigerant R410A does not contain chlorine element, which will do no harm to the ozone layer

Reliable & High quality

2.1 Quality prevails, trusted by users

Daikin modular air cooled unit boasts continuous technology development for over 40 years and successful domestic marketing experience for nearly 15 years. Thousands of users have chosen Daikin and our products are also exported overseas. The product wins a good reputation on the market for its excellent quality, which provides infinite motivation for our constant improvement and pursuit of perfection. All the components of the unit are of world well-known brands and undergo strict inspection and recognition. Quality review and recording cover the entire production process, with all units being tested online before they leave the factory, to guarantee the quality products delivered to our customers.

2.2 Multiple safety protection, stability and reliability

A dozen of safety protection functions of the unit can provide comprehensive protection for the unit and system.

2.2.1 Anti-freezing protection

Intelligent anti-freezing protection of the unit can automatically run the pump or heating mode in low temperature so as to greatly decrease the risk of being frozen when the unit is not used in winter.

By using forth generation advanced antifreeze technologies and according to the system super heat, pressure, temperature and time the system can precisely determine whether freezing occurs in the evaporator and stop the unit to implement timely protection. In addition, the unit is provided with standard 18-mesh water filter that supports the filtering of particles with the minimum diameter of 1.0 mm (smaller than the plate range) so as to efficiently prevent dirty, blocked or frozen plates.

2.3 Serve as standbys mutually, reduce impacts of unit faults on applications

When multiple modular units are combined, the need of maintenance or repair for a certain unit in the group does not influence normal operations of other units. The property of serving as standbys mutually for the systems and units can effectively reduce the impacts of unit faults on air conditioning systems to the minimum. If a failure occurs in an integral air cooled heat pump, the entire system will fail or affected by a relatively large shortage of cooling/heating capacity. Consequently, for places requiring high operation reliability, the modular air cooled unit is a prevailing choice.

2.4 Low startup current to ease the shock on the power grid

The low-current startup can ease the shock on the power grid due to unit startups and also improve safety of unit power consumption.

When variable-frequency units are applied in combination, the units are started up with low frequency and small startup current.

2.5 Wide operating range for much more assured use

The unit is functional in severe conditions, no matter a 52°C high ambient temperature or a -15°C low ambient temperature. The unit undergoes many long-term testings of CNAS which are tougher than those of national standards and all the testing results surpass national standards.

Intelligent Control

3.1 User-friendly control function, convenient operation

The unit uses a user-friendly micro-computer controller with a large LCD screen to facilitate operation. The controller provides parameter display, parameter setting and mode switching functions.

One controller can control up to 16 units and dynamically monitor the units' running statuses. Centralized controller can be provided as option if total quantity is more than 16 units.

3.1.1 Agenda management

Set the time of timed on/off every day in a period of week to make the unit operate automatically and implement the unsupervised function.

3.1.2 The compressor operates with balance

The controller monitors in real time the operating time of each modular unit in the group. The compressor is configured to operate intelligently and in balance as to prolong the service life of the unit.

3.1.3 Auto detection function

When a unit failure occurs, the controller can promptly and precisely displays where the failure locates and assists the fast troubleshooting, thus making the management and maintenance more convenient.

3.2 Full-automatic joint control function for more convenient use

3.2.1 Terminal interlocking control:

The operating state of the unit is controlled according to the starting/stopping of terminal equipment such as FCU or AHU so as to implement full-automatic operation.

3.2.2 Remote ON/OFF control:

Control the starting/stopping of the unit by connecting the remote switch.

3.2.3 Interlocking control of chilled water pump:

Control the starting/stopping of the pump to avoid damages due to the out-of-step of the pump and unit.

3.2.4 Interlocking controlling of auxiliary heat source of the system:

Intelligently control the starting/stopping of auxiliary heat source by using multivariate to determine the starting condition of auxiliary heat source.

Note: The foregoing functions have reserved control interfaces in advance and onsite connection of lines is required.

3.3 Multivariate intelligent defrosting control (For Heat pump unit)

By detecting multivariate to precisely determine frosting conditions, the unit can intelligently enter or exit the defrosting working condition at the best time so as to avoid uncompleted or frequent frosting.

Units in combination system can implement defrosting at intervals so that water temperature of the systems does not show large fluctuations and users can still enjoy comfortable heating. In harsh conditions, users can also configure Manual Defrosting at their demands.

3.4 Precise control of water temperature to improve comfort of air conditioners

By default, the unit implements entering water temperature control. And leaving water temperature control can be provided as option. Slight changes in water temperature ensure stable and comfortable indoor air supply.

3.5 Low-noise design to make a tranquil night

In the case of low-load running, the fan rotate speed will reduce automatically and the speed of unit operation can be as low as 50d(B)A. The noise of the unit is substantially reduced.

Stepless variable-speed fan adopted by the innovative unit can dynamically adjust the rotate speed according to unit operation. The noise level of the unit is significantly reduced using professional noise reduction practices, such as strictly choosing and improving fans, motors, structures and pipelines based on national precision noise rooms and noise spectrum analysis results.

3.6 Standard Modbus port to access BAS

The unit provides standard Modbus port to easily connect the unit to Building Automation System (BAS) to implement centralized control and intelligent management. Unnecessary energy waste is avoided and the cost for operating air conditioners is reduced.

Flexible Application

4.1 Modular Design and Diversified Composite Application Solutions

Modular design of units allows a maximum of 16 units in each group to meet various load requirements in different buildings.

1. All inverter: 1 Inverter unit as master unit + maximum 15 inverter units as slave units
2. Inverter + fix speed: Inverter units can be combined with fix speed units, one of the inverter units must be set as master

4.2 Convenience for Capacity Expansion and Able to Handle Phased Investment Projects.

Modular design of units composes the air-conditioner master unit system with different cooling (heating) ability through modular groups with different number of units. For the projects planned to construct in phases, reserve the pipeline in advance and purchase modular units by installment. In the case of function changing or expansion of the project which lead to the increase of air-conditioner load, appropriately increase the number of modular units to meet the load requirement.

4.3 Dispersal Transport of Modules, Safety and Convenience

In terms of transport, modular units is much simpler compared to integral air cooled heat pump. The forklift is applied to load and unload modular air cooled units, and small lifting equipment is applied to transport light modular units, even freight elevator is available. For an integral air cooled heat pump, large lifting equipment is required for the loading and unloading work of motor transport and lifting work on the construction site.

4.4 Simple System and High Space Utilization Rate

Modular designed units can be installed independently, so as to achieve installation in batches or simultaneously operating by several people. The unit is adaptable to irregular installation space, improving the space utilization. The units are installed in outdoor positions with good ventilation without need of specified indoor engine room, or installation of cooling tower or cooling water system, or heating source such as the boiler.

Specifications

General Data

Model	Unit	UAL230E5-Y	UAL230ER5-Y	UAL450E5-YA	UAL450ER5-YA
Rated cooling capacity	kW	65	65	130	130
Rated heating capacity	kW	-	70	-	140
Capacity control	-	30%~100%		15%~100%	
Rated cooling power input	kW	20.0	20.0	38.5	38.5
Rated cooling current	A	32.3	32.3	62.2	62.2
Rated heating power input	kW	-	21.2	-	40.3
Rated heating current	A	-	36.1	-	67.6
Cooling COP	-	3.25	3.25	3.38	3.38
IPLV	-	5.52	5.52	5.61	5.61
Power supply	-	380-415V/3N~/50Hz/60Hz			
Rated cooling water flow	m³/h	11.2	11.2	22.4	22.4
Rated heating water flow	m³/h	-	12.0	-	24.1
WPD (water pressure drop)	kPa	34	34	45.0	45.0
Size of water pipe	inch	RC 2	RC 2	Rc 2-1/2	Rc 2-1/2
Design max ΔT (EWT-LWT)	°C	7	7	7	7
Unit dimensions	L × W × H	mm	1100*1045*2120	1100*1045*2120	2100*1100*2300
Packing dimensions	L × W × H	mm	1140*1180*2250	1140*1180*2250	2175*1150*2430
Net weight	kg	420	420	920	920
Gross weight	kg	430	430	940	940
Operating weight	kg	425	425	930	930

NOTE:

1. RATED COOLING CODITION: LEAVING WATER TEMPERATURE IS 7°C, WATER FLOW IS $0.172[M^3/(H \cdot KW)]$, AMBIENT TEMPERATURE IS 35°C.
2. RATED HEATING CONDITION: LEAVING WATER TEMPERATURE IS 45°C, WATER FLOW EQUALS TO COOLING RATED WATER FLOW, AMBIENT DRY BULB TEMPERATURE IS 7°C. WET BULB TEMPERATURE IS 6°C.
3. $IPLV = COP \text{ IN } 100\% \text{ LOAD @ } 35.0^{\circ}C \text{ AMBIENT} \times 1\% + COP \text{ IN } 75\% \text{ LOAD @ } 27^{\circ}C \text{ AMBIENT} \times 42\% + COP \text{ IN } 50\% \text{ LOAD @ } 19^{\circ}C \text{ AMBIENT} \times 45\% + COP \text{ IN } 25\% \text{ LOAD @ } 13^{\circ}C \text{ AMBIENT} \times 12\%$.
4. ABOVE PERFORMANCE DATA IS TESTED UNDER RATED VOLTAGE 380V.
5. WPD INCLUDES WATER PRESSURE DROP OF THE UNIT AND PRESSURE DROP OF THE SUPPLIED Y-TYPE FILTER.
6. ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

Components Data

Model		Unit	UAL230E5-Y	UAL230ER5-Y	UAL450E5-YA	UAL450ER5-YA
Evaporator	Type	-	Brazed plate heat exchanger	Brazed plate heat exchanger	Brazed plate heat exchanger	Brazed plate heat exchanger
	Plate material	-	Stainless steel	Stainless steel	Stainless steel	Stainless steel
	Water volume	L	5.18	5.18	11.4	11.4
Condenser coil tube	Material	-	Copper	Copper	Copper	Copper
	Type	-	Inner groove	Inner groove	Inner groove	Inner groove
	Outer diameter	mm	7.94	7.94	7.00	7.00
	Rows	-	3	3	3	3
Fin	Material	-	Aluminum	Aluminum	Aluminum	Aluminum
	Type	-	Blue	Blue	Blue	Blue
	Fin per inch	-	14	14	16	16
Face area		m ²	3.23	3.23	6.53	6.53
Condenser fan	Type/Drive	-	Low-noise axial fan with large blades/AC inverter	Low-noise axial fan with large blades/AC inverter	Low-noise axial fan with large blades/AC inverter	Low-noise axial fan with large blades/AC inverter
	Qty	-	1	1	2	2
	Blade material	-	Aluminum	Aluminum	Aluminum	Aluminum
	Air volume	m ³ /h	21000 (max)	21000 (max)	21000 x 2 (max)	21000 x 2 (max)
Compressor	Type	-	EVI inverter scroll	EVI inverter scroll	EVI inverter scroll	EVI inverter scroll
	Qty	-	1	1	2	2
Refrigerant	Type	-	R410A	R410A	R410A	R410A
	Charge*	kg	17.5	17.5	14.5*2	14.5*2
Flow control		-	EXV	EXV	EXV	EXV
Numbers of circuits		-	1	1	2	2
Oil	Model	-	RL-32H	RL-32H	RL-32H	RL-32H
	Charge	L	1.0	1.0	1*2	1*2
Casing	Colour	-	RAL 7032 pebble grey	RAL 7032 pebble grey	RAL 7032 pebble grey	RAL 7032 pebble grey
	Material	-	Hot-dip galvanized steel sheet	Hot-dip galvanized steel sheet	Hot-dip galvanized steel sheet	Hot-dip galvanized steel sheet
	Coating	-	Highlight powder	Highlight powder	Highlight powder	Highlight powder
Protection devices		-	High pressure switch/ low pressure sensor/ high pressure sensor/ Over current Protection	High pressure switch/ low pressure sensor/ high pressure sensor/ Over current Protection	High pressure switch/ low pressure sensor/ high pressure sensor/ Over current Protection	High pressure switch/ low pressure sensor/ high pressure sensor/ Over current Protection

NOTE: 1. ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2. *THE VALUE IS THE FULL CHARGE AMOUNT OF REFRIGERANT.FACTORY ONLY CHARGES 11KG , THE REST AMOUNT SHALL BE REPLENISHED AT SITE.

Electrical Data

Model		Unit	UAL230E5-Y	UAL230ER5-Y	UAL450E5-YA	UAL450ER5-YA
Fan motor	Type	-	AC Inverter	AC Inverter	AC Inverter	AC Inverter
	Rated output	kW	1.8*1	1.8*1	1.8*2	1.8*2
	Poles	-	8	8	8	8
	Rated speed	RPM	720	720	720	720
	IP/Insulation grade	-	IP55/F	IP55/F	IP55/F	IP55/F
Compressor	Rated running current	A	31.0	31.0	31.0*2	31.0*2
	Box IP	-	IP21	IP21	IP21	IP21
Unit IP/Insulation grade		-	IPX4/F	IPX4/F	IPX4/F	IPX4/F
Unit max power input		kW	28.3	28.3	56.8	56.8
Unit max running current		A	48.2	48.2	97.9	97.9

NOTES:

1. ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.
2. MAX RUNNING CURRENT IS TESTED UNDER BELOW CONDITION: COOLING OUTDOOR DRY-BULB TEMPERATURE 43°C, COOLING LEAVING WATER TEMPERATURE 20°C

Safety Devices

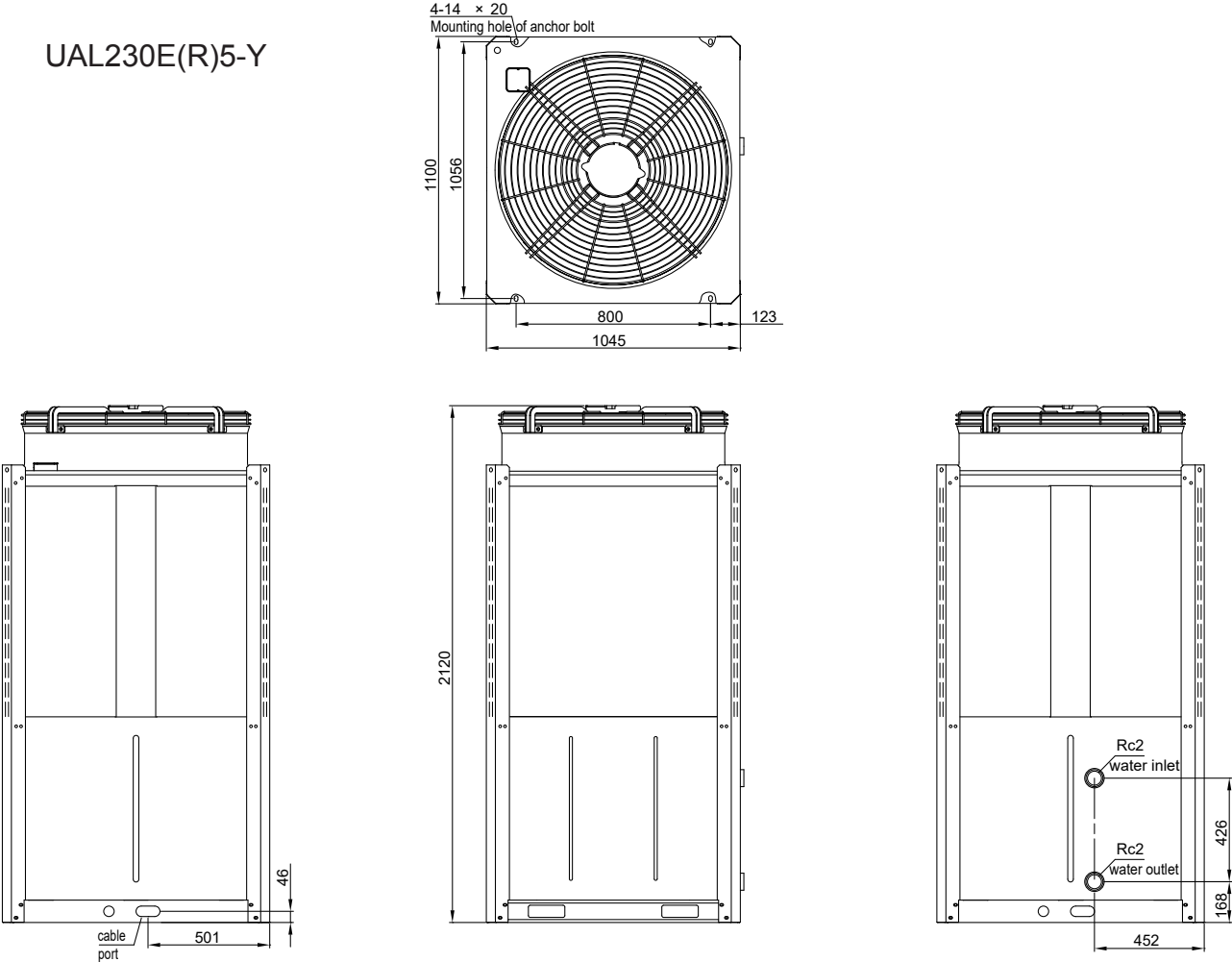
Model			Unit	UAL230E5-Y	UAL230ER5-Y	UAL450E5-YA	UAL450ER5-YA
Safety device	High pressure switch	Model	-	H20PS B	H20PS B	H20PS B	H20PS B
		Open	MPa	3.11±0.15MPa	3.11±0.15MPa	3.11±0.15MPa	3.11±0.15MPa
		Close	MPa	4.15 ± 0.15MPa	4.15 ± 0.15MPa	4.15 ± 0.15MPa	4.15 ± 0.15MPa
	Low pressure switch	Type	-	N/A	N/A	N/A	N/A
		Open	MPa	N/A	N/A	N/A	N/A
		Close	MPa	N/A	N/A	N/A	N/A
	Phase sequencer		-	N/A	N/A	N/A	N/A
	Discharge temperature setting		°C	115	115	115	115

NOTES:

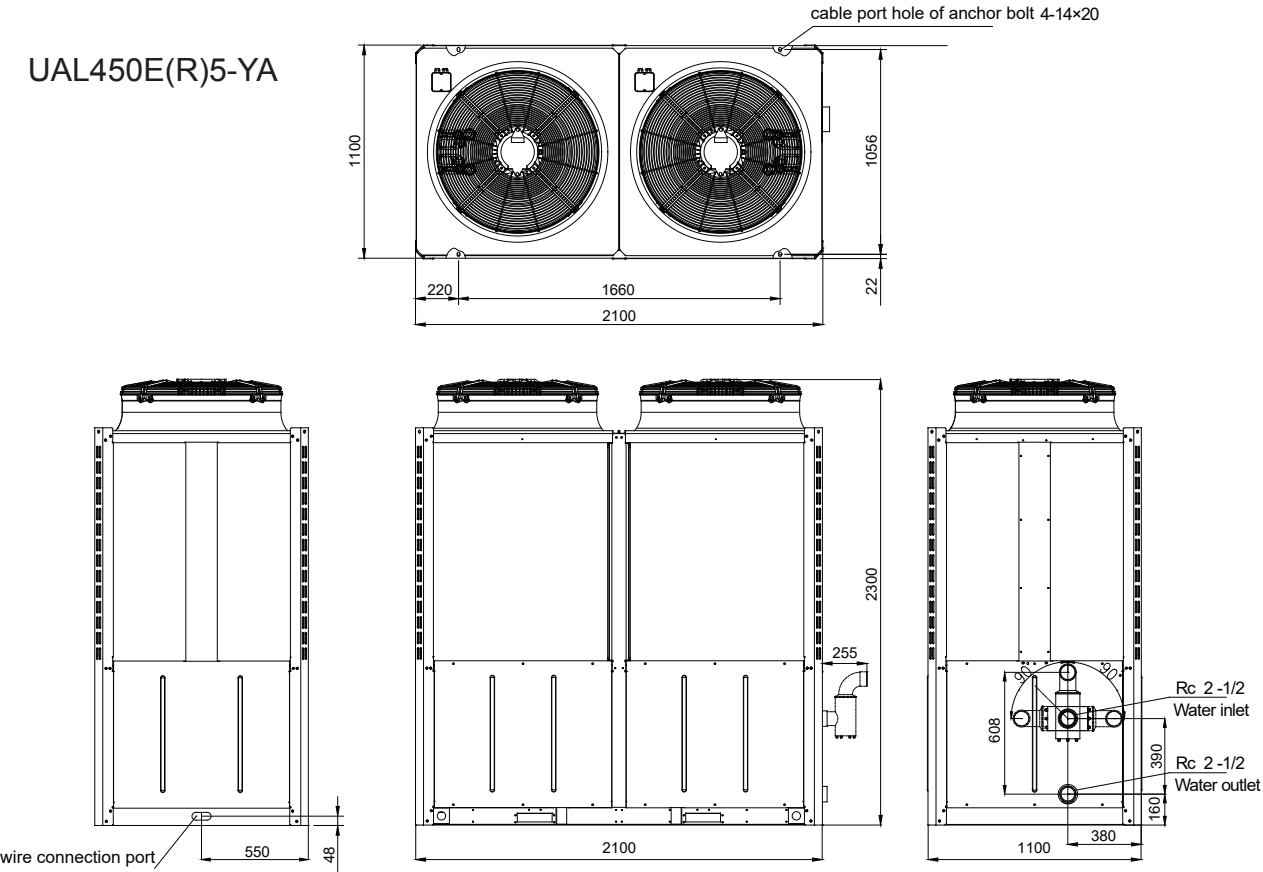
1. ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

Dimensions

UAL230E(R)5-Y

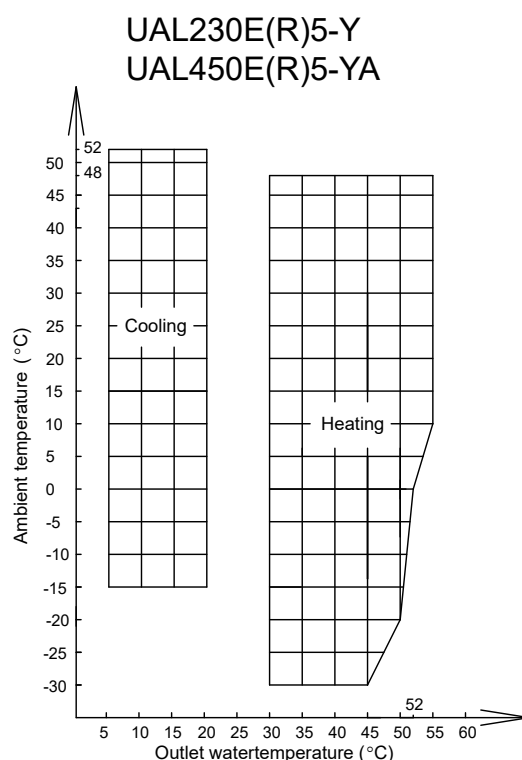


UAL450E(R)5-YA



Performance Data

Operating Range



Note: Heating operating range is for heat pump unit only.

Working Condition

Item	Description
Power supply voltage	380-415V
Power supply frequency	Rated frequency $\pm 1\%$
Variations between phases	Rated voltage $\pm 2\%$
Air quality	Must not contain solute that can corrode copper, aluminum or iron.
Flow range of chilled water	Rated water flow $\pm 30\%$
Flow velocity of chilled water	0.5~2.0m/s
Pressure of chilled water	<1.6Mpa
Quality of chilled water	Must not contain solute that can corrode copper, iron, or welding material. For details on the water quality requirements, Refer to "Water Quality Management."
Installation site	Take anti-snow and ventilation measures as required.
Ambient temperature.	Refer to operating range
Relative humidity	<90%

NOTE:

1. THE UNIT IS STRICTLY TESTED BEFORE DELIVERY AND CAN WORK SAFELY IN THE OPERATING RANGE.
2. THE OPERATING RANGE IS ACHIEVED UNDER TEST AT RATED WATER FLOW, UNIT CAN ONLY RUN IN A SHORT TIME WHEN EXCEEDING THE RANGE, OTHERWISE IT WILL OCCUR ALARM.
3. WHEN THE UNIT RUNS FOR LOW AMBIENT TEMPERATURE COOLING OR LOW LEAVING WATER TEMPERATURE, CERTAIN CONCENTRATION OF GLYCOL MUST BE ADDED INTO WATER SYSTEM, AND IT MUST BE TEST RUN BY DAIKIN CERTIFICATED PROFESSIONAL, OTHERWISE THERE MAY BE RISK OF HEAT EXCHANGER FREEZING.

Glycol concentration and correctiong factors

Mininum glycol concentration for low ambient cooling

Minimum ambient temperature (°C)	-1	-5	-10	-15
Glycol volume concentration %	9	18	26	33

Mininum glycol concentration for low LWT

LWT (°C)	4	2	0	-2	-4	-5
Glycol volume concentration %	10	10	15	18	20	22

NOTE: MINIMUM LWT CAN REACH -5°C.

Correction Factors With Glycol Use

Glycol volume concentration %	10	20	30	40	50
Cooling capacity	0.991	0.982	0.972	0.961	0.94
Cooling power input	0.996	0.992	0.986	0.976	0.966
Heating capacity	0.996	0.991	0.985	0.980	0.97
Heating power input	1.005	1.010	1.016	1.023	1.030

TIPS FOR LOW LWT CAPACITY CALCULATION:

STEP 1: CHOOSE GLYCOL PERCENTAGE WHICH CAN BE LARGER THAN MINIMUM REQUIREMENT.

STEP 2: CALCULATE LOW LWT COOLING CAPACITY/ POWER AFTER USING GLYCOL BY GLYCOL USING CORRECTION FACTOR

NOTE:

1. PLEASE CONSULT FACTORY FOR LOW LWT REQUIREMENT.
2. THE WATER QUALITY OF THE GLYCOL WATER SYSTEM MUST BE CHECKE REGULARLY TO ENSURE THAT THE WATER QUALITY MEETS THE WATER QUALITY REQUIREMENTS.
3. WHEN ADDING GLYCOL TO THE WATER SYSTEM, PLEASE ADD A CERTAIN AMOUNT OF CORROSION INHIBITOR TO THE SYSTEM; OTHERWISE, THE COMPONENTS IN THE WATER SYSTEM MAY BE DAMAGED BY CORROSION.
4. THE ETHYLENE GLYCOL SOLUTION HAS A CERTAIN SHELF LIFE AND NEEDS TO BE REPLACED REGULARLY.

Cooling capacity performance table

	LWT °C	OAT °C																									
Model		52		48		45		40		35		30		25		15		5		0		-5		-10		-15	
		cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW	cooling capacity kW	Power input kW
UAL230E(R)5-Y	5	23.6	11.4	33.9	14.9	48.8	19.4	56.1	19.6	61.4	19.6	64.0	17.6	65.2	16.0	68.1	13.3	69.7	11.7	70.5	11.3	70.8	11.2	72.1	11.0	73.6	10.8
	7	25.0	11.6	36.0	15.3	51.9	19.8	59.6	20.1	65.0	20.0	68.0	18.0	69.1	16.3	72.6	13.7	73.9	12.0	74.9	11.6	75.2	11.5	76.5	11.2	78.2	11.1
	9	26.6	11.9	38.2	15.6	54.8	20.1	63.0	20.4	68.6	20.3	71.9	18.3	73.0	16.6	76.4	13.9	78.1	12.2	79.1	11.8	79.5	11.6	81.0	11.4	82.8	11.3
	12	28.5	12.2	41.0	16.1	58.7	20.7	67.5	21.0	73.4	21.0	77.0	18.9	78.3	17.2	81.8	14.3	83.5	12.5	84.6	12.2	85.0	12.0	86.6	11.7	88.7	11.7
	15	30.4	12.6	43.8	16.4	62.7	21.2	72.0	21.5	78.2	21.5	82.3	19.4	83.5	17.6	87.6	14.7	89.0	12.8	90.5	12.5	90.7	12.3	92.4	12.0	94.6	12.0
	20	34.6	13.5	49.5	17.1	70.7	22.2	81.0	22.5	87.9	22.5	92.9	20.4	94.0	18.5	98.7	15.5	100.1	13.4	101.8	13.1	102.1	12.9	104.0	12.6	106.5	12.5
UAL450E(R)5-YA	5	54.2	22.4	78.0	29.3	106.6	38.2	116.4	38.5	127.4	38.5	132.9	34.5	135.3	31.4	141.4	26.2	144.8	23.0	147.8	22.3	151.6	21.8	154.4	20.7	157.5	19.8
	7	55.5	22.4	79.8	29.4	109.2	38.2	119.2	38.6	130.0	38.5	136.1	34.6	138.3	31.5	145.2	26.3	147.8	23.0	151.3	22.4	155.0	21.8	157.8	20.7	161.2	19.9
	9	58.9	23.0	84.7	30.2	115.5	39.0	126.1	39.4	137.4	39.4	144.0	35.4	146.2	32.2	153.0	26.9	156.2	23.5	159.9	22.9	164.0	22.3	167.1	21.1	170.9	20.4
	12	62.2	22.9	89.5	30.0	121.7	38.6	133.0	39.2	144.6	39.2	151.8	35.2	154.2	32.0	161.2	26.7	164.5	23.4	168.4	22.7	172.7	22.2	176.0	21.0	180.3	20.3
	15	67.5	23.4	97.1	30.6	131.9	39.6	144.0	40.1	156.5	40.2	164.7	36.2	167.1	32.9	175.2	27.5	178.0	24.0	182.8	23.4	187.1	22.8	190.5	21.6	195.1	20.8
	20	76.8	25.5	109.6	32.4	148.8	42.0	162.0	42.4	175.8	42.6	185.8	38.5	188.0	34.8	197.4	29.2	200.1	25.4	205.6	24.8	210.4	24.2	214.5	22.8	219.5	22.1

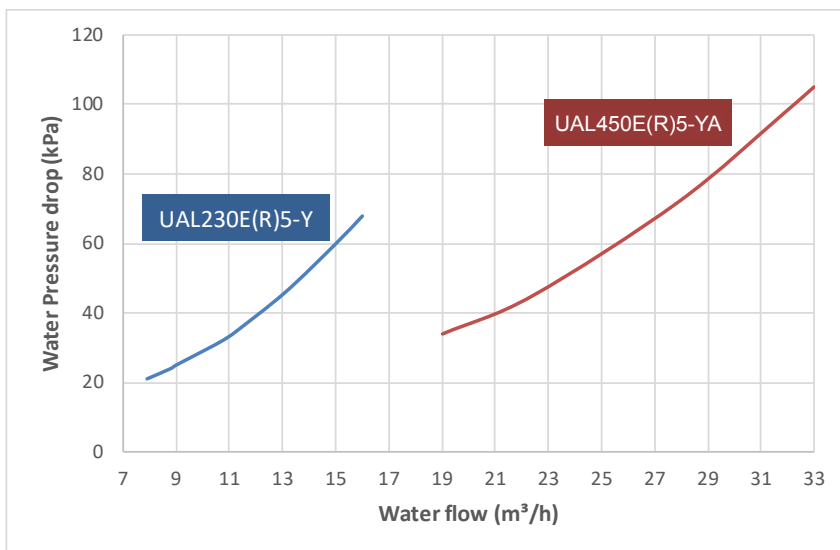
Heating capacity performance table

Model	LWT °C	OAT °C																																	
		-30	-26	-20	-15	-12	-10	-5	0	7	10	15	21	25	30	40	43	48																	
		Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW	Heating capacity tykW	Power input kW																
UAL230ER5-Y	30	21.9	9.9	27.9	12.1	39.0	15.7	45.8	16.6	49.9	16.9	52.5	17.1	61.4	17.0	65.8	16.9	74.5	17.0	78.0	16.4	84.4	16.4	95.6	16.9	100.9	16.9	105.1	16.9	112.0	17.1	118.7	17.0	120.4	17.2
	35	21.7	10.1	27.5	12.4	38.3	16.1	45.1	16.9	49.2	17.1	51.7	17.5	60.4	17.4	64.8	17.3	73.3	17.4	76.9	16.8	83.1	16.8	94.5	17.4	100.6	17.5	103.5	17.3	110.2	17.5	116.7	17.4	118.4	17.6
	40	21.4	11.0	27.1	13.7	37.9	17.8	44.5	18.6	48.5	19.0	51.2	19.4	59.8	19.3	63.9	19.2	72.3	19.3	76.1	18.7	82.2	18.6	93.5	19.3	99.5	19.5	102.2	19.2	108.7	19.4	115.2	19.3	116.8	19.5
	41	21.3	11.5	26.9	14.2	37.5	18.7	44.1	19.5	48.0	20.0	50.7	20.3	59.2	20.3	63.3	20.1	71.5	20.3	75.3	19.6	81.4	19.6	92.8	20.4	98.7	20.5	101.4	20.2	107.8	20.5	114.2	20.3	115.8	20.5
	45	21.0	12.0	26.6	14.9	36.7	19.0	43.1	20.3	47.0	20.7	49.6	21.1	58.0	21.2	62.0	21.0	70.0	21.2	73.7	20.5	79.8	20.4	90.8	21.2	96.8	21.4	99.3	21.1	105.6	21.4	111.8	21.1	113.4	21.4
	50	-	-	-	-	36.1	19.1	42.4	20.8	46.2	21.1	48.8	21.5	57.1	21.6	61.0	21.6	68.9	21.8	72.6	21.0	78.5	21.0	89.4	21.8	95.7	22.1	97.8	21.6	104.0	21.9	110.1	21.7	111.6	21.9
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68.0	21.3	73.5	21.3	83.7	22.2	89.7	22.5	91.5	21.9	97.3	22.2	103.0	22.0	104.5	22.2	
UAL450ER5-YA	30	43.8	18.9	55.8	23.0	77.9	30.6	91.7	32.9	99.9	32.8	105.1	32.8	122.7	32.4	131.7	32.2	149.0	32.4	156.0	31.2	168.8	31.2	191.3	32.1	201.7	32.2	210.2	32.1	223.9	32.6	237.3	32.4	240.7	32.7
	35	43.5	19.2	55.0	23.5	76.7	31.3	90.2	33.4	98.3	33.6	103.5	33.6	120.7	33.0	129.5	32.9	146.6	33.1	153.7	32.0	166.3	32.0	189.0	33.0	201.2	33.3	207.0	32.8	220.3	33.3	233.5	33.1	236.8	33.4
	40	42.9	21.0	54.3	26.0	75.7	34.7	89.0	36.9	97.0	37.3	102.3	37.2	119.6	36.7	127.8	36.5	144.6	36.8	152.1	35.5	164.3	35.4	186.9	36.7	199.0	37.0	204.3	36.4	217.4	36.9	230.4	36.7	233.7	37.1
	41	42.6	21.9	53.8	27.1	75.0	36.4	88.1	38.6	96.0	39.6	101.4	39.0	118.4	38.6	126.6	38.3	143.1	38.6	150.6	37.3	162.8	37.2	185.5	38.7	197.4	39.0	202.7	38.3	215.6	38.9	228.4	38.6	231.7	39.0
	45	42.0	22.8	53.1	28.3	73.4	37.1	86.3	40.2	94.0	40.4	99.2	40.5	115.9	40.2	123.9	39.9	140.0	40.3	147.4	38.9	159.6	38.8	181.6	40.3	193.6	40.7	198.6	40.0	211.2	40.6	223.7	40.1	226.9	40.6
	50	-	-	-	-	72.2	37.3	84.9	41.2	92.5	41.2	97.6	41.3	114.1	41.0	122.0	41.0	137.7	41.4	145.1	39.9	157.0	39.9	178.7	41.5	191.4	42.1	195.5	41.1	207.9	41.7	220.2	41.2	223.3	41.7
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	136.1	40.5	146.9	40.4	167.4	42.1	179.4	42.7	183.0	41.6	194.6	42.2	206.0	41.7	208.9	42.2	

NOTE: HEATING CAPACITY IS FOR HEAT PUMP UNIT ONLY.

Water Pressure Drop Curve

Models	Water flow	Resistance
UAL230E(R)5	7.9	21
	8.8	24
	9	25
	10.5	31
	11	33.3
	11.2	34.4
	13.1	46
	15	60
	16	68
UAL450E(R)5	19	34
	22.4	45
	27.9	72
	31.8	97
	33	105



NOTES:

- 1) WATER PRESSURE DROP OF THE UNIT IS TESTED BY THE PLATE HEAT EXCHANGER AND THE SUPPLIED Y-TYPE FILTER.
- 2) WATER RESISTANCE OF PLATE HEAT EXCHANGER AND Y-TYPE FILTER IS TESTED UNDER CONDITION OF CLEAN WATER; IT MAY BE INCONSISTENT WITH THAT SHOWN IN THE DIAGRAM DUE TO THE WATER QUALITY ON SITE.

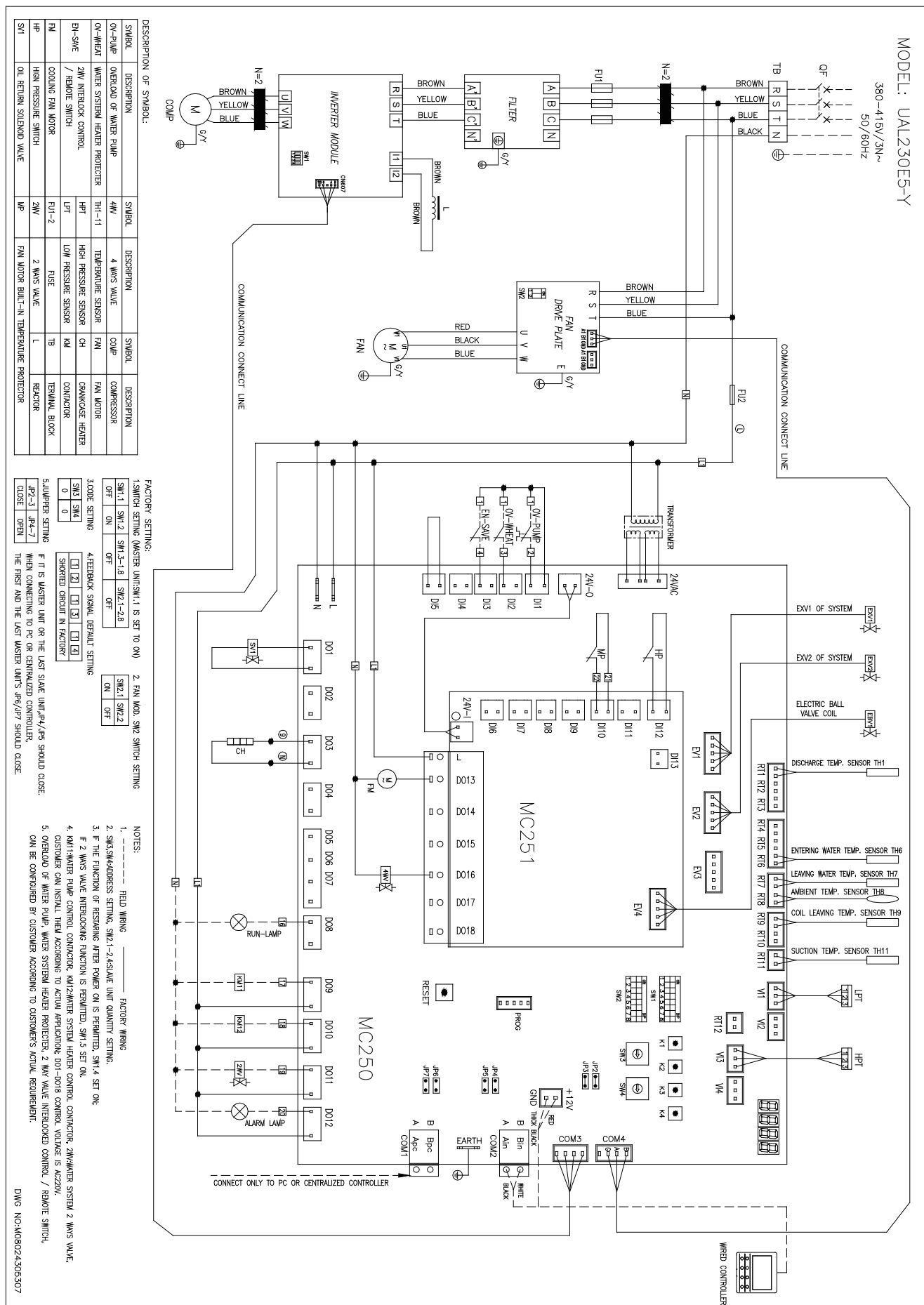
Sound Data

Acoustic Noise

Model	Octave band sound pressure level (dB,ref20μPa)								dB(A)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
UAL230E5-Y	47.3	55.0	59.2	56.3	60.5	55.5	48.6	40.7	65.0
UAL230ER5-Y	47.3	55.0	59.2	56.3	60.5	55.5	48.6	40.7	65.0
UAL450E5-YA	50.3	56.5	59.3	62.5	65.3	60.5	53.3	44.0	69.0
UAL450ER5-YA	50.3	56.5	59.3	62.5	65.3	60.5	53.3	44.0	69.0

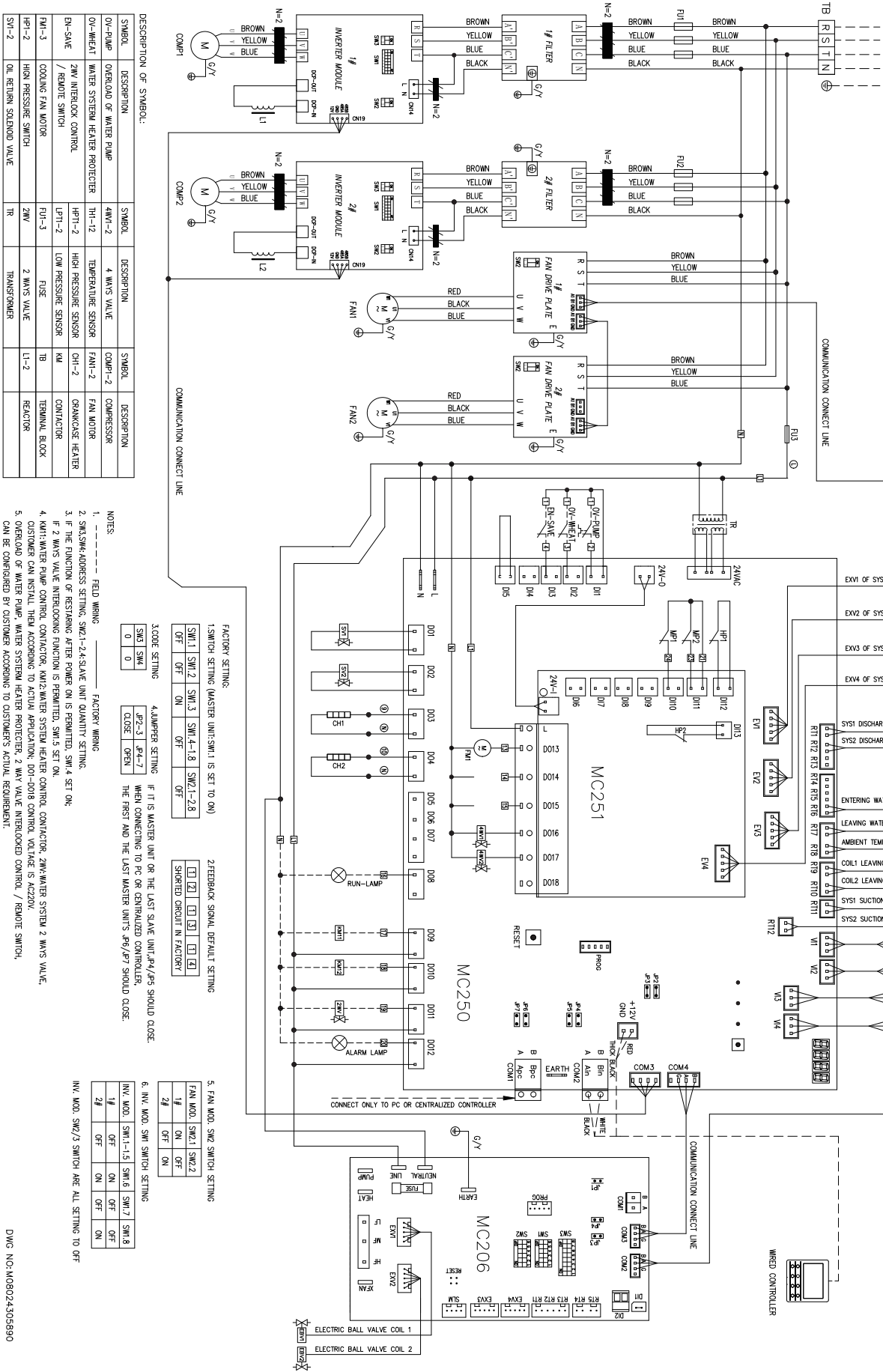
Test condition: Octave band sound pressure level noise is tested base on 11.5dB(A) background noise semi-anechoic room.

Wiring Diagram



MODEL: UAL450E5-YA

380-415V/3N~
50/60Hz



DESCRIPTION OF SYMBOL:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
ON-PUMP	OVERLOAD OF WATER PUMP	COMP-2	COMPRESSOR
ON-HEAT	WATER SYSTEM HEATER PROTECTOR	FAN-2	FAN MOTOR
2W	INTERLOCK CONTROL	CH-2	CHANGECASE HEATER
BP-SAVE	/ REMOTE SWITCH	KM	CONTACTOR
FAN-3	COOLING FAN MOTOR	TR	TRANSFORMER
HP1-2	HIGH PRESSURE SWITCH	LI-2	REACTOR
SM-2	OL RETURN SOLENOID VALVE		

NOTES:

1. FIELD WIRING
2. SW3, SW4 ADDRESS SETTING, SW2, 1-2, 4 SLAVE UNIT QUANTITY SETTING.
3. IF THE FUNCTION OF RESTORING AFTER POWER ON IS PERMITTED, SW 4 SET ON.
4. IF 2 WAYS VALVE INTERLOCK FUNCTION IS PERMITTED, SW 5 SET ON.
5. WATER PUMP CONTROL, CONTACTOR, 2W WATER SYSTEM HEATER PROTECTOR, 2W WATER SYSTEM 2 WAYS VALVE, CUSTOMER CAN INSTALL THEM ACCORDING TO ACTUAL APPLICATION. DO1-DO18 CONTROL VOLTAGE IS AC220V.
6. OVERLOAD OF WATER PUMP, WATER SYSTEM HEATER PROTECTOR, 2 WAYS VALVE INTERLOCK CONTROL / REMOTE SWITCH, CAN BE CONTROLLED BY CUSTOMER ACCORDING TO CUSTOMER'S ACTUAL REQUIREMENT.

FACTORY SETTING:

1. SWITCH SETTING (MASTER UNIT: SW1 IS SET TO ON)

SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
ON	OFF	OFF	ON	OFF	ON	OFF	ON

2. FEEDBACK SIGNAL DEFAULT SETTING

DO1	DO2	DO3	DO4	DO5	DO6	DO7	DO8	DO9	DO10	DO11	DO12
0	0	0	0	0	0	0	0	0	0	0	0

3. CODE SETTING

SW1	SW2	SW3	SW4
0	0	0	0

4. ADDRESS SETTING

JP2-3	JP4-7
CLOSE	OPEN

5. FAN MOD. SW2 SWITCH SETTING

FAN MOD.	SW2.1	SW2.2
1#	ON	OFF
2#	OFF	ON

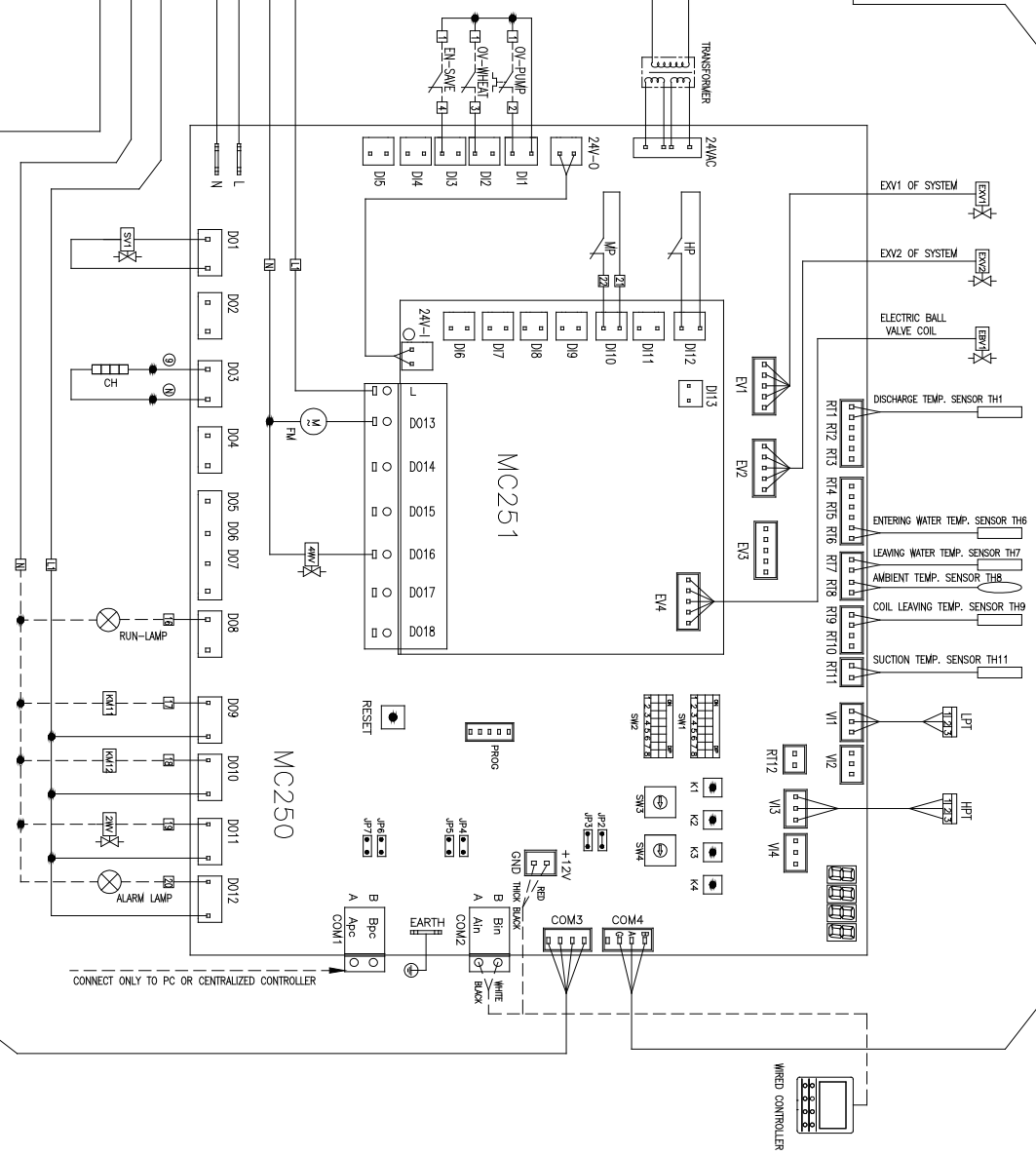
6. INV. MOD. SW1 SWITCH SETTING

INV. MOD.	SW1.1-1.5	SW1.6	SW1.7	SW1.8
1#	OFF	ON	OFF	OFF
2#	OFF	ON	OFF	ON

INV. MOD. SW2/3 SWITCH ARE ALL SETTING TO OFF

DWG NO: M08024305890

380-415V/3N~
50/60Hz



3.000E SETTING		4.000E SIGNAL OUTPUT SETTING	
SW1	SW2	SW1	SW2
ON	ON	ON	ON
OFF	OFF	OFF	OFF
5.000E SETTING		6.000E SETTING	
SW1	SW2	SW1	SW2
ON	ON	ON	ON
OFF	OFF	OFF	OFF

7.000E SETTING

SW1 SW2

ON OFF

8.000E SETTING

SW1 SW2

ON OFF

9.000E SETTING

SW1 SW2

ON OFF

10.000E SETTING

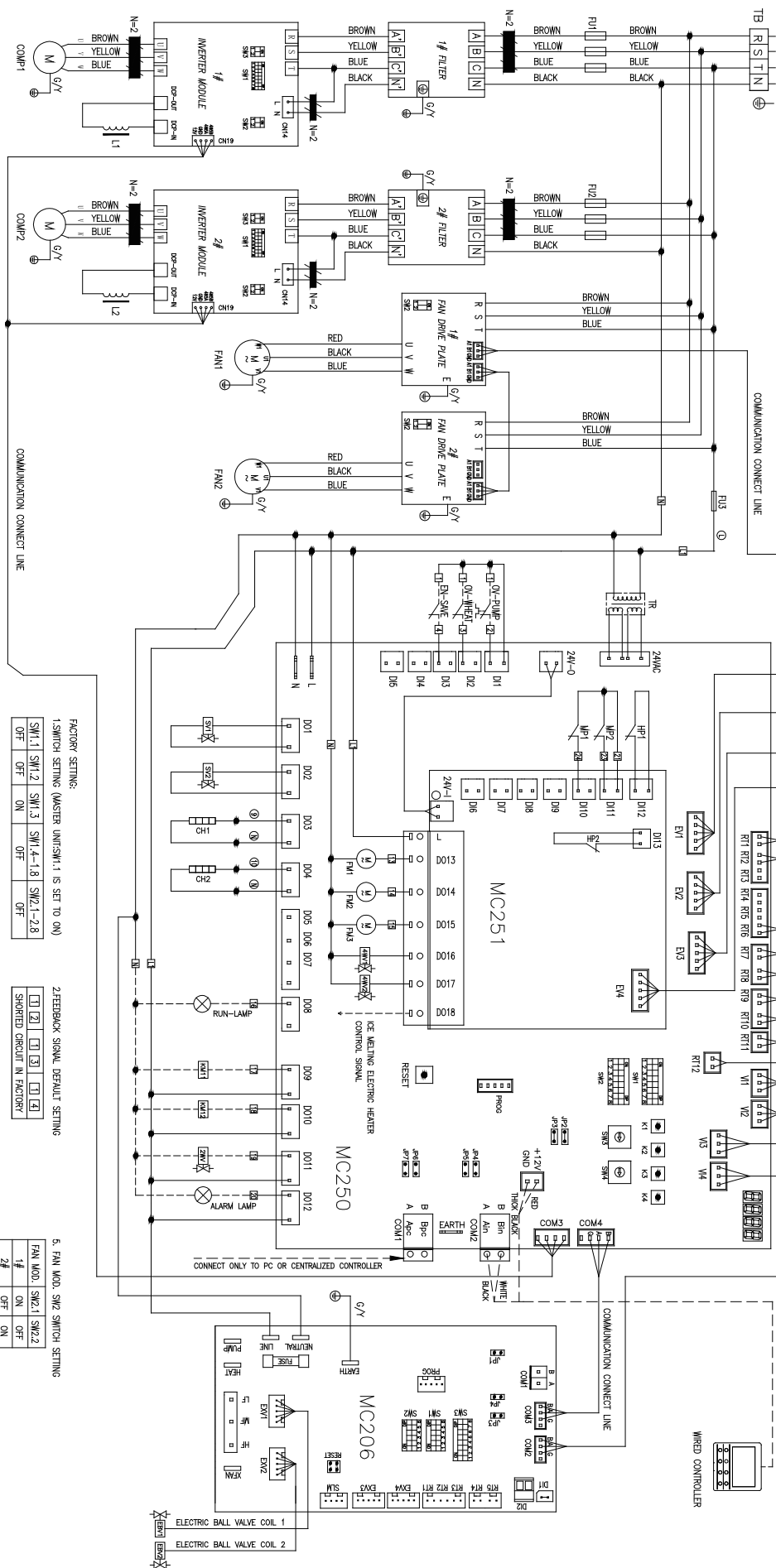
SW1 SW2

ON OFF

1. ----- FIELD WIRING ----- FACTORY WIRING
 2. SW1,SW4,ADDRESS SETTING, SW2,1-PASLAVE UNIT QUANTITY SETTING.
 3. IF THE FUNCTION OF RESISTING AFTER POWER ON IS REQUIRED, SW1,4 SET ON.
 IF 2 WAS WARE, INTERLOCKING FUNCTION IS PERMITTED. SW1,5 SET ON.
 4. KALTI WATER PUMP CONTROL CONNECTOR, KALZIN WATER STEEL HEATER CONTROL CONNECTOR, ZINWATER STEEL 2 WMS VALVE
 CUSTOMER CAN INSTALL THEM ACCORDING TO ACTUAL APPLICATION. DOI-0018 CONTROL VOLUME IS 46220N.
 5. OVERLOAD OF WATER PUMP, WATER SYSTEM HEATER PROTECTOR, 2 WMS VALVE, INTERLOCKING CONTROL / HANDLE SWITCH,
 CAN BE CONSIDERED BY CUSTOMER ACCORDING TO CUSTOMER'S ACTUAL REQUIREMENT.

MODEL: UAL450ER5-YA

380-415V/3N~
50/60Hz



DESCRIPTION OF SYMBOL:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
OV-PUMP	OVERLOAD OF WATER PUMP	COMP1-2	COMPRESSOR
OV-HEAT	WATER SYSTEM HEATER PROTECTOR	TH1-12	TEMPERATURE SENSOR
EX-SAVE	2WAY INTERLOCK CONTROL	HPT1-2	HIGH PRESSURE SENSOR
FPT1-2	LOW PRESSURE SENSOR	LM	LOW PRESSURE SENSOR
FPT1-3	COOLING FAN MOTOR	FPT1-3	FUSE
HPT1-2	HIGH PRESSURE SWITCH	2WV	2 WAYS VALVE
SV1-2	OL RETURN SOLENOID VALVE	TR	TRANSFORMER

NOTES:

1. --- FIELD WIRING --- FACTORY WIRING
2. SW1, SW2 ADDRESS SETTING. SW1, SW2 SLAVE UNIT QUANTITY SETTING.
3. IF THE FUNCTION OF RESTING AFTER POWER ON IS PRINTED, SW1, SW2 SET ON.
4. KAT/WATER PUMP CONTROL, KAT/WATER SYSTEM HEATER CONTROL, KAT/WATER SYSTEM 2 WAYS VALVE, CUSTOMER CAN INSTALL THEM ACCORDING TO ACTUAL APPLICATION. DO1-DO8 CONTROL VOLTAGE IS AC200V.
5. OVERLOAD OF WATER PUMP, WATER SYSTEM HEATER PROTECTOR, 2 WAYS VALVE INTERLOCK CONTROL / REMOTE SWITCH, CAN BE CONFIGURED BY CUSTOMER ACCORDING TO CUSTOMER'S ACTUAL REQUIREMENT.

FACTORY SETTING:

1. SWITCH SETTING (MASTER UNIT SW1.1 IS SET TO ON)

SW1.1	SW1.2	SW1.3	SW1.4-1.8	SW1.2-2.8
OFF	OFF	ON	OFF	OFF

2. FEEDBACK SIGNAL DEFAULT SETTING

DO1	DO2	DO3	DO4	DO5	DO6	DO7	DO8	DO9	DO10	DO11	DO12
□	□	□	□	□	□	□	□	□	□	□	□

3. CODE SETTING

SW1	SW2
0	0

4. JUMPER SETTING

JP1-3	JP4-7
CLOSE	OPEN

IF IT IS MASTER UNIT OR THE LAST SLAVE UNIT, JP4/JPS SHOULD CLOSE. WHEN CONNECTING TO PC OR CENTRALIZED CONTROLLER, THE FIRST AND THE LAST MASTER UNIT'S JP6/JP7 SHOULD CLOSE.

5. FAN MOD. SW2 SWITCH SETTING

FAN MOD.	SW2.1	SW2.2
1#	ON	OFF
2#	OFF	ON

6. INV. MOD. SW1 SWITCH SETTING

INV. MOD.	SW1.1-1.6	SW1.6	SW1.7	SW1.8
1#	OFF	ON	OFF	OFF
2#	OFF	ON	OFF	ON

INV. MOD. SW2/3 SWITCH ARE ALL SETTING TO OFF

DWG NO:MO8024305892

Installation

Installation Dimensions and Environment Limits

Machine Installation Space

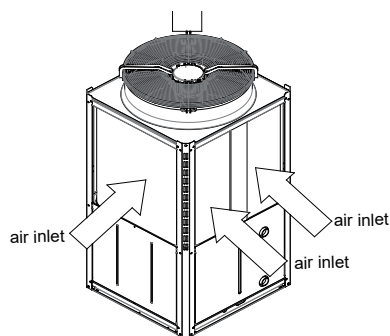
Units must be installed by DAIKIN service staff or by specially trained personnel. Units must be installed by following relevant national and local electric, building and environment protection standards as well as the installation manual.

Installation space

The units must be installed by Daikin service personnel or personnel who are specially trained. The installation must abide by local laws and regulations in aspects of electricity, construction and environment protection as well as meet the requirement of product installation instructions.

The instructions, warranty, accessories and packing list of the units are placed on the shadow area on the right side of the units before delivery, as shown in the figure on the left side. Reserve maintenance space as large as possible permitted by the onsite conditions. If the units are installed in snowy area, take measures against the snow for the normal operation of units.

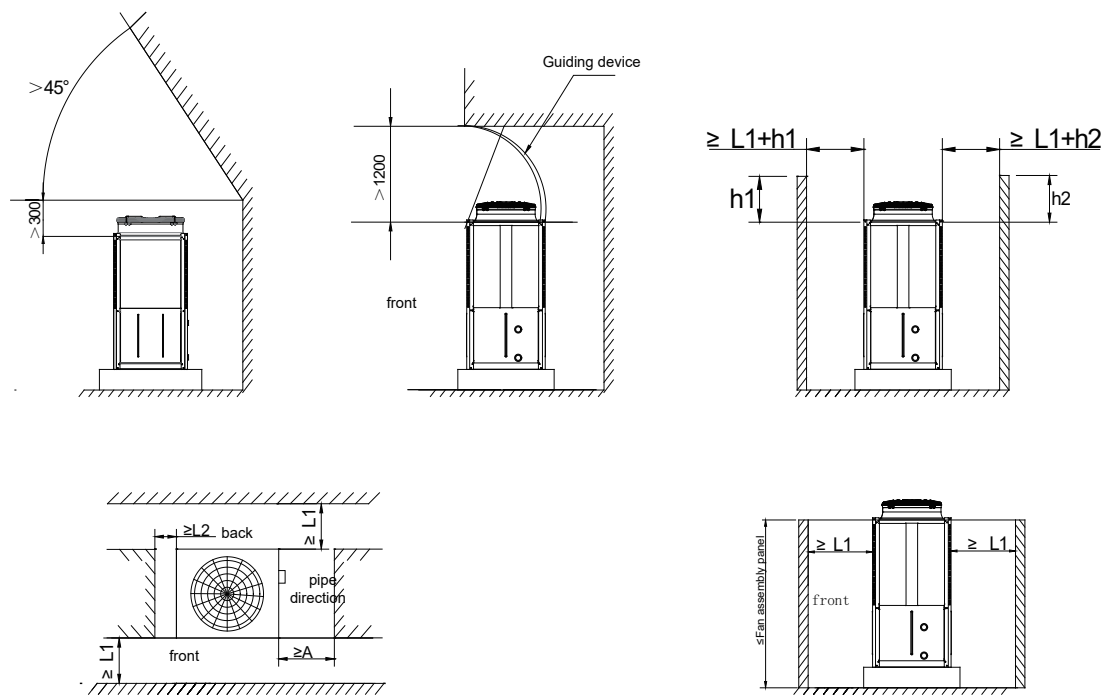
UAL230E(R)5-Y



NOTE:

TO ENSURE THE STABLE OPERATION OF THE UNIT AND RESERVE THE MAINTENANCE SPACE, OBSTACLES SHOULD BE AVOIDED AROUND THE UNIT (DEFINED AS THE HEIGHT OF THE OBSTACLE WHEN THE HEIGHT IS HIGHER THAN THE PART ABOVE THE BOTTOM OF THE HEAT EXCHANGER), AND THE INSTALLATION SPACE SHOULD MEET THE CORRESPONDING GRAPHIC REQUIREMENTS OF THE CORRESPONDING UNIT. SEE THE TABLE BELOW FOR INSTALLATION SPACING.

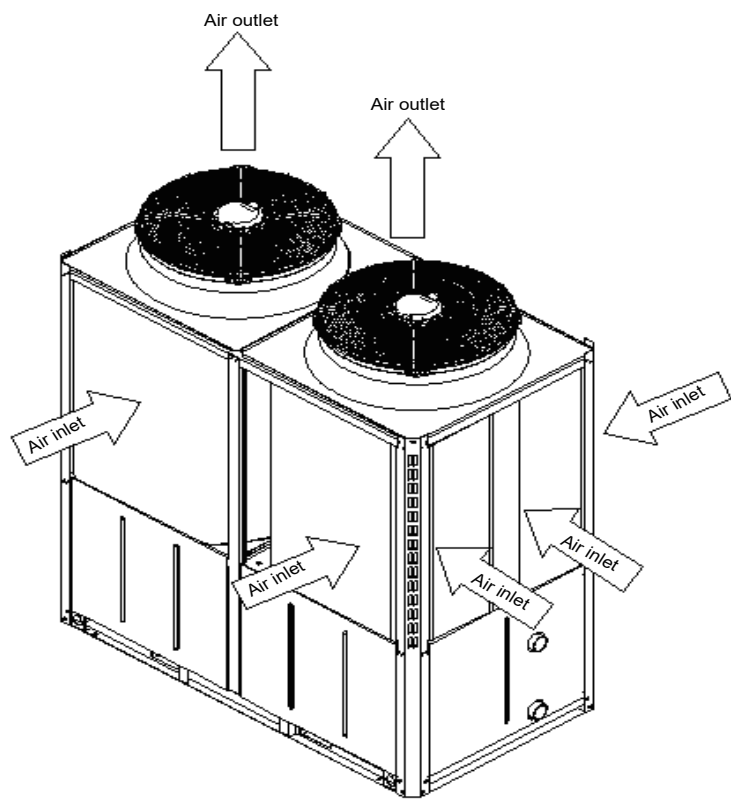
Installation space for single water chillers



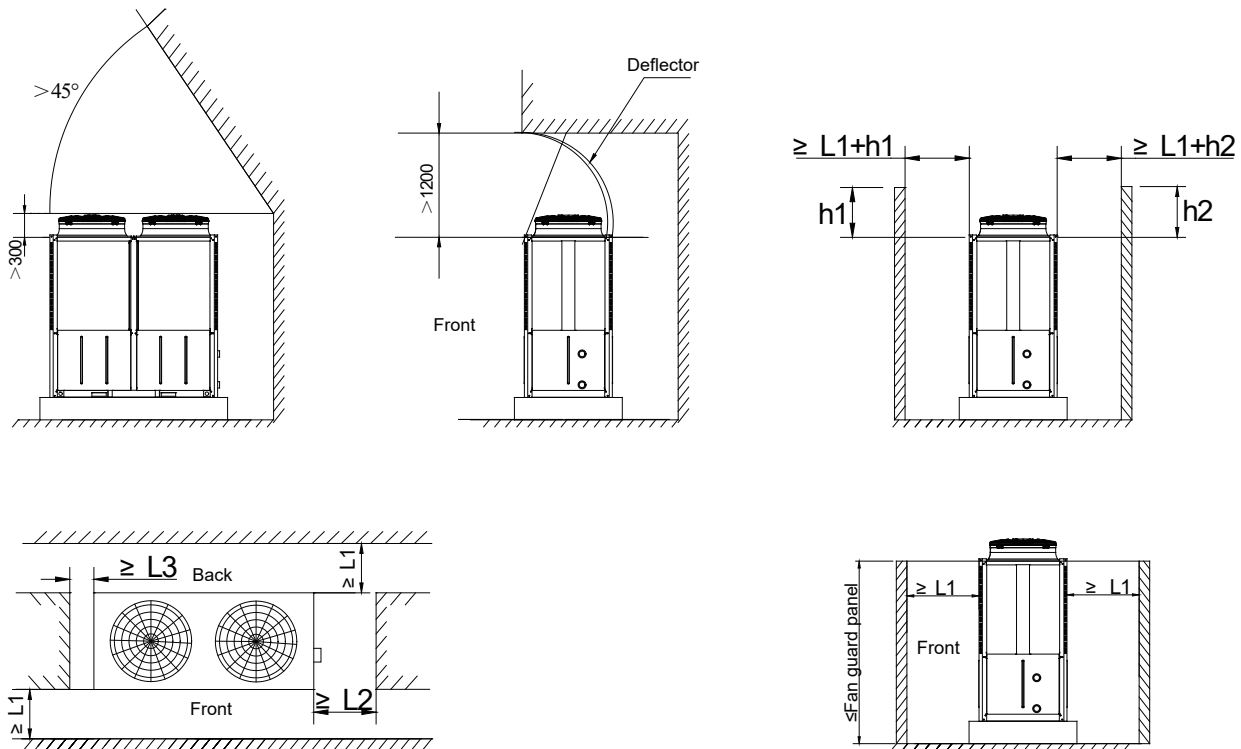
L1	L2	A
500	600	800

Unit:mm

UAL450E(R)-YA



Installation space for single chiller

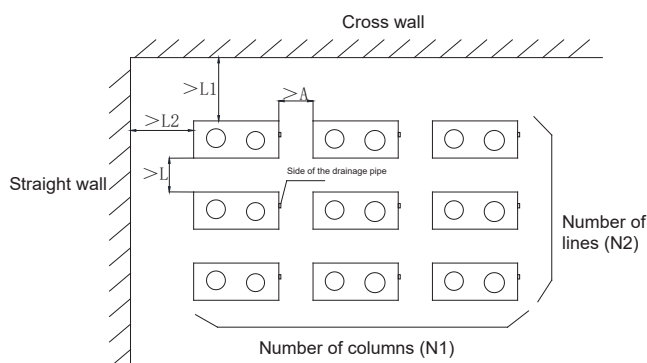


L1	L2	L3
500	800	600

Unit:mm

Installation space for multiple water chillers

UAL230/450 Installation spacing requirements



NOTE:

- WHEN THERE ARE OBSTACLES SUCH AS WALLS AROUND MULTIPLE COMBINED UNITS, THE INSTALLATION SPACING MUST MEET THE CORRESPONDING SPACING REQUIREMENTS OF THE CORRESPONDING UNITS;
- FOR SINGLE-LINE/SINGLE-COLUMN INSTALLATION, IF THE SIDE OF THE DRAINAGE PIPE IS IN THE LINE/COLUMN DIRECTION, THE INSTALLATION SPACING MUST BE GREATER THAN A; IF THE SIDE OF THE DRAINAGE PIPE IS IN THE COLUMN/LINE DIRECTION, THE INSTALLATION SPACING NEEDS TO MEET THE REQUIREMENTS OF "INSTALLATION SPACE FOR SINGLE WATER CHILLER".

1. The installation spacing A needs to be greater than 800mm;
2. Requirements for the distance L1/L2 from the wall: when the wall height $H > 2300\text{mm}$, $L1/L2 > 2000\text{mm}$; when the wall height $H \leq 2300\text{mm}$, $L1/L2 > (H-300)\text{mm}$.
3. Combined installation spacing L (models and applicable table parameters are as follows):

Table 1 Minimum spacing of assemble installation

unit:mm

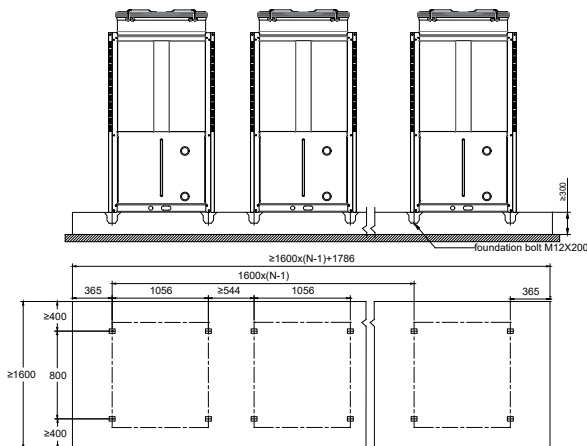
		Column Number							
		1	2	3	4	5	6	7	
Line Number	1	/							
	2	600							
	3								
	4	800		1000		1000			
	5					1400			
	6					2000			
	7					Please contact with the manufacturer			
	8								
.....									

Note:For the installation, if both the horizontal and vertical walls exist, in the calculation, the column number shall be plus by 1,and the line number shall be plus by 2;

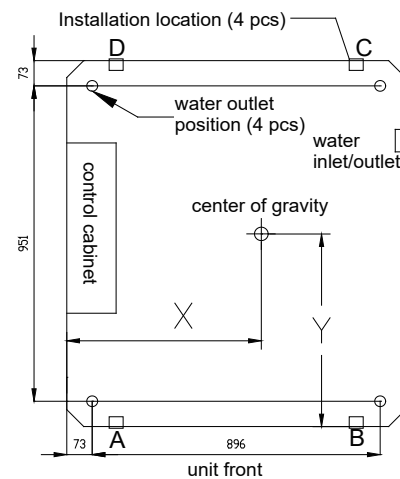
For example: In above figure, the number of columns is 3 + 1 = 4, the number of lines is 3 + 2 = 5, L value is 1000mm;

The installation base must be concrete ground or V-iron structure capable of bearing the operating weight of the units. N indicates the sum of installed modular. Each unit is fastened with four M12 bolts. Rubber cushions with specifications of 280 x 180 x 20 mm must be installed between the units and installation base. The installation base must be equipped with drainage facility to drain away the condensate water and defrosting water.

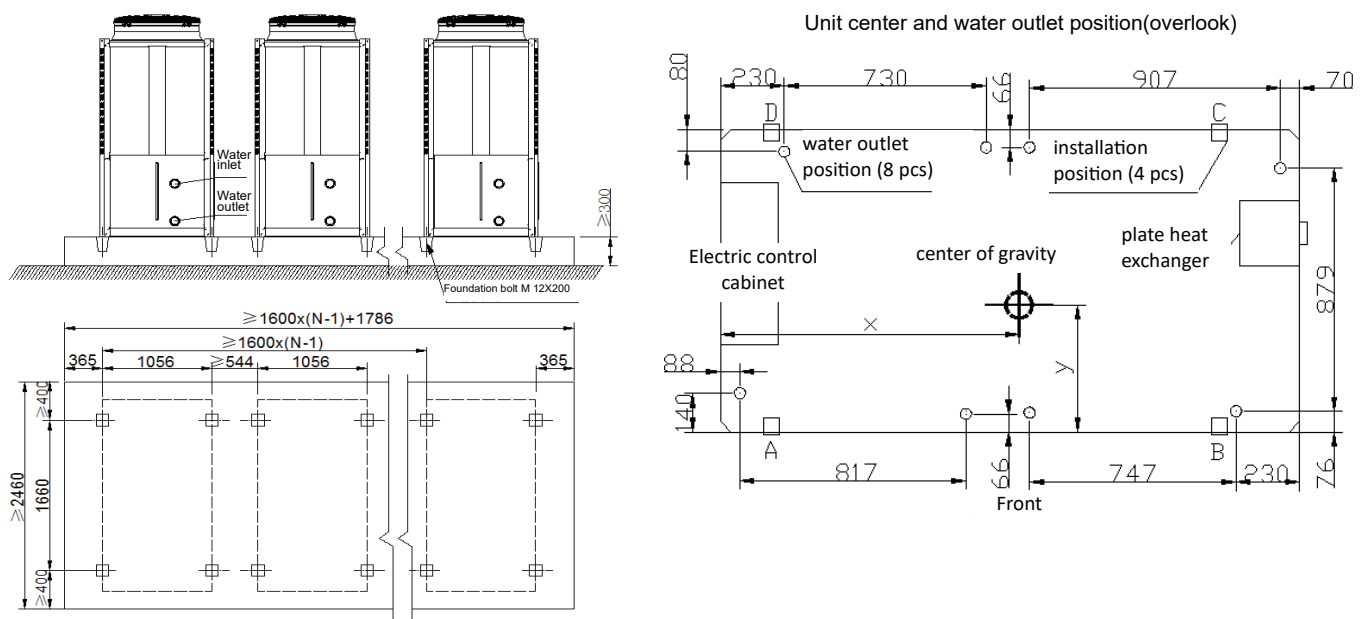
UAL230E(R)5-Y



Unit center and water outlet position(overlook)



UAL450E(R)5-YA



unit:mm

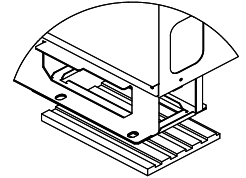
Model	X(mm)	Y(mm)	A(Kg)	B(Kg)	C(Kg)	D(Kg)
UAL230E(R)5-Y	561	497	107	126	102	90
UAL450E(R)5-YA	1070	481	258	270	208	202

NOTE:

- THE INSTALLATION BASE MUST BE CONCRETE GROUND OR V-IRON STRUCTURE CAPABLE OF BEARING THE OPERATING WEIGHT OF THE UNITS.
- N INDICATES THE SUM OF INSTALLED MODULAR.
- EACH UNIT IS FASTENED WITH FOUR M12 BOLTS.
- FOUR 20MM THICK RUBBER SHOCK ABSORBERS SHOULD BE INSTALLED BETWEEN THE UNIT AND THE INSTALLATION FOUNDATION.
- THE INSTALLATION BASE MUST BE EQUIPPED WITH DRAINAGE FACILITY TO DRAIN AWAY THE CONDENSATE WATER AND DEFROSTING WATER, AS SHOWN IN FIGURE BELOW.

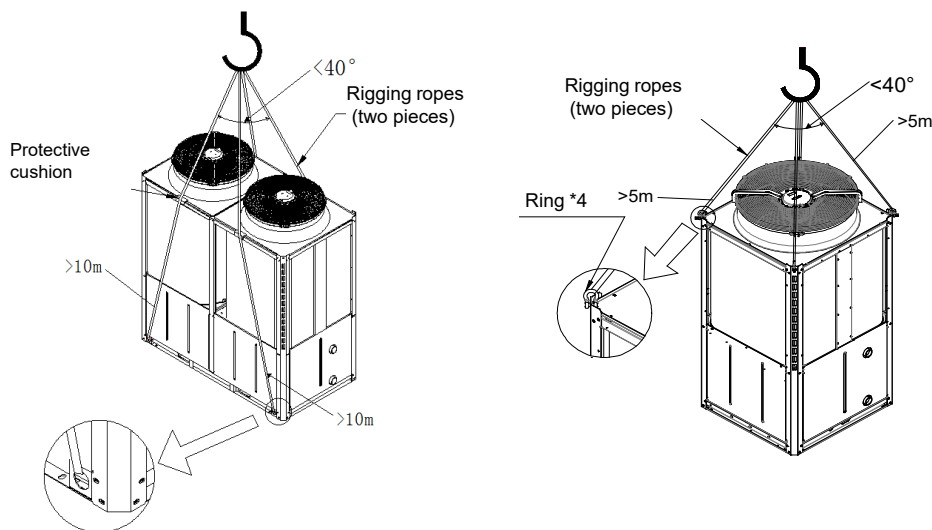
Installing Chiller

- The user manual, accessories, and packing list are placed at the right side of the unit, as illustrated by the shaded part of the figure on the left.
- Reserve sufficient maintenance space if possible.
- If the unit is installed in a place where it snows in winter, proper measures must be taken to protect the unit against snow and ensure that the unit works properly.
- The groundwork should be made of concrete or supporting structures. While designing the groundwork, you must fully consider the strength of the floor, water discharge (the unit discharges water while working), pipelining and wiring. If the floor is not strong enough, the unit might fall off and breakdown, even incur bodily injuries.
- Screw down the chilled water unit using anchor bolts so that it will not fall off in case of strong wind or earthquakes. To avoid damages caused by strong wind or earthquakes, The unit must be securely installed at a proper place to avoid direct hit of strong winds.
- Depending on mounting conditions, operation vibration might pass through the groundwork and generate noises in the floor and walls. Therefore, proper vibration dampening mechanisms (such as bumper cushion, bumper frame etc.) should be in place.
- Corners and edges should be properly installed. Otherwise, the unit might get unbalanced and cause the grounding pins to bend. The unit might fall off and cause bodily injuries if it is not properly installed.



Hoisting Chillers

Please hoist the unit according to the following illustrations. Tie the cables to the four corners of the unit while moving it. If you tie the cables to only two corners of the unit, the unit might get unbalanced and fall off.



NOTES:

- CHILLED WATER UNITS MUST BE MOVED WITH GREAT CARE.
- ACCESSORY STRIPS CANNOT BE USED TO HOIST OR MOVE THE UNIT AS THEY MIGHT BREAK AND CAUSE UNEXPECTED ACCIDENTS.
- DO NOT TOUCH THE HEAT SINKS OF THE HEAT EXCHANGER BARE-HANDEDLY AS THEY MIGHT CUT YOUR FINGERS.
- DISPOSE ALL PLASTIC BAGS PROPERLY AND KEEP THEM AWAY FROM CHILDREN.
- DUE TO THE DIFFERENT APPEARANCE OF THE UNIT, THE ABOVE HOISTING PICTURE IS ONLY FOR REFERENCE.

Water System Installation

Water Quality Requirements

Water in the water system must be softened to prevent scale in the heat exchanger and affecting the heat exchanger performance. Water not softened can also cause scale in the water pipes and cause the water resistance to increase. This affects the water flow and the performance of the water pump. Softened water must meet the following requirements.

Item			Base Value	Tendency	
				Corrosion	Scale Formation
Standard item	pH (25°C)		7.5~9.0	O	O
	Conductivity (25°C)	μS/cm	<800	O	O
	Cl ⁻	mg(Cl ⁻)/L	<200	O	
	SO ₄ ²⁻	mg(SO ₄ ²⁻)/L	<200	O	
	Acid consumption (pH=4.8)	mg(CaCO ₃)/L	<100		O
	Full hardness	mg(CaCO ₃)/L	<200		O
	Free Cl ²	mg(Cl ₂)/L	<1	O	
Reference item	Fe	mg(Fe)/L	<1.0	O	O
	S ²⁻	mg(S ²⁻)/L	Not detectable	O	
	NH ₄ ⁺	mg(NH ₄ ⁺)/L	<1.0	O	
	SiO ₂	mg(SiO ₂)/L	<50		O
NOTE: O INDICATES RELEVANT FACTORS THAT ARE INCLINED TO CORROSION OR SCALE FORMATION.					

Water System Installation Schematic Diagram

Connecting Water Pipes

No water pump is provided as an accessory. A proper water pump must be installed to overcome resistance of the water pipes.

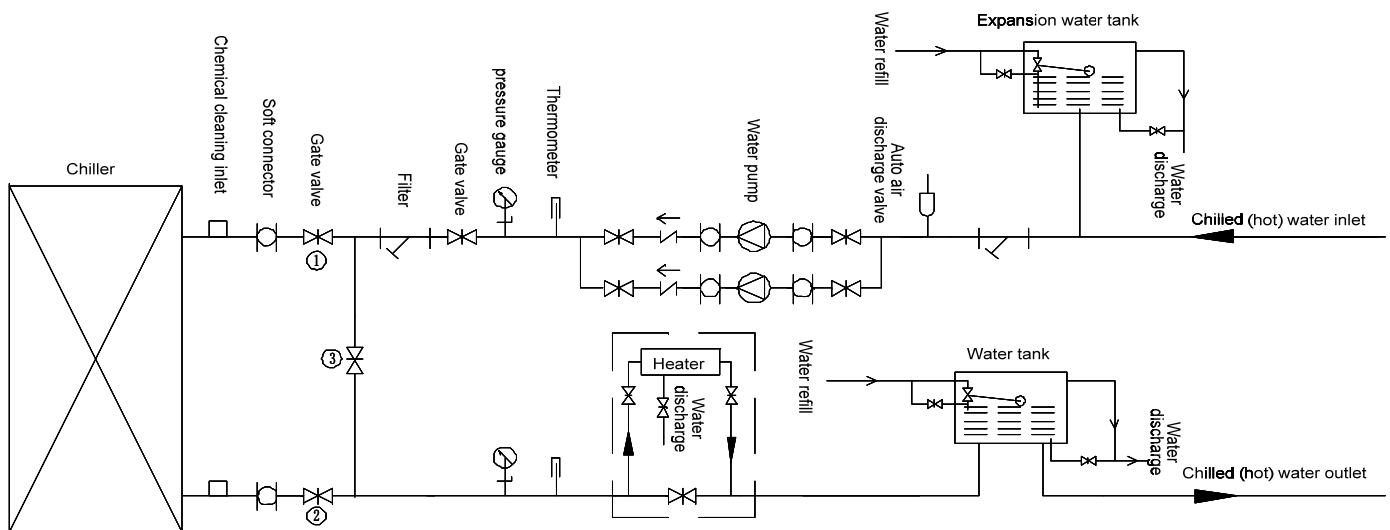
- Water pressure gauges and thermometers must be installed at the water inlets and outlets to facilitate the reading of unit operation status.
- The heat exchanger at the water side is made of stainless steel. Water scale may accumulate depending on the water quality and must be cleared using chemicals from time to time. Therefore, a chemical cleaning pipe connector needs to be installed at the water pipes (see the following figure).

The water flow must be in the rated range. If the water flow is too small, scale may accumulate and degrade the performance of the unit, cause the antifreeze device to activate, or cause rust points and refrigerant leakage. If the water flow is too large, the unit may be corroded due to water impact.

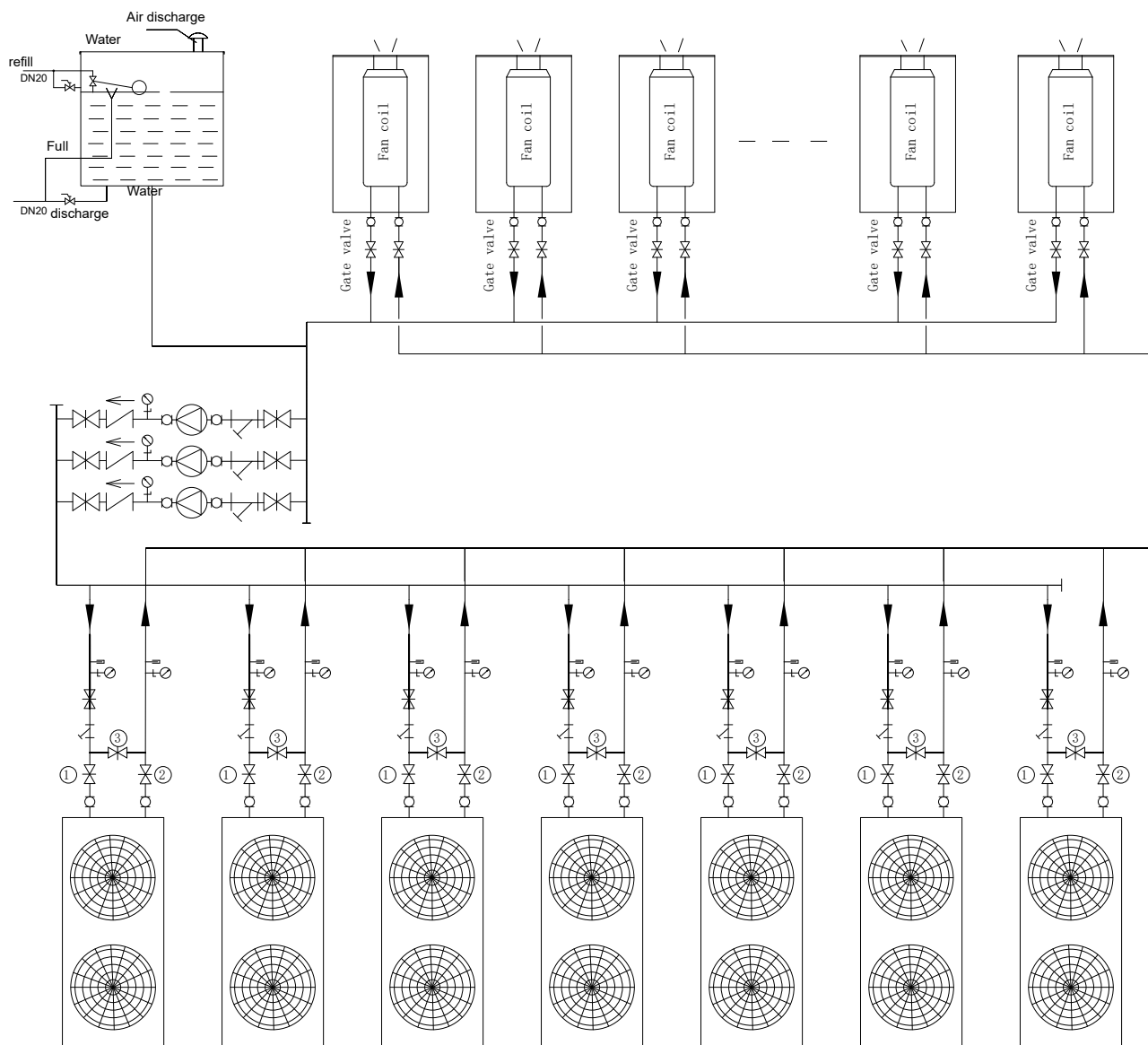
- Thermal insulated water tank with a proper volume is suggested to install. If the capacity is too small, the unit might frequently restart, which causes wear and tear on the compressor.
- An expansion water tank must be installed at the return water side of the water system to adapt to water pressure variations in the water supply system caused by ambient temperature changes.
- An auto relief valve must be installed at the highest point in the water system. A suitable water discharge valve must be installed at the lowest point in the water system.
- The water pipes must be thermal insulated to avoid heat loss and condensate water.
- Please follow the "Illustration for water system installation" and drawings from the design institute while installing the water system.
- Install the Y-shaped water filter inside the water inlet pipe and rinse the filter screen after commissioning.
- Before injecting water, make sure that no sand, rubble, rust, soldering tin residue or other impurities exist in the pipe, as these things might damage the heat exchanger.

While rinsing the water system, please bypass the unit and the terminal heat exchanger using by-pass valves.

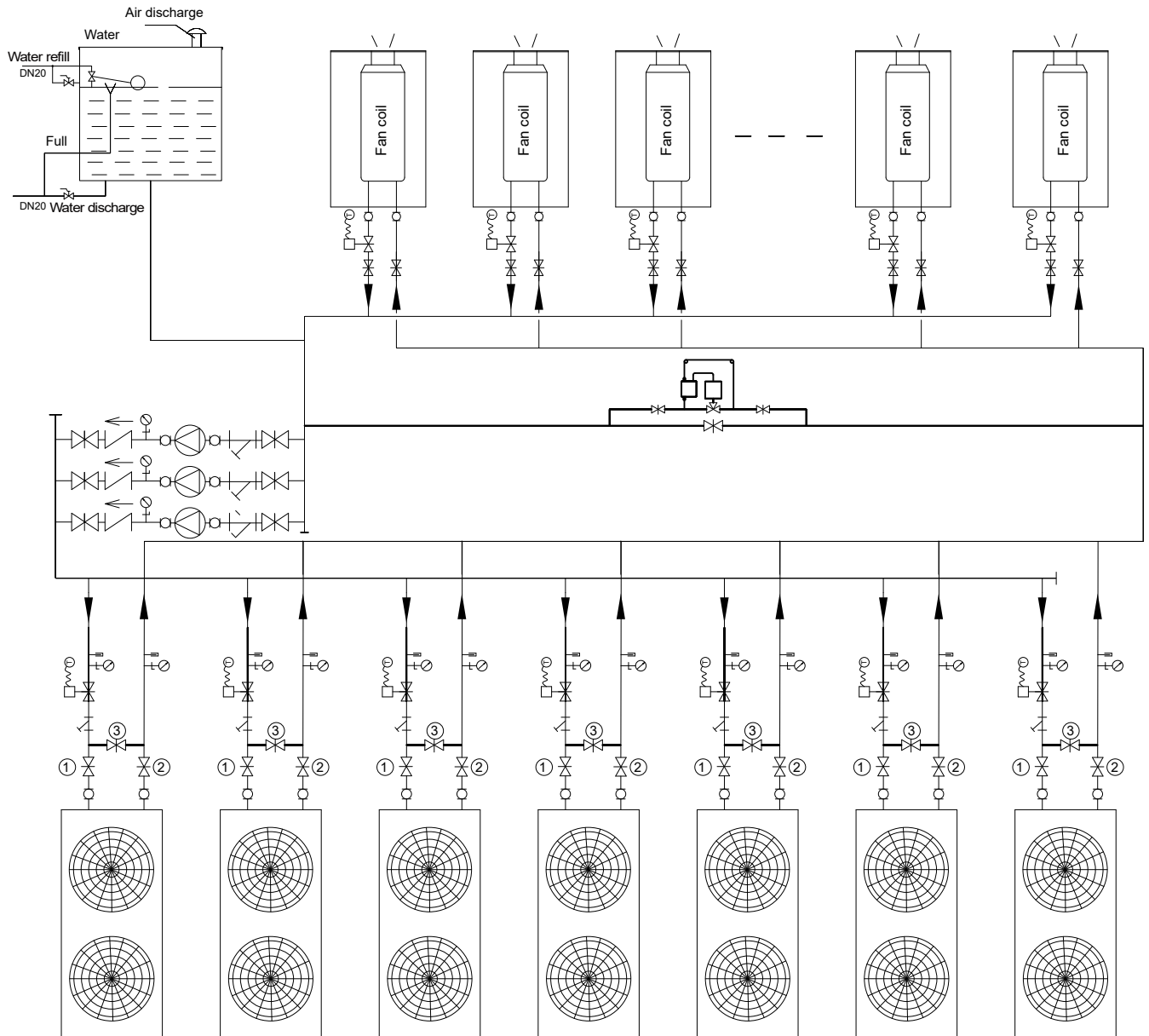
- Installation illustration for the water system of a single unit:



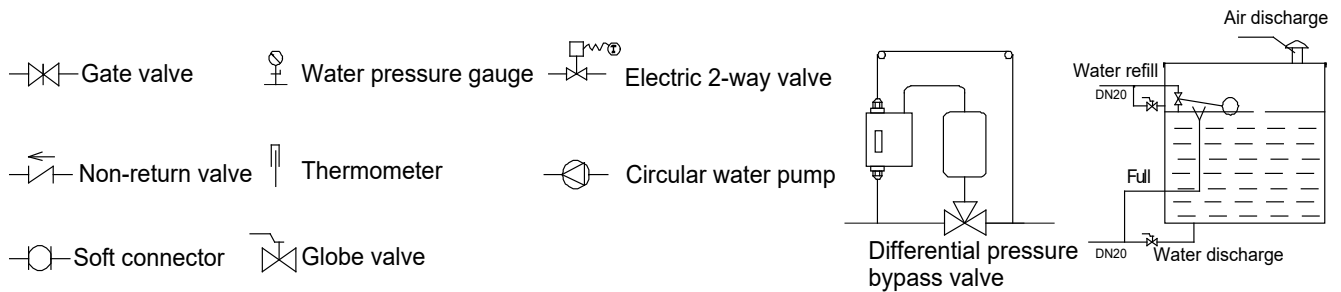
- Multi-unit combination, illustration for water system with fixed chilled water flow which conditions indoor air by modulating the terminal air rate



- Illustration for variable flow rate water system which adjusts indoor temperature by adjusting flow rate of chilled water (modular combination of multiple units)



Legends for the water system illustration:



Size of the main connecting pipe for modular combinations:

Number of Units	1	2~3	4~5	6~10	11~16
Total Dimension for the Pipes of UAL230 (inch)	≥2	≥3	≥4	≥5	≥6
Total Dimension for the Pipes of UAL450 (inch)	≥2.5	≥5	≥6	≥9	≥11

NOTE: WHEN CLEANING THE WATER SYSTEM, PLEASE SHUT ① ② GATE VALVE AND OPEN ③ GATE VALVE MARKED IN THE DIAGRAM OF ALL THE UNITS, IN ORDER TO BYPASS THE UNITS, SO THE IMPURITIES CAN BE PREVENTED FROM ENTERING THE PLATE HEAT EXCHANGER AND THE EFFICIENCY AND SERVICE LIFE OF PLATE HEAT EXCHANGER CAN NOT BE AFFECTED.

Hydraulic Calculation and Pipe System

Pipe Design for the Air-Conditioning System

- The pipes of an air conditioning system must have sufficient transportation capacities. For example, the water system must ensure that the water flowing through the air conditioning unit or fan coil reaches the rated flow rate to ensure that the unit works properly.
- Deploy pipes properly. Use pipes with reverse return if possible. Although the initial investment is increased a little, the water flow in the system is more stable. If pipes have no reverse return design, pressure between branch pipes must be balanced in the design process.
- When determining the diameters of pipes, ensure that the transportation capacity is sufficient, the resistance and noise is minimal, and that the unit works economically. A larger pipe diameter requires more investment, but the flow resistance is smaller, the circulation pump consumes less energy, and the operation cost is smaller. Therefore, a balance needs to be achieved between the operation cost and investment by designing the pipe diameter properly. Avoid a large water flow with small temperature variation to ensure that the pipe system is economical.
- In the design process, calculate water resistance accurately to ensure that water pressures between circuits are well balanced and that the air conditioning system works with the best water and thermal conditions.
- The pipe system of an air conditioning system must meet the adjustment requirements for partial workload.
- The pipe system of an air conditioning system should use energy saving technologies whenever possible.
- Pipes and accessories of the pipe system must meet the related requirements.
- The design of the pipe system must facilitate maintenance, operation, and adjustment.

* Determining the diameter of pipes in the air conditioning system

The pipe diameter is determined based on the following:

$$d = \sqrt{\frac{4m_w}{3.14 v}}$$

In the formula: m_w -----water flow m^3/s
 v -----water speed m/s

The water speed should be determined by the recommendations in the first table and design the water pipe diameters accordingly, or you can determine the water pipe diameter based on water flow in the second table.

Table 1: Recommended water speed (m/s)

Diameter (mm)	12	20	25	32	40	50	65	80
Closed water system	0.4 - 0.5	0.5 - 0.6	0.6 - 0.7	0.7 - 0.9	0.8 - 1.0	0.9 - 1.2	1.1 - 1.4	1.2 - 1.6
Open water system	0.3 - 0.4	0.4 - 0.5	0.5 - 0.6	0.6 - 0.8	0.7 - 0.9	0.9 - 1.0	0.9 - 1.2	1.1 - 1.4
Diameter (mm)	100	125	150	200	250	300	350	400
Closed water system	1.3 - 1.8	1.5 - 2.0	1.6 - 2.2	1.8 - 2.5	1.8 - 2.6	1.9 - 2.9	1.6 - 2.5	1.8 - 2.6
Open water system	1.2 - 1.6	1.4 - 1.8	1.5 - 2.0	1.6 - 2.3	1.7 - 2.4	1.7 - 2.4	1.6 - 2.1	1.8 - 2.3

Table 2: Pipe diameter and resistance loss in unit length

Diameter of the steel tube (mm)	Closed water system		Open water system	
	Water flow (m ³ /h)	kPa/100m	Water flow (m ³ /h)	kPa/100m
15	0 - 0.5	0 - 60	--	--
20	0.5 - 1.0	10 - 60	--	--
25	1 - 2	10 - 60	0 - 1.3	0 - 43
32	2 - 4	10 - 60	1.3 - 2.0	11 - 40
40	4 - 6	10 - 60	2 - 4	10 - 40
50	6 - 11	10 - 60	4 - 8	--
65	11 - 18	10 - 60	8 - 14	--
80	18 - 32	10 - 60	14 - 22	--
100	32 - 65	10 - 60	22 - 45	--
125	65 - 115	10 - 60	45 - 82	10 - 40

NOTE: PARAMETERS IN THE PRECEDING TABLE MAY VARY BASED ON THE DESIGN MANUAL. FOR DETAILS, SEE THE "HVAC DESIGN MANUAL".

Calculation of water system volume & Application of buffer water tank

Calculation of water system volume:

Application	Minimum effective water volume Vmin (L/kW)	Recommended water volume (L/kW)
Comfort	4.3	6.4~9.5
Process	6.9	10.3~15.1

NOTES:

1. Minimum effective water volume Vmin is the minimum system water volume set in order to prevent unit alarm and causing reduction of service life;
2. The effective water volume during the operation of the water system includes the total volume of the main water pipe, buffer water tank, air side units with two-way valve normally opened, etc.;
3. The actual effective capacity V of the water system in the water system in the operation process must be greater than or equal to Vmin ,otherwise , it will cause frequent alarm and shutdown of the unit;
4. When the system water temperature fluctuates greatly, please increase a certain volume of buffer water tank and the system water volume, so that water temperature tends to be stable, to prevent the unit failure alarm;
5. For units of common water system with different operating modes, the capacity(kW) in the above coefficient table is calculated according to the maximum capacity(kW) at the point of cooling or heating design, and the water capacity can be obtained by multiplying the capacity(kW) with the coefficient;
6. The above calculation of water volume coefficient method is mainly used in the application where the water temperature accuracy is not high, if higher water temperature control accuracy is required, please consult factory.

Application of buffer water tank :

When the actual effective water capacity of the system is less than the water capacity calculated in the above table, in order to solve the problems of short service life of the unit and user experience caused by the large fluctuation of water temperature, it is recommended to add a buffer water tank on the pipeline of the system to make the actual effective water volume of the system greater than the water volume calculated in the above table. When the inlet water temperature control is adopted, it is recommended that the buffer water tank be installed in the main inlet water pipe. When the unit adopts the water temperature control, it is recommended that the buffer water tank be installed in the main outlet water temperature pipe and the outlet water temperature sensor be placed in the tank.

Model Selection Principles for the Water Circulation Pump

- Water flow in the water circulation pump $\geq$ rated water flow $\times 1.1$
Closed water circulation system: Water circulation pump lift $\geq$ (Pipe resistance of the water system + Partial resistance of the water system + Water pressure drop of the unit) $\times 1.1$
- Open water circulation system: Water circulation pump lift $\geq$ (Static resistance of the water system + Pipe resistance of the water system + Partial resistance of the water system + Water pressure drop of the unit) $\times 1.1$
- In the case that multiple units share the same pump, the pump lift is calculated according to the circuit that has the maximum resistance (usually the unit that is farthest away from the pump).

NOTE: THE WATER FLOW OF THE UNIT SHOULD CALCULATE ACCORDING THE WATER FLOW RANGE.

Caution for Charging Refrigerant

- After the unit is installed at site, unit's refrigerant shall be replenished by qualified worker according the corresponding content of refrigerant. The R410A refrigerant must be charged in **liquid form**, otherwise unit's operation and performance might be affected.

Please refer to following refrigerant charging label:

UAL230E(R)5-Y

FACTORY CHARGED REFRIGERANT(kg)		FIELD ADDITIONAL CHARGED REFRIGERANT(kg)	
SYSTEM 1	SYSTEM 2	SYSTEM 1	SYSTEM 2
11	-	6.5	-

UAL450E(R)5-YA

FACTORY CHARGED REFRIGERANT(kg)		FIELD ADDITIONAL CHARGED REFRIGERANT(kg)	
SYSTEM 1	SYSTEM 2	SYSTEM 1	SYSTEM 2
5.5	5.5	9.0	9.0

Commissioning and Operation

Items to be Confirmed before Turning on Unit



Note: Before the pilot run, check that the following conditions are met and read the "Safety Precautions" again.

- Ensure that the water pump and the unit are connected.
Use the PCB controller to Control the on and off the water pump using the water pump output on the PCB controller; otherwise the BPHE may burst due to freezing.
The water pump connection point must have no voltage. If a voltage circuit is connected, basic components may be damaged.
- Power on the unit to preheat the crankcase for at least 12 hours before starting up the unit for the first time or after a long-term stoppage. This ensures that the compressor works properly.
- Before turning on the unit, check that the water pump is filled with water.
Before turning on the water pump, open the water supply valve, fill the pump with water, and discharge free air in the system
- Wiring of the unit: Check that the diameter of the wires meets requirements; the wires are correctly connected; the grounding line is securely connected;
- Before turning on the unit, clean the water system and ensure that pipes are clean without contaminants. For the cleaning method, see "Connecting Water Pipes"
- Make sure that the working conditions do not exceed the rated working range.

Items to be Checked during the Pilot Run

Check the following items after the unit has worked properly for a period of time:

S/N	Inspection Item	Inspection Method	Reference
1	Voltage	Voltmeter	380-415V
2	Operating current of single compressor	Galvanometer	25~55A
3	Operating current of single fan	Galvanometer	2~5A
4	Inlet water temperature in cooling operation	Thermometer	10~25°C
5	Outlet water temperature in cooling operation	Thermometer	5~20°C
6	Inlet water temperature in heating operation	Thermometer	25~50°C
7	Outlet water temperature in heating operation	Thermometer	30~55°C
7	Temperature difference of inlet/outlet water	Thermometer	2~7°C
8	Discharge air temperature of the compressor	Thermometer	65~115°C
9	Low-pressure in cooling operation	Baresthesiometer	6.5~10.0bar
10	High-pressure in cooling operation	Baresthesiometer	22~41.5bar
11	Low-pressure in heating operation	Baresthesiometer	1.4~10.0bar
12	High-pressure in heating operation	Baresthesiometer	22~37.0bar
13	Vibration and operating sound	Listening or touching	No abnormal vibration or operating sounds

NOTE: THE REFERENCE STANDARDS ARE USED TO CHECK WHETHER A UNIT WORKS PROPERLY ONSITE. REFERENCE STANDARDS ARE DETERMINED BASED ON THE MAXIMUM AND MINIMUM WORKING CONDITIONS. IF REFERENCE STANDARDS ARE EXCEEDS AFTER THE UNIT HAS PROPERLY WORKED FOR A PERIOD OF TIME, CONTACT THE LOCAL DEALER OR DAIKIN FOR HELP.

Maintenance

Repair



Note: Before checking and maintaining the unit, confirm the safety precautions again.



Note: Before delivery, strict factory test is conducted to ensure the unit works at optimal performance. The unit must be maintained from time to time.

- The unit can only be repaired and serviced by specially-trained technicians. After a unit is serviced, safety controls must be checked and analyzed before the unit is turned on.

Items to be Checked Periodically

- Clean the fins of heat exchanger periodically.
To optimize heat exchange efficiency of the condenser, check that the external part of the condenser is clean without leaves, cotton fibers, insects or other impurities which might clog up fins of the condenser. Use water or water vapor while cleaning to clean it.
- Check the status of the chilled water from time to time.
Discharge water by loosening the air or water discharge plug.
If the water quality degrades, replace water in the system timely. (for the reference standards, see page 16)
Contaminated water can degrade the cooling capacity and corrode the heat exchanger and water pipes.
- Check whether free air exists in the water pipe system.
Free air may get into the system even during the air discharging process. Discharge air from time to time.
- Clean the Y-shaped water filter in the water system periodically.
- Replenishing refrigerant and lubricant.
Each unit is filled with enough refrigerant and lubricant before delivery.
If the system operates smoothly, customers neither need nor are allowed to replenish or change the refrigerant or lubricant.
If replenishment is necessary due to leakage, please refill the quantity specified in the nameplate of the unit.

Maintenance

The unit must be checked on a routine basis to ensure performance. Routine check is the best way to reduce downtime and waste. The following needs to be checked on a routine basis:

Items	Monthly	Quarterly	Once half a year	Once a year	If necessary
1. Compressor					
Performance appraisal; whether there is abnormal sound	•				
Whether wires are securely connected	•				
Whether the working current is abnormal (fluctuation: 10%)		▲			
Discharge air temperature of the compressor		▲			
Check the oil level					▲
Check the color of the lubricant					▲
2. Controller					
Check parameter settings			▲		
Check protective device			▲		
Delay protector			▲		
Phase order protector			▲		
High/low pressure switch					▲
Differential water pressure switch/water flow switch					▲
Overload protector			▲		
Protector against extreme temperature of discharged air			▲		
3. Plate heat exchanger					
Check the water quality	•				
Clean the plate heat exchanger					▲
Seasonal protection measures (Anti-freezing)					▲
4. Fin heat exchanger					
Clean the fin heat exchanger		▲			
5. Others					
Whether the Y-shaped filter needs to be cleaned or replaced	•				
Whether bolts have loosened		•			

NOTE: THE PRECEDING MAINTENANCE PLAN IS FOR REFERENCE ONLY. THE MAINTENANCE PLAN MAY VARY BASED ON REGION.

• INDICATES ITEMS TO BE CHECKED BY CUSTOMERS; ▲ INDICATES ITEMS TO BE CHECKED BY SERVICE PERSONNEL.

Control System Instruction

Electric connection for water chiller unit

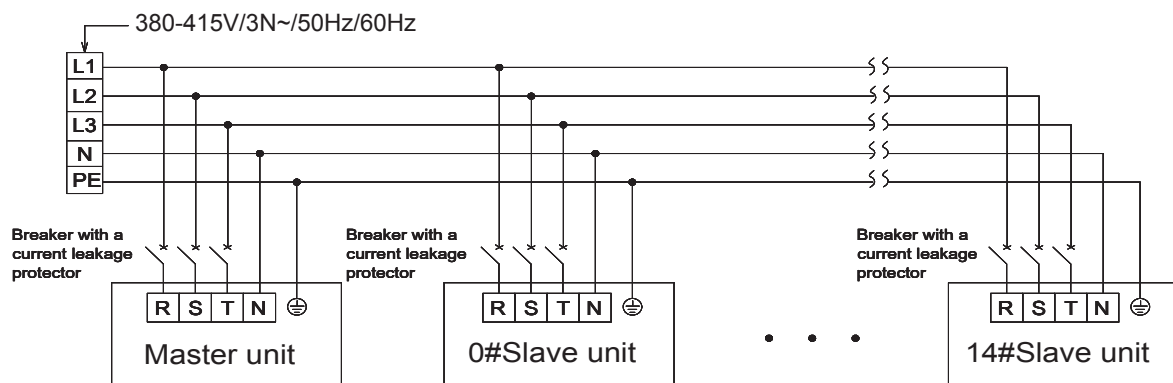
Before connecting the circuit, strictly abide by the following safety rules and measures:

- The units must be installed by Daikin service personnel or personnel who are specially trained. The installation must abide by local laws and regulations in aspects of electricity, construction and environment protection as well as meet the requirement of product installation instructions. Users are not allowed to remove or add control components. For units damages and personal injuries caused by operations which fail to follow the rules, Daikin air-conditioner company assumes no responsibility.
- Circuit connecting must refer to Electric connection and parameters. Each machine is provided with connection figure which is put inside the switch box.
- The earthing wires of the air conditioning unit must be grounded well. Earthing wires cannot be connected to gas pipes, water pipes, and telephone lines, because poor earthing may result in electric shock.
- Check whether the power supply is of standards before starting.

Model	Cross-sectional area of power cord (mm ²)			Max working current (A)	Max input power (kW)
	Main line (R/S/T)	Neutral line	Earth wire		
UAL230E5-Y	10	10	10	48.2	28.3
UAL230ER5-Y	10	10	10	48.2	28.3
UAL450E5-YA	35	16	16	97.9	56.8
UAL450ER5-YA	35	16	16	97.9	56.8

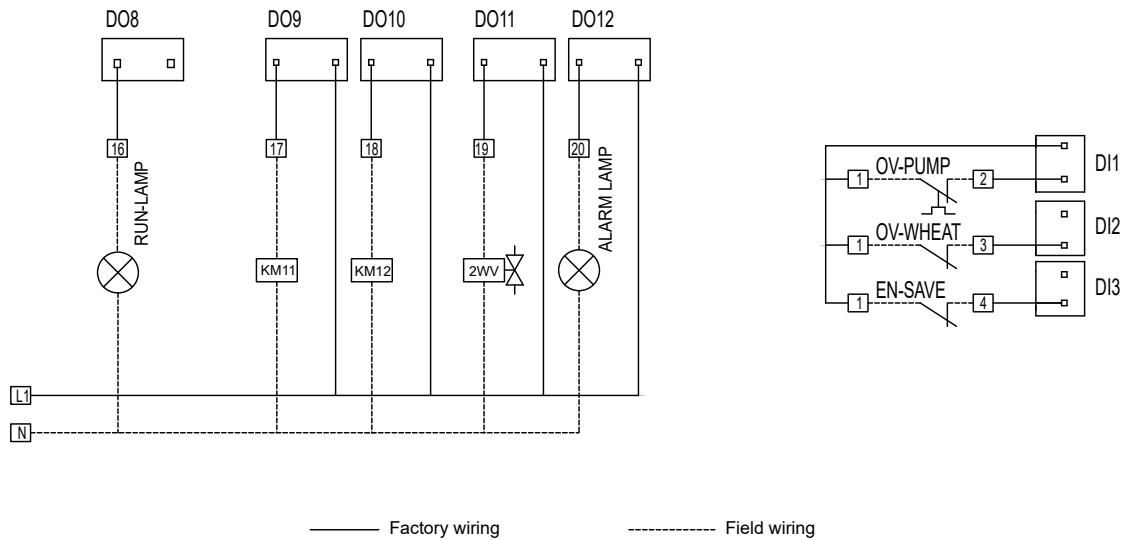
- ✧ The above data are electric parameters for basic module units.
- ✧ Connection for all the conductors must be secure.
- ✧ Keep all the conductors away from refrigerant pipes and movable components like compressor and fan.

Power Cable Connection Diagram



PCB Instruction

■ Connection illustration for parts at job site



NOTE:

CONTROL MODULE VOLTAGE OUTPUT 220-240V FOR CONNECTIONS FOLLOWS:

2WV: WATER SYSTEM 2-WAY VALVE

KM11: CONTACTOR OF CHILLED WATER PUMP

KM12: CONTACTOR OF WATER SYSTEM HEATER

RUN-LAMP

ALARM-LAMP

FOLLOWS ARE PASSIVE DRY CONTACTS (FEEDBACK SIGNAL 24V INPUT):

OV-PUMP: PUMP OVERLOAD PROTECTION

OV-WHEAT: WATER SYSTEM HEATER OVERLOAD PROTECTION (FOR HEAT PUMP UNIT ONLY)

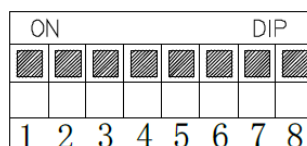
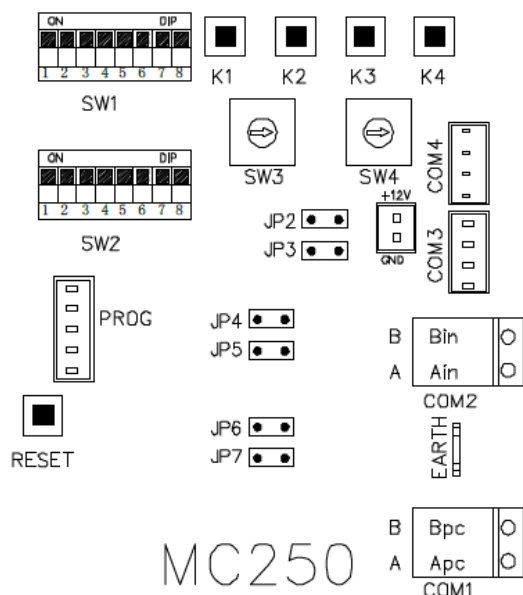
EN-SAVE: 2-WAY VALVE INTERLOCKING OR REMOTE ON/OFF CONTROL SWITCH

NOTE:

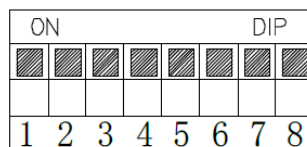
1. ABOVE PARTS CAN BE CONFIGURED BY CUSTOMER ACCORDING TO ACTUAL REQUIREMENT OF CUSTOMER.
2. PUMP CONTACTOR (KM11) AND PUMP OVERLOAD PROTECTION (OV-PUMP) ARE STRONGLY RECOMMENDED TO BE INSTALLED FOR UNIT SAFE OPERATING.

■ DIP and Address Settings

The controller of the unit has the functions of terminal 2-way valve interlock control, automatic startup after restoration of power failure, water inlet/outlet temperature control, DIP for the quantity of slave units and the master/slave address rotary encoder. The address DIP and the number of slave units must be set according to the specific situation after installation. In addition, users must record the address number and installation position, and save them as an important file for reference during maintenance.



SW1



SW2

Dialing upward: 1
Dialing downward: 0

■ DIP Settings

- Feature function DIP position

DIP Type	DIP Position	DIP Selection		Remarks
		ON	OFF	
SW1	1	Master unit	Slave unit	-
	4	With automatic startup after restoration of power failure	Without automatic startup after restoration of power failure	Master unit valid
	5	Terminal 2-way valve interlock enabled	Terminal 2-way valve interlock disabled	-
SW2	7	Water outlet temperature control*	Water inlet temperature control	Water outlet temperature control needs to be customized

NOTE:

THE SW2.7 DIP POSITION HAS THE WATER INLET/OUTLET TEMPERATURE CONTROL FUNCTION, **AND WATER INLET TEMPERATURE CONTROL IS THE STANDARD FACTORY CONFIGURATION FUNCTION.** IN CASE WATER OUTLET TEMPERATURE CONTROL IS REQUIRED ACCORDING TO THE ACTUAL SITUATION, IT IS NECESSARY TO CUSTOMIZE THE WATER OUTLET TEMPERATURE CONTROL ACCESSORY PACKAGE, WITH THE HEADER PIPE WATER OUTLET TEMPERATURE SENSOR RT5 AND THE CONNECTING LINE.

- DIP position for the quantity of slave units (SW2)

Quantity of slave units	DIP Position				Quantity of slave units	DIP Position			
	1	2	3	4		1	2	3	4
0	0	0	0	0	8	1	0	0	0
1	0	0	0	1	9	1	0	0	1
2	0	0	1	0	10	1	0	1	0
3	0	0	1	1	11	1	0	1	1
4	0	1	0	0	12	1	1	0	0
5	0	1	0	1	13	1	1	0	1
6	0	1	1	0	14	1	1	1	0
7	0	1	1	1	15	1	1	1	1

NOTE:

POSITIONS 1-4 OF SW2 REPRESENT THE QUANTITY OF SLAVE UNITS. THE MASTER UNITS MUST SET THE QUANTITY OF SLAVE UNITS TO BE CONNECTED, WHILE SLAVE UNITS DO NOT NEED TO SET THE SAME;

- Model DIP position

SW1.2/3/6/7/8 and SW2.5/6/8 are model DIP positions for the unit, which do not represent specific functions. For details of the DIP position, please refer to the electrical schematic diagram of the corresponding model.

■ Address Encoder Setting

The ODU address is the address of the master unit when it is set as the master unit, and is the address of the slave unit when it is set as the slave unit. The master unit address ranges from 0 to 99:

SW3	SW4	Master unit address	SW3	SW4	Master unit address	SW3	SW4	Master unit address	SW3	SW4	Master unit address
0	0	1#	0	8	9#	1	6	17#	2	4	25#
0	1	2#	0	9	10#	1	7	18#	2	5	26#
0	2	3#	1	0	11#	1	8	19#	2	6	27#
0	3	4#	1	1	12#	1	9	20#	2	7	28#
0	4	5#	1	2	13#	2	0	21#	2	8	29#
0	5	6#	1	3	14#	2	1	22#	2	9	30#
0	6	7#	1	4	15#	2	2	23#	3	0	31#
0	7	8#	1	5	16#	2	3	24#	3	1	32#

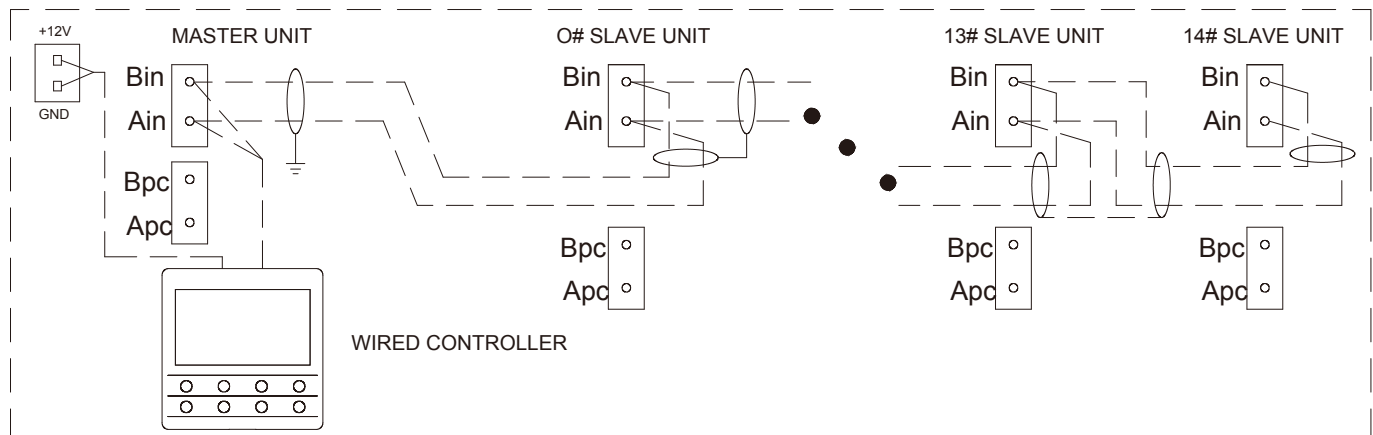
The ODU address is the address of the master unit when it is set as the master unit, and is the address of the slave unit when it is set as the slave unit. The slave unit address ranges from 0 to 14:

SW3	SW4	Slave unit address	SW3	SW4	Slave unit address
0	0	0#	0	8	8#
0	1	1#	0	9	9#
0	2	2#	1	0	10#
0	3	3#	1	1	11#
0	4	4#	1	2	12#
0	5	5#	1	3	13#
0	6	6#	1	4	14#
0	7	7#			

NOTE:

1. ADDRESS CODES IN THE SAME SYSTEM CANNOT BE DUPLICATE.
2. PREPARE FOR COMMISSIONING WITH POWER-ON ONLY AFTER SETTING THE ADDRESS CODE.
3. THE INNER SIDE OF THE CONTROL BOX OF THE UNIT IS ATTACHED WITH ELECTRICAL WIRING DIAGRAM OF THE UNIT, WHICH PROVIDES DETAILED DESCRIPTIONS FOR DIP SETTING. PLEASE KEEP IT PROPERLY

■ **Communication between master and slave unit**



- A) conductor (WTC pair with cross section area of at least 0.5mm² or 20AWG);
 B) insulator; C) Screen layer (twisted WTC with a screening factor no less than 95%);
 D) Outer jacket (PVC).

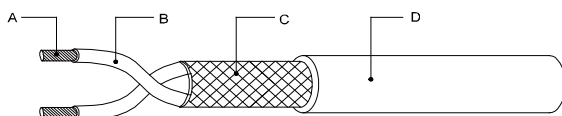


Illustration of shielded twisted pair

NOTE:

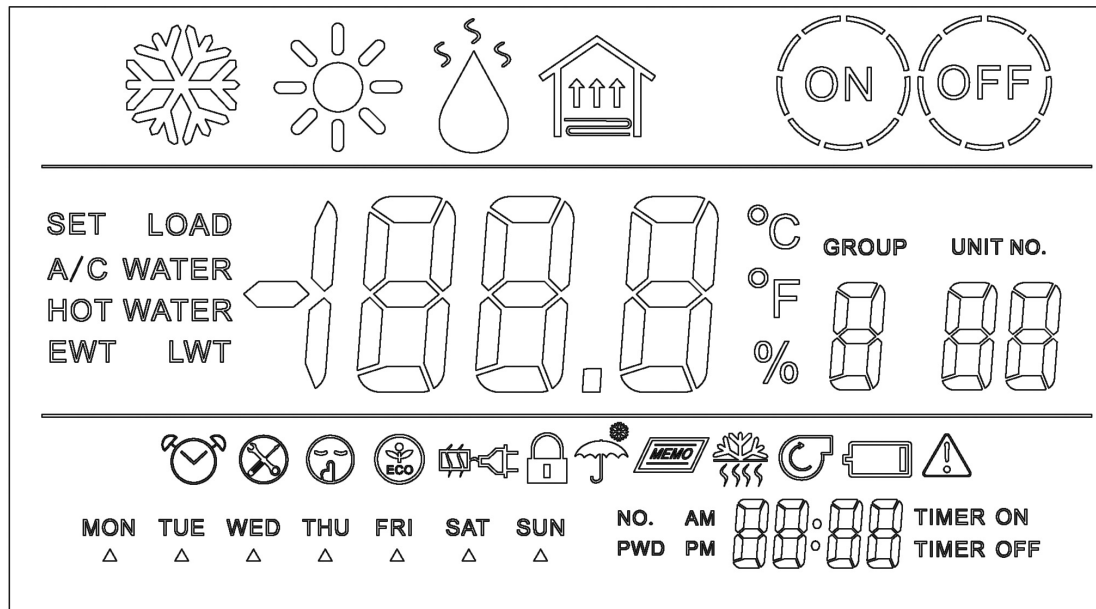
- BETTER CHOOSE NETWORK CABLES WITH A TENSER SHIELDING LAYER AND SMALLER TWISTING DISTANCE.
 PLEASE REFER TO THE UL2547 OR UL2791 WIRE SPECIFICATION.
 THE CONTROL WIRE MUST NOT BE LONGER THAN 1000 METERS.
 THE CONTROL WIRE MUST BE AT LEAST 20CM AWAY FROM MAJOR CURRENT WIRE.

Wired Controller Instruction

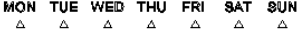
Overview

The MC325 is a wired controller with touch keys. It supports power-on/off control, mode switching, parameter setting, real-time clock, timer setting, status display, and malfunction-indication.

Display Screen of the Wired Controller



Icon and description

Icon	Description	Icon	Description
	Cooling mode		Alarm
	Heating mode		Weekday
	Hot water mode		No.
	Set		Password
	Air conditioning chilled water temperature		a.m.
	Hot water temperature		p.m.
	Timer		Timer ON

Icon	Description	Icon	Description
	Defrost	TIMER OFF	Timer OFF
	Locked	UNIT NO.	Unit No.
	Quiet mode		Auto startup upon power restoration
	Water pump		Low battery
LOAD	Compressor load		Floor heating mode
EWT	Entering water temperature		Anti-freezing
LWT	Leaving Water temperature		Electric heater
GROUP	Group	%	Load rate
	Maintenance		ON
	Energy-saving mode		OFF

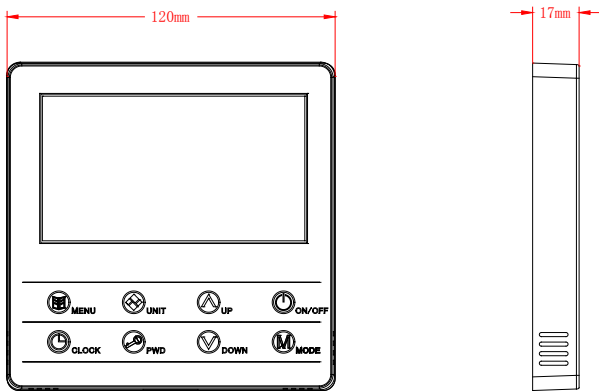
Keys of the Wired Controller

The wired controller has eight keys. The following table lists the key icons and meanings.

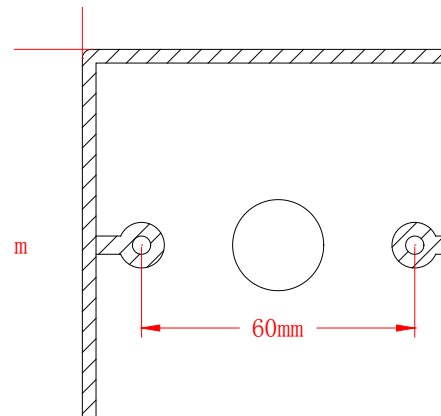
Icon	Description	Icon	Description
	Menu		Unit
	Clock		Password
	Up		ON/OFF
	Down		Mode

Installation of the Wired Controller

Dimensions:



The wired controller is installed using the standard 86 mm box.

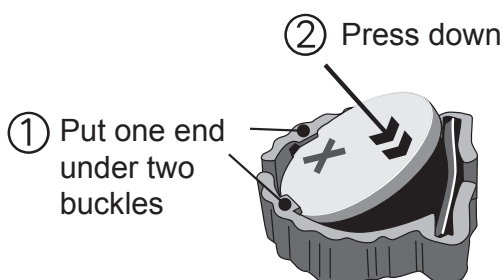


For detailed installation steps, see the installation manual inside the package box of the wired controller.

For detailed operation steps, ask factory for operation manual.

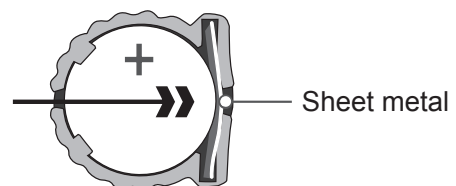
Note: The wired controller is delivered without battery, battery CR1220 3V * 1 shall be purchased locally and installed on site, please refer to following instruction.

Installing the battery



Place one end of the battery under the two buckles, with the positive electrode upward, and then press down the other end to horizontal position.

Removing the battery



Push the metal sheet along the direction indicated by the arrow. Then, the battery pops up automatically.

Storage

If you need to store the unit before installation, please follow some precautions:

- Do not remove the protective plastic;
- Do not expose the unit to direct sunlight indeed, keep the storage area dry and ventilated;
- Do not use heat sources and/or open flames near the unit;
- Protect the unit from dust, inclement weather and any rodents, and for long term storage, it is necessary to cover with tarpaulins.
- Environmental conditions must be within the following limits:
 - Maximum ambient temperature : 70°C
 - Minimum ambient temperature : - 30°C
 - Maximum R.H.: 90% non-condensing

Storage at a temperature below the minimum or over the maximum values can cause damage to the components.
Storage in a humid atmosphere may damage electrical components.

Warning

- Daikin Industries, Ltd.'s products are manufactured for export to numerous countries throughout the world. Daikin Industries, Ltd. does not have control over which products are exported to and used in a particular country. Prior to purchase, please therefore confirm with your local authorized importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.
- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

1. The units should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the unit close to the sea shore, contact your local distributor.

Dealer**DAIKIN INDUSTRIES, LTD.**

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