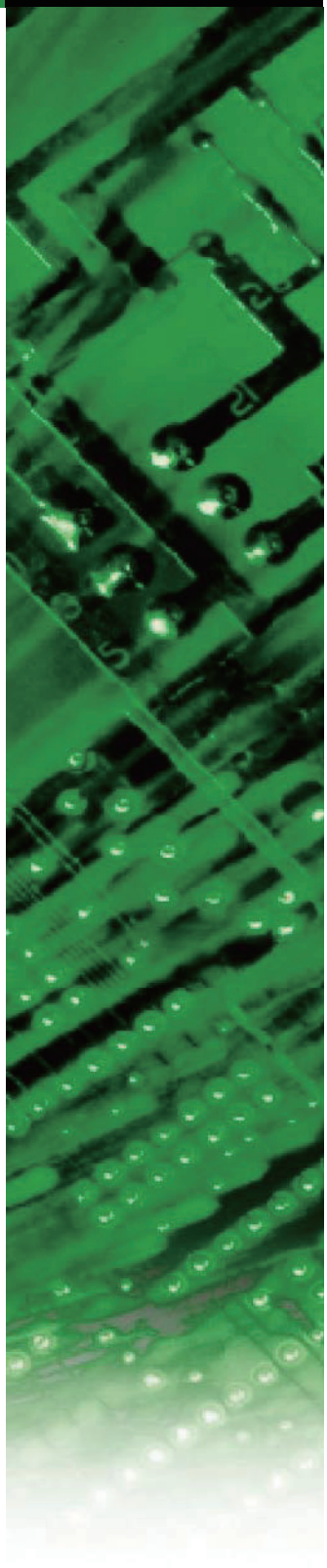
UAL-D R410 A Series Air-cooled Modular Chiller/Heat Pump

Model:	UAL210D5-UAL1680D5
	UAL230D5-UAL1840D5
	UAL210DR5-UAL1680DR5
	UAL230DR5-UAL1840DR5
Refrigerant:	R410A
Cooling Capacity:	60kW-544kW
Heating Capacity:	64kW-528kW



R410A ECOLOGIC AND HIGH EFFICIENCY

DAIKIN

Literature No.: ED-UAL-D-201401A
Supersedes: ED-UAL-D-201310A

Contents

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

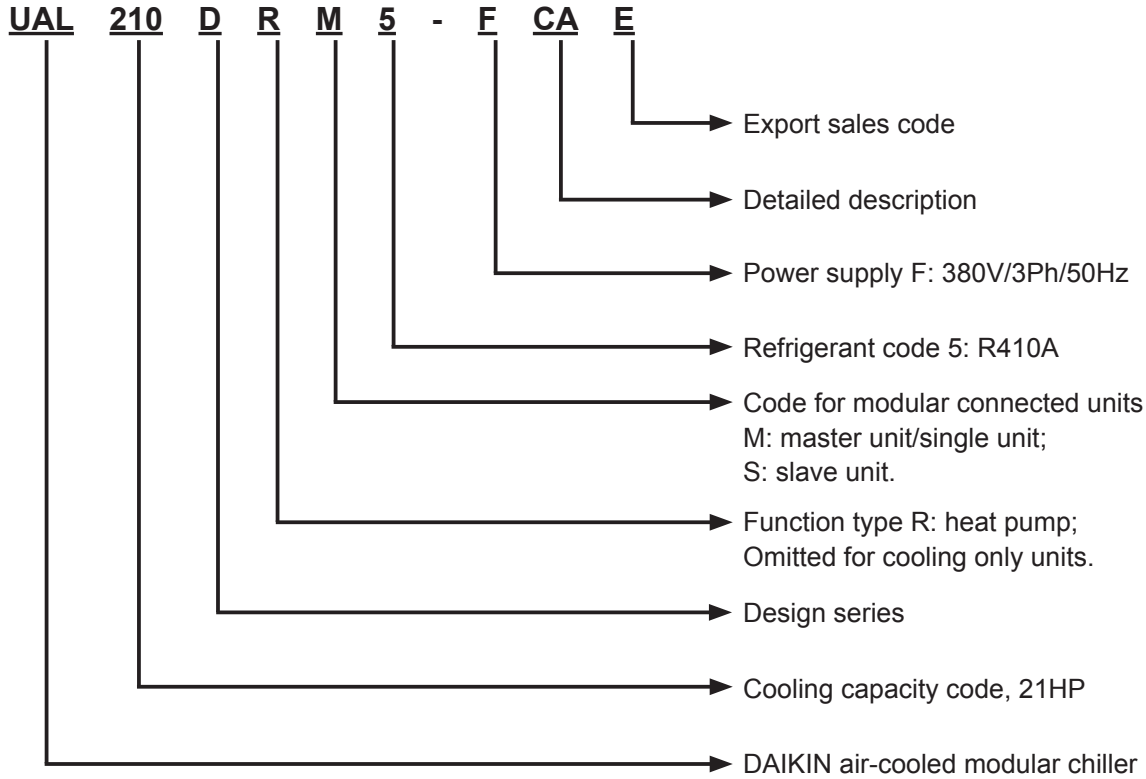
Caution: Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

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

Overview

DAIKIN air-cooled modular chiller/heat pump R22 series, DAIKIN UAL-D R410A series is a new generation of air-cooled chillers/heat pumps. They ideally combine the advanced and mature chiller technology with new type environment-friendly refrigerant. In addition, this series features outstanding performance, high capacity, low sound level, easy installation, and flexible system management, taking the lead in the global market.

Nomenclature



Features

Environment-friendly Refrigerant

DAIKIN is committed to protecting the global ecosystem and has developed air-cooled chiller/heat pump with R410A, a new type of environment-friendly refrigerant. Without chlorine, the environment-friendly R410A causes no harm to the ozonosphere (ODP=0).

Low Sound Level

Thanks to the newly designed spiral blades, the outdoor units feature smooth air flow, significantly reducing the turbulence and lowering the air flow sound level. Unique compressor sound-insulation design and fully hermetic volute compressor minimizes the operation noise. Moreover, unique Night Mode brings down nightly noise greatly and ensures you a sound sleep.

Easy Installation

UAL R410 series is designed to best facilitate user installation. The refrigerant system is made hermetic in the factory. Customers do not need to connect any copper pipe or refill refrigerant or invest more money for complex water systems.

Multi-grade Modulation

UAL R410 series features 2-grade modulation which can be transformed to multi-grade modulations in modular combinations. With operation grades controlled electronically, the unit exerts less shock to the power grid and saves more energy.

Compact Size

Moreover, UAL R410 series features compact size. Its dimensions and weight are significantly reduced. UAL R410 can be lifted without large lifting tools and located on the roof, balcony or any possible outdoor space.

Reliable Operation

UAL R410 series adapts modular design and one by one start, reducing the impact upon the grid when starting. All units have undergone strict and long-term test, ensuring reliable operation even under extreme hot/cold conditions. Units themselves, moreover, have multiple protections. The security of units is maximally guaranteed.

Outstanding Performance

UAL R410 series features leading-edge scroll technology and name-brand accessories which are strictly tested for high compatibility and reliability. Equipped with efficient scroll compressors and precise electronic expansion valves, these units feature high EER and COP, especially at partial load.

Intelligent Control System

UAL-D features user-friendly intelligent control system. Micro chip and large-scaled LCD display are employed to make the control swift and easy.

- Group control: One single controller can control a group made up by one master unit and maximum 15 slave units.
- BMS: UAL-D provides interfaces for BMS. One serial port can support maximum 31 gateway and one gateway can support one master unit and maximum 15 slave units.

Basic Operating Mode

- Cooling
- Heating

Parameter Setting

- Real time setting
- Weekly timing on/off (one on/off per day)
- Cooling water inlet temperature
- Heating water inlet temperature
- Anti-freezing/defrost temperature setting
- Defrost point A/B temperature setting

Parameter Display

- Running status display
- Setted inlet temperature
- Actual inlet temperature
- Timing point
- Anti-freezing/defrost temperature

Fault Alarm And Protection

- 13 protections and fault alam functions
- Indoor controller lock

Defrost Mode

- Auto defrost
- Mannual defrost

Memory Function

- Backup battery for realtime clock
- Customized parameters preservation after power failure

Other Functions

- Error log inquiry
- Average compressor worn time
- Remote on/off
- Water system two-way valve control
- Auxiliary electric heating

NOTE:

- *THE LENGTH OF COMMUNICATION WIRE BETWEEN THE MASTER UNIT AND THE WIRED CONTROLLER IS 40M. THE LENGTH OF COMMUNICATION WIRE ATTACHED TO THE SLAVE UNIT IS 5M.*
- *THE MAIN BOARD OF THE UNIT PROVIDES AN INTERFACE FOR REMOTE CONTROL. BUT REMOTE CONTROLLERS ARE NOT PROVIDED AND SHOULD BE INSTALLED ON SITE.*

Specifications

General Data - R410A

MODEL			UAL210D5	UAL210DR5	UAL230D5	UAL230DR5
NOMINAL COOLING CAPACITY		Ton	17	17	18.5	19.1
		kW	60	60	65	68
NOMINAL HEATING CAPACITY		Ton	--	17.9	--	18.5
		kW	--	64	--	66
RATED TOTAL COOLING INPUT POWER		kW	18.8	19.8	19.2	21
RATED TOTAL HEATING INPUT POWER		kW	--	20.5	--	20
EER		Btu/h/W	10.9	--	11.5	--
COP			--	3.1	--	3.3
RATED COOLING RUNNING CURRENT		A	36	37.2	36.9	36.8
RATED HEATING RUNNING CURRENT		A	--	38.2	--	36.2
POWER SOURCE		V/Ph/Hz	380-415V/3N~/50Hz			
REFRIGERANT	TYPE		R410A			
	CHARGE	kg/lb	17/37	17/37	17.2/37.9	17.2/37.9
WATER FLOW	COOLING	m^3/h	10.3	10.3	11.2	11.7
	HEATING	m^3/h	--	11	--	11.4
WPD		kPa	38	38	44	37.3
UNIT DIMENSION	L × W × H	mm/in	1990 × 840 × 1840/78 × 33 × 72			
PACKING DIMENSION	L × W × H	mm/in	2010 × 890 × 2010/79 × 35 × 79			
NET WEIGHT		kg/lb	520/1145	540/1189	520/1145	515/1134
GROSS WEIGHT		kg/lb	570/1256	590/1300	570/1256	565/1244
OPERATING WEIGHT		kg/lb	530/1167	555/1222	530/1167	525/1156

NOTES:

1. *THE SPECIFICATIONS GIVEN IN THE TABLE WILL BE SUBJECT TO THE MODIFICATIONS ON PRODUCT DESIGN BY THE MANUFACTURER.*
2. *NOMINAL COOLING CAPACITY CONDITION: LWT 7°C, WATER FLOW 0.172 [M^3/(H•KW)], OUTDOOR TEMPERATURE 35°C.*
3. *NOMINAL HEATING CAPACITY CONDITION: LWT 45°C, WATER FLOW 0.172 [M^3/(H•KW)], OUTDOOR DRY-BULB TEMPERATURE 7°C, WET-BULB TEMPERATURE 6°C.*

Components Data - R410A

MODEL			UAL210D5	UAL210DR5	UAL230D5	UAL230DR5
EVAPORATOR	TYPE		BRAZED PLATE HEAT EXCHANGER			
	PLATE MATERIAL		STAINLESS STEEL			
	MODEL NAME		ACH230-58DQ	ACH230-58DQ	ACH230-58DQ	DP300X78
	NOMINAL WATER FLOW COOLING	L/s	10.3		11.2	11.17
	NOMINAL WATER FLOW HEATING	L/s	--	11	--	11.4
	WATER VOLUME	L	6.56			
	BPHE PRESSURE DROP	kPa	26			
	PIPING CONNECTION	mm/in	DN50/DN2			
	UNIT WATER PRESSURE DROP	kPa/psi	38/5.5	38/5.5	44/6.4	37.3/5.4
CONDENSER COIL TUBE	MATERIAL		COPPER			
	TYPE		INNER GROOVE			
	WALL THICKNESS	mm	0.71			
	OUTER DIAMETER	mm	7.94			
	TUBE HEIGHT	TH	36/40			
FIN	MATERIAL		ALUMINUM			
	TYPE		WHITE	HYDRAULIC	WHITE	HYDRAULIC
	THICKNESS	mm	0.12			
	ROWS		3			
	FIN PER INCH		14			
TOTAL FACE AREA		m^2/ft^2	3.43/36.9			
CONDENSER FAN	TYPE/DRIVE		BROAD WHEEL AXIAL FANS WITH LOW NOISE			
	QUANTITY		2			
	BLADE MATERIAL		GALVANIZED STEEL			
	POWER SUPPLY	V/Ph/Hz	380V/3N~/50Hz			
	MOTOR POLES		6			
	AIR VOLUME	CMH/CFM	12000/7059			
COMPRESSOR	TYPE		HERMETIC SCROLL COMPRESSOR			
	MODEL NAME		SH140A4ALC			
	QUANTITY		2			
	NUMBERS OF CIRCUITS		2			
	POWER SUPPLY	V/Ph/Hz	380V/3N~/50Hz			
	RATED RUNNING CURRENT	A	19.22	19.22	20.8	20.8
	RATED INPUT POWER	W	10862	10862	10800	10800
REFRIGERANT	TYPE		R410A			
	CHARGE	kg	17	17	17.2	17.2
FLOW CONTROL	TYPE		EXV			
	MODEL		UKV-25D5			
OIL	MODEL		POE			
	CHARGE	L	3.25			
CASING	COLOUR		RAL 7032 PEBBLE GREY			
	MATERIAL		EG			
PROTECTION DEVICES			H/L PRESSURE SWITCH/THERMAL AND CURRENT OVERLOAD PROTECTOR			

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

Electrical Data - R410A

MODEL			UAL210D5	UAL210DR5	UAL230D5	UAL230DR5
FAN MOTOR	INSULATION GRADE		F			
	IP		IPX4			
	POWER SOURCE	V/Ph/Hz	380/3/50			
	RATED RUNNING CURRENT	A	2.5/1.7			
	MOTOR OUTPUT	W	900			
	POLES		6/10			
FAN SPEED	H/L	RPM	780/477			
COMPRESSOR	INSULATION GRADE		F			
	IP		IPX4			
	POWER SOURCE	V/Ph/Hz	380/3/50			
	RATED RUNNING CURRENT	A	19.22		20.8	
	LOCKED ROTOR AMP	A	115		124	
UNIT OPERATING CURRENT		A	35.5	36.0/37.2	36.9	36.8/36.7
UNIT MAX RUNNING CURRENT		A	44.5	45	47	47.7

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; HEATING DRY-BULB TEMPERATURE 21°C, WET-BULB TEMPERATURE 15.5°C.

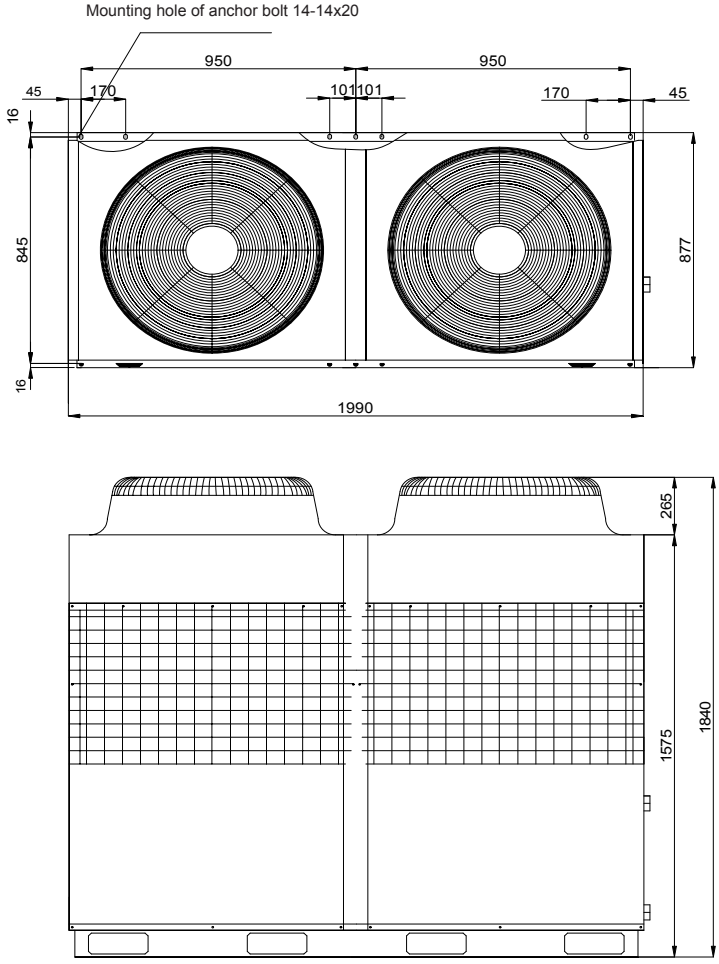
3) THE RATED RUNING CURRENT AND POLES ARE TESTED IN THE HIGH SPEED AND LOW SPEED.

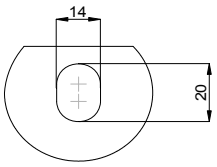
Safety Devices

MODEL				UAL210D5	UAL210DR5	UAL230D5	UAL230DR5
SAFETY DEVICE	HIGH PRESSURE SWITCH	TYPE		PSW,H20PS	PSW,H20PS	PSW,H20PS	PSW,H20PS
		OPEN	MPa	4.15 ± 0.1	4.15 ± 0.1	4.15 ± 0.1	4.15 ± 0.1
		CLOSE	MPa	3.11 ± 0.1	3.11 ± 0.1	3.11 ± 0.1	3.11 ± 0.1
	LOW PRESSURE SWITCH	TYPE		N/A			
		OPEN	MPa	N/A			
		CLOSE	MPa	N/A			
	PHASE SEQUENCER			YES			
	DISCHARGE THERMOSTAT SETTING		°C/°F	130/266			

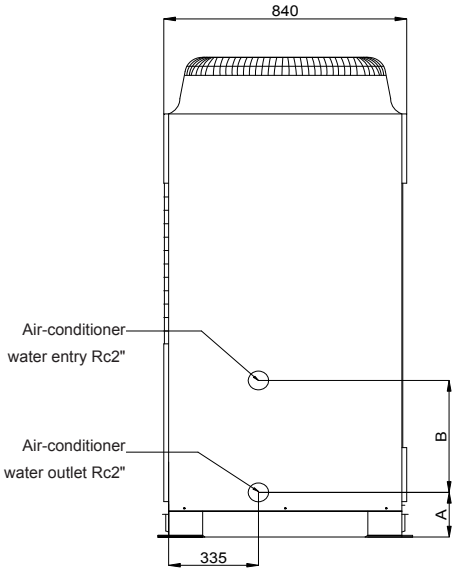
NOTE: ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

Dimensions





14x20 Enlarged drawing for
Mounting hole of anchor bolt



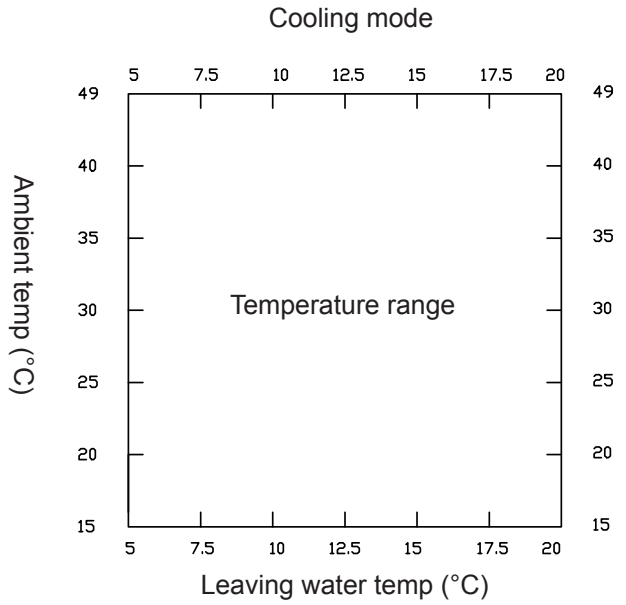
Modular Air Cooled Chiller/Heat Pump
UAL210DM5/DS5 UAL210DRM5/DRS5
UAL230DM5/DS5 UAL230DRM5/DRS5

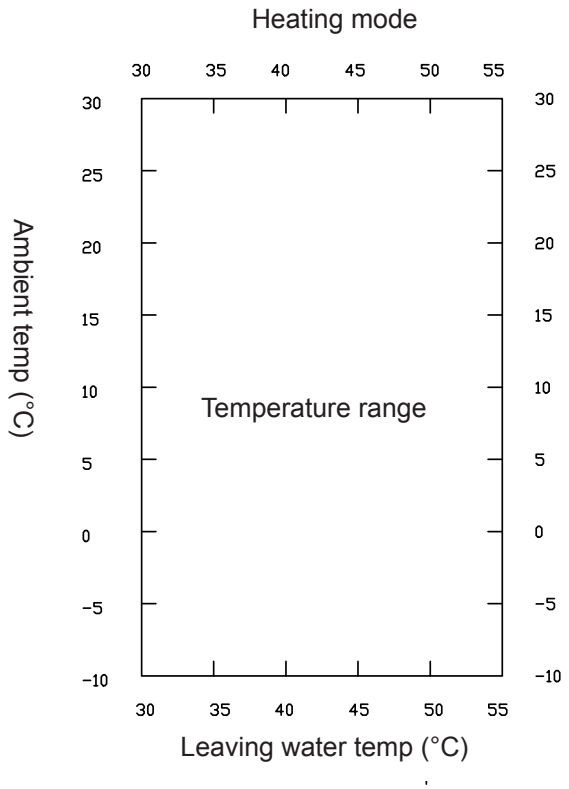
Unit: mm

Model	A	B
UAL210DM5/DS5	171	369
UAL210DRM5/DRS5		
UAL230DM5/DS5		
UAL230DRM5/DRS5	165	390

Performance Data

Operating Range





Cooling Capacity Performance Table

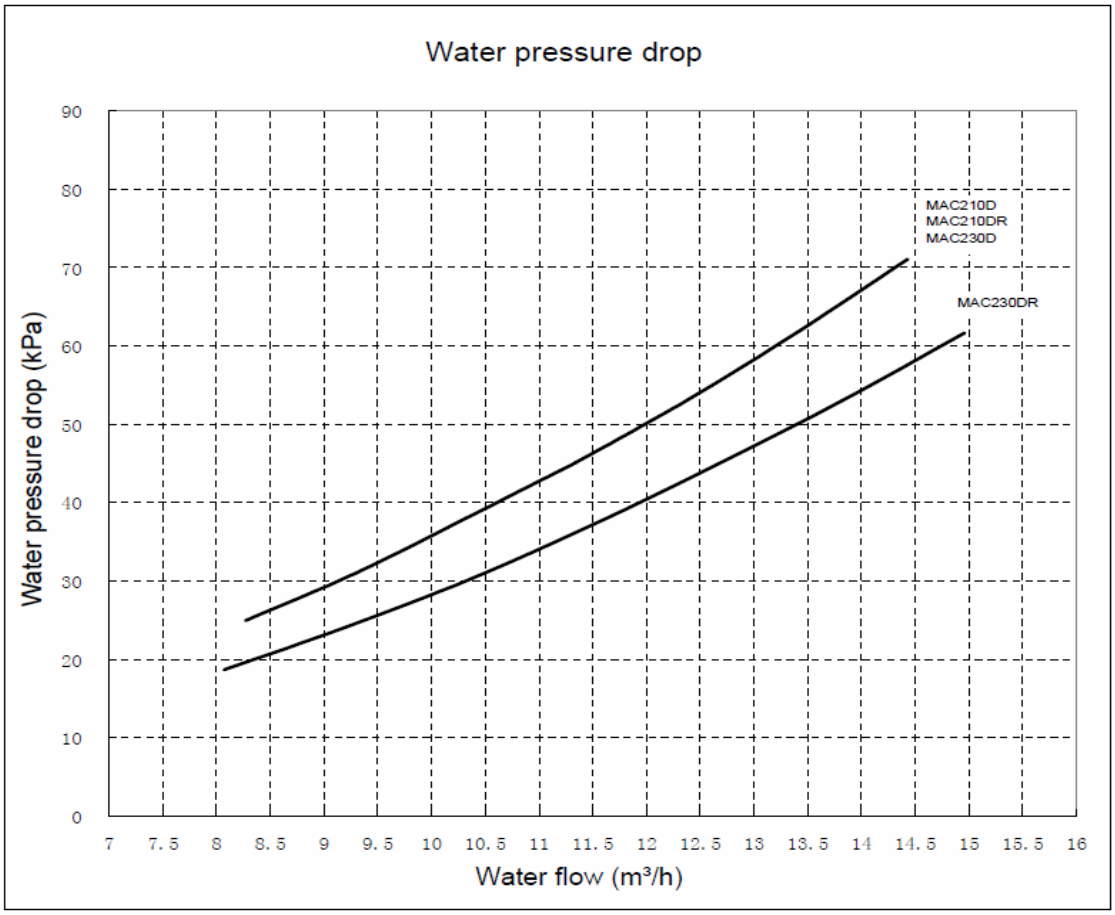
Model	Outlet water temp (°C)	Ambient temp. (°C)															
		15°C		20°C		25°C		30°C		35°C		40°C		45°C		48°C	
		Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)	Cooling capacity (kW)	Power (kW)
UAL210D5	5	70.6	13.6	66.5	14.7	62.9	16	59.4	17.2	55.3	18.5	50.9	20.1	46.3	21.8	42.4	23.1
	7	75	13.8	71	14.9	66.9	16.3	63.4	17.5	60	18.8	55.6	20.4	50.9	22.1	46.9	23.4
	9	79.8	14.1	75.7	15.2	71.6	16.5	68.4	17.8	64.9	19	60.8	20.7	55.8	22.4	51	23.7
	12	86.7	14.6	82.5	15.7	78.6	17	75	18.3	71.6	19.5	67.2	21.3	61.8	23	56.7	24.1
	15	93	14.9	89.7	16.1	86.5	17.4	82.6	18.7	78.7	20	73.7	21.9	68	23.7	63.5	24.7
	20	103.5	15.4	101.7	16.8	99.7	18.1	95.3	19.4	90.5	20.8	84.5	22.9	78.3	24.9	74.8	25.7
UAL210DR5	5	67	14.6	65	15.7	62.9	16.7	59.8	18	56.3	19.4	51.7	21.1	47.4	22.9	42.8	24.3
	7	71.3	15	69.3	16.1	67.3	17.1	64.1	18.4	60	19.8	55.8	21.6	50.9	23.3	46.4	24.9
	9	75.8	15.5	73.8	16.5	71.2	17.5	67.9	18.7	64.2	20.2	59.8	22	54.7	23.7	50.3	25.1
	12	83.2	16	81.3	16.9	78.8	18.1	75.5	19	70.6	20.7	66.1	22.4	60.8	24.1	56.3	25.5
	15	91.1	16.6	89.4	17.6	86.6	18.6	82.9	19.7	78.3	21.1	73	22.9	67.7	24.7	62.4	26
	20	104.2	17.8	102.8	18.7	99.8	19.4	95.2	20.8	91.1	21.9	84.5	23.7	79.2	25.6	72.6	26.8
UAL230D5	5	72.5	14.2	70.3	15.2	68.1	16.2	64.7	17.4	60.9	18.8	56	20.5	51.3	22.2	46.3	23.6
	7	77.2	14.6	75	15.6	72.8	16.6	69.4	17.8	65	19.2	60.4	21	55.1	22.6	50.2	24.1
	9	82	15	79.9	16	77.1	17	73.5	18.1	69.5	19.6	64.7	21.3	59.3	23	54.4	24.3
	12	90.1	15.5	88	16.4	85.3	17.5	81.7	18.5	76.4	20	71.6	21.7	65.8	23.4	60.9	24.8
	15	98.6	16.1	96.7	17.1	93.8	18	89.7	19.1	84.7	20.5	79.1	22.2	73.3	23.9	67.6	25.2
	20	112.8	17.1	111.2	18.3	108	18.8	103	20.1	98.5	21.3	91.6	23	85.8	24.7	78.8	25.9
UAL230DR5	5	74.5	14.9	70.6	15.9	66.7	16.9	64	18.3	61.3	19.6	56.3	21.6	51.3	23.5	48.3	24.7
	7	79	15.4	75.4	16.4	71.8	17.3	69.4	18.7	68	20.1	61.1	21.9	55.3	23.8	51.7	25
	9	83.7	15.9	80.1	16.8	76.5	17.8	73.9	19.1	71.3	20.5	65.4	22.4	59.5	24.3	55.9	25.4
	12	90.7	16.6	87.1	17.5	83.6	18.4	80.6	19.8	77.7	21.2	71.7	23	65.8	24.9	62.2	26
	15	96.9	17.2	93.7	18.1	90.5	19	87.4	20.5	84.2	21.9	78.3	23.8	72.4	25.6	68.8	26.7
	20	105.1	17.8	102.5	18.7	99.8	19.7	97.2	21.2	94.6	22.8	88	24.5	81.4	26.2	77.4	27.2

Heating Capacity Performance Table

Model	Outlet water Temp (°C)	Ambient temp. (°C)															
		-10°C		-5°C		0°C		7°C		10°C		15°C		21°C		30°C	
		Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)	Heating capacity (kW)	Power (kW)
UAL210DR5	30	42.6	15	50.7	15.2	60.8	15.4	69.8	15.5	73.4	15.7	78.2	16	82.9	16.3	90	16.7
	35	41.5	16.6	49	16.7	58.3	16.9	67.8	17.1	71.5	17.3	75.8	17.5	80.7	17.7	88.1	18
	40	40.3	18.1	47.4	18.2	55.8	18.4	65.9	18.7	69.6	18.9	73.5	19	78.6	19.1	86.3	19.2
	45	39.1	19.7	46	19.9	53.9	20.3	64	20.5	67.2	20.7	71.3	20.9	76.3	21.1	83.8	21.3
	50	38.4	21.4	44.2	21.8	51.4	22	60.5	22.2	64.1	22.4	68.9	22.6	73.2	22.8	80.7	23
	55	37.3	23.5	42.8	24	48.3	24.3	57.4	24.5	61	24.6	65.6	24.7	70.5	24.8	77.9	25
UAL230DR5	30	42.1	14.6	47.6	14.7	55.1	15	70	15.1	71	15.2	72.6	15.3	80.8	15.4	88.3	15.6
	35	41.1	16	46.3	16.2	53.9	16.3	68.6	16.6	69.7	16.7	71.5	16.7	79.9	17	87.9	17.2
	40	39.9	17.5	44.9	17.6	52.4	17.9	67.4	18.1	68.4	18.3	70.2	18.4	78.7	18.6	86.8	18.8
	45	38.5	19.4	43.4	19.6	51.1	19.8	66	20	67.1	20.1	68.8	20.3	77.3	20.5	85.7	20.7
	50	37.7	21.3	42.3	21.5	49.4	21.7	63.9	21.9	65	22	67	22.2	75.5	22.5	84.3	22.6
	55	36.4	23.4	40.7	23.7	47.9	23.9	61.7	24	63	24.2	65.2	24.4	73.8	24.7	82.6	24.9

NOTE: PARAMETERS IN THE ABOVE TABLE ARE MEASURED WHEN THE UNIT OPERATES AT THE RATED WATER FLOW.

Water Pressure Drop Curve



NOTES:

1) *THE WATER PRESSURE DROP OF THE UNIT IS THE TEST RESULT WHEN A PLATE HEAT EXCHANGER AND THE ACCESSORY Y-SHAPED FILTER ARE INSTALLED.*
2) *THE WATER RESISTANCE OF THE PLATE HEAT EXCHANGER AND THE Y-SHAPED FILTER ARE TESTED WITH PURE WATER.IF THE ONSITE WATER QUALITY CHANGES, THE TEST RESULT MAY BE DIFFERENT FROM THAT SHOWN IN THE FIGURE.*

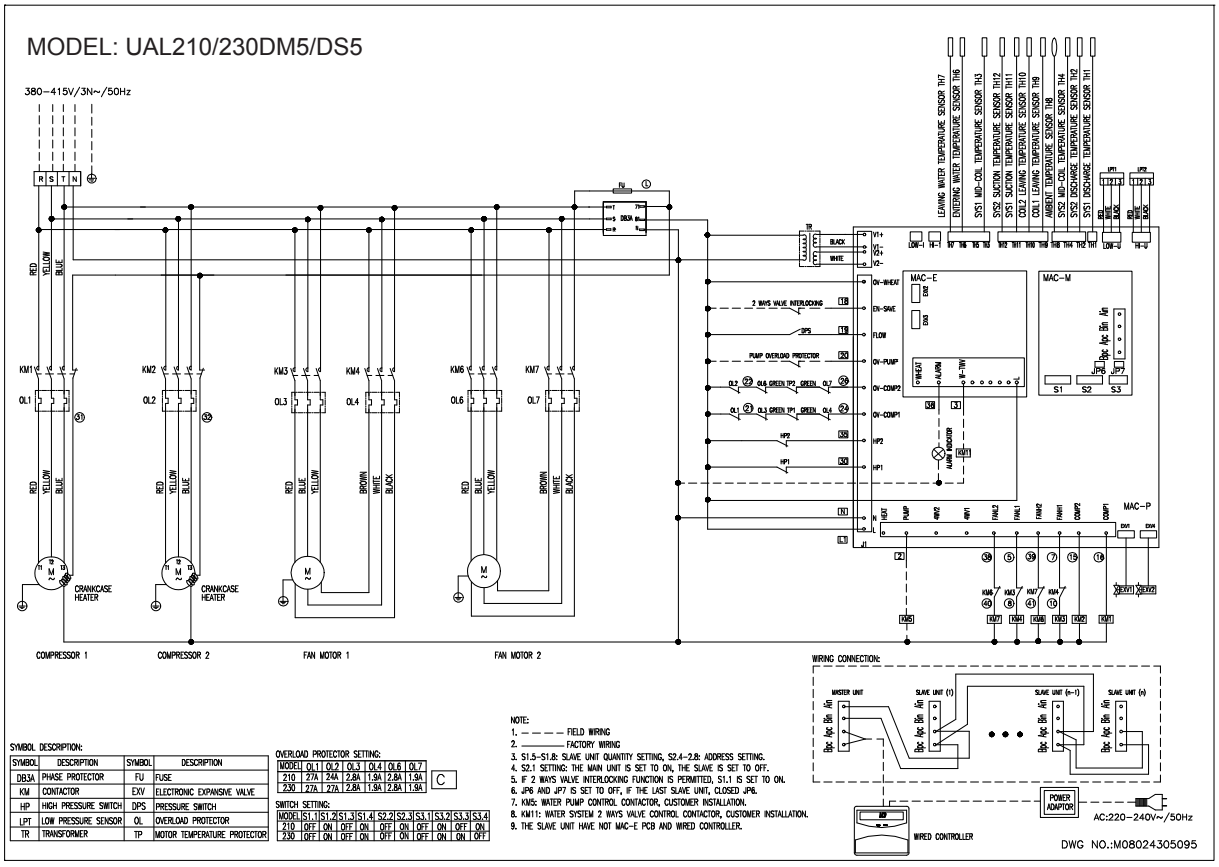
Sound Data

Acoustic Noise

Units	Octave Sound Pressure Level (dB,ref20μPa)								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
UAL210D/DR	43.9	50.1	54.0	57.7	56.2	54.2	50.5	40.7	63.7
UAL230D/DR	45.3	52.6	55.5	59.6	59.8	57.7	50.2	41.2	65.8

Wiring Diagrams

MODEL: UAL210/230DM5/DS5



SYMBOL DESCRIPTION:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
DB3A	PHASE PROTECTOR	FU	FUSE
KM	CONTACTOR	EXV	ELECTRONIC EXPANSIVE VALVE
HP	HIGH PRESSURE SWITCH	DPS	PRESSURE SWITCH
LPT	LOW PRESSURE SENSOR	OL	OVERLOAD PROTECTOR
TR	TRANSFORMER	TP	MOTOR TEMPERATURE PROTECTOR

OVERLOAD PROTECTOR SETTING:

MODEL	OL1	OL2	OL3	OL4	OL6	OL7	
210	27A	24A	2.8A	1.9A	2.8A	1.9A	C
230	27A	27A	2.8A	1.9A	2.8A	1.9A	

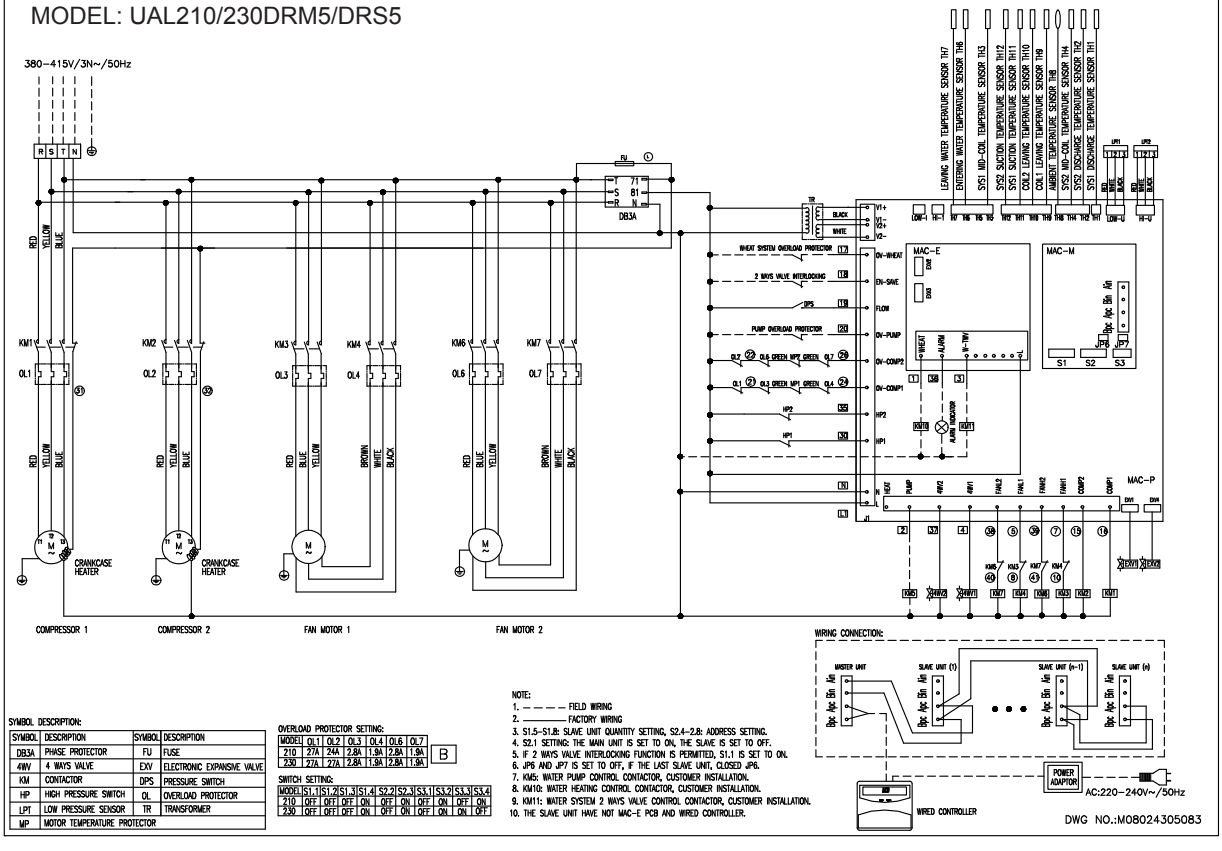
SWITCH SETTING:

MODEL	S1.1	S1.2	S1.3	S1.4	S2.2	S2.3	S3.1	S3.2	S3.3	S3.4
210	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
230	OFF	ON	OFF	ON	OFF	ON	OFF	ON	ON	OFF

NOTE:
1. ------ FIELD WIRING
2. ——— FACTORY WIRING
3. S1.5~S1.8: SLAVE UNIT QUANTITY SETTING, S2.4~2.8: ADDRESS SETTING.
4. S2.1 SETTING: THE MAIN UNIT IS SET TO ON, THE SLAVE IS SET TO OFF.
5. IF 2 WAYS VALVE INTERLOCKING FUNCTION IS PERMITTED, S1.1 IS SET TO ON.
6. JP6 AND JP7 IS SET TO OFF, IF THE LAST SLAVE UNIT, CLOSED JP6.
7. KM5: WATER PUMP CONTROL CONTACTOR, CUSTOMER INSTALLATION.
8. KM1: WATER SYSTEM 2 WAYS VALVE CONTROL CONTACTOR, CUSTOMER INSTALLATION.
9. THE SLAVE UNIT HAVE NOT MAC-E PCB AND WIRED CONTROLLER.

DWG NO.:M08024305095

MODEL: UAL210/230DRM5/DRS5



SYMBOL DESCRIPTION:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
DB3A	PHASE PROTECTOR	FU	FUSE
4WV	4 WAYS VALVE	EXV	ELECTRONIC EXPANSIVE VALVE
KM	CONTACTOR	DPS	PRESSURE SWITCH
HP	HIGH PRESSURE SWITCH	OL	OVERLOAD PROTECTOR
LPT	LOW PRESSURE SENSOR	TR	TRANSFORMER
MP	MOTOR TEMPERATURE PROTECTOR		

OVERLOAD PROTECTOR SETTING:

MODEL	OL1	OL2	OL3	OL4	OL6	OL7	
210	27A	24A	2.8A	1.9A	2.8A	1.9A	B
230	27A	27A	2.8A	1.9A	2.8A	1.9A	

SWITCH SETTING:

MODEL	S1.1	S1.2	S1.3	S1.4	S2.2	S2.3	S3.1	S3.2	S3.3	S3.4
210	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
230	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	ON	OFF

NOTE:
1. ------ FIELD WIRING
2. ——— FACTORY WIRING
3. S1.5~S1.8: SLAVE UNIT QUANTITY SETTING, S2.4~2.8: ADDRESS SETTING.
4. S2.1 SETTING: THE MAIN UNIT IS SET TO ON, THE SLAVE IS SET TO OFF.
5. IF 2 WAYS VALVE INTERLOCKING FUNCTION IS PERMITTED, S1.1 IS SET TO ON.
6. JP6 AND JP7 IS SET TO OFF, IF THE LAST SLAVE UNIT, CLOSED JP6.
7. KM5: WATER PUMP CONTROL CONTACTOR, CUSTOMER INSTALLATION.
8. KM10: WATER HEATING CONTROL CONTACTOR, CUSTOMER INSTALLATION.
9. KM11: WATER SYSTEM 2 WAYS VALVE CONTROL CONTACTOR, CUSTOMER INSTALLATION.
10. THE SLAVE UNIT HAVE NOT MAC-E PCB AND WIRED CONTROLLER.

DWG NO.:M08024305083

Installation

Working Condition

Item	Description
Power supply voltage	Rated voltage ± 10%
Power supply frequency	Rated frequency ± 1%
Variations between phases	Rated voltage ± 2%
Air quality	Must not contain solute that can corrode copper, aluminum or iron.
Flow rate of chilled water	0.5 - 2.0m/s
Pressure of chilled water	< 0.7MPa
Quality of chilled water	"Must not contain solute that can corrode copper, iron, or welding material. For details on the water quality requirements, see Chapter 9: Water Quality Management (page 42)."
Installation site	Take anti-snow and ventilation measures as required.
Ambient temp.	Refer to the figure above.
Relative humidity	< 90%

NOTES:

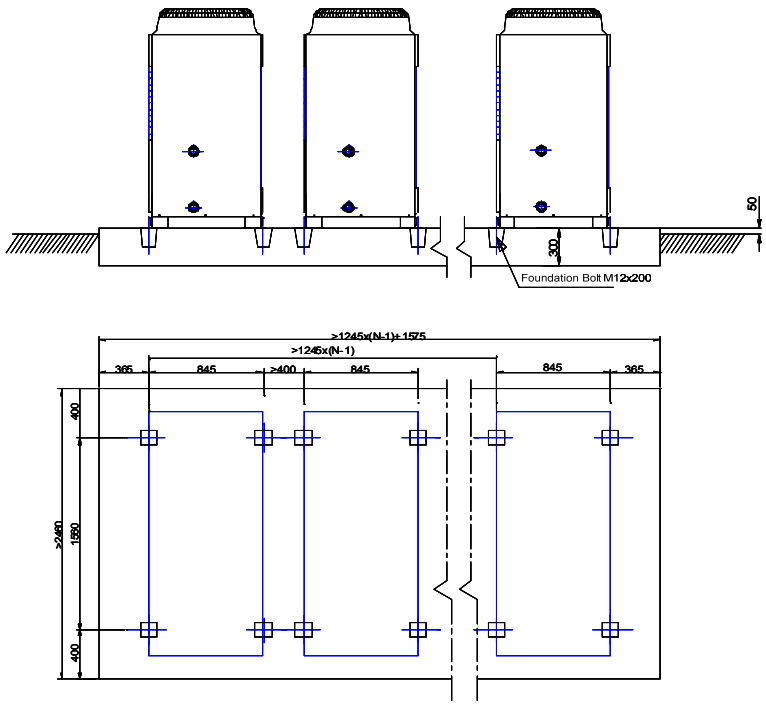
1. *THE UNIT IS STRICTLY TESTED BEFORE DELIVERY AND CAN WORK SAFELY IN THE RATED WORKING CONDITIONS.*
2. *FOR THE PERFORMANCE PARAMETERS OF THE UNIT IN DIFFERENT WORKING CONDITIONS, SEE 3.3 REFERENCE TABLE FOR PERFORMANCE PARAMETERS.*
3. *THIS IS THE NORMAL OPERATING TEMPERATURE RANGE FOR THE UNIT. BEYOND THIS TEMPERATURE RANGE, THE UNIT CAN ONLY OPERATE FOR A SHORT MOMENT BEFORE A FAILURE ALARM IS TRIGGERED.*

Installation Dimensions and Environment Limits

Machine Installation Space

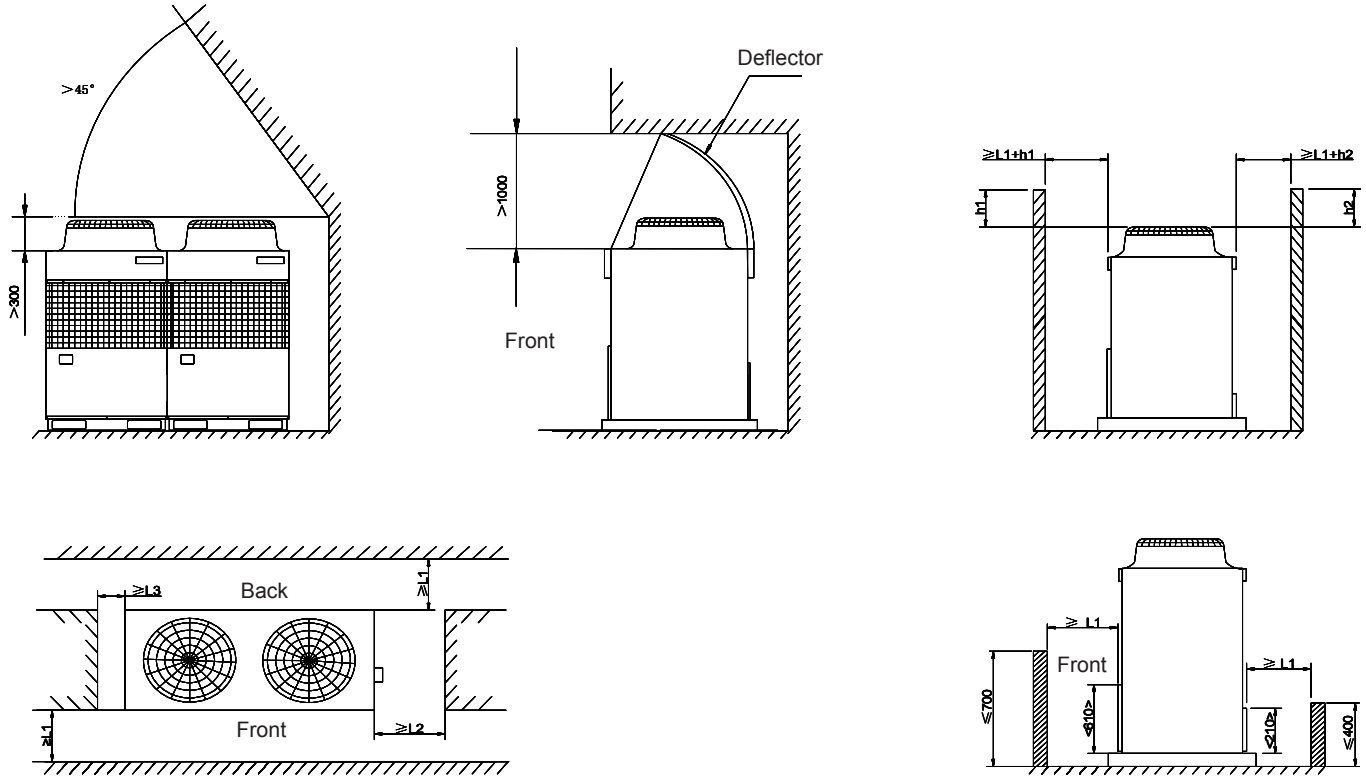
Units must be installed by DAIKIN service staff or by specially trained personnel. Units must installed by following relevant national and local electric, building and environment protection standards as well as the installation manual.

Assembling Unit Modules

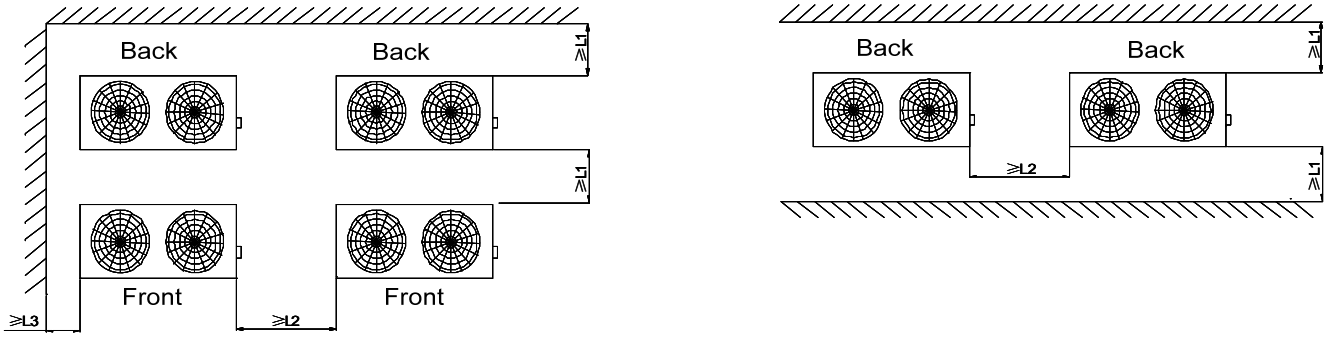


NOTE:
THE GROUNDWORK MUST BE A CONCRETE FLOOR OR A V-IRON STRUCTURE THAT IS STRONG ENOUGH TO BEAR THE OPERATION PRESSURE OF THE UNIT.
N REPRESENTS THE NUMBER OF MODULES INSTALLED.
EACH UNIT MUST BE FIXED BY 4 M12 BOLTS; 6 RUBBER CUSHIONS OF 20MM THICK MUST BE INSTALLED BETWEEN THE UNIT AND THE GROUNDWORK.
THE GROUNDWORK MUST HAVE DRAINING FACILITIES TO DISCHARGE CONDENSATE WATER AND DEFROSTING WATER.

Space Allocated for A Single Chilled Water Unit



Space Allotted for An Array of Chilled Water Units

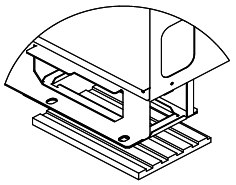


Unit: mm

L1	L2	L3
400	800	100

Installing Chiller

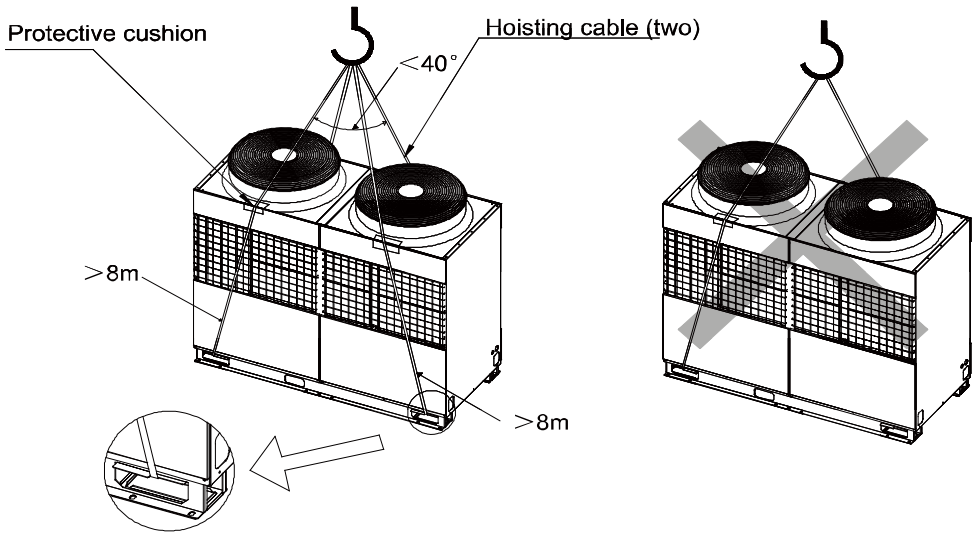
- The user manual, warranty card, accessories, and packing list are place at the right side of the unit, as illustrated by the shaded part of the figure on the left.
- Reserve sufficient maintenance space if possible.
- If the unit is installed in a place where it snows in winter, proper measures must 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 three 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.*

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			Benchmark value	Tendencies	
				Corrosion	Scaling
Benchmark items	pH (25°C)		7.0 - 9.0	○	○
	Conductivity (25°C)	μS/cm	< 800	○	○
	Cl^-	mg (Cl^-)/L	< 200	○	
	SO_4^{2-}	mg (SO_4^{2-})/L	< 200	○	
	Acid consumption	mg ($CaCO_3$)/L	< 100		○
	(pH = 4.8)				
	Total hardness	mg ($CaCO_3$)/L	< 200		○
Reference items	Fe	mg (Fe)/L	< 1.0	○	○
	S^{2-}	mg (S^{2-})/L	0	○	
	NH^+	mg (NH^+)/L	< 1.0	○	
	SiO_2	mg (SiO_2)/L	< 50		○
NOTE: ○ REPRESENTS FACTORS THAT MAY CAUSE CORROSION OR SCALING.					

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.

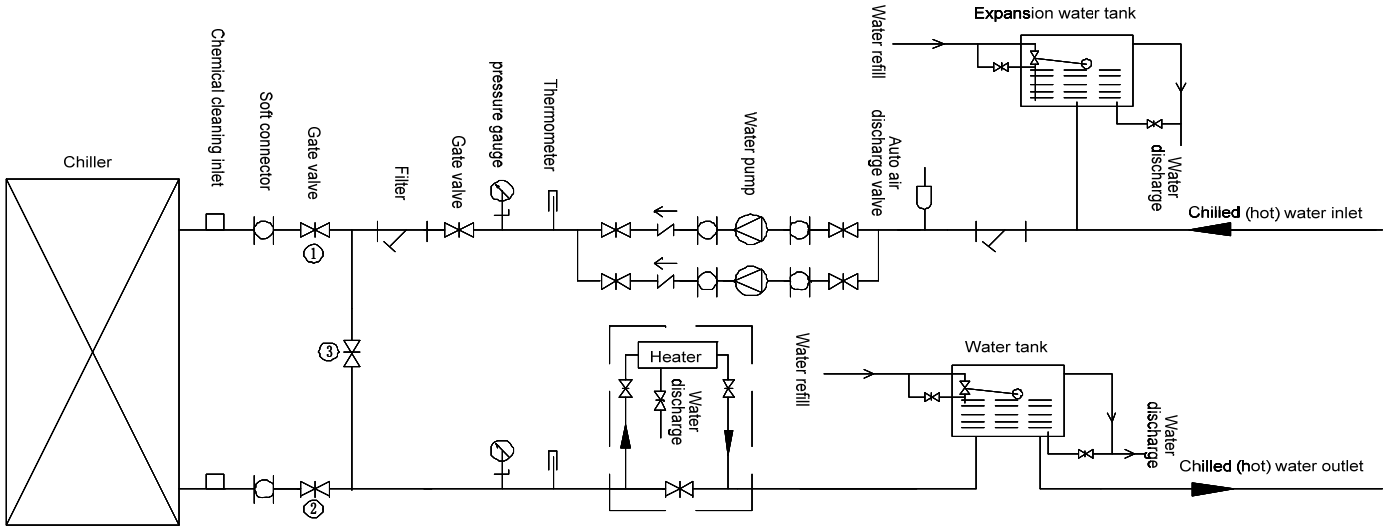
- Water pressure gauges and thermometers must be installed at the water inlets and outlets to facilitate the reading of unit operation status.
- The heat exchanger at the water side is made of stainless steel. Water scale may accumulate depending on the water quality and must be cleared using chemicals 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.

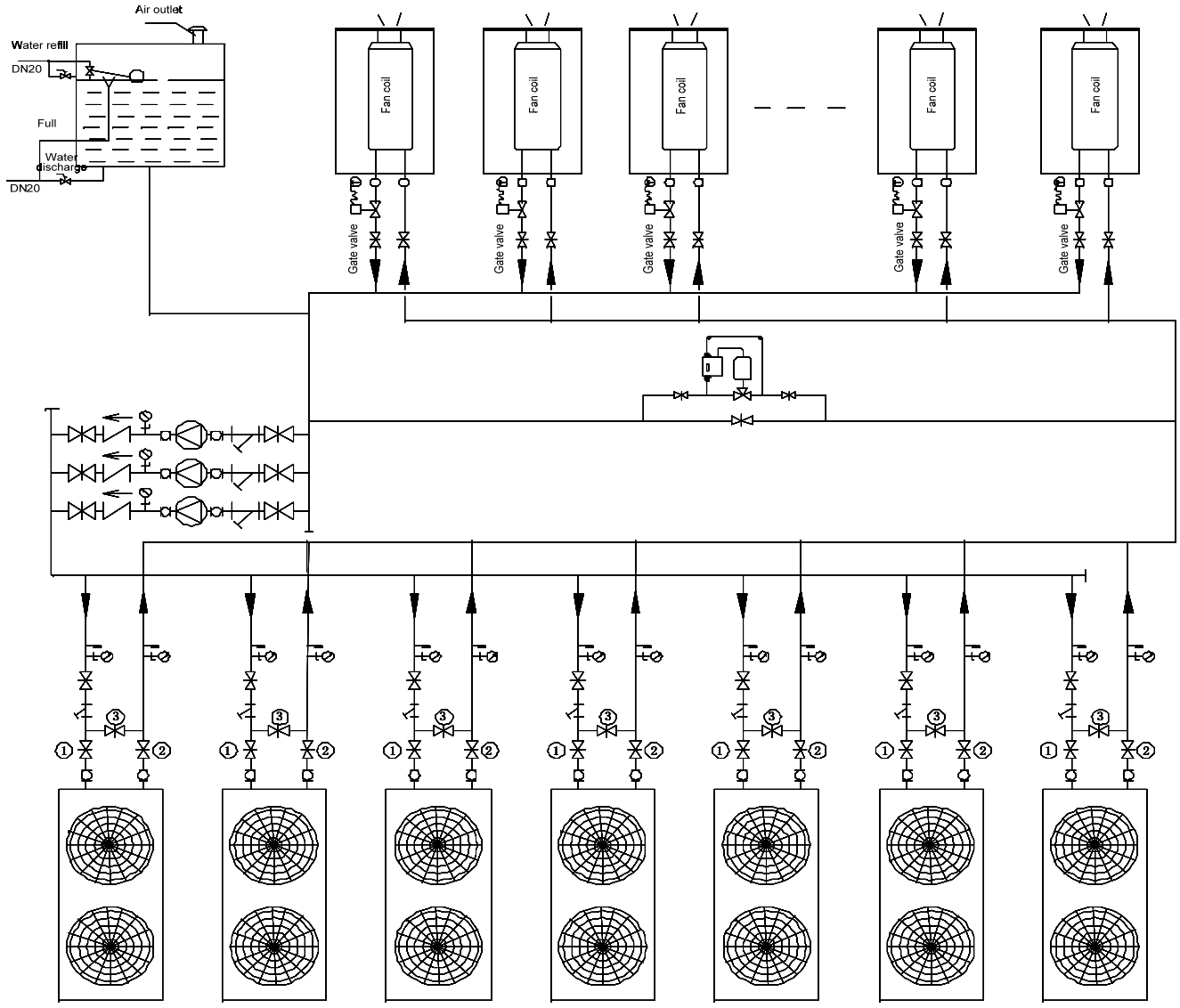
- A adiabatic water tank with a proper volume is suggested to installed. If the capacity is too small, the unit might frequently restart, which causes wear and tear on the compressor.
- An expansion water tank must be installed at the return water side of the water system to adapt to water pressure variations 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 adiabatic 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.

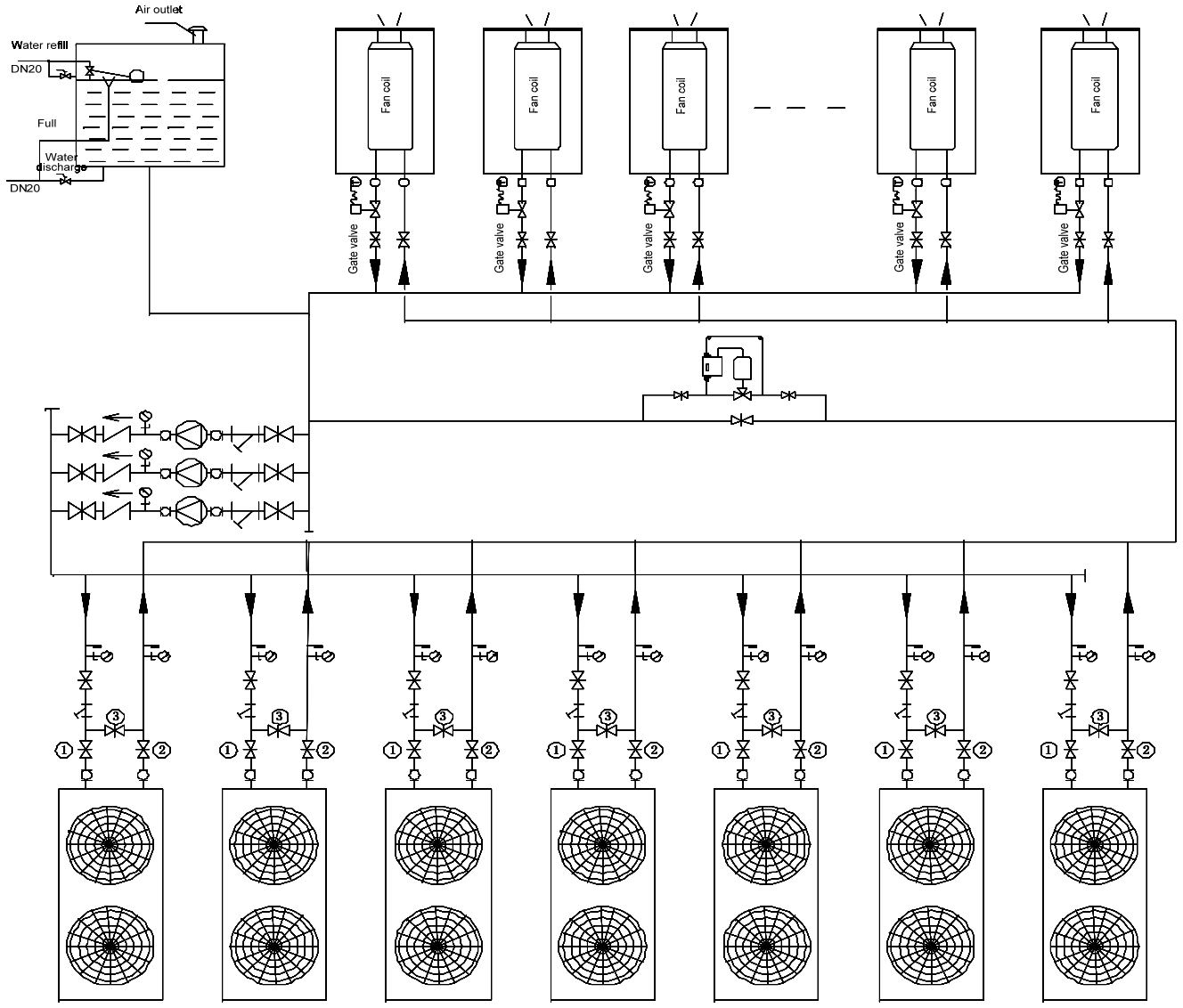
- Installation illustration for the water system of a single unit:



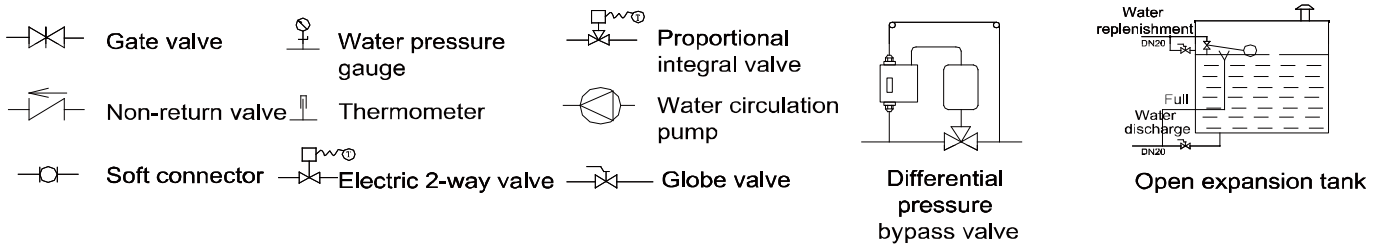
■ Multi-unit combination, illustration for water system with fixed chilled water flow which conditions indoor air by modulating the terminal air rate



■ 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:

Unit Qty.	1	2-3	4-5	6-10
Size of main connecting pipe (inch)	≥2	≥3	≥4	≥5

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".

Water Storage Tank Volume Calculating

Model	Setting temperature of return water (°C)	Minimum working volume Vmin. (l)
UAL210DM5/DS5 UAL210DRM5/DRS5	14	198
	13	234
	12	286
	11	367
	10	514
	9	857
UAL230DM5/DS5 UAL230DRM5/DRS5	14	224
	13	265
	12	324
	11	416
	10	583
	9	971

NOTES:

- *THE MINIMUM WORKING VOLUME REFERS TO THE ADDED-UP VOLUME OF THE MAIN WATER PIPE, WATER TANK AND CONSTANTLY-OPEN TERMINALS OF 2-WAY VALVES IN THE WATER CIRCULATION SYSTEM.*
- *THE ACTUAL WORKING VOLUME OF THE WATER SYSTEM MUST BE LARGER THAN VMIN; OTHERWISE THE UNIT WILL SEND OUT ALARMS AND SHUT DOWN FREQUENTLY.*
- *IF THE ACTUAL RESULTFUL VOLUME OF THE WATER SYSTEM V IS LESS THAN VMIN, PLEASE INSTALL A TANK THE VOLUME OF WHICH IS L (L=VMIN-V).*

Example for water system volume calculation:
There are 2 UAL230DR5 modular units with temperature of return water set to 12°C, a main inlet/out water pipe of DN80 and 50m long and 10 fans with coils constantly open (each has a volume of 1.5 L)
Calculation: Volume of main inlet/outlet water pipe = 3.14 * [(80/2)/100] 2 * 500 = 251 L

Volume of terminal fan coils = 10 * 1.5 = 15
According to the table above, Vmin. = 324 L

To avoid frequent unit startup/shutdown and alarms, the volume of the water tank should be no less than Vmin.
- V = 324 - 251 - 15 = 58 L

Calculating Volume of Expansion Water Tank

An expansion water tank with a proper volume must be installed to adapt to water volume changes as the temperature changes and avoid freezing burst and pressure instability at the water pump inlet.
The expansion water tank can also be used to supplement water and discharge air.
Calculating volume of expansion water tank.

$Vp=\alpha*\Delta t*Vs$

Vp----effective volume of the expansion water tank (volume of water between the signal pipe and the overflow pipe). m^3
α----volume expansion coefficient of water (α =0.0006/°C)
Δt----max. water temperature variation °C
Vs----water volume in the system (total water volume in the system and pipes) m^3

Model Selection Principles for the Water Circulation Pump

- Water flow in the water circulation pump ≥ rated water flow × 1.1
  Closed water circulation system: Water circulation pump lift ≥ (Pipe resistance of the water system + Partial resistance of the water system + Water pressure drop of the unit) × 1.1
- Open water circulation system: Water circulation pump lift ≥ (Static resistance of the water system + Pipe resistance of the water system + Partial resistance of the water system + Water pressure drop of the unit) × 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.

- Water flow range

Model		UAL210DM5/DS5	UAL210DRM5/DRS5	UAL230DM5/DS5	UAL230DRM5/DRS5
Flow range	Max. value (m^3/h)	13.4	13.4	14.6	15
	Rated value (m^3/h)	10.3	10.3	11.2	11.52
	Min. value (m^3/h)	7.2	7.2	7.8	8

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 4.5 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	Item	Checking Method	Reference Standard
1	Power supply voltage	Voltage	Rated voltage ± 10%
2	Working current of a single compressor	Current	13 - 23A
3	Working current of a single fan	Current	2 - 5A
4	Inlet water temperature in cooling operation	Temperature	15- 20°C
5	Outlet water temperature in cooling operation	Temperature	6 -15°C
6	Inlet water temperature in heating operation	Temperature	30 - 45°C
7	Inlet/outlet water temperature difference	Temperature	2 - 7°C
8	Discharge air temperature of the compressor	Temperature	65 -115°C
9	Low pressure in cooling mode	Pressure	6.5 - 10.0bar
10	High pressure in cooling mode	Pressure	22 - 41.5bar
11	Low pressure in heating mode	Pressure	3.0 - 10.0bar
12	High pressure in heating mode	Pressure	22 - 33bar
13	Vibration and operation noise	Listen or touch	No abnormal vibration or noise

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 fin 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 42)
  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-freeze in winter)					
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.

Water Processing Method

To ensure effective operation and durability, cleaning, washing and chemical processing are very important for water systems. Different types of water circuits need to be cleaned in different ways.

- Close Re-Circulation System
  Water systems of this type generally require no adjustment to subdue scale, and require no chemical to suppress mud and alga. This type of water system is recommended. Closed recycle systems may need anti-corrosion measures, including the following (for reference only):
  $NaNO_2$, borate and inhibitors for organic materials
  a. $NaNO_2$, borate and silicate
  b. High density chromate solution and pH control
  c. pH and sulfite control
  d. Polyphosphate salt and silicate
  e. Alkali, phosphate and sulfite control

Because it is hard to control water quality, for closed recycle systems, we recommend that the total density of copper pipe inhibitors such as $NaNO_2$, borax, silicate and benzothiazole should be no less than 1400 ppm. The inhibitor $NaNO_2$ is soluble in glycol, and can be used in northern areas or in the subsystem of solar power systems.

- Open Re-circulation System
  This type of water system is generally not recommended. They are exposed to the atmosphere, and are susceptible to scale, corrosion, mud and alga. Therefore, they might degrade the performance and reduce the service life of the unit.

- Once-through System
  Generally, once-through systems are only used for cooling only air conditioners. Water systems of this type use water from taps, lakes, rivers, and wells. Although the once-through system exchanges heat with the closed water circuit, it is not considered as an integral part of the water source heat pump system. Once-through systems may be troubled by either scale or corrosion. This type of water system requires large amount of adjustment water. Therefore, you need to consider the scale coefficient, the equipment used for cleaning work, and necessary anti-corrosion materials.

⚠ Caution

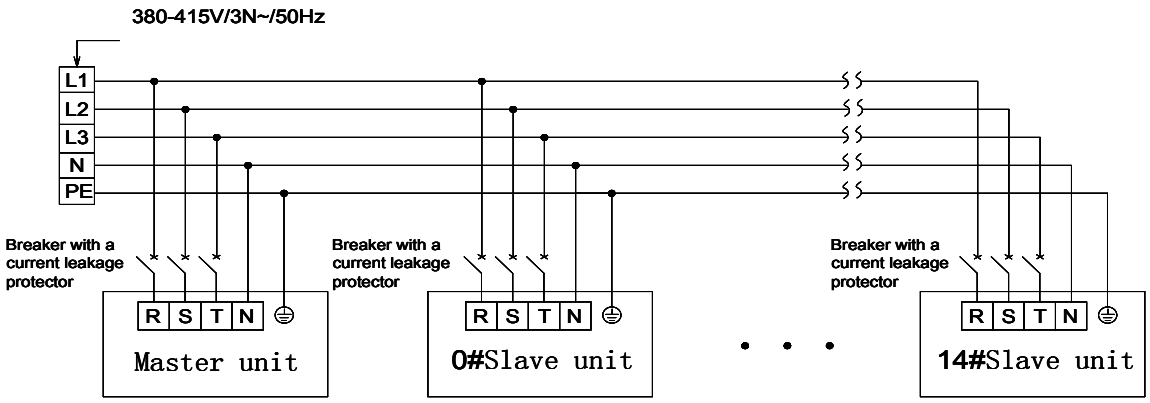
Water from lakes and rivers may cause problems such as mud and alga!

Comparison among closed recycle systems, open recycle systems and once-through systems

	Once-through System	Open Recycle System	Closed Recycle System
Scale control	1. Surface activator such as polyphosphate salt 2. Increased acidity 3. pH adjustment 4. Other considerations include: surface temperature, water temperature and system cleaning	1. Discharge 2. Surface activator such as polyphosphate salt 3. Increased acidity 4. pH adjustment 5. Softening (other considerations include: surface temperature, water temperature and system cleaning).	No control is necessary
Corrosion control	1. Low density corrosion inhibitor 2. Anti-$CaCO_2$ plate 3. pH control 4. Proper material	1. High density (200 - 500 ppm) corrosion inhibitor 2. Low density (20 - 30 ppm) corrosion inhibitor 3. pH control 4. Proper material	1. High density corrosion inhibitor 2. Proper material
Mud and alga control	1. Chloridized hydroxybenzene 2. Other chemicals 3. Chlorine formed by hypochlorite and liquid chlorine	1. Chloridized hydroxybenzene 2. Other chemicals 3. Chlorine formed by hypochlorite and liquid chlorine	No control is necessary

Control System Instruction

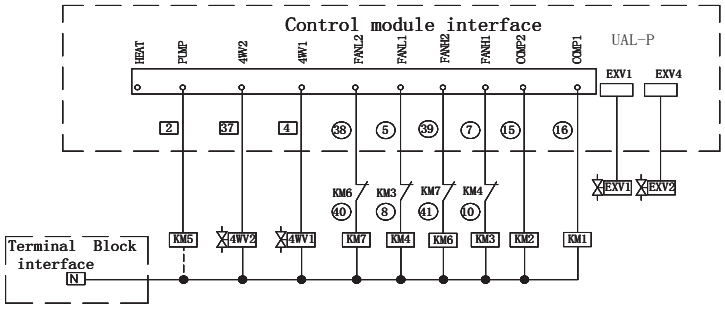
Power Cable Connection Diagram



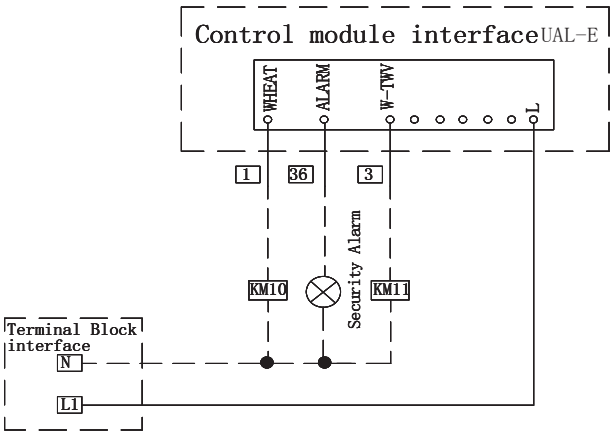
- The dimension of power cable connection refer to electical parameters.
- All wires must be securely connected.
- Wires must not contact the refrigerating pipes or moving parts of the compressor and the fan.

PCB Instruction

- **Connection illustration for the pump and the auxiliary heat exchanger**



Pump connection illustration



Connection illustration
for the auxiliary heat exchanger

NOTE:

PARTS WITHIN THE DASHED BOX ARE TO BE CONNECTED ONSITE. THE OUTPUT VOLTAGE OF THE MODULE INTERFACE IS 220-240 V.

PARTS WITHIN THE REAL-LINE BOX ARE CONNECTED BEFORE DELIVERY.

A COOLING ONLY UNIT HAS NO 4WV1 AND 4WV2 OUTPUT. A SLAVE UNIT HAS NO EXTENSION BOARD UAL-E.

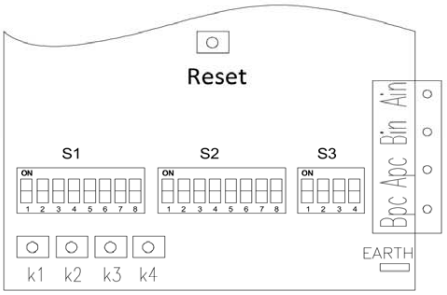
HEAT—BPHE ELECTRIC HEATER; PUMP—WATER PUMP; 4WV—4-WAY VALVE; FANL—FAN AT LOW SPEED

FANH—FAN AT HIGH SPEED; COMP—COMPRESSOR; EXV—ELECTRONIC EXPANSION VALVE

WHEAT—AUXILIARY ELECTRIC HEATER OF THE WATER SYSTEM; W-TWV—2-WAY VALVE INTERLOCK OF THE WATER SYSTEM

■ **Setting up Address Using DIP Switch**

The controller can be used to set the unit's capacity, address and slave unit number. The capacity DIP has been set at delivery time and cannot be changed. The address DIP and slave number DIP need to be set as needed after the unit is installed. Customers need to take down the address number and location of the unit and keep the record in good condition for maintenance reference.



Upward represents 1

Downward represents 0

■ **A slave unit number must be set for the master unit (not for slave units) (bits 5~8 of S1):**

Slave unit number	5	6	7	8	Slave unit number	5	6	7	8
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

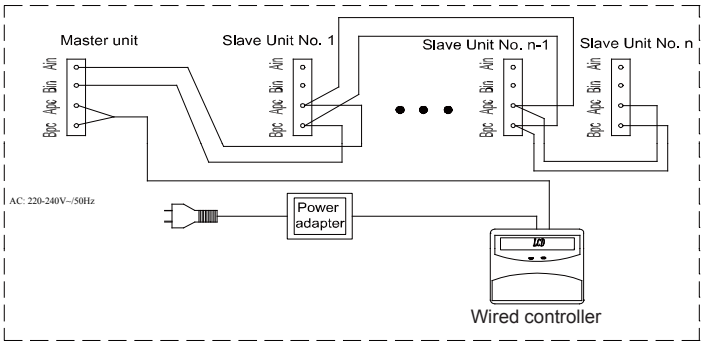
■ **DIP address setting (4~8 bits of S2):**

Address number	4	5	6	7	8	Address number	4	5	6	7	8
0	0	0	0	0	0	8	0	1	0	0	0
1	0	0	0	0	1	9	0	1	0	0	1
2	0	0	0	1	0	10	0	1	0	1	0
3	0	0	0	1	1	11	0	1	0	1	1
4	0	0	1	0	0	12	0	1	1	0	0
5	0	0	1	0	1	13	0	1	1	0	1
6	0	0	1	1	0	14	0	1	1	1	0
7	0	0	1	1	1	15	0	1	1	1	1

The address number of the master unit must be set to 0#, and that of the slave units should follow this.
Address numbers must be unique in te same system.

■ Communication between master and slave unit

A) The unit can only be powered on and commissioned after the address numbers are configured.
B) Control (Communication) Wire Connection



A) conductor (WTC pair with cross section area of at least 0.5mm^2 or 20AWG); B) insulator; C) Screen layer (twisted WTC with a screening factor no less than 95%); D) Outer jacket (PVC);

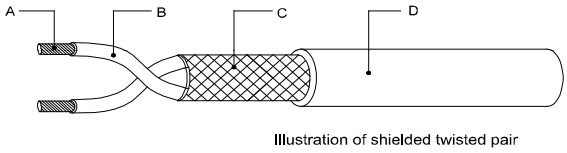
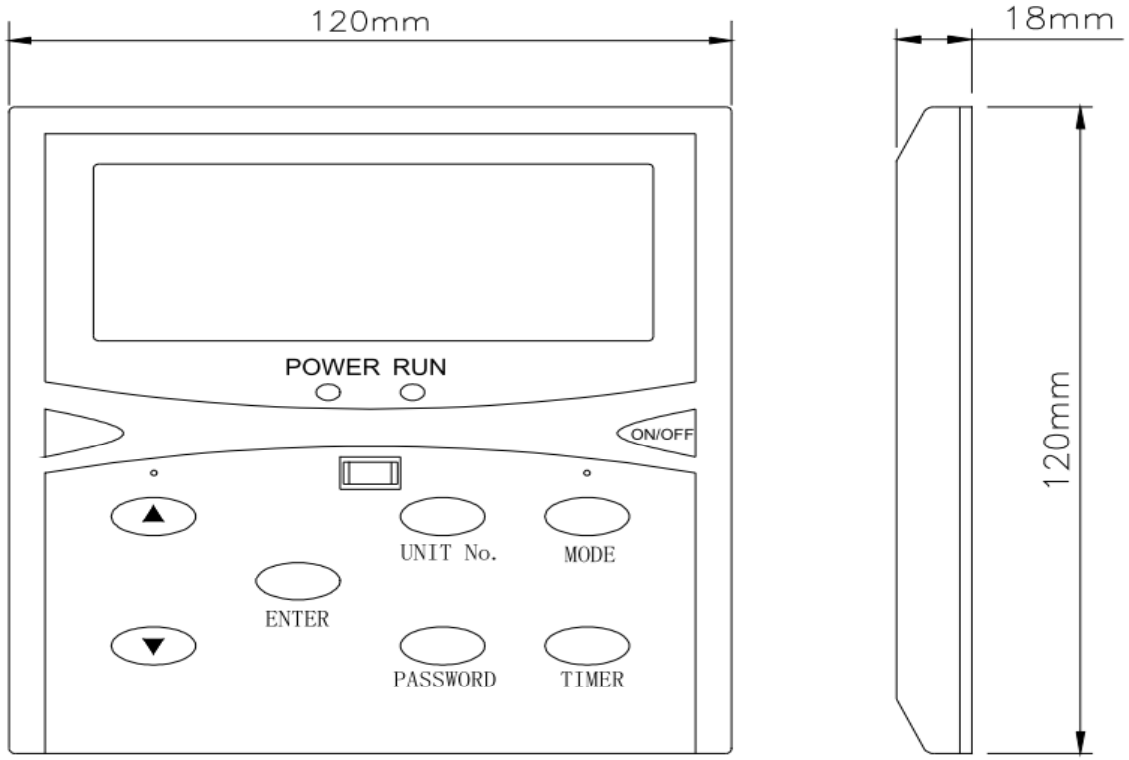


Illustration of shielded twisted pair

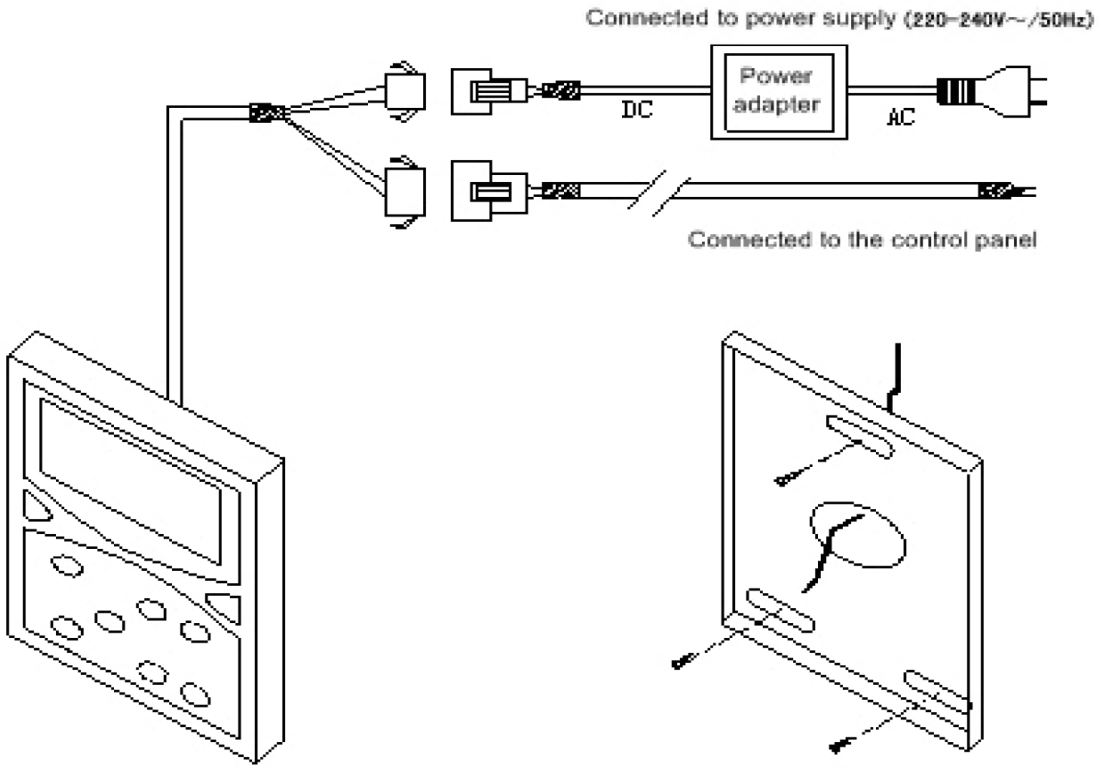
NOTE:
BETTER CHOOSE NETWORK CABLES WITH A TENSER SHIELDING LAYER AND SMALLER TWISTING DISTANCE.
PLEASE REFER TO THE UL2547 OR UL2791 WIRE SPECIFICATION.
THE CONTROL WIRE MUST NOT BE LONGER THAN 1000 METERS.
THE CONTROL WIRE MUST BE AT LEAST 20CM AWAY FROM MAJOR CURRENT WIRE.

Wired Controller Instruction

Dimensions



Controller Installation



Functions

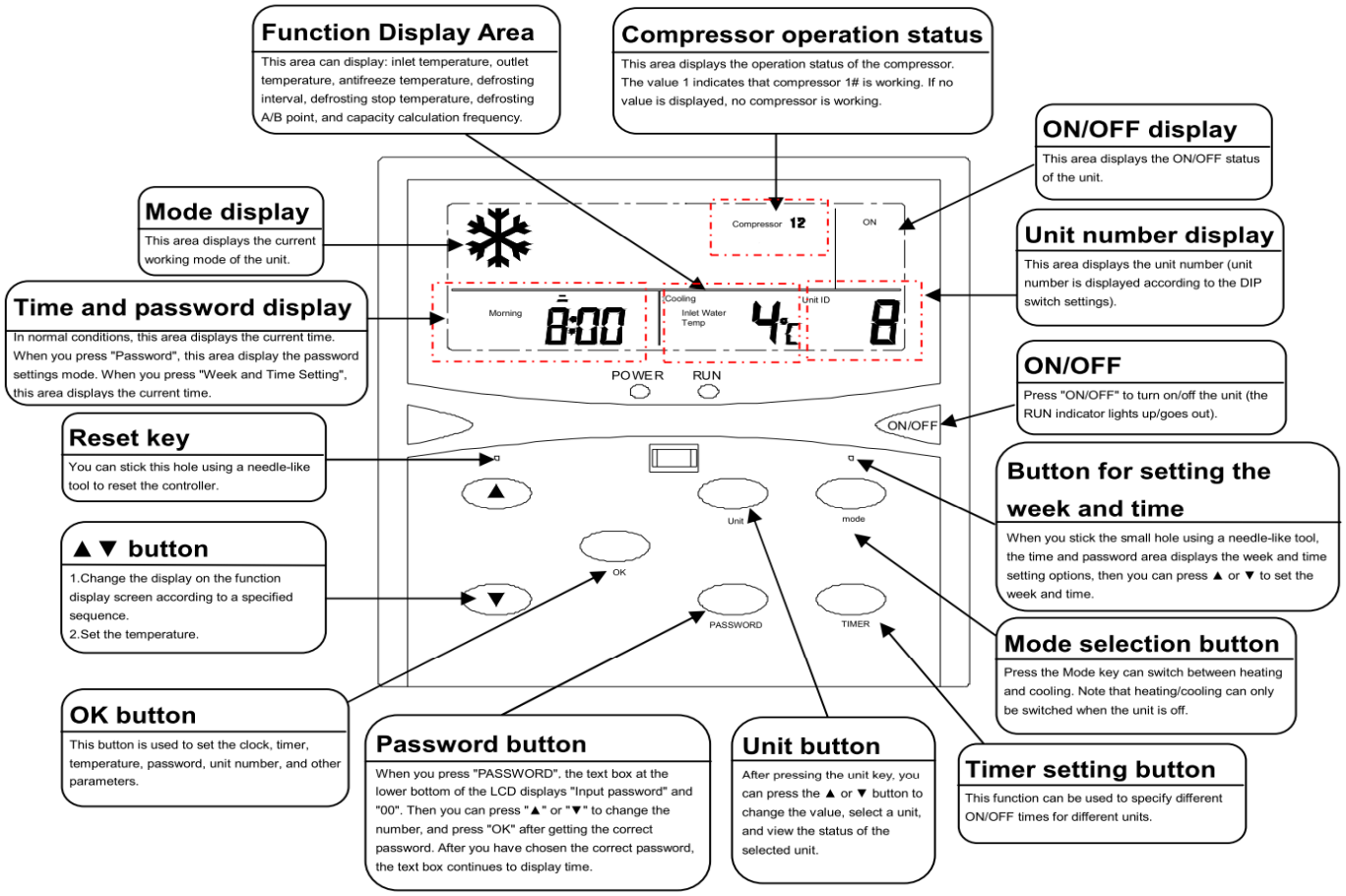
MC305 is a wall-mounted LCD controller which directly controls air conditioners through keys on its panel.

1) Features

Two operation modes: heating/cooling (note: operation modes can only be switched when the unit is off)
Temperature setting range for inlet water: cooling 9°C - 25°C; heating 25°C - 50°C; Temperature setting range for inlet water: cooling 9°C - 25°C (-10°C - 10°C for units with low water temperature); heating 25°C - 50°C.

- Temperature setting range for anti-freeze: 2°C - 5°C.
- A LED is used to indicate the status of the unit (ON/OFF).
- Timed ON/OFF: a timing schedule can be set for a maximum of 7 days with up to 4 timed actions each day.
- Real-time clock.
- Error code display speeds up diagnosis.
- Blue back light will shine 8 second if any key is pressed, it makes sure that we can browse or modify parameters even in dark.

2) Use Specification



The control system has the following functions:

S/N	Function	S/N	Function
1	Controlling the 2-way valve of the water system (relevant accessories need to be purchase separately);	11	Timing
2	Anti-freeze protection for plate heat exchanger	12	Protection for Compressors in Operation
3	Alternative defrosting	13	Averaging Workload among Compressors
4	Manual defrosting	14	Failure alarm, viewing and output
5	2-way Valve Interlock Control	15	Memorizing parameters in the case of a power failure
6	Week Setting	16	Setting and resetting the operating parameters of the unit
7	Status display	17	Electric heater
8	Auto-startup at power on	18	Setting the clock of the system
9	Setting the serial number of a unit	19	Displaying the indoor and inlet water temperatures
10	Memorizing the clock settings in the case of a power failure		

Settings

1) Parameter Viewing

The controller can be used to view the operation status and parameters of any unit connected to it.
Parameters can be view include operation status of the compressor, inlet/outlet water temperature, timer setting, cooling antifreeze temperature setting, antifreeze temperature setting in winter, defrosting temperature, and so on.
After pressing the "UNIT" key, you can increase/decrease the blinking unit No. and view the parameters of the current unit by pressing "▲" or "▼". To view more working parameters of a unit, you can press "OK" and "▲" or "▼" after reaching the unit No.

2) Setting Parameters (parameters can be set only when the unit is turned off)

① When you press "PASSWORD", the text box at the lower bottom of the LCD displays "Input password" and "00". Then you can press "▲" or "▼" to change the number, and press "OK" after getting the correct password (the default password set in factory is "55"). After you have chosen the correct password, the parameters to be set blinks, and you can perform the following settings:

② Change operation parameters: after choosing the correct password, you can change operation parameters by following steps ② → ③ → ④ .

Change password: after choosing the correct password, you can change the password by pressing "PASSWORD" again. In this case, the text box displays "00" and you can change the number by pressing "▲" or "▼". After reaching the number you want to set as the password, you can complete password setting and exit the parameter setting mode by pressing "OK".

After pressing the "UNIT" key, you can increase/decrease the blinking unit No. by pressing "▲" or "▼", and set operation parameters (including inlet water temperature for cooling/heating mode) for the desired unit by pressing "OK" after reaching the unit No. You can choose and set parameters by pressing "▲" or "▼" and then press "OK" to save the setting.

Repeat step ② to set other parameters (note: the controller quits the parameter setting mode if no key is pressed within 60 seconds).

3) Real Time Setting

To set week and time, stick the small hole above the "MODE" key using a needle-like tool (the LCD displays "Weekday Setting"); press "▲" or "▼" to choose the weekday; stick the small hole again to save weekday setting (the LCD displays "Time Setting" and the time starts to blink); press "▲" to change the hour and "▼" to change the minute; and stick the small hole again to save time setting.

4) Timer Setting

① After pressing "TIMING", the LCD displays "Week Setting" and "Timer Setting" at the same time. Then you can press "▲" or "▼" to choose the weekday and press "OK" to save the weekday setting. The LCD now displays "Timer Setting", and you can continue to set the times of timing.

② Press "▲" or "▼" to set the number of timed actions for the day (you can set 4, as indicated above Unit No.) Select a timed action and press OK to select the action (timed ON/OFF).

③ Press "▲" or "▼" to select "Timed On" or "Timed Off" and press "OK". Now the LCD displays "Timer Setting" and "Time Setting" and the time displayed starts to blink.

④ You can press "▲" to change the hour and "▼" to change the minute" and press "OK" to save the time setting. Now the LCD displays "Timer Setting" and returns to step ③ . You can continue to set other timed actions for a whole week and then quit this setting mode.

⑤ To cancel a timed action, set the time for this action to 00:00. To cancel all timed actions, press "MODE" + "UNIT" until you hear a long beeping sound.

NOTE: TIMED ON/OFF ACTIONS ARE TRIGGERED WHEN THE TIME OF THE WIRED CONTROLLER REACHES THE SET TIME. THEREFORE, IF THE TIME OF THE WIRED CONTROLLER IS INACCURATE, THE ACTUAL ON/OFF TIME COULD ALSO BE INACCURATE. IN THE TIMING PROCESS, IF YOU DO NOT PRESS ANY KEY IN FIVE SECONDS AFTER PRESSING THE UNIT, MODE, OR PASSWORD BUTTON, THE TIMING PROCESS IS TERMINATED AND THE RESULT IS NOT SAVED. THE DEFAULT TIME SETTING IS 00:00.

5) Manual Defrost

When the unit works in heating mode, press "▲" or "▼" until "Manual Defrosting" appears, and then press "OK" to enter Manual Defrosting mode.

6) Reset

The controller can be reset by sticking the small hole above the "▲" key using a needle-like tool.

Error Code

S/N	Code	Symptoms	S/N	Code	Symptoms
1	0	0#-slave communication failure	19	36	Low pressure of #2
2	01 ~ 13	1# ~ 13# slave communication failure	20	37	Superheat of #2 is too low
3	14	14# slave communication failure	21	38	Refrigerant leakage in #1
4	16	Overload of compressor/fan in #1	22	39	Refrigerant leakage in #2
5	17	Overload of compressor/fan in #2	23	40	TH1 temperature sensor malfunction
6	18	Pump overload	24	41	TH2 temperature sensor malfunction
7	19	Water flow is too small	25	42	TH3 temperature sensor malfunction
8	20	High pressure of #1	26	43	TH4 temperature sensor malfunction
9	21	Low pressure of #1	27	45	TH6 temperature sensor malfunction
10	24	High pressure of #2	28	46	TH7 temperature sensor malfunction
11	25	Temperature of inlet/outlet water is too low	29	47	TH8 temperature sensor malfunction
12	26	Overload of electric heater in water system	30	48	TH9 temperature sensor malfunction
13	27	Ambient temperature is too high/low	31	49	TH10 temperature sensor malfunction
14	29	Superheat of #1 is too low	32	50	TH11 temperature sensor malfunction
15	32	suction temperature #1 is too high	33	51	TH12 temperature sensor malfunction
16	33	discharge temperature #1 is too high	34	52	Low pressure sensor malfunction of #2
17	34	suction temperature #2 is too high	35	53	Low pressure sensor malfunction of #1
18	35	discharge temperature #2 is too high	36	F6	Communication failure between wired controller and master unit

Error Code and Running Status

■ Characters displayed by the LED indicator are explained in the following table

Character	Meaning	Character	Meaning	Character	Meaning	Character	Meaning	Character	Meaning	Character	Meaning
0	0/O	2	2	4	4	6	6	8	8	A	A
1	1	3	3	5	5	7	7	9	9	b	B

Character	Meaning	Character	Meaning	Character	Meaning	Character	Meaning	Character	Meaning	Character	Meaning
C	C	E	E	H	H	n	N	r	R	U	U
d	D	F	F	L	L	P	P	t	T	y	Y

■ Codes representing normal operation statuses are explained in the following table

Code	Status	Code	Status	Code	Status
nULL	NULL: standby	CSP	CSP: shutdown during cooling	HEAt	HEAT: heating
rESt	REST: reset	dEF	DEF: defrosting	HSP	HSP: shutdown during heating
COOL	COOL: cooling				

Cause for Failure and Troubleshooting

S/N	Error code	Description	Possible causes for the failure	Solution
1	Wired controller	Communication failure between wired controller and master unit	1. A/B communication lines of the wired controller and master unit are incorrectly connected.	Check and troubleshoot the communication lines.
	F6 alarm		2. The communication line has broken off.	
			3. Communication wires between the wired controller and the master unit cross over strong-current cables.	Rewire the unit, use shielded communication lines or keep the communication lines away from strong current cables.
			4. Control panel of the master unit is not powered on.	Check and troubleshoot the control panel
			5. The communication line between the master unit and the wired controller is too long.	1. Use shield lines 2. Short the JP7 jumper on the control panel
			6. Can communicate with the monitoring software while the wired controller sends out the alarm F6	Remove the R44 resistor on the wired controller or replace the wired controller
			7. Failure of communication ports on the control panel of the master unit	Replace
			8. Failure of communication ports on the wired controller	Replace
			9. Incorrect address setting for the master unit	Reset the S2 DIP switch of the master unit according to the technical specifications.
2	The LED indicator of the unit displays ECXX and the wired controller displays XX (XX represents 00 ~ 14)	Communication failure of Slave Unit No. XX	1. Communication line of Slave Unit No. XX has broken off	Check and troubleshoot the communication lines.
			2. The control panel of Slave Unit No. XX is not powered on.	Check and troubleshoot the control panel
			3. Incorrect DIP address setting for the slave unit	Reset the addresses of all slave units and check that there is no duplicate address
			4. The number of slave unit is set incorrectly for the master unit.	Reset the number of slave units and check that the number match with all the addresses
			5. The PC communication port of the slave unit has broken down	1. Exchange positions of the two 485 on Slave Unit No. XX 2. Replace the control panel
			6. The communication line of Slave Unit No. XX is incorrectly connected.	Connect the communication line of Slave Unit No. XX to Apc/Bpc port
3	The LED indicator of the unit displays EC78	Communication failure for all slave units	1. The Bin/Ain communication line of the master unit has broken off	Reconnect the communication line to the Bin/Ain port and screw down the wire terminal
			2. One of the A/B communication lines is connected incorrectly	Check the communication line
			3. The Bin/Ain port of the master unit has broken down	Replace the control panel of the master unit

S/N	Error code	Description	Possible causes for the failure	Solution
4	The LED indicator of the unit displays ER16 and the wired controller displays 16	Compressor overload in #1	Over current in the compressor has triggered the overload protector.	1. Check whether the electric current parameter of the overload protector is configured correctly by referring to the electric circuit. 2. Check whether the resistor of the malfunctioned compressor meets specification requirements.
		Fan overload in #1	Over current in the fan has triggered the overload protector.	1. Check whether the electric current parameter of the overload protector is configured correctly by referring to the electric circuit. 2. Check whether the resistor of the malfunctioned fan meets specification requirements.
5	The LED indicator of the unit displays ER17 and the wired controller displays 17	Compressor overload in #2	Over current in the compressor has triggered the overload protector.	1. Check whether the electric current parameter of the overload protector is configured correctly by referring to the electric circuit. 2 Check whether the resistor of the malfunctioned compressor meets specification requirements.
		Fan overload in #2	Over current in the fan has triggered the overload protector.	1. Check whether the electric current parameter of the overload protector is configured correctly by referring to the electric circuit. 2. Check whether the resistor of the malfunctioned fan meets specification requirements.
6	The LED indicator of the unit displays ER18 and the wired controller displays 18	Pump overload	Over current in the pump has triggered the overload protector.	1. Check whether the electric current parameter of the overload protector is configured correctly for the pump by referring to the electric circuit. 2. Check whether the resistor of the malfunctioned pump meets specification requirements.
7	The LED indicator of the unit displays ER19 and the wired controller displays 19	Alarm from the differential water pressure switch	1. The pump model is too small	Replace the pump
			2. The water filter is clogged up	Clean the water filter
			3. Air in the water system is not completely discharged	Turn on the pump to further discharge residual air
			4. The differential water pressure switch is clogged up	Repair or replace the differential water pressure switch
			5. The differential water pressure switch has broken down	Replace the differential water pressure switch
			6. Pressure drop in the water system is too sharp and unbalanced	Optimize the water system
			7. Other parts in the water system are clogged up	Check and repair

S/N	Error code	Description	Possible causes for the failure	Solution
8	The LED indicator of the unit displays ER20 and the wired controller displays 20	Low pressure of #1	1. The motor has broken down (cooling)	Check and troubleshoot
			2. Circulatory air is shorted (cooling)	
			3. The heat exchanger needs cleaning (cooling)	
			4. The fluorine-side filter is clogged up	Check and replace
			5. The water temperature is too high (heating)	Tune down the water temperature
			6. The water flow is too small (heating)	Check and troubleshoot
			7. The water filter is clogged up (heating)	Clean the water filter
			8. The ambient temperature is too high (cooling)	OFF
			9. Too much refrigerant	Release a proper amount of refrigerant
			10. Failure of high-voltage modular output port	Replace the module
			11. The switch has broken down	Replace pressure switch
9	The LED indicator of the unit displays ER21 and the wired controller displays 21	Low pressure of #1	1. Malfunction of heat exchanger during heating	Check and troubleshoot the outdoor unit
			2. Malfunction of motor during heating	Check and troubleshoot the outdoor motor
			3. Insufficient refrigerant or leakage	Check and replenish refrigerant
			4. Failure of low-voltage modular input port	Replace the module
			5. The low pressure sensor has broken down	Replace the pressure sensor
10	The LED indicator of the unit displays ER24 and the wired controller displays 24	High pressure of #2	1. The motor has broken down (cooling)	Check and troubleshoot
			2. Circulatory air is shorted (cooling)	
			3. The heat exchanger needs cleaning (cooling)	
			4. The fluorine-side filter is clogged up	Check and replace
			5. The water temperature is too high (heating)	Tune down the water temperature
			6. The water flow is too small (heating)	Check and troubleshoot
			7. The water filter is clogged up (heating)	Clean the water filter
			8. The ambient temperature is too high (cooling)	OFF
			9. Too much refrigerant	Release a proper amount of refrigerant
			10 Failure of high-voltage modular output port	Replace the module
			11. The switch has broken down	Replace pressure switch
11	The LED indicator of the unit displays ER25 and the wired controller displays 25	Temperature of inlet/outlet water is too low	1. The temperature of return water is set too low	Change the temperature setting for return water
			2. The water flow is too small, resulting in a large pressure drop	Check the water system (see Item 7 in the table)

S/N	Error code	Description	Possible causes for the failure	Solution
12	The LED indicator of the unit displays ER26 and the wired controller displays 26	Overload of electric heater in water system	1. Check whether the water system is equipped with an electric heater	Short the overload switch for the electric heater if there is no electric heater in the water system
			2. The heating wire of the electric heater in the water system is shorted	Replace the electric heater of the water system
13	The LED indicator of the unit displays ER27 and the wired controller displays 27	Ambient temperature is too high/ low	1. The ambient temperature sensor has broken down	Replace the ambient temperature sensor
			2. The ambient temperature is too high/low	OFF
14	The LED indicator of the unit displays ER29 and the wired controller displays 29	Superheat of #1 is too low	1. The low pressure sensor or temperature sensor has broken down	Replace
			2. The electronic expansion valve fails to provide proper control	Upgrade the modular program
15	The LED indicator of the unit displays ER31	Communication failure between the master unit and slave units	1. Communication line of the slave unit has broken off	Check and troubleshoot the communication lines.
			2. Incorrect DIP address setting for the slave unit	Reset the addresses of all slave units and check that there is no duplicate address
			3. The number of slave unit is set incorrectly for the master unit	Reset the number of slave units and check that the number match with all the addresses
			4. The PC communication port of the slave unit has broken down	1. Exchange positions of the two 485 on the slave unit 2. Replace the control panel of the unit
			5. The communication line of the slave unit is incorrectly connected	Connect the communication line of the slave unit to the Apc/Bpc port
16	The LED indicator of the unit displays ER32 and the wired controller displays 32	Temperature of return air in #1 is too high (40°C)	1. The slider of the 4-way valve is jammed in the middle	Restart the unit and slap slightly on both sides of the 4-way valve. If the problem persists, replace the 4-way valve.
			2. The winding of the 4-way valve operates abnormally	Replace the winding
			3. The temperature of discharge air is too high and has triggered the racing protector of the compressor	(see Item 17 in the table)
17	The LED indicator of the unit displays ER33 and the wired controller displays 33	Temperature of discharge air in #1 is too high	1. The fan motor has broken down (cooling)	Check and troubleshoot the unit
			2. Circulatory air is shorted (cooling)	
			3. The heat exchanger needs cleaning (cooling)	
			4. The electronic expansion valve is not opened as expected (heating)	Check and troubleshoot the electronic expansion valve
			5. The water temperature is too high	Change the setting for return water temperature (to be performed by service personnel)
			6. Insufficient refrigerant or leakage	Replenish a proper amount of refrigerant
			1. Incomplete defrosting	Change the defrosting parameter (to be performed by service personnel)

S/N	Error code	Description	Possible causes for the failure	Solution
18	The LED indicator of the unit displays ER34 and the wired controller displays 34	Temperature of return air in #2 is too high (40°C)	1. The slider of the 4-way valve is jammed in the middle	Restart the unit and slap slightly on both sides of the 4-way valve. If the problem persists, replace the 4-way valve.
			2. The winding of the 4-way valve operates abnormally	Replace the winding
			3. The temperature of discharge air is too high and has triggered the racing protector of the compressor	(see Item 19 in the table)
19	The LED indicator of the unit displays ER35 and the wired controller displays 35	Temperature of discharge air in #2 is too high	1. The fan motor has broken down (cooling)	Check and troubleshoot the unit
			2. Circulatory air is shorted (cooling)	
			3. The heat exchanger needs cleaning (cooling)	
			4. The electronic expansion valve is not opened as expected (heating)	Check and troubleshoot the electronic expansion valve
			5. The water temperature is too high	Change the setting for return water temperature (to be performed by service personnel)
			6. Insufficient refrigerant or leakage	Replenish a proper amount of refrigerant
			7. Incomplete defrosting	Change the defrosting parameter (to be performed by service personnel)
20	The LED indicator of the unit displays ER36 and the wired controller displays 36	Low pressure of #2	1. Malfunction of heat exchanger during heating	Check and troubleshoot the outdoor unit
20	The LED indicator of the unit displays ER36 and the wired controller displays 36	Low pressure of #2	2. Malfunction of motor during heating	Check and troubleshoot the outdoor motor
			3. Insufficient refrigerant or leakage	Check and replenish refrigerant
			4. Failure of low-voltage modular input port	Replace the module
			5. The low pressure sensor has broken down	Replace the pressure sensor
21	The LED indicator of the unit displays ER37 and the wired controller displays 37	Superheat of #2 is too low	1. The low pressure sensor or temperature sensor has broken down	Replace
			2. The electronic expansion valve fails to provide proper control	Upgrade the modular program
22	The LED indicator of the unit displays ER38 and the wired controller displays 38	Refrigerant leakage in #1	1. Low pressure sensor failure	Replace the low pressure sensor
			2. Insufficient refrigerant	Add refrigerant
23	The LED indicator of the unit displays ER39 and the wired controller displays 39	Refrigerant leakage in #2	1. Low pressure sensor failure	Replace the low pressure sensor
			2. Insufficient refrigerant	Add refrigerant

S/N	Error code	Description	Possible causes for the failure	Solution
24	The LED indicator of the unit displays ER40	TH1 temperature sensor failure	1. TH1 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH1 temperature sensor is shorted/open	Test whether the resistance of TH1 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
25	The LED indicator of the unit displays ER41	TH2 temperature sensor failure	1. TH2 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH2 temperature sensor is shorted/open	Test whether the resistance of TH2 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
26	The LED indicator of the unit displays ER42	TH3 temperature sensor failure	1. TH3 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH3 temperature sensor is shorted/open	Test whether the resistance of TH3 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
27	The LED indicator of the unit displays ER43	TH4 temperature sensor failure	1. TH4 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH4 temperature sensor is shorted/open	Test whether the resistance of TH4 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
28	The LED indicator of the unit displays ER45	TH6 temperature sensor failure	1. TH6 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH6 temperature sensor is shorted/open	Test whether the resistance of TH6 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
29	The LED indicator of the unit displays ER46	TH7 temperature sensor failure	1. TH7 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH7 temperature sensor is shorted/open	Test whether the resistance of TH7 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module

S/N	Error code	Description	Possible causes for the failure	Solution
30	The LED indicator of the unit displays ER47	TH8 temperature sensor failure	1. TH8 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH8 temperature sensor is shorted/open	Test whether the resistance of TH8 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
31	The LED indicator of the unit displays ER48	TH9 temperature sensor failure	1. TH9 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH9 temperature sensor is shorted/open	Test whether the resistance of TH9 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
32	The LED indicator of the unit displays ER49	TH10 temperature sensor failure	1. TH10 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH10 temperature sensor is shorted/open	Test whether the resistance of TH10 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
33	The LED indicator of the unit displays ER50	TH11 temperature sensor failure	1. TH11 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH11 temperature sensor is shorted/open	Test whether the resistance of TH11 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
34	The LED indicator of the unit displays ER51	TH12 temperature sensor failure	1. TH12 temperature sensor is not properly plugged or has broken off	Check the control module and re-plug the temperature sensor
			2. TH12 temperature sensor is shorted/open	Test whether the resistance of TH12 sensor meets specification requirements/replace if not
			3. There is something wrong with the test circuit of the temperature sensor in the control module	Replace the control module
35	The LED indicator of the unit displays ER52	Low pressure sensor failure of #2	1. Three lines of the low pressure sensor is incorrectly connected	Reconnect the connecting lines of the low pressure sensor
			2. The low pressure sensor is shorted/open	Repair or replace the lines of the low pressure sensor
			3. The Low pressure sensor has broken down	Replace the low pressure sensor
			4. There is something wrong with the test circuit of the low pressure sensor in the control module	Replace the control module

S/N	Error code	Description	Possible causes for the failure	Solution
36	The LED indicator of the unit displays ER53	Low pressure sensor failure of #1	1. Three lines of the low pressure sensor is incorrectly connected	Reconnect the connecting lines of the low pressure sensor
			2. The low pressure sensor is shorted/open	Repair or replace the lines of the low pressure sensor
			3. The Low pressure sensor has broken down	Replace the low pressure sensor
			4. There is something wrong with the test circuit of the low pressure sensor in the control module	Replace the control module

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.

MOODY INTERNATIONAL CERTIFICATION UKAS QUALITY MANAGEMENT 014

The air conditioners manufactured by Daikin Industries have received **ISO 9001 series** certification for quality assurance.

Certificate Number. 9601019

BSI UKAS ENVIRONMENTAL MANAGEMENT 003

The airconditioning factories of Daikin Industries have received environmental management system standard **ISO 14001** certification.

Certificate Number. EMS80362

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

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