



# YORK<sup>®</sup>

## AIR-COOLED FULL DC INVERT CHILLER/HEAT PUMP

Installation , Operation & Maintenance Manual

FORM NO.: 6U8A-A04C-NA-EN

YMAE045XRME50 YMAE065XRME50

AIR-COOLED FULL DC INVERT CHILLER/HEAT PUMP



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## GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During rigging, installation, operation, maintenance, or service, individuals may be exposed to certain components or conditions including, but not limited to: heavy objects, refrigerants, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of rigging, installation, and operating service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized rigging, installation, and operating/service personnel. It is expected that these individuals possess independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood the on-product labels, this document and any referenced materials. This individual shall also be familiar with and comply with all applicable industry and governmental standards and regulations pertaining to the task in question.

Pay attention to keep this document and you can acquire it from **local authorized YORK service center** in case it would be lost.

## SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to specific situations:



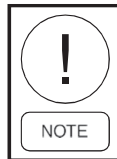
***Indicates a possible hazardous situation which will result in death or serious injury if proper care is not taken.***



***Identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution if proper care is not taken or instructions are not followed.***



***Indicates a potentially hazardous situation which will result in possible injuries or damage to equipment if proper care is not taken.***



***Highlights additional information useful to the technician in completing the work being performed properly.***



***External wiring, unless specified as an optional connection in the manufacturer's product line, is not to be connected inside the control cabinet. Devices such as relays, switches, transducers and controls and any external wiring must not be installed inside the micro panel. All wiring must be in accordance with Johnson Controls' published specifications and must be performed only by a qualified electrician. Johnson Controls will NOT be responsible for damage/problems resulting from improper connections to the controls or application of improper control signals. Failure to follow this warning will void the manufacturer's warranty and cause serious damage to property or personal injury.***

**WARRANTY**

YORK warrants all equipment and materials against defects in workmanship and materials for a period of 36 months from the date of purchase or shall not exceed 42 months from the date of production, whichever occurs first, unless labor or extended warranty has been purchased as part of the contract.

The warranty is limited to parts only replacement and shipping of any faulty part, or sub-assembly, which has failed due to poor quality or manufacturing errors. All claims must be supported by evidence that the failure has occurred within the warranty period, and that the unit has been operated within the designed parameters specified.

All warranty claims must specify the unit model, serial number, order number and run hours/starts. Model and serial number information is printed on the unit identification plate.

The unit warranty will be void if any modification to the unit is carried out without prior written approval from Johnson Controls.

For warranty purposes, the following conditions must be satisfied:

- a) The initial start of the unit must be carried out by trained personnel from an Authorized Johnson Controls Service Center.
- b) Only genuine YORK approved spare parts, oils, coolants, and refrigerants must be used.
- c) All the scheduled maintenance operations detailed in this manual must be performed at the specified times by suitably trained and qualified personnel.
- d) Failure to satisfy any of these conditions will automatically void the warranty.



1. The installation must be carried out by trained professionals, Don't start work without authorization. Improper installation will cause leakage, electric shock or fire.
2. The start-up of the machine must be carried out by professional maintenance personnel of the professional York Company Maintenance Service Center or designated special company personnel.
3. Only use the various spare parts provided by York Company. Incorrect components may cause leaks, electric shock, fire, or air conditioning to not function properly.
4. All machine operation and maintenance items specified in this manual must be carried out in strict accordance with the specified time and frequency.
5. Air conditioning should be installed in a solid place sufficient to carry its weight, load-bearing surface should be reliable, horizontal, easy to install. Please take into account the impact of strong winds, typhoons and earthquakes, reinforcement installation. Improper installation, will cause air conditioning to fall, resulting in accidents.
6. Be sure to use a separate circuit to power. All electrical work must be carried out in accordance with local laws and regulations, with reference to this installation instruction, and with a professionally qualified electrician. Insufficient capacity or improper electrical work can cause electric shock or fire.
7. Leak breakers must be installed. There is a risk of electric shock or fire without installing a leakage circuit breaker.
8. The machine must be grounded. Ground wires cannot be connected to gas pipes, water pipes, lightning rods, or telephone lines. Poor grounding can cause electric shock, fire, or machine failure.
9. The use of oxygen or any flammable gas for airtight testing is strictly prohibited, May cause and serious accidents

and personal injury.

10. During installation, in the event of a refrigerant leak, open the doors and windows immediately to ventilate. The refrigerant itself is safe, but an open fire can produce toxic gases and can cause suffocation.
11. After installation, it is necessary to check for refrigerant leaks. If there is a refrigerant leak in the room, encountering fire sources, such as heaters, etc. will produce toxic gases, when reached a certain concentration, may cause personnel asphyxiation.
12. If there is a refrigerant leak, do not touch the refrigerant leaking refrigerant directly from the refrigerant fitting. Failure to do so will cause frostbite.
13. After power off completely, Can contact with electrical components.
14. Do not touch the switching part with a wet hand, which may cause electric shock.
15. Don't let the children climbed up the outdoor units, or beside the machine to play, to prevent children hurt.



1. Please pay special attention to the handling of the product. Do not pull the lifting of the pack strap to prevent the packing belt from breaking, damaging the unit and personal injury.
2. The storage environment temperature should not exceed 48°C, avoid direct sunlight.
3. The air-cooled coil heat exchanger on the unit should be covered. Especially in the construction area Can't be open storage, in order to prevent the fins dirty blocking. If the unit is ready to be stored for a period of time before installation, some protective measures should be taken to prevent damage, rust or wear.
4. Please place the packaging material properly. Packaging materials such as nails and wood may cause stab wounds or other injuries.
5. The unit may not be installed in a working environment with pollution level 4 (environmental conditions specified by GB14048.1-2006).
6. Installed indoor machines, outdoor machines, enamel water tanks, power lines and communication lines, should be kept with television, radio and other equipment at least one meter or more, in order to avoid interference or noise.
7. The unit may not be installed in some places where the machine is not suitable:
  - a) Where mineral oil fumes, sprays or steam are dispersed, causing deterioration and damage to machine plastic parts
  - b) Places with corrosive gases, salt spray and severe dust (such as coal ash, metal dust, etc.), such as seaside with high salt content and hot springs with sulfurized gas. Corrosive gases can corrode copper pipes, solder joints and sheet metal parts and cause refrigerant leakage.
  - c) The unit should be kept away from electromagnetic radiation sources and high-frequency electromagnetic interference facilities (such as electric welders, inverters, radio transmitting equipment, etc.). Because the electromagnetic wave will affect the control system, the air conditioner will not operate normally.
  - d) Where there is a risk of flammable gas leakage, where there is suspended carbon fiber or flammable dust in the air, or where there is volatile gas, such as thinner or benzene. Using air conditioners in these locations may cause a fire.
  - e) Small animals may have entered the unit. If electrical components are touched, it may cause unit failure or fire.
8. When refrigerant supplementation is required, be sure to use a qualified refrigerant R410A, YORK refrigerants are recommended. Non-conforming refrigerants can cause damage to the machine

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**CHANGEABILITY OF THIS DOCUMENT**

In complying with Johnson Controls' policy for continuous product improvement, the information contained in this document is subject to change without notice. Johnson Controls makes no commitment to update or provide current information automatically to the manual or product owner. Updated manuals, if applicable, can be obtained by contacting the nearest Johnson Controls Service office or accessing the Johnson Controls website.

It is the responsibility of rigging, lifting, and operating/ service personnel to verify the applicability of these documents to the equipment. If there is any question regarding the applicability of these documents, rigging, lifting, and operating/service personnel should verify whether the equipment has been modified and if current literature is available from the owner of the equipment prior to performing any work on the chiller.

**CHANGE BARS**

Revisions made to this document are indicated with a line along the left or right hand column in the area the revision was made. These revisions are to technical information and any other changes in spelling, grammar or formatting are not included.

## SECTION 1-PRODUCT DESCRIPTION

### INTRODUCTION

YORK YMAE Air-cooled DC invert Chiller/Heat Pump provide chilled water and hot water for all air conditioning applications using central station air handling or terminal units. They are completely self-contained and are designed for outdoor (roof or ground level) installation. Each complete packaged unit includes hermetic rotary compressors, a liquid cooler, air cooled condensers, a charge of refrigerant R410A and a weather resistant microprocessor control center, all mounted in a sheet metal shell. Each module can be run separately and installed, or multiple modules can be run and assembled together, and the module model can be the same or different. Up to 16 modules are allowed together.

The unit combines a multiple step control design with tandem technology allowing the unit's compressors to operate more efficiently across all capacity-load and ambient-temperature conditions.

The unit is intended for cooling and heating water and is not suitable for purposes other than those specified in this manual.

This manual contains all the information required for correct installation and commissioning of the unit, together with operating and maintenance instructions. The manual should be read thoroughly before attempting to operate or service the unit.

All procedures detailed in the manual, including installation, commissioning and maintenance tasks must only be performed by suitably trained and qualified personnel.

The manufacturer will not be liable for any injury or damage caused by incorrect installation, commissioning, operation or maintenance resulting from a failure to follow the procedures and instructions detailed in the manual.

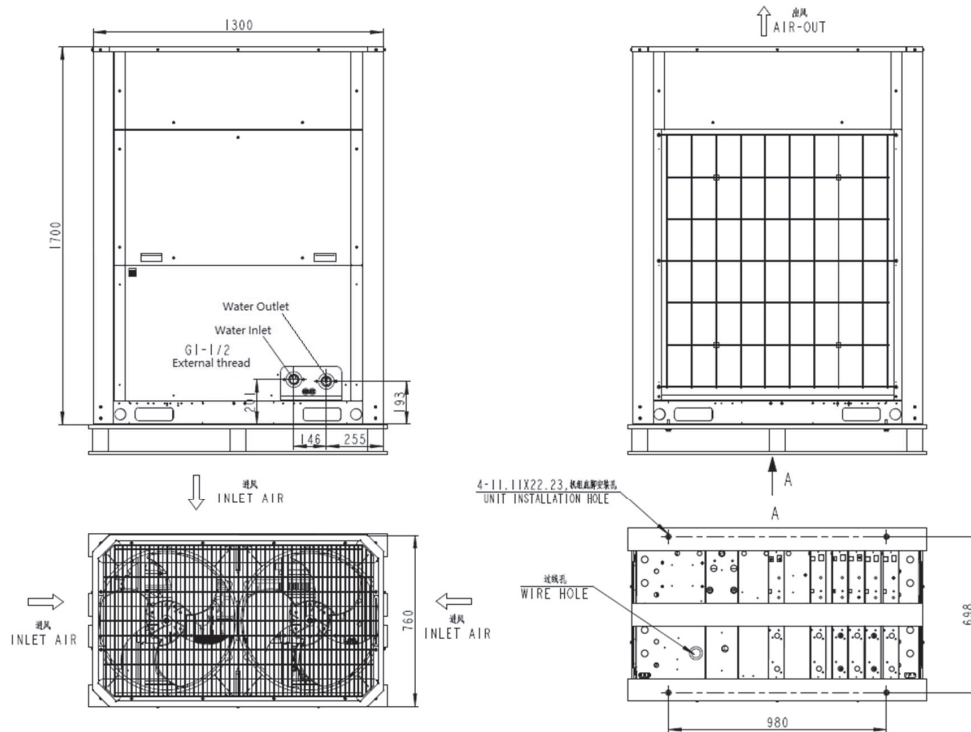
### BASIC UNIT NOMENCLATURE

Named	Y	M	A	E	0	4	5	X	R	M	E	5	0	-	0	A	P	E
Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
The number 1:	Y-YORK																	
The number 2:	M-Variable Frequency																	
The number 3:	A -Air-cooled																	
The number 4:	E-Scroll Compressor																	
The number 5、6、7:	Nominal Capacity, (Unit: kW)																	
The number 8:	X - High Energy Efficiency Series																	
The number 9:	Specific Function, R- Integral & Heat Pump																	
The number 10:	M- Module Combination																	
The number 11:	Refrigerant, E-R410A																	
The number 12、13:	Voltage, 50- 380V~400V 3N 50/60Hz																	
The number 14、15、16	-0A:Unit Version Number.																	
The number 17	P: Built-in Pump System (No 60Hz) , Default To Omit.																	
The number 18	E: Export Unit																	

# THE UNIT DIMENSION

YMAE045:

Unit: mm



YMAE065:

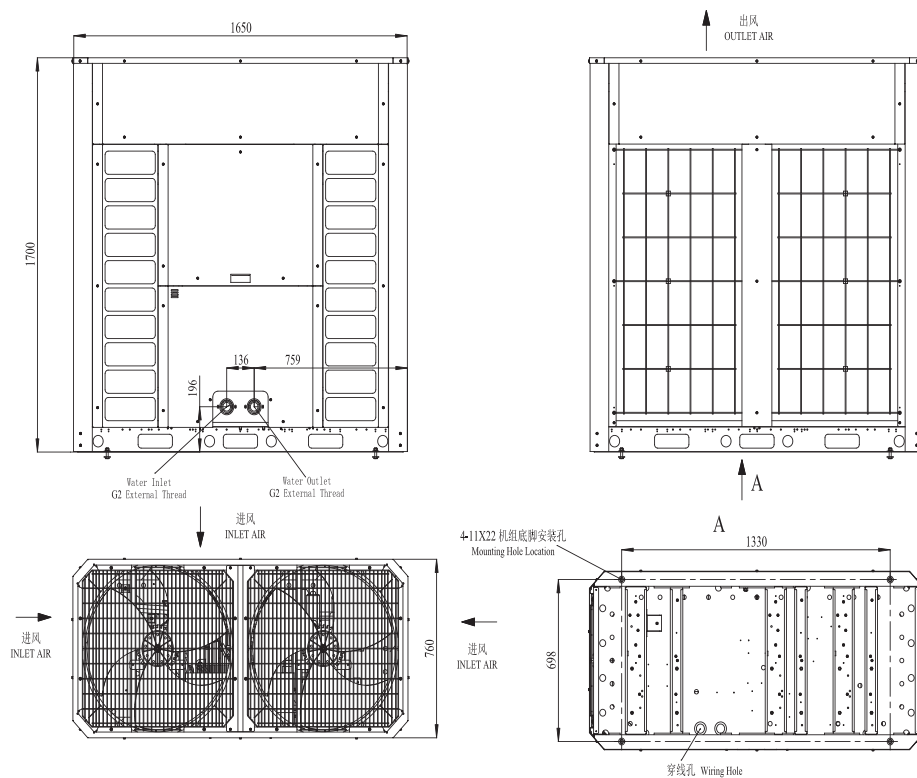


FIGURE 1 – YMAE045/065 DIMENSIONS

## OPERATING RANGE

### Voltage Range

Supply voltage: 380/400V-3-50/60Hz, (built-in pump system no 60Hz)。

The maximum fluctuation range of supply voltage is  $\pm 10\%$

Three-phase electric phase unbalance rate should be less than 2%.

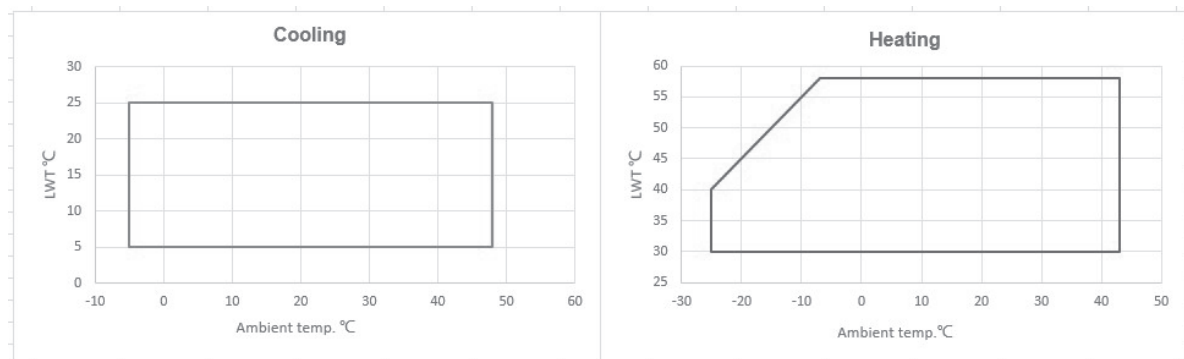
### Temperature Range

TABLE 1-Temperature range

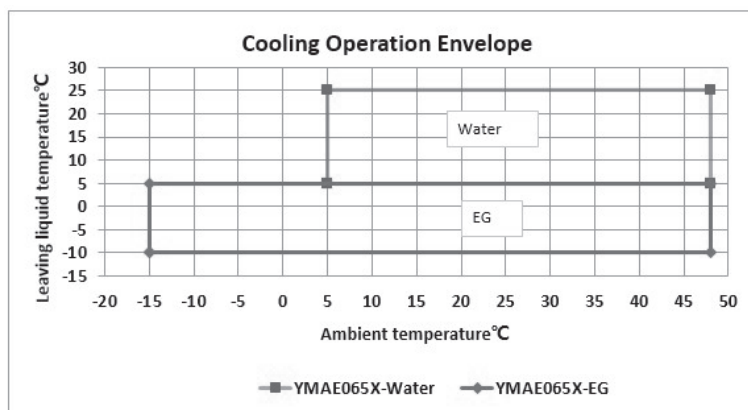
Project	YMAE045/065
Relative humidity	$\leq 93\%$ , No condensation
Operating environment of wire controller	$-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$
Standard ambient at cooling mode	$-5^{\circ}\text{C} \sim 48^{\circ}\text{C}$ (045) $-15^{\circ}\text{C} \sim 48^{\circ}\text{C}$ (065)
Ambient temp. at heating mode	$-25^{\circ}\text{C} \sim 43^{\circ}\text{C}$
Standard leaving chilled water temp	$5^{\circ}\text{C} \sim 25^{\circ}\text{C}$ (045&065 Water) $-10^{\circ}\text{C} \sim 25^{\circ}\text{C}$ (065 EG)
Standard leaving hot water temp	$30^{\circ}\text{C} \sim 58^{\circ}\text{C}$
Unit storage ambient temp.	$-25^{\circ}\text{C} \sim 60^{\circ}\text{C}$

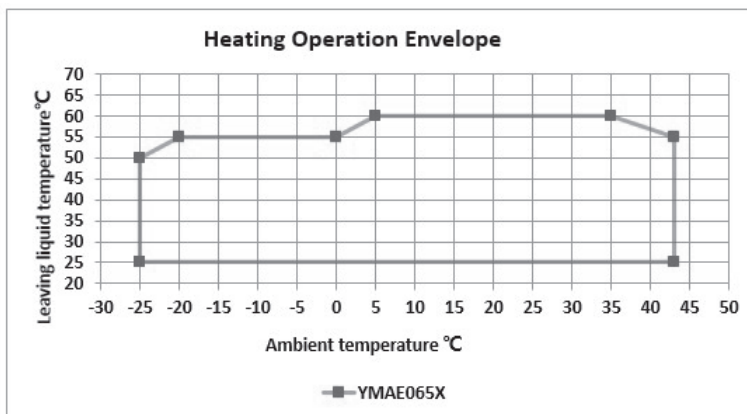
Temperature range diagram

YMAE045:



YMAE065:





### Please note that



The return water temperature control is default by the unit controller, and return water temperature control is recommended.

The above data are obtained in the laboratory, the practical use there will be deviation affected by the installation position and so on.

For applications with temperature below  $-25^{\circ}\text{C}$ , please consult YORK company.

### Applicable Medium

The standard design applicable medium of the unit is purified water. Please consult YORK Company for special medium such as glycol antifreeze fluid.

### Altitude


No more than 2000m

### Wind Side External Static Pressure

YMAE045 No more than 30Pa

YMAE065 No more than 80Pa

## SECTION 2 –INSTALLATION REQUIREMENTS




# WARNING

**Failure to follow these instructions could result in death, serious injury or equipment damage.**

**Follow all warnings and instructions in the unit's Manual(s).**

<b>EN</b> Installation Instructions for the technician / fitter <b>PL</b> Instrukcja instalacji dla technika / monter <b>SV</b> Installationsguide för installatör / montör <b>CS</b> Pokyny k instalaci pro techniky a montéry <b>HU</b> Telepítési utasítás gyakorlott szervizmérnök / kivitelező részére	<b>IT</b> Istruzioni d'installazione per il personale specializzato <b>NL</b> Installatiehandleiding voor de vakman / monteur <b>DE</b> Installationsanleitung für die Fachkraft / Monteur <b>ES</b> Instrucciones de instalación para el técnico / contratista especializado <b>PT</b> Instruções de instalação para o técnico / instalador	<b>JA</b> 一般仕様・取扱説明書 <b>FR</b> Manuel d'installation pour le spécialiste / monteur <b>RU</b> Инструкция по установке для техника/монтажника <b>ZH</b> 适用于技术人员与安装人员的 安装说明书 <b>KO</b> 기술자 / 설비기술자에 대한 설치 지침
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1. Follow all applicable regulations and safety practices during rigging and lifting.
2. Prepare and follow written rigging and lifting plan.
3. Rigging must be directed by trained professional rigger.
4. Spreader bars must be used and be long enough to prevent rigging from contacting unit.
5. Use all and only designated lift points according to units manual(s).
6. Locate center of gravity through trial lifts to account for possible variations in unit configuration.
7. Use rigging and lifting techniques that keep unit stable and level.
8. Keep clear of unit when lifted.

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Rigging and lifting should only be done by a professional rigger in accordance with a written rigging and lifting plan. The most appropriate rigging and lifting method will depend on job specific factors, such as the rigging equipment available and site needs. Therefore, a professional rigger must determine the rigging and lifting method to be used, and it is beyond the scope of this manual to specify rigging and lifting details.

### INSPECTION

Remove any transit packing and inspect the unit to ensure that all components have been delivered and that no damage has occurred during transit. If any damage is evident, it should be noted on the carrier's freight bill and a claim entered in accordance with the instructions given on the advice note.

Major damage must be reported immediately to your local Johnson Controls representative.

### MOVING THE UNIT

Prior to moving the unit, ensure that the installation site is suitable for installing the unit and is easily capable of supporting the weight of the unit and all associated services.

The unit should be lifted using lifting lugs and a spreader bar or frame of sufficient width to prevent damage to the unit from the lifting chains.

The units shall be suitable for elevator or forklift truck or crane for convenience of lifting. When transporting with

a crane, a canvas hammock shall be used to come round the unit base and be fastened. If the packaging box has been removed, in order to move the machine, please apply suitable partition to protect the surface and the side panel, as shown in the picture below. During the transit, the machine shall be kept in level condition to avoid damaging the unit due to crude operation.

## LIFTING WEIGHTS

Refer to the unit nameplate for unit shipping weight. Note that weight may vary depending on unit configuration at the time of lifting. Refer to the Physical Data tables within this manual for further information regarding shipping and operating weights.

## DELIVERY AND STORAGE

To ensure consistent quality and maximum reliability, all units are tested and inspected before leaving the factory. Units are shipped completely assembled and containing refrigerant under pressure. Units are shipped without export crating unless crating has been specified on the Sales Order.

If the unit is to be put into storage, prior to installation, the following precautions should be observed:

- The unit must be “blocked” so that the base is not permitted to sag or bow.
- Ensure that all openings, such as water connections, are securely capped.
- Do not store where exposed to high ambient air temperatures that may exceed relief valve settings.
- The condensers should be covered to protect the coils and fins from potential damage and corrosion, particularly where building work is in progress.
- The unit should be stored in a location where there is minimal activity in order to limit the risk of accidental physical damage.
- To prevent inadvertent operation of the pressure relief devices the unit must not be steam cleaned.
- It is recommended that the unit is periodically inspected during storage.



**Be particularly careful to ensure unit steady. Pay special attention to the weight distribution of the unit to avoid maldistribution and the center of gravity leans to the side of compressor. Please try once before hoisting and observe whether it is tightened and whether there is any risk of tip-over of the unit. The hoisting shall be slowly lifted with constant speed to avoid the tip-over of the unit and attention shall be paid to the security of personnel nearby.**

## INSPECTION CHECKLIST

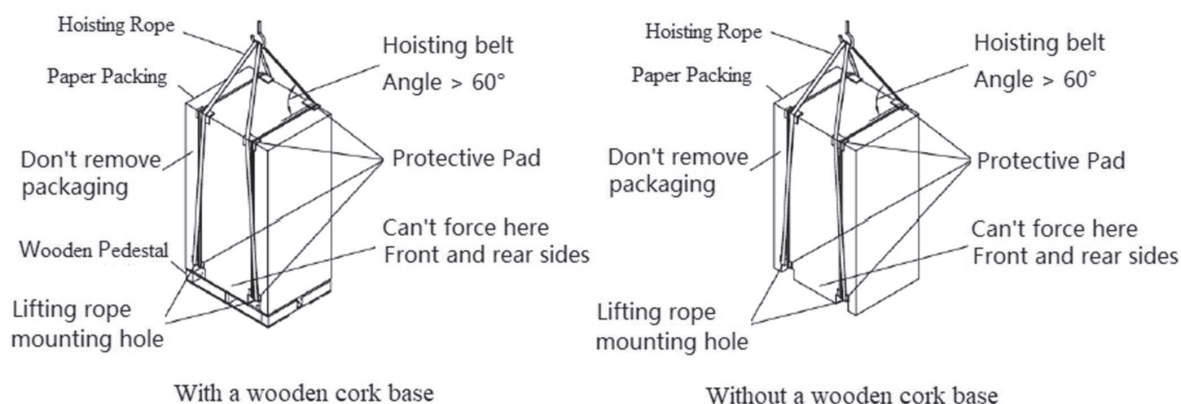
The following items, 1 through 4, must be checked before placing the units in operation.

1. The nameplate content of the unit is identical with the order;
2. The accompanying documents of the unit are complete;
3. The accessories of the unit are in accordance with the items listed in the packing list;
4. Immediately upon receiving the unit, it should be inspected for possible damage which may have occurred during transit. If damage is evident, it should be noted in the carrier’s freight bill. A written request for inspection by the carrier’s agent should be made at once.

## HOISTING REQUIREMENTS

### Lifting Precautions:

1. Always observe applicable regulations and safety measures during lifting;
2. Prepare and follow the written lifting plan;
3. Lifting must be carried out under the guidance of professionally trained professional hoisting personnel;
4. The props must be long enough to keep the sling or chain from touching the unit, which can cause damage to the unit;
5. Use all specified lifting points for lifting according to the instructions in the unit manual;
6. In view of the possible changes in the structure of the unit, the center of gravity of the unit is determined by test lifting;
7. Use lifting techniques to keep the unit stable and level;
8. It is strictly forbidden to stand under the unit during lifting, please keep away from the position directly below the unit.
9. In order to facilitate moving, the buyer shall use a suitable elevator or use a forklift crane or crane. When lifting with a crane, canvas straps shall be used, to cross the unit base and tighten. If the packing box has been removed, please use suitable spacers to protect the surface and side panels to move the machine, as shown in the following Figure. During the handling process, the machine shall be kept horizontally to avoid damaging the unit due to reckless operation.
10. During the lifting process, special care shall be taken to ensure the smooth lifting of the outdoor unit, especially the problems such as uneven weight distribution of the unit and biased center of gravity to the compressor side. Please try lifting once before lifting to observe whether the strap is fastened tightly and whether the unit is in danger of tipping over. During the lifting process, the unit shall be slowly raised at a constant speed to prevent tipping over and pay attention to the safety of surrounding personnel.



**FIGURE 2 –HOISTING DIAGRAMMATIC DRAWING**

### Product Weight

**TABLE 2 – PRODUCT WEIGHT**

Unit/Parameters		045	045 (Pump)	065	065 (Pump)
Net weight	kg	332	350	410	430
Operating weight	kg	339	357	413	433



**Center of gravity of the unit inclined to one side, please hoisting according to the above picture and the requirements of installation manual. Please refer to the parameter list for the weight of the unit.**



**To ensure warranty coverage, this equipment must be commissioned and serviced by an authorized YORK service mechanic or a qualified service person experienced in unit installation. Installation must comply with all applicable codes, particularly in regard to electrical wiring and other safety elements such as HP cutout settings, design working pressures, and ventilation requirements consistent with the amount and type of refrigerant charge.**

**Lethal voltages exist within the control panels. Before servicing, open and tag all disconnect switches.**

## HANDLING

These units are shipped as completely assembled units containing full operating charge, and care should be taken to avoid damage due to rough handling.

## LOCATION

These units are designed for outdoor installations on ground level, rooftop, or besides a building. Location should be selected for minimum sun exposure and away from boiler flues and other sources of airborne chemicals that could attack the ambient coils and steel parts of the unit. The units must be installed with sufficient clearances for air entrance to the condenser coil to ensure adequate supply of fresh air, for air discharge away from the condenser, and for servicing access.

In installations where winter operation is intended and snow accumulations are expected, additional height must be provided to prevent ice accretion in base frame of the unit.

Clearances are listed under “Notes” in the Dimensions section. The clearances recommended are nominal for the safe and efficient operation and maintenance of the unit and power and control panels. Local Health and safety regulations, or practical considerations for service replacement of large components, may require larger clearances than those given in this manual.



**For places with special installation requirements, please consult to the building contractor or the architect and designer or other professionals.**

## Noise Sensitive Locations

Efforts should be made to assure that the unit is not located next to occupied spaces or noise sensitive areas where unit noise level would be a problem.

Please make the unit face the place that is sensitive to noise as far as possible to reduce the influence of operating noise of the unit;

If the heat exchanger part is without block, protective baffle plate can be added to reduce the influence of operating noise of the unit.

## Cold Climate Locations

If the unit is operating in low ambient temperature, be sure to follow the instructions listed below.

1. A baffle plate installed on the airside of the unit is recommended to prevent exposure to snow in winter.

2. In areas with large snow precipitation, make sure the coil and fan will not be affected by the snow. Construct a lateral canopy if necessary.
3. Deice before operating if the fan blades fail to rotate after long time standby in snow.
4. Flexible hoses must be installed to ensure effective condensation water drainage while operating.

## FOUNDATION

The unit should be mounted on a flat and level foundation, floor, or rooftop capable of supporting the entire operating weight of the equipment. See PHYSICAL DATA for operating weight. If the unit is elevated beyond the normal reach of service personnel, a suitable catwalk must be capable of supporting service personnel, their equipment, and the compressors.

To ensure the outdoor unit is placed flat on the base, the outdoor unit must be placed after confirming the plane where the outdoor unit would be placed is even. After the installation of the outdoor unit the outdoor unit shall be examined whether it is leveled, and the angle of inclination shall be smaller than 10°; for a unit with an absorber, the level inspection shall be installed after the installation of absorber;

There are installing holes on the foundation of the unit, and they can be used to closely connect the unit and the foundation;

### Ground Level Location

It is important that the units be installed on a substantial base that will not settle. A one piece concrete slab with footers extended below the frost line is highly recommended.

Additionally, the slab should not be tied to the main building foundations as noise and vibration may be transmitted. Mounting holes are provided in the steel channel for bolting the unit to its foundation (see Dimensions section).

For ground level installations, precautions should be taken to protect the unit from tampering by or injury to unauthorized persons. Screws and/or latches on access panels will prevent casual tampering. However, further safety precautions such as a fenced-in enclosure or locking devices on the panels may be advisable. This will help to prevent the possibility of vandalism, accidental damage, or possible harm caused by unauthorized removal of protective guards or opening panels to expose rotating or electrically live components.

### Rooftop Locations

Choose a spot with adequate structural strength to safely support the entire weight of the unit and service personnel. Care must be taken not to damage the roof.

The unit can be mounted on a concrete slab, similar to ground floor locations, or on steel channels of suitable strength. The channels should be spaced with the same centers as the unit side and front base rails. This will allow vibration isolators to be fitted if required.

Consult the building contractor or architect if the roof is bonded.

Roof installations should have wooden beams (treated to reduce deterioration), cork, rubber, or vibration isolators under the base to minimize vibration. Isolators are recommended for rooftop locations.

### Corrosion Locations

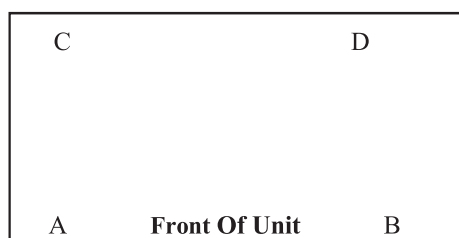
The unit is designed to withstand most of the climate conditions. If the unit is installed near the sea where high levels of salt may shorten the life of the unit, make sure it is not exposed to sea winds directly.

For any units being installed at the seashore, or where salt spray may hit the units, or where acid rain is prevalent, please contact Johnson Controls.

### Isolators (Optional)

It is recommended to place damped spring vibration isolator (especially for units with rack mounting or installed on the roof floor) between the base and the foundation of the outdoor unit. The isolator mounting shall be selected and installed according to design requirements to satisfy the demand of vibration isolation and to avoid phenomena including solid-borne sound transmission and resonance; generally the construction shall be undertaken by professionals with the models provided by the design engineer; the table below is the recommended model selection of absorber, a proximal absorber can be selected near the given optimal load and vertical stiffness:

#### YMAE045&065:



**TABLE 3 – ABSORBER SELECT**

Unit	Total No. of isolators	Optimal Load of A Side (kg)	Optimal Load of B Side (kg)	Optimal Load of C Side (kg)	Optimal Load of D Side (kg)
YMAE045	4	150	110	110	110
YMAE065	4	150	150	150	150

**Note:** The safety factor of shock absorber is generally 1.3, and anti-shear shock absorber should be selected.

### Draining

There should be drainage way around the unit so that the rainwater and water generated from heating for defrosting and heating condensation can be discharged; if there is no drainage way, please add water pond on the bottom of the unit and lead it with pipeline to a suitable place.

### Compressor Mounting

The compressor is mounted on four (4) rubber or steel isolators. The mounting bolts should not be loosened or adjusted during installation of the unit.

### CHILLED LIQUID PIPING

General – When the unit(s) has been located in its final position, the unit water piping may be connected. Normal installation precautions should be observed in order to receive maximum operating efficiencies. Piping should be kept free of all foreign matter. All chilled water evaporator piping must comply in all respects with local plumbing codes and ordinances.

Since elbows, tees and valves decrease pump capacity, all piping should be kept as straight and as simple as possible. All piping must be supported independent of the unit.

Consideration should be given to compressor and control panel access when laying out water piping. Routing the water piping too close to the unit could make compressor / control panel servicing/ replacement difficult.

Hand stop valves should be installed in all lines to facilitate servicing.

## INSTALL SPACING

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated above, resulting in unpredictable airflow patterns and possible diminished performance. YORK's unit control will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation.

The influence of downward flow caused by tall buildings around the unit toward the exhaust air of the unit shall also be taken into consideration in installation.

If the unit is installed at a place with violent airflow, such as exposed roof, measures including parapet or blinds shall be taken to prevent turbulent flow from interfering the air flow into the unit. If the unit needs to set parapet, the height shall not be taller than the unit and the clearance between the unit and the parapet or the blinds shall also satisfy the minimum clearance requirement for unit installation.

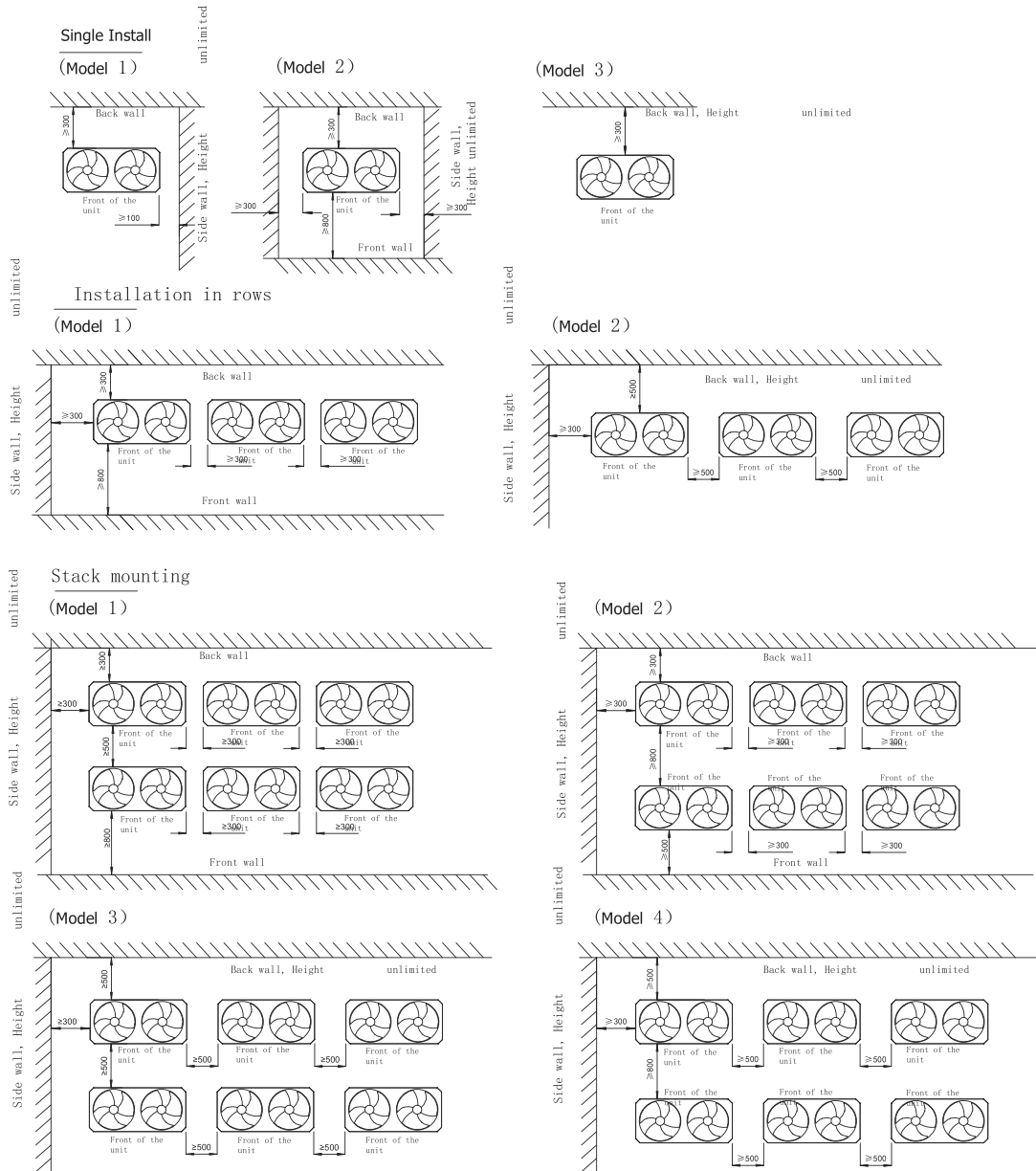
When the unit is placed on a snow covered surface, the bottom face of the unit should be at least 100mm higher than the surface of the snow cover to guarantee the air successfully flow through the coil exchanger.

After the unit is installed in the position, it is necessary to reserve the maintenance space of the maintenance personnel (recommended reserved spacing  $\geq 500\text{mm}$ )

## INSTALLATION CLEARANCES

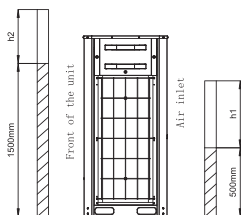
Units are surrounded by walls or other obstacles, installation spacing, referring to the following figure.

**YMAE045&065:**



注:

1. The above data unit is mm;
2. With the exception of special instructions, the high wall limits for each mode are: Front Wall: 1500mm; Back Wall: 500mm; Side Wall: Height unlimited  
The installation space shown in the figure depends on the outdoor temperature of 35 degrees in the refrigeration operation. When the specified outdoor temperature exceeds 35 degrees or when the heat of all outdoor machines exceeds the maximum allowable value, Should be above the suction side of the space increases.
3. If the above the wall is higher than the h1 and h2, should be in at right side entry and suction side to increase the h2/2 and h1/2 spare space.
4. In order to obtain the most appropriate space, should bear in mind that in the machine and the wall between the pedestrian to set aside enough, and to ensure smooth flow channel. ( More than the number of the mode of air conditioners, when installation should consider the possibility of airflow short circuit. )
5. On-site installation of air conditioning, should set aside enough space in front of the machine to facilitate pipe laying road.



**FIGURE 3- INSTALLATION SPACE DIAGRAM**

## WATER SYSTEM INSTALLATION

### Chilled Liquid Piping Specification

**General** – When the unit(s) has been located in its final position, the unit water piping may be connected. Normal installation precautions should be observed in order to receive maximum operating efficiencies. All chilled water evaporator piping must comply with local plumbing codes and ordinances in all aspects.

Since elbows, tees and valves decrease pump capacity, all piping should be kept as straight and as simple as possible. All piping must be supported independent of the unit.

The following considerations of piping specification should be observed:

- YMAE045 pipe diameter of the pipes inlet and outlet unit shall not be smaller than the joint specification (DN40). YMAE065 pipe diameter of the pipes inlet and outlet unit shall not be smaller than the joint specification (DN50).
- Piping to the inlet and outlet connections of the unit should include high-pressure rubber hose or piping loops to ensure against transmission of water pump vibration. The necessary components must be obtained in the field.
- The connection between the pipe and the water pump, the connection of the air conditioner must be in a flexible pipe, and the flexible taking cannot be forcibly connected to reduce the transmission of vibration;
- Galvanized steel pipe (not recommended) shall be designed as screwed connection. When the pipe diameter is larger than DN100, clamp, flange or welded joint can be applied for connection.
- For welded connection (not recommended) applied for piping, antiseptic treatment (rust cleaning before painting) shall be conducted to the surface of welded joint and heat-affected area.
- Galvanized steel piping, PP-R piping and the corresponding screwed joints are indicated in piping specification of TABLE 4, and just for reference only.

Piping specification	Thread specification							
	G3/4	G1	G1-1/4	G1-1/2	G2	G2-1/2	G3	G4
Specification of galvanized steel pipes	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
Outer diameters of galvanized steel pipes (mm)	27	34	42	48	60	76	89	114
Specification of PP-R pipes	D25	D32	D40	D50	D63	D75	D90	D110
Outer diameters of PP-R pipes (mm)	25	32	40	50	63	75	90	110

TABLE 4 – PIPE LINES SPECIFICATIONS

### Chilled Liquid Piping Installation

Water pipeline connection shall observe relevant installation regulations. Piping should be kept free of foreign matter.

The piping to and from the chiller must be designed to suit the individual installation. It is important that the following considerations are observed:

- The operating flow rate of the unit shall not exceed 20% of rated flow for each unit type, too large or too small water flow rate would affect the normal use of the unit.
- The water flow direction of the unit shall be connected according to the inlet and outlet pipe marks on the unit, otherwise the performance of the unit might be affected.
- The pipeline must have independent support and should not be placed on the unit.

- d) Hand stop valves, thermometers and pressure gauges should be installed in both inlet and outlet line for adjusting water flow rate and facilitating servicing.
- e) For the unit without water pump, the unit itself provides the passive signal of water pump control (contact capacity 3A@220V). The water pump must be linked to the control signal on the host (1# module) to realize the linkage between the host and the water pump. A backup pump should be installed on site to prevent the failure of the commonly used pump from affecting the operation of the unit.
- f) The water filter included the unit shall be installed on the inlet pipe of each unit to prevent the cooler from large particles entering, which could cause damage to the evaporator.
- g) A water filter of no less than 30 mesh per inch shall be installed on the inlet pipe of the external water pump to guarantee reliable operation of the water pump.
- h) At least one vent valve should be installed at the highest points in the chilled water pipeline to allow any trapped air to be exhausted. It can avoid generating cavitation noise and damaging the water pump.
- i) Auto-supply valve shall be installed for closed type of water system (without open expansion tank) in case that the unit could not operate normally when the system is short of water. It is suggested to set the outlet water pressure of the auto-supply valve 0.3bar higher than the static pressure of the system, but the set value shall be lower than the supplementing water pressure (the source of the water supplementing), or it would not conduct normal water supplement. The auto-supply valve is usually installed at the return water line of the system; heat isolation measures shall be conducted to the water supplement pipeline and water supply valve to against freeze-up in winter.
- j) The chilled water lines that are exposed to ambient should be wrapped with supplemental heater cable and insulated to protect against freeze-up during low ambient periods, and to prevent formation of condensation on lines in warm humid locations. Vent valves and drain valves do not need heat isolation for the convenience of maintenance
- k) The inlet minimal pressure of water pump shall reach 20kPa to avoid cavitation noise and damage of water pump due to cavitation.
- l) It is recommended that a suitably sized by-pass and valve arrangement shall be installed to allow flushing of the pipework system. The by-pass can be used during maintenance to isolate the cooler without disrupting flow to other units.
- m) Drain connections should be provided at all low points to permit complete drainage of the cooler and system water piping during low ambient temperature period and the unit would not be used with a long time. Unit power should be left switched on to provide the freeze protection function unless the liquid systems have been drained. Also unit power should be left switched off to avoid unit failure by auto starting for the freeze protection function while the liquid systems have been drained.
- n) The fan coil in the water system shall be equipped with a three-way valve or a by-pass valve to make the water system circulate fluently during the period when anti-freezing water pump is operating in winter.
- o) For module application, a place for thermometer sensor shall be retained on the main outlet pipe of the water system so that the leaving water temperature sensor can be installed.
- p) A chilled water flow switch is already installed in the leaving water piping of the cooler. If the units are modularized, it is recommended to install another flow switch in main liquid leaving pipe.



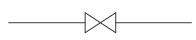





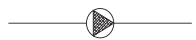







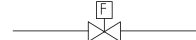

1. The Flow Switch **MUST NOT** be used to start and stop the unit (i.e. starting and stopping the chilled water pump). It is intended only as a safety switch.
2. Quality of the chilled water should comply with the requirement in chilled water requirement in SECTION 5. No air will be permitted in water system.

3. The pump shall be designed in accordance with the constant flow system, and a bypass valve shall be added in the main pipe;
4. Scum dirt in the water pipe network will reduce the heat transfer performance of the heat exchanger, which will cause damage to the heat exchanger and water pipe in serious cases;
5. The chilled water system shall be operated for more than 2 hours after the system flushing and sewage discharge are qualified (visual inspection: the water color and transparency of the discharge outlet are similar to the water inlet, and there is no visible sundries), and the water quality is normal before it can be connected with the refrigeration unit and air conditioning equipment.
6. The unit itself is not equipped with drainage valves, and drainage valves must be set at both supply and return water lowest points of the water system, so that when the unit is not in use in winter, the water in the system can be completely discharged, otherwise in winter, it will cause unclean water drainage and frozen damaged pipeline. When the external pipeline is higher than the inlet/outlet, the drainage valve must be installed before the water pipe rises to prevent the existence of a trap, which will lead to the water discharge in the unit is not clean
7. After the installation of the unit, if the unit cannot be debugged and used before the coming of winter, the water in the system must be drained clean and the power supply of the unit must be cut off to avoid damage to the water pump caused by the automatic start of antifreeze operation of the unit ; If the unit is debugged well, the unit can operate normally, Can't drain, but must ensure that the unit on power ; Otherwise, when the temperature is lower than 0 degrees, the water will freeze and crack the pipeline, unit board, water pump and other parts.

### Water System Pipework Arrangement

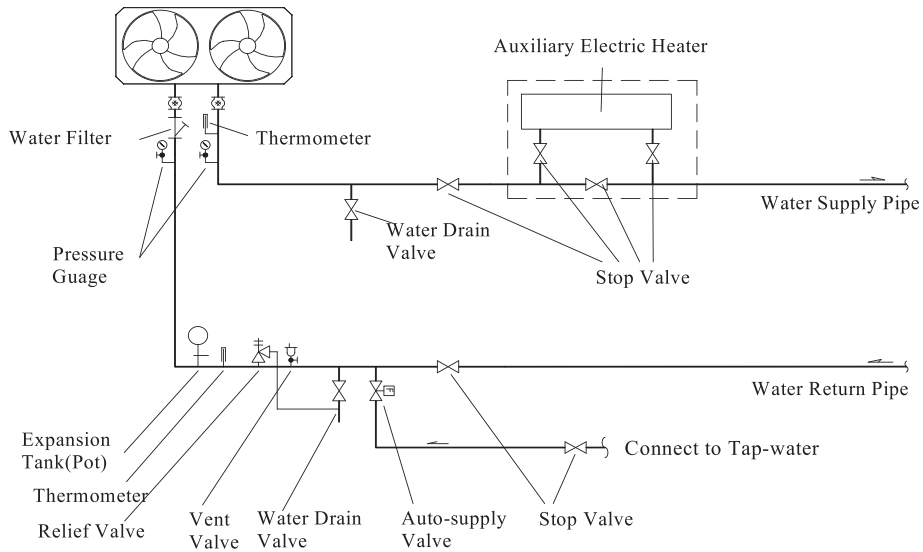
The following are suggested pipework arrangements for single unit with built-in pump installations. For multiple unit installations, each unit should be piped as shown.

#### Components Symbol:

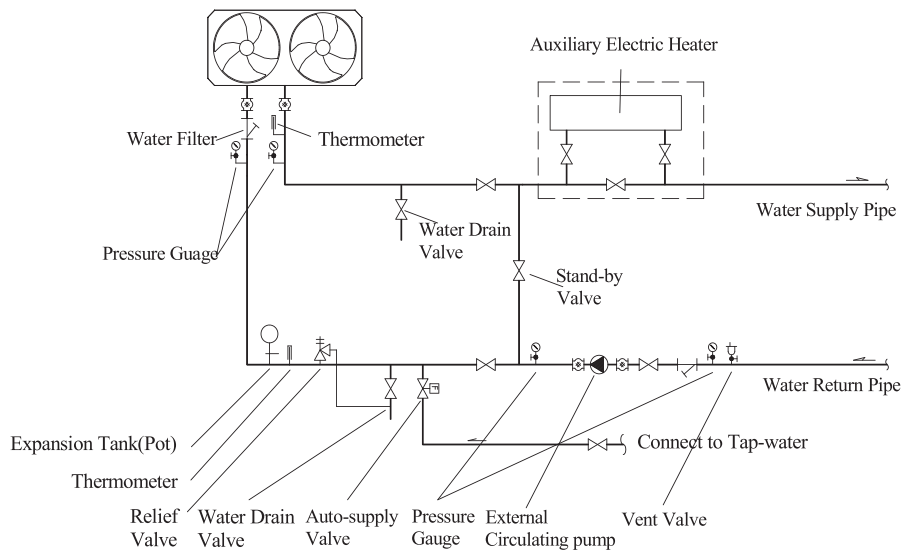
Graphic Symbol	name	Graphic Symbol	name
	Stop Valve		Flow Switch
	Pressure Gauge		Temperature Sensor
	Thermometer		Vent Valve
	Water Pump		Safety Valve
	Metal flexible joint		Check Valve
	Y Type Fliter		Pressure Differential Valve
	Ball Valve		Pressure Differential controller
	Auto-supply Valve		Expansion tank

**TABLE 5— COMPONENTS SYMBOL**

## Chilled Water System For Single Unit



**FIGURE 4 – SINGLE UNIT SYSTEM (BUILT-IN PUMP)**

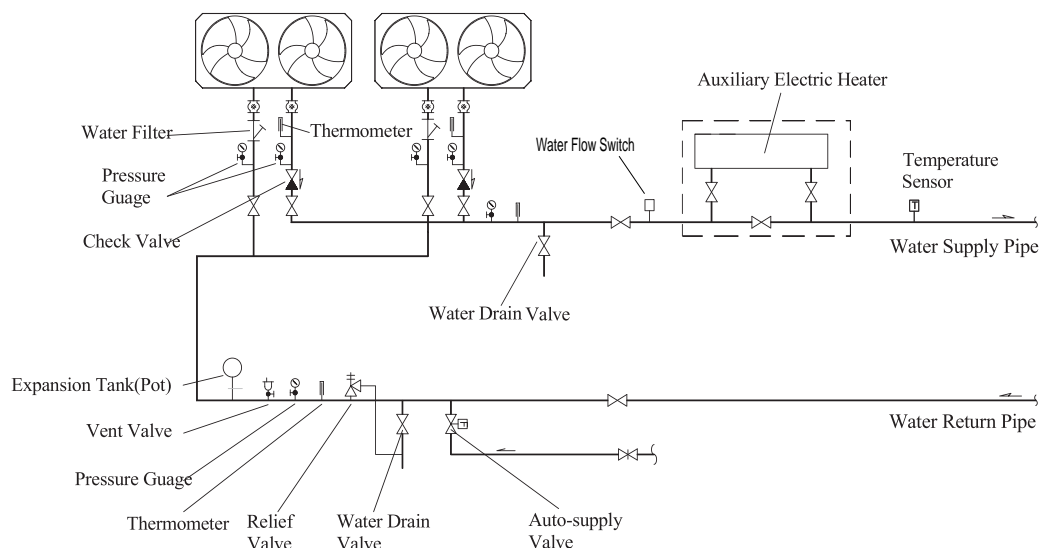


**FIGURE 5 – SINGLE UNIT SYSTEM (WITH EXTERNAL PUMP)**

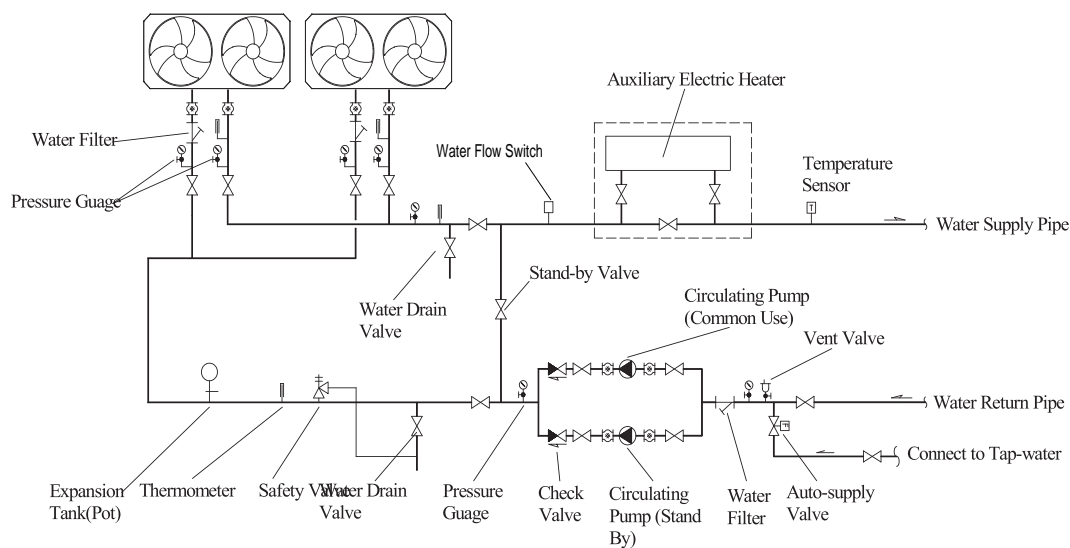
**Notes:** Parts in the dotted box are optional components, and if the site does not need installation, the pipeline here can be directly connected

YMAE045( Built-In Pump)is expansion tank as standard components built-in the unit. No additional expansion tank is required on the return pipe.

## Chilled Water System For Modular Unit



**FIGURE 6 – MODULAR UNIT SYSTEM (BUILT-IN PUMP)**



**FIGURE 7 – MODULAR UNIT SYSTEM (WITH EXTERNAL PUMP)**

### Notes:

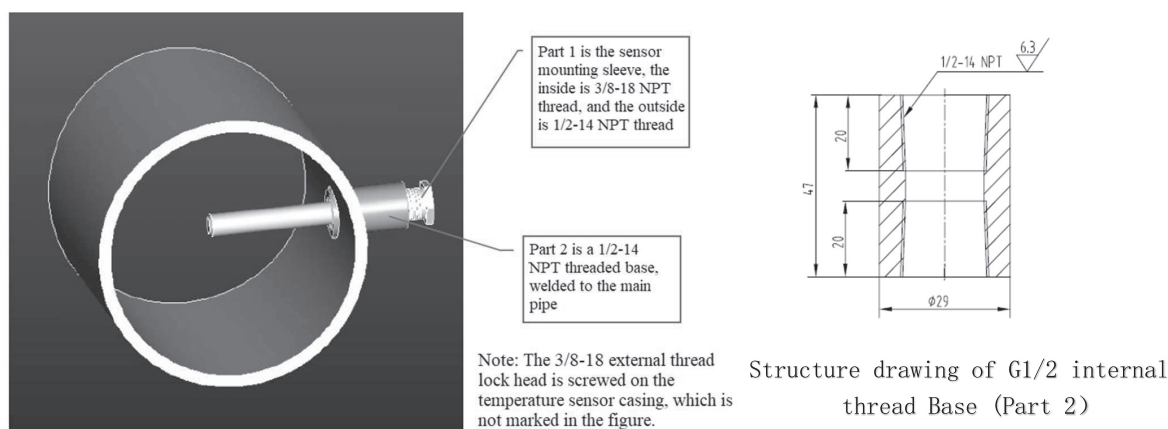
1. Parts in the dotted box are optional components, and if the site does not need installation, the pipeline here can be directly connected.
2. In modular connection, considering the balance of water pressure drop and water flow rate, the same route design should be applied. If pipelines could not be installed in the same route due to the limitation of installation space, please contact the local JCI office for confirmation.
3. In modular connection system with external water pump, the standby water pump is not necessary; but the standby water pump is recommended to be included in case that the water pump in common use might break down and affect the normal use of the unit.

## System Leaving Water Temperature Sensor

When the unit is controlled by a modular combination and needs to be controlled by the outlet water temperature, a system outlet temperature sensor must be installed on the main water supply pipe. The system outlet temperature sensor is connected to the 1# host. When the outlet water temperature control is not required, it is not necessary to install and connect the system outlet temperature sensor.

Installation method of temperature sensor:

- A) Install the G1/2 internal threaded connector on the main water supply pipe
- B) Install the G1/2 blind pipe with external thread on the joint with internal thread
- C) Inject a certain heat conduction oil into the blind tube, then insert the temperature sensor, and seal tightly with the screw lock
- D) Module combination. The water outlet temperature control RT5 of the system is connected to the host machine 1#. If no water outlet temperature control is needed, RT5 can be disconnected. (See electrical schematic Diagram requirements for RT5 locations)



**FIGURE 8** –Installation diagram of system leaving water temperature sensor

Note:

- A) In order to prevent the inlet water freezing of the blind pipe, it is recommended to install the blind pipe in the lateral horizontal direction.
- B) For accurate temperature sensing, the temperature sensor shall be inserted into the bottom of the blind tube, and there shall be no air or water in the blind tube.
- C) Anti-rust treatment is required after the joint is installed on the water supply pipe.

## Buffer Water Tank

The buffer tank is not mandatory in water system. However, if the system water capacity is too small, a buffer tank must be used to reach the minimum value shown in the table below.

- a) Water system water capacity is less than the minimum water capacity.
- b) Water temperature requires high control accuracy.
- c) The load between the unit and the FCU does not match, and the load of the unit is greater than that of the FCU.
- d) Sharp drop of water temperature would affect defrosting when the unit is operating in heat mode for defrosting.

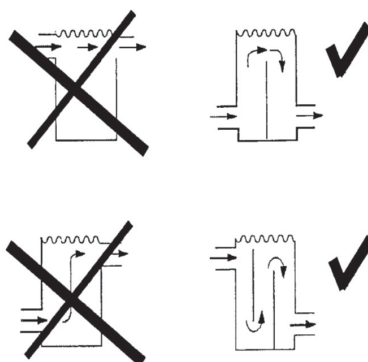
**TABLE 6**–Minimum Volume and Recommended Volume:

Application	Minimum Volume (L/kW)	Recommended Volume (L/kW)
Air Conditioning	3.5	5.5~8.5
Process Cooling	6.5	7.5~12

Note: The above calculation method is applicable in cases where the requirement of water temperature fluctuation is not high. If the site's requirement of water temperature fluctuation is high, please contact the personnel of the York office.

To avoid this, buffer water tank should be applied or the diameter of main water pipe should be enlarged to meet the recommended range in the following table.

Refer to the following correct installation method for installation of the buffer tank.


**FIGURE 9** – BUFFER WATER TANK INSTALLATION

### Expansion Tank (Pot)

There is no expansion tank as standard components built-in the unit. **When the site water system is set as a closed cycle system, Expansion Tank must be installed on the return pipe of the unit.** Expansion tank should be applied when water volume capacity of water system is higher than that in the following table. Installing height of the expansion water tank should be within 50 m above the unit. The design pressure of expansion tank should be 6 bar at least.

Note : Consider winter antifreeze, expansion tank needs insulation.

YMAE045( Built-In Pump)is expansion tank as standard components built-in the unit. No additional expansion tank is required on the return pipe.

### Water Treatment

The cooling capacity performance of the unit given in the data is based on the case where the fouling coefficient is 0.018m<sup>2</sup>°C/kW. Dirt, filth, grease and other impurities will adversely affect the heat exchange effect of the heat exchanger and the performance of the unit. Foreign matters in chilled water will increase the water pressure drop of the heat exchanger, reduce the water flow, and cause mechanical damage to the heat exchanger tube bundles, and even block the water passage.

Please check the water quality of the water system in strict accordance with the water quality requirements of the unit, so as to ensure that the water quality in the unit meets the requirements in the table.

PROJECT	UNIT	value	result	
			corrosion	scale
PH (25℃)		7.5-8.0	○	
SO <sub>4</sub> <sup>2-</sup>	ppm	<100	○	
HCO <sub>3</sub> <sup>-</sup> / SO <sub>4</sub> <sup>2-</sup>	ppm	>1.0	○	
Cl <sup>-</sup>	ppm	<50	○	
PO <sub>4</sub>	ppm	<2.0	○	
NH <sub>3</sub>	ppm	<0.5	○	
Free Chlorine	ppm	<0.5	○	
Fe <sup>+++</sup>	ppm	<0.5	○	
Mn <sup>++</sup>	ppm	<0.05	○	
CO <sub>2</sub>	ppm	<10	○	
H <sub>2</sub> S	ppb	<50	○	
Temperature	℃	<65	○	○
Oxygen content	ppm	<0.1	○	
Total hardness	dH	4.8-8.5		○

TABLE 7- Water quality standards



- Users shall regularly check the water quality before installation and during operation of the unit. Please ensure that the water quality meets the requirements in the above table. Once the water quality exceeds the allowable value for a long time, the heat exchanger may have the problem of corrosion leakage and serious scaling.
- Items with corrosion tendency show that when the water quality exceeds the allowable value for a long time, it can cause corrosion and leakage of heat exchange tubes, and the failure of unit operation and affection of normal use;
- Items with scaling tendency show that when the water quality exceeds the allowable value for a long time, it will lead to serious scaling of heat exchanger, affection of heat exchange and direct reduction of cooling (heating) effect of the unit.
- The loss caused by the water quality problem of the user shall be borne by the user.**

### Water Flow Switch

The flow switch shall be installed in the mixed outlet pipe section of the same communication network, so as to realize cut-off protection for the unit. The factory is equipped with a water flow switch in the control module package (with several targets) , The installation site needs to select the target according to the diameter and velocity of the main water pipe. The disconnection action value of the water flow switch is set at 70% of the rated water flow.

- Flow switches can be installed in horizontal or vertical pipelines with upward flow direction, but not in pipelines with downward flow direction. The effect of gravity should be taken into account when installing piping in the direction of flow
- The flow switch must be installed on a straight pipe with a straight stroke of at least 5 pipe diameters on both sides. At the same time, it must be noted that the direction of liquid flow in the pipe must be consistent with the direction of the arrow on the controller.
- The wiring terminal should be in the position of easy wiring. The connection of water flow switch adopts normally open contact connection method. Do not connect it to normally closed contact by mistake. Connect the signal circuit of the water flow switch to module 1# with a shielded cable and connect it to the unit

- The target type must be determined according to the rated flow rate of the unit, the diameter of the outlet pipe and the target adjustment range of the flow switch (please refer to the instruction), and the target should not be in contact with the inner wall of the pipeline and other components in the pipeline, otherwise it is easy to cause the flow switch can not be properly protected or reset
- The installation location of the output and return water temperature sensor and flow switch of the system can be seen in the "Water System Installation Diagram".



- (1) It is strictly prohibited to set the water flow switch on the branch pipe inside the main engine or on the main pipe after merging multiple main engines
- (2) Please connect the signal of water flow switch on the main water pipe of 1# to the main water pipe of 1#, and no cross connection phenomena such as wrong connection to the main water pipe of 2# shall be allowed
- (3) It is necessary to select and cut the target in the field so that the target plate of the plug-in target flowmeter is located in the pipe

## UNIT EXTERNAL HEAD

Measurement unit (contain water pump) to the inlet and outlet water pressure difference, can draw a closed head under the water, the closed to lift the water flow basic as shown in the closed pressure curve, the pipeline system design "closed pressure curve" for reference.

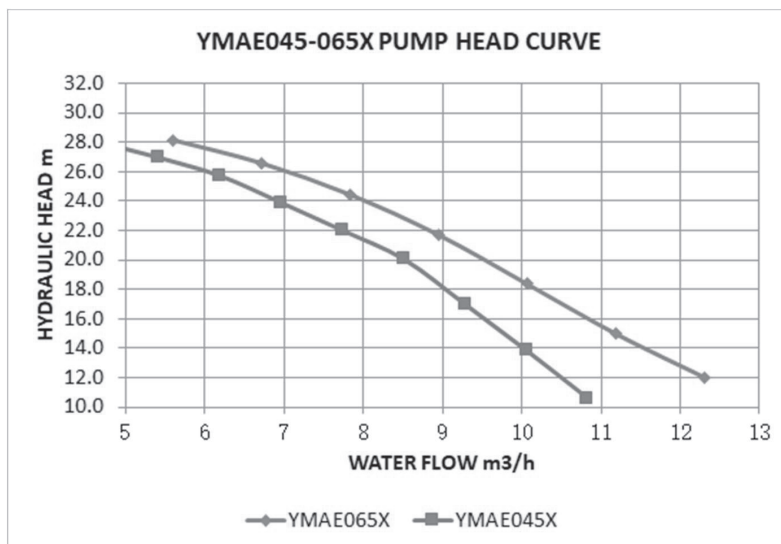


FIGURE 9– UNIT EXTERNAL HEAD CURVE (Unit with built-in water pump)

## ELECTRICAL CONNECTION

The units are shipped with all factory-mounted controls wired for operation.

### Alarm Status Contacts

Normally-open contacts are available for each unit. These normally-open contacts remain open when the system is functioning normally. The respective contacts will close when the unit is shut down on a unit fault, or locked out on a system fault. For modular applications, the master unit will not only output internal fault, but also the fault of subordinate units.

### Remote Start/ Stop Contacts

To remotely start and stop the unit, dry contacts can be wired to terminals 87/80G. Refer to unit wiring diagram.

The function will be available after being activated through HMI.

### **Remote Cooling/ Heating Switch**

The contacts are used to switch unit operating mode remotely. Dry contacts can be wired to terminals 86/80F. Refer to unit wiring diagram.

The function will be available after being activated through HMI.

### **External Interlock**

The unit will be allowed to run only if the interlock is connected. It is used to link external facilities like fire alarms in case there's an emergency cutoff. It is wired to terminals 80 /88H.

External interlock is short-circuited before delivery.

### **Compressor Heater**

Compressor heaters are standard. All compressors utilize one heaters with 40 W\*2 each.

Compressor heater will be switched on in standby mode when ambient temperature is below 12 °C. This will assure that liquid slugging and oil dilution does not damage the compressors.

### **Pressure Cutout**

One high pressure cutout is installed in the discharge piping of each system. The HP cutout opens at 4.03 MPa (585 PSIG) and closes at 3.1 MPa (450 PSIG).

### **Pump Start Contacts**

Terminal block XTB2 – terminals 21 to 22, are normally open contacts that can be used to switch field supplied power to provide a start signal to the pump contactor. User-provided pump contactor and thermal relay are required if the pump is field installed. The contacts will be closed when any of the following conditions occur:

1. Any compressor is running
2. The unit(s) is on and no flow fault occurred
3. Anti-freezing operation
4. Pump circulation mode

The pump will not run if the micro panel has been powered up for less than 30 seconds, or if the pump has run in the last 30 seconds, to prevent pump motor overheating. Refer to unit wiring diagram.

## SECTION 3 –ELECTRICAL CONTINUITY

### ELECTRICAL CONNECTION

The units are shipped with all factory-mounted controls wired for operation.

**Field Wiring** – Power wiring must be provided through a non-fused disconnect switch to the unit terminals in accordance with GB or local code requirements. Minimum circuit ampacity and maximum dual element fuse size are given in Electrical Data.

Only copper power wiring should be used for supplying power to the unit. This is recommended to avoid safety and reliability issues resulting from connection failure at the power connections to the unit. Aluminum wiring is not recommended due to thermal characteristics that may cause loose terminations resulting from the contraction and expansion of the wiring. Aluminum oxide may also build up at the termination causing hot spots and eventual failure.

See unit wiring diagrams for field and power wiring connections, communication wiring connections, modular wiring, alarm contactors, remote switch input, remote cooling/ heating switch, etc.

### Safety Precautions

**Please comply strictly with the following important items related with safety in “safety precautions”**

1. Power line and communication line, must keep with TV, radio and other equipment at least one meter above, so as to avoid interference
2. Wire should conform to national standards, its diameter should not be lower than recommended wire diameter and its weight shall not be lighter than chloroprene rubber armored cable (No. 57 wire in IEC60245).
3. Only professionals from manufacturers, its service departments or other similar institutions can renew the broken flexible power wires for safety reasons.
4. Never share the power supply with other electric appliances in case of overload. Earth leakage circuit breaker matching with working voltage of unit should be used.
5. Only designated accessories by YORK can be used, and services of installation and technology support can be obtained from manufacturers or authorized resellers. Fail to correct installation for control accessories may cause malfunction of the controller or electric shock etc. Users are not allowed to make any repair which may cause damage or electric shock. For any maintenance demand, please contact the manufacturer.
6. Never connect ground wire of unit power supply with that of a gas fuel pipe, water pipe, lightning arrester or telephone. Improper ground connection may cause electric shock etc. Make sure connection between ground wire and the ground terminal/the grounding electrode is normal with regular inspection.
7. Field wiring should avoid edges of sheet metal, sharp point of bolt, high-temperature tube pipe and compressor shell in case of wire damage.
8. Wire fasteners should be used in case of wires dropping out and wire damage caused by friction with other parts.
9. Never touch with control elements and terminal parts other than control panel in case of personal injury as there's electricity in control cabinet before power supply is cutoff.

10. Never operate the wire controller with sharp materials for fear of scratching the wire controller screen. Never contort or pull out electric wires in the control cabinet to prevent loose wiring and control failure. Benzene, diluents or chemical reagent is not allowed to clean the controller and control elements to avoid corrosion or malfunction. Use cloth with neutral decontaminant solution for cleaning during which the cloth should not be too wet; then clean again with dry cloth. Never excessively press on the screen in case of allochromasia.

11. Electric wires and electronic wires should be separated during unit wiring for normal communication and operation

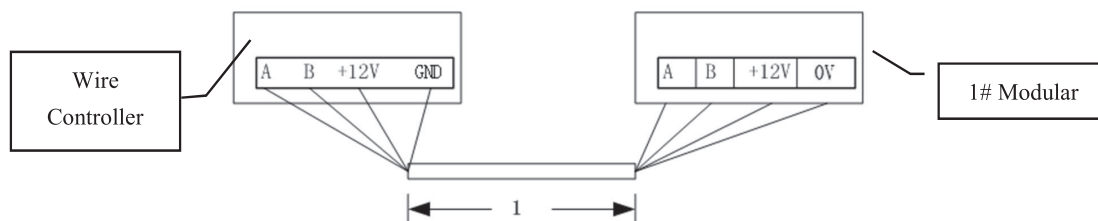
## ELECTRICAL DIAGRAM

All electrical wiring should be carried out in accordance with local regulations. Route properly sized cables to the cable entries in the side of the unit.

It is the responsibility of the user to install over current protection devices between the supply conductors and the power supply terminals on the unit.

## Wire Controller Installation

### STEP 1: Wiring

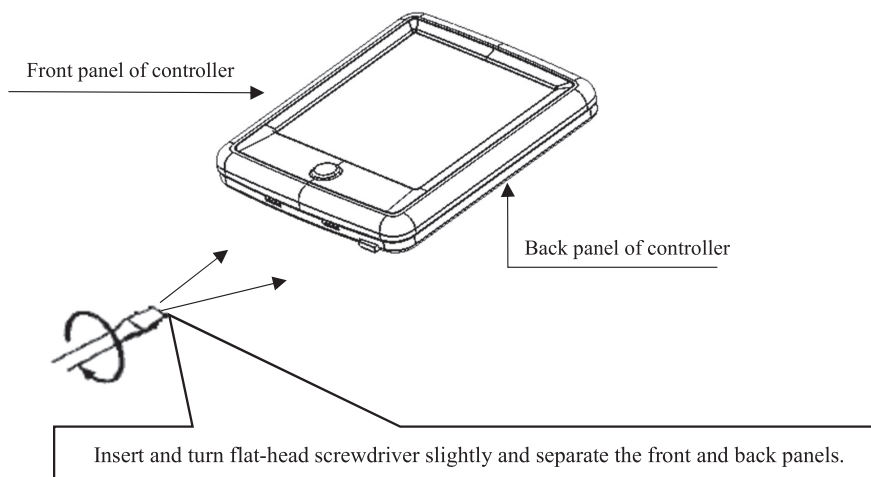


**FIGURE 10– WIRE CONTROLLER CONNECT TO UNIT**

### Notes:

1. Total length of communication and power supply line should be within 15m.
2. A, B, 12V, and 0V should be connected correspondingly in case of malfunction or controller damage.

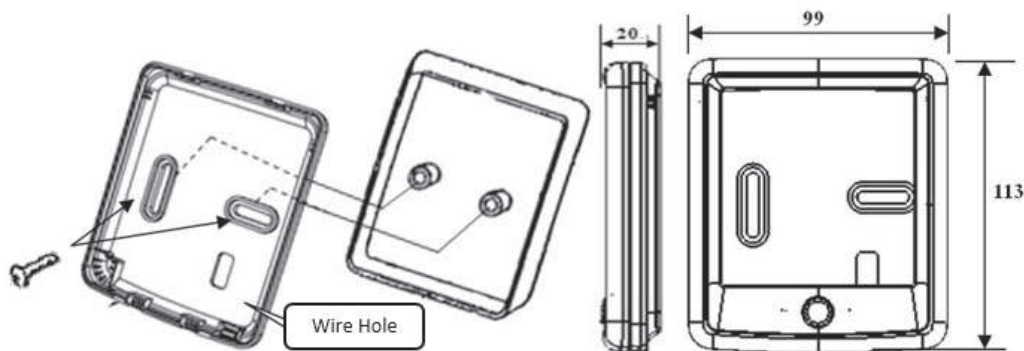
### STEP 2: Panel Disassembly



**FIGURE11 – WIRE CONTROLLER STRUCTURE**

**Notes:** As printed circuit board is on the front panel of controller, be cautious when using flat-head screwdriver.

### STEP 3: Back Panel Fixation



Back panel;

Pre-embedding and installation box;

Controller size

**FIGURE 12 – BACK PANEL FIXATION**

#### Notes:

1. Installed on flat surface, never excessively fasten upon the screw in case of deformation of back panel.
2. Installation box and communication cable pipe (supplied by user) from indoor unit to wire controller shall be pre-embedded. Strip off the protective film from screen slowly in case of damage.
3. Power supply should be switched off and never touch printed circuit board by hands in case of any damage while installation.

### STEP 4: SW1 Confirm Dialing Dial Setting

Wire Controller Dial Code					
SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6
ON	ON	OFF	OFF	ON	ON

### STEP 5: Install the panel

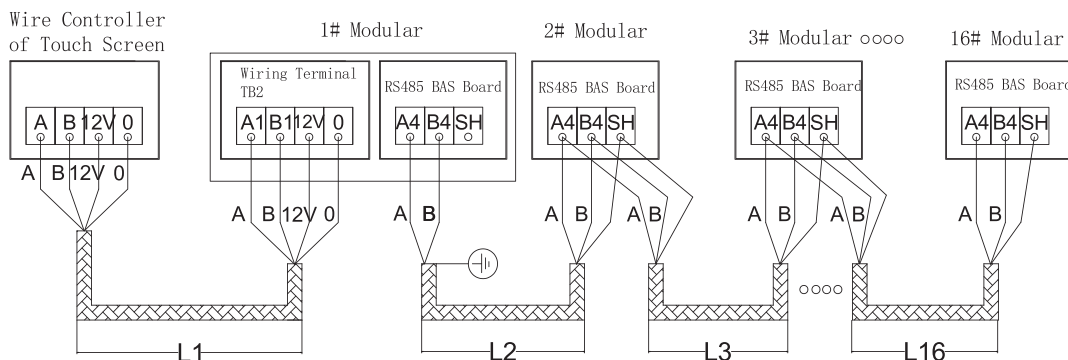
Pull out the battery isolation strip and snap the front and rear panels together



**When the isolation strip is not pulled out or the battery is dead, Time is lost when power is cut off, affects time-related function and protection; When the power is switched on again, it can also cause time confusion due to static electricity, affect time-related function and protection due to electrostatic reasons.**

1. Before installation, please embed the 86 box and the communication line tube between the indoor machine and the wire controller in the appropriate position (provided by the user). Please be sure to slowly remove the screen protective film to avoid damage to the display screen;
2. When installing, do not touch the printed circuit board or live installation, so as not to cause damage to the controller;
3. The wire controller must be installed in a dry and ventilated place indoors.

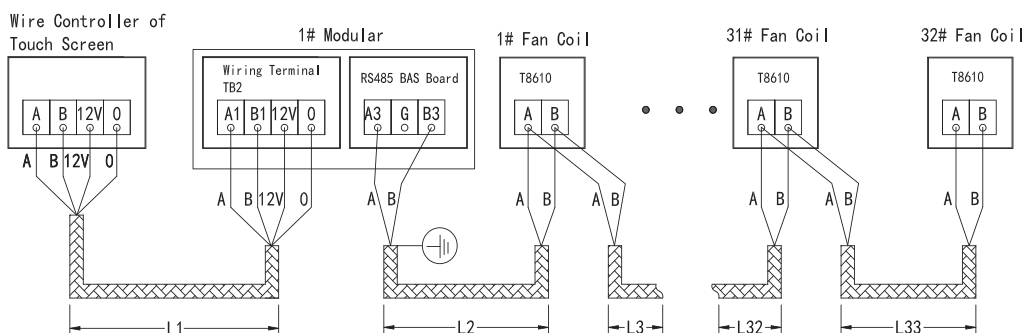
## Communication Cable Connection



**FIGURE 13 – COMMUNICATION WIRING DIAGRAM FOR MODULAR UNIT**

### Notes:

1. Communication cables between host and wire controller should be 85% net type shielded wire of four-core, which length is within 15m.
2. Communication cables between units should be 85% net type shielded wire of two-core, specifications and length are as following table.



**FIGURE 14 – COMMUNICATION WIRING DIAGRAM FOR FAN COIL CONTROL**

### Notes:

1. When YMAE is combined with YVAE, YCAE-X, YCAE-G and YCAE-XH modules, YMAE is used as slave machine.
2. Communication cables between host and wire controller should be 85% net type shielded wire of four-core, which length is within 15m.
3. Communication cables between units and fan coils should be 85% net type shielded wire of two-core, specifications and length are as following table

**TABLE 8– COMMUNICATION CABLE SPECIFICATION**

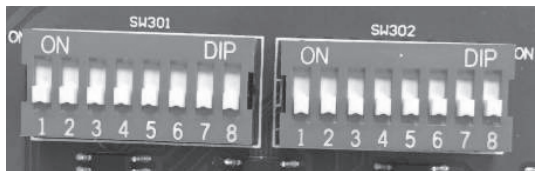
Total length of communication cable (from wire controller to the last unit)	L=L1+L2+L3+L4+.....+L33 (Unit: m)	
	L < 100 m	100 m < L < 500 m
Model of communication line	RVSP2×0.75mm <sup>2</sup>	RVSP2×1.0mm <sup>2</sup>

### Notes:

1. All the communication cables should be equipped on site as per the above requirement, and any inconformity should be submitted to YORK Company for confirmation in case of unit malfunction.

2. Modular connection and fan coil joint control cannot be applied simultaneously

## Function and Dial List



## Address Setting:

Model	SW301-1	SW301-2	SW301-3	SW301-4	SW301-5
1#	ON	OFF	OFF	OFF	OFF
2#	OFF	ON	OFF	OFF	OFF
3#	ON	ON	OFF	OFF	OFF
4#	OFF	OFF	ON	OFF	OFF
5#	ON	OFF	ON	OFF	OFF
6#	OFF	ON	ON	OFF	OFF
7#	ON	ON	ON	OFF	OFF
8#	OFF	OFF	OFF	ON	OFF
9#	ON	OFF	OFF	ON	OFF
10#	OFF	ON	OFF	ON	OFF
11#	ON	ON	OFF	ON	OFF
12#	OFF	OFF	ON	ON	OFF
13#	ON	OFF	ON	ON	OFF
14#	OFF	ON	ON	ON	OFF
15#	ON	ON	ON	ON	OFF
16#	OFF	OFF	OFF	OFF	ON
17#	ON	OFF	OFF	OFF	ON
18#	OFF	ON	OFF	OFF	ON
19#	ON	ON	OFF	OFF	ON
20#	OFF	OFF	ON	OFF	ON
21#	ON	OFF	ON	OFF	ON
22#	OFF	ON	ON	OFF	ON
23#	ON	ON	ON	OFF	ON
24#	OFF	OFF	OFF	ON	ON
25#	ON	OFF	OFF	ON	ON
26#	OFF	ON	OFF	ON	ON
27#	ON	ON	OFF	ON	ON
28#	OFF	OFF	ON	ON	ON
29#	ON	OFF	ON	ON	ON
30#	OFF	ON	ON	ON	ON
31#	ON	ON	ON	ON	ON
32#	OFF	OFF	OFF	OFF	OFF

## Model and Function Setting:

Model	SW301-6	SW301-7	SW301-8	Note
YMAE045	OFF	OFF	OFF	
YMAE065	OFF	ON	OFF	

## Function selection:

Operating conditions	SW302-3	SW302-4	Note
EG ★	OFF	OFF	
Standard Unit ★	OFF	ON	default

## Other dial the code:

DIAL	OFF	ON	DEFAULT
SW302-1	Reserve	Reserve	OFF
SW302-2	Normal load	high load	OFF
SW302-5	Cooling	heating	ON
SW302-6	Unshared pump	Shared pump	OFF
SW302-7	Standard static pressure	HP	OFF
SW302-8★	HMI2	BAS	ON

## Notice:

- ★Only the first module setting;
- All communication wires shall be arranged on site according to the above requirements. If they do not meet the above requirements, York Company shall confirm them. Otherwise, it will cause unit failure.

## Power Protector Set (KPF SET)

Dial-up(DIP)	Supply Voltage	DIP
13	380V	 Default 380V
12	400V	
03	415V	
02	Alarm	



**Power Protector  
Dialing Position**

## Notes:

- After the installation of the unit, the dial code of the power protector should be determined according to the actual power supply voltage before starting the unit.
- Set according to customer's on-site power supply voltage.
- The default power protector is 380V.

## Unit Power Supply

### 1. Unit Power Supply

**TABLE 9 – POWER SUPPLY CABLE SPECIFICATION**

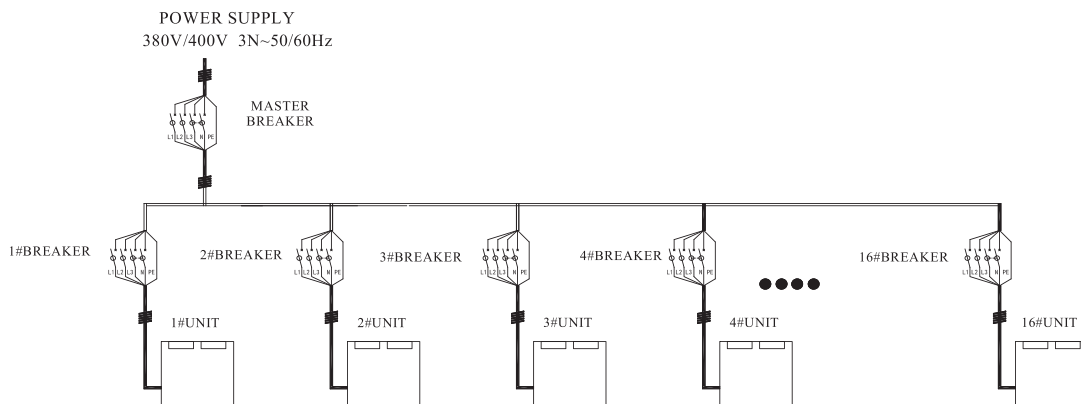
MODEL TYPE	YMAE045	YMAE065	YMAE045 Built-in pump system	YMAE065 Built-in pump system
POWER SUPPLY	380V/400V	3N~50/60Hz	380V /400V	3N~50Hz
MAXIMUM OPERATING CURRENT	29A	51A	29A	51A
RECOMMENDED WIRE DIAMETER	6mm <sup>2</sup>	10mm <sup>2</sup>	6mm <sup>2</sup>	10mm <sup>2</sup>
RECOMMENDED BREAKER (EARTH LEAKAGE PROTECTOR)	C Type 40A 3P/4P	C Type 63A 3P/4P	C Type 40A 3P/4P	C Type 63A 3P/4P

## Notes:

- Cable selection specification above is suitable for the conditions where ambient temperature is under 40℃, local regulations should be referred to for practice.

2. Leakage protector must be deployed, and reliable ground connection should be conducted on site.
3. For any discrepancy on site, like capacitance decreasing, refer to IEC standards and requirements by cable manufacturers for selection.
4. Only copper conductor can be applied as power supply cable and ZR-RVV type cable is recommended.

## 2. System Power Supply Distribution

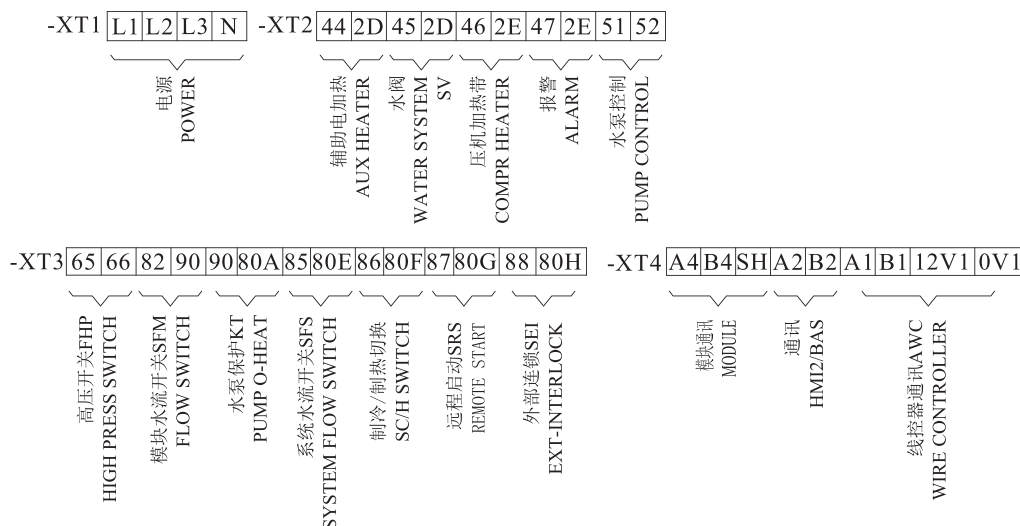


**FIGURE 14– SYSTEM POWER SUPPLY DISTRIBUTION DIAGRAM**

### Notes:

1. User is responsible for providing breakers (Including master breaker).
2. Modular system with more than 32 units will not be permitted.
3. The maximum use of the line controllers can't exceed 16 units, and HMI uses up to 32 units.
4. Specifications of the master breaker and the power supply cable need to be selected according to the total load. Please contact YORK service personnel for professional support.
5. This manual for the requirement of user power supply voltage: YMAE045 /065 units for 380 V and 400 V.
6. YMAE045 /065 units with built-in pump systems can't be installed at 60 Hz power supply

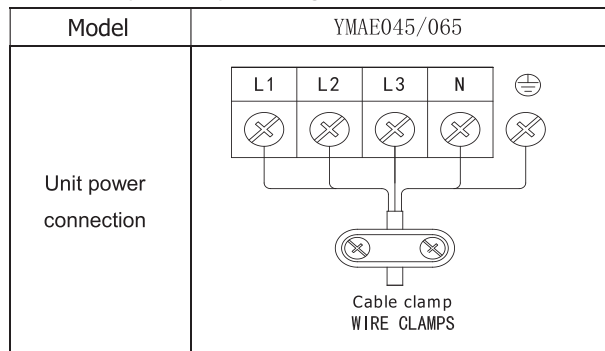
## 3. Single Unit Wire Diagram



**FIGURE 15 – SINGLE UNIT POWER SUPPLY CONNECTION**

**Notes:**

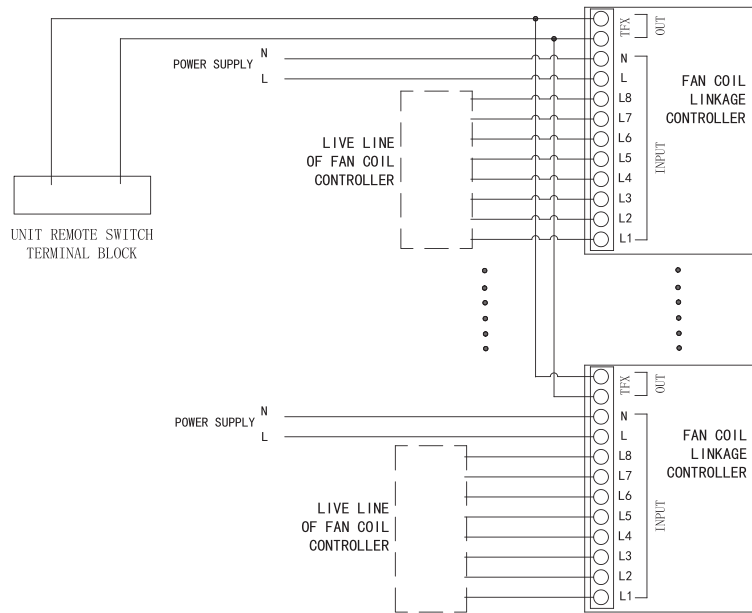
1. Terminal blocks of the power supply should be circular terminals, while other control signal can be connected with U shape terminals.
2. Wiring shall be performed according to the tag number on the terminals.
3. The power line can't be pressed to the insulation layer of the wire.
4. Please apply not less than  $R\bar{V}0.5\text{mm}^2$  wire for external interlocking, remote switch and cooling/heating switch installation.
5. Auxiliary electric heater of water system, alarm and solenoid valve need to be provided by user. The unit provides 220VAC active output signal (XT2:44&2D, XT2:47&2E) ;
6. The cable diameter of auxiliary electric heater is decided by the power output of the auxiliary electric heater; the coils of alarms, contactors and solenoid valves can apply  $R\bar{V}0.5\text{mm}^2$  wire.
7. In modular system, wirings of external interlocking, remote switch, cooling/heating switch and auxiliary electric heater are all connected to the 1# modular.
8. Water pump: When customers install their own water pump, the unit can provide passive output control (XT2:51&52);
9. If you need to use a variable flow system, you need to install the electric water valve on the branch of all modules outside 1 #, and the water valve control provides 220VAC active output signal (XT2: 45 & 2D);
10. YMAE045/065 unit can meet the power input voltage is 380 v and 400 v under the conditions of use.


**FIGUR16 – UNIT POWER SUPPLY TERMINAL BLOCK**
**Notes:**

1. All the user's cable termination shall be pressure welded with copper terminals.
2. Directly intertwine the cable on the binding post is strictly forbidden.
3. The strong current and weak current should be wired separately, and the wire should be entered through different locks at the lower part of the electric control.

**Air Side Terminal Connect**

If the user need to operate the unit through solenoid valve connection point of the fan coil (floor heating) controller, a fan coil linkage controller (as option) is necessary to be added. The wiring schematic diagram is shown below:



**FIGURE17 – FAN COIL LINKAGE CONTROLLER WIRING**

**Notes:**

1. Live line of fan coil (floor heating) controller means the control line which controls a two-way or three-way valve (normally closed type), and the fan coil linkage controller need to be connected with another power supply.
2. All the controller of air side terminals need to be connected to the fan coil linkage controller.
3. A single fan coil linkage controller can be connected with 8 temperature controllers at most.
4. Fan coil linkage controllers can be in modular connection.
5. Only by setting the remote switch option on the online controller can it be enabled. The unit parameters are set to 25/26 items and set to 01 (25 items of cold/hot mode are remote, and 26 items of switching machine are remote).

Note: Parameter settings are completed by YORK after-sales personnel

6. For remote switch wiring see the figure 18-19.

# ELECTRICAL SCHEMATIC DIAGRAM

The power supply voltage of the unit is 380V~400V, 3N-50/60Hz, but the unit with water pump does not have 60Hz.

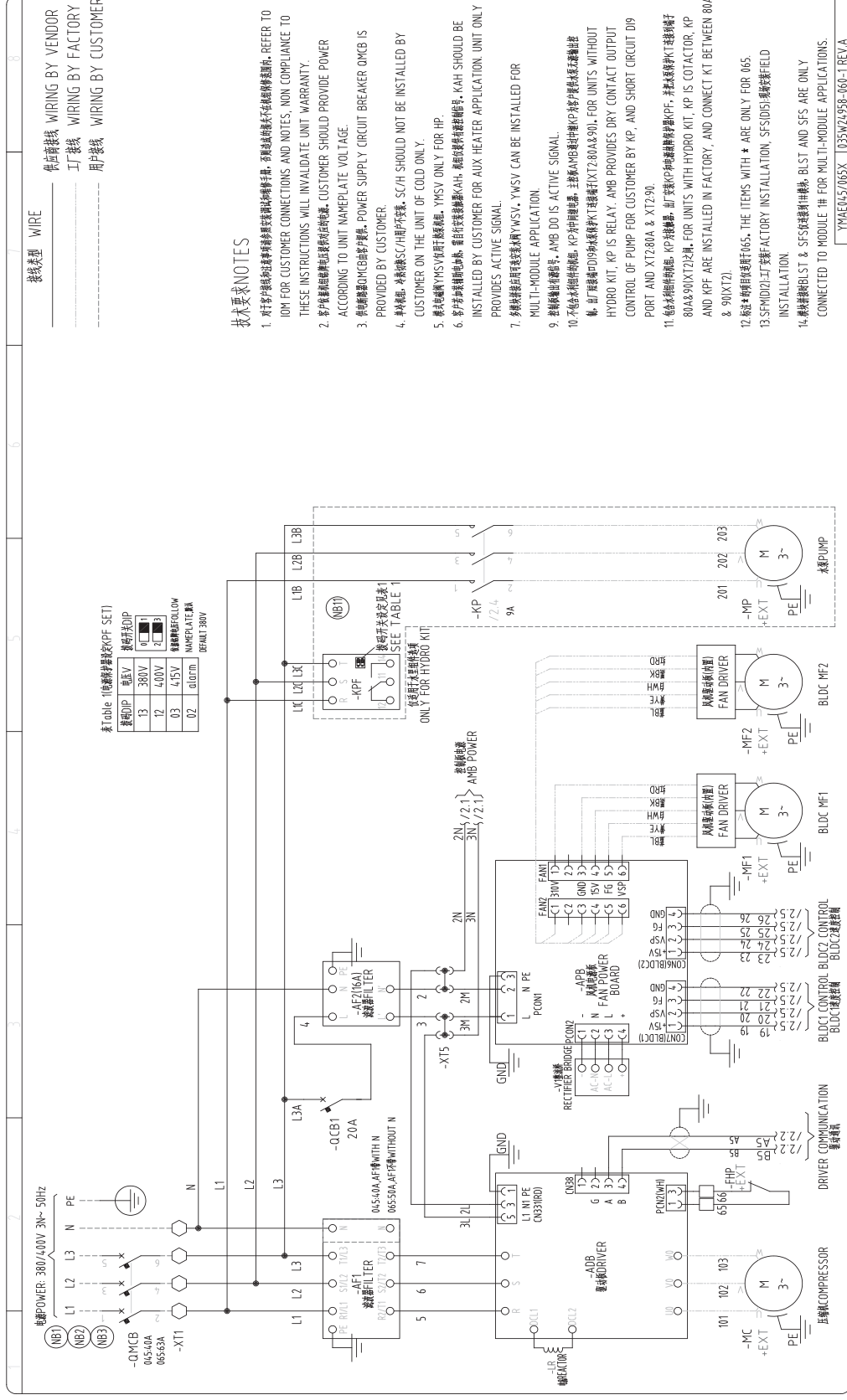


FIGURE 18 - YMAE045/065 ELECTRICAL SCHEMATIC DIAGRA-(1)

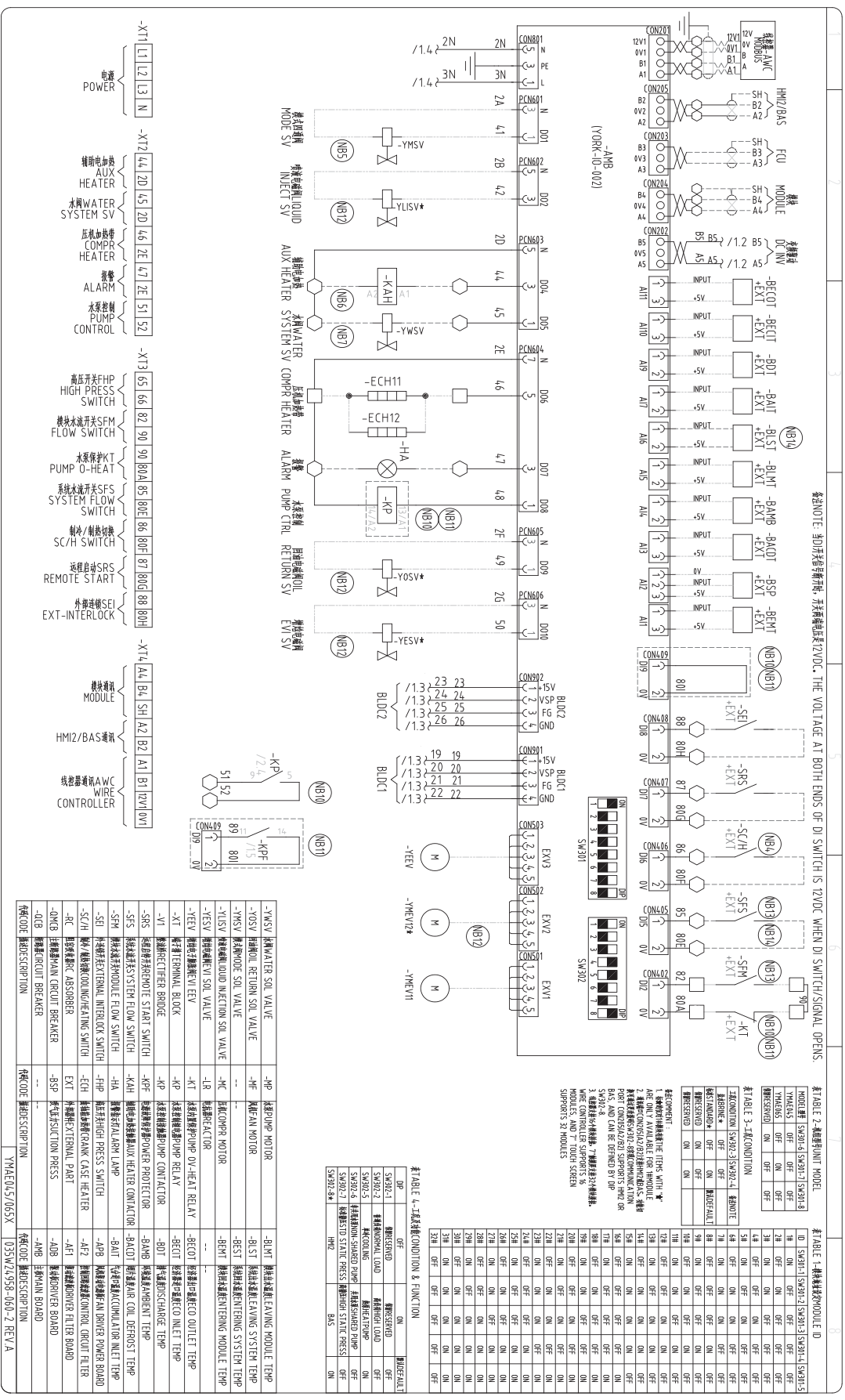


FIGURE 19 – YMAE045/065 ELECTRICAL SCHEMATIC DIAGRAM- (2)

## TERMINAL WIRING AND CONTROLLER PARAMETER SETTING

Control function (HMI, Thermostat, Communication Module, Wind Disk Joint Control) is adjusted by referring to the table below

Wiring					Parameter Setting (Wire Controller)				PARAMETER ITEM 31	PARAMETER ITEM 43
No	A1 B1	A2 B2	A3 B3	A4 B4	PARAMETER ITEM 7	PARAMETER ITEM 25	PARAMETER ITEM 26	PARAMETER ITEM 31	Indoor Controller Type	
	Terminal Block				Module Number	Mode Control Options	On/Off Control Options	Number Of Indoor Units		
1	HMI	/	/	/	1	0-HMI	0-HMI	0		
2	HMI	/	FCU	/	1	0-HMI、4-HMI+T8600	0-HMI、4-HMI+T8600	Actual Quantity		
3	/	/	FCU	/	1	5-T8600	5-T8600	Actual Quantity		
4	HMI	BAS	/	/	1	0-HMI、2-HMI+ BAS	0-HMI、2-HMI+ BAS	0		
5	HMI	BAS	FCU	/	1	0-HMI	0-HMI	Actual Quantity	According to the type of indoor controller, set: 0-T8600, 1-T8610, 2-YWFC	
						2-HMI+ BAS	2-HMI+ BAS			
						3-BAS	3-BAS			
						4-HMI+T8600	4-HMI+T8600			
						5-T8600	5-T8600			
						6-BAS+T8600	6-BAS+T8600			
						7-HMI+BAS+T8600	7-HMI+BAS+T8600			
6	/	BAS	FCU	/	1	3-BAS 5-T8600 6-BAS+T8600	3-BAS 5-T8600 6-BAS+T8600	Actual Quantity	If the indoor controller is not connected to the outdoor unit, press the default value	
7	/	BAS	/	/	1	3-BAS	3-BAS	0		
8	HMI	/	/	Modular	Actual Quantity	0-HMI	0-HMI	0		
9	HMI	/	FCU	Modular	Actual Quantity	0-HMI、4-HMI+T8600	0-HMI、4-HMI+T8600	Actual Quantity		
10	/	/	FCU	Modular	Actual Quantity	5-T8600	5-T8600	Actual Quantity		
11	HMI	BAS	/	Modular	Actual Quantity	0-HMI、2-HMI+ BAS	0-HMI、2-HMI+ BAS	0		
12	HMI	BAS	FCU	Modular	Actual Quantity	0-HMI	0-HMI	Actual Quantity		
						2-HMI+ BAS	2-HMI+ BAS			
						3-BAS	3-BAS			
						4-HMI+T8600	4-HMI+T8600			
						5-T8600	5-T8600			
13	/	BAS	FCU	Modular	Actual Quantity	6-BAS+T8600	6-BAS+T8600	Actual Quantity		
						7-HMI+BAS+T8600	7-HMI+BAS+T8600			
						3-BAS	3-BAS			
14	/	BAS	/	Modular	Actual Quantity	5-T8600 6-BAS+T8600	5-T8600 6-BAS+T8600	Actual Quantity		
					Actual Quantity	3-BAS	3-BAS	0		

### NOTE:

1. All communication cables need to be configured on site according to the above requirements
2. The BAS/wire controller/communication fan interface needs to be set according to the needs by dialing the main board of the unit, and the wiring needs to be set up
3. For details on dialing operation and parameter setting, please refer to the unit "Instruction Manual"

## SECTION 4 –WIRE CONTROLLER OPERATION



*Don't touch the screen with sharp points or edges which may damage the controller. Don't twist or pull the wires of the controller. Don't wipe the controller with benzene, diluent or chemical cloth. Otherwise discoloration or mechanical failure may occur. To remove dirt, dip the cloth in the water with a neutral detergent and wring the water before cleaning. Wipe dry the controller with dry cloth. Do not exert excessive force on the display or connection in order to avoid changes in hue. The following controllers are optional accessories.*

### INTRODUCTION

The touch screen wire controller is standard optional for remote controls of YMAE units. The functions of parameter setting, operating status viewing and fault recording are available. Instead of describing the information above, the wire controller utilizes graphic icons in user interface.

### Interface



Area 1: Date and time display;

Area 2: Timer display;

Area 3: Temperature display (include the set point and actual controlled water temperature);

Area 4: Serial number display;













Area 5: Operating mode setting;

Area 6: Running status display;

Area 7: Touch-keys.

The meanings of the icons are listed in Table 8

TABLE 8 – FUNCTIONS OF KEYS

KEY	MEANING	KEY	MEANING	KEY	MEANING
	COOLING		FUNCTION		FAULT
	HEATING		TIMER		PUMP
	CONFIRM		UP		LOCK
	CANCEL		DOWN		LOW SOUND

## BASIC OPERATIONS

### Start and Stop the Unit

Press the button below on the screen to start or stop the unit.



### Operating Mode

Press the key of “COOLING” or “HEATING” to set or switch operating modes. The “SET” icon will be showing during the process. Press “CONFIRM” to finish the setting, or the controller will automatically save if there’s no operation for 10 seconds. Press “CANCEL” to abandon the setting.

### Liquid Temperature Setpoint

Press “UP” or “DOWN” key in daily display screen to set target liquid temperatures. Press “CONFIRM” to finish the setting, or the controller will automatically save if there’s no operation for 10 seconds. Press “CANCEL” to abandon the setting.

## ADVANCED OPERATIONS

### Date and Time

Press the “TIMER” and “FUNCTION” keys simultaneously for 5 seconds to enter the Date and Time setting screen. The “TIMER” and “SET” icons will flicker while the function is activated.

Press “TIMER” to toggle between Year, Month, Day, Hour and Minute. Press “UP” and “DOWN” icons to modify the values. Touch and hold the icons to increase or decrease the values by 5 each time.

Press “CONFIRM” to save the value and auto switch to the next setting. Press “TIMER” to cancel the operation and auto switch to the next setting.

The setting will terminate if there's no operation for 5 seconds or "CANCEL" is pressed.

### Schedule Timer

Press the "TIMER" key for 5 seconds to enter Schedule Timer setting screen. The "TIMER", "SET" and "ON" icons will flicker while the function is activated.

The Schedule Timer will toggle between Timer ON, Timer OFF and Timer Mode.

Press "FUNCTION" to select Hour and Minute which are able to be set by "UP" and "DOWN" keys. Once the setting is finished, press "CONFIRM" to save the value and auto switch to the next setting. Press "TIMER" to cancel the operation and auto switch to the next setting.

In Timer Mode setting, press "FUNCTION" to switch the modes between ONCE, DAILY and WEEKLY. Press "CONFIRM" to save the value and auto switch to the next setting. Press "TIMER" to cancel the operation and auto switch to the next setting.

In WEEKLY timer setting, the weekdays are able to be switched over by pressing "FUNCTION" key. Press "UP" to "CONFIRM" the weekday timer activation and move on to the next weekday. Press "DOWN" to cancel the activation of the weekday and move on to the next.

The Schedule Timer setting will terminate if there's no operation for 5 seconds or "CANCEL" is pressed.

### Parameter Setting

Press the "FUNCTION" key in daily display for 5 seconds to enter System Parameter Setting screen. Repeat the operation to enter Module Parameter Setting screen. The "LOCK" icon will appear while the function is activated.

In System Parameter Setting, the parameters will be displayed in hour display area (Area 1) in sequence by pressing "FUNCTION" key.

In Module Parameter Setting, the modules can be switched over by pressing "TIMER" key.

Press "UP" or "DOWN" to set the value and press "CONFIRM" to save the value. The setting will terminate if there's no operation for 5 seconds or "CANCEL" is pressed.

**TABLE 9** –System Parameter Setting:

Param eter Setting	name	setting range	Customer wire controller	Maintenance wire controller	Notes
2	Cooling control selection	0-3	✓	✓	0- return water, 1- leaving water, 2- Variable leaving water temperature control, 3- Variable return water temperature control
3	Heating control selection	0-3	✓	✓	0- return water, 1- leaving water, 2- Variable leaving water temperature control, 3- Variable return water temperature control
4	Temperature control cycle	10~120	✓	✓	S
5	Temperature fluctuation of unit operation	1~3	✓	✓	°C
7	Module Number	1-16	✓	✓	
8	BAS Modbus address	1-65535	✓	✓	
18	Alarm temperature when the outlet water temperature is too low	-12~12	✓	✓	°C
19	Alarm temperature when the outlet water temperature is too high	30~60	✓	✓	°C

25	Cooling and heating mode selection	0-7	✓	✓	0-HMI, 1-Remote Control, 2-HMI+ BAS, 3-BAS, 4-HMI+T8600, 5- T8600, 6-BAS+T8600, 7-HMI+BAS+T8600
26	Switching machine selection	0-7	✓	✓	0-HMI, 1-Remote Control, 2-HMI+ BAS, 3-BAS, 4-HMI+T8600, 5- T8600, 6-BAS+T8600, 7-HMI+BAS+T8600
27	Power lost memory	0-1	✓	✓	1-Start
31	Number of networked end controllers	0-64	✓	✓	0~64
43	Type of End Unit	0~2	✓	✓	0: Nothing, 1: T8600, 2: fan coil
57	Operation time of water valve	0~120	✓	✓	S

NOTE : During operation, pressing other no key is invalid

## FAULT DIAGNOSIS

Press “FUNCTION” and “CANCEL” keys for 5 seconds to enter Fault Diagnosis. The “FAULT” icon will appear while the function is activated.

The fault codes will be displayed in temperature display area (Area 3) with time recorded. The serial number of the module will be displayed as 10-bit of Area 4.

Press “UP” and “DOWN” for more fault information. A maximum of 16 faults can be recorded.

The setting will terminate if there’s no operation for 5 seconds or “CANCEL” is pressed.

**TABLE 10– DESCRIPTION OF FAULT CODE**

DESCRIPTION	FAULT CODE
AI1 Unit EWT sensor fault	1A
AI2 Circuit low pressure transducer fault	2A
AI3 Coil temperature sensor fault	3A
AI4 Ambient temperature sensor fault	4A
AI5 Unit LWT sensor fault	5A
AI6 System LWT sensor fault★	6A
AI7 Circuit accumulator inlet temperature sensor fault	7A
AI9 Compressor discharge port temperature sensor fault	9A
AI10 Economic entering temperature sensor fault	10A
AI11 Economic leaving temperature sensor fault	11A
DI2 Unit water flow switch fault or water pump overload alarm failure	2d
DI3 high pressure switch fault	3d
DI5 Chiller water flow switch fault or water pump overload alarm failure★	5d
DI8 External Interlock failure★	8d
DI9 Power protector (Only units with water pumps)	9d
Communication failure ( Failure on 1# unit is between principal unit and wire controller while others for principal and subordinate unit.)	1E

Communication failure between principal unit and BAS	2E
Chiller low ambient temperature in cooling	4E
Chiller low leaving temperature in cooling	6E
Chiller high leaving temperature in heating	7E
Chiller Locked	8E
Communication failure between principal unit and T8600 or FCU	9E
Winter anti-freezing protection failure alarm	10E
Unit low leaving temperature in cooling	11E
Unit high leaving temperature in heating	13E
Unit low leaving temperature in heating	15E
Compressor high discharge port temperature	1F
BPHE anti-freeze protect	9F
Communication failure of unit (between Mainboard and driver)	2p
Mismatching of driver type	4p
Compressor driver alarm	6p
Excessive higher or lower speed of fan 1	8p
Excessive higher or lower speed of fan 2	9p
Mainboard hardware failure	14p

#### YMAE045

FOCx / APFCx overcurrent	101
FOCx drive failure	102
Internal failure of drive	103
Input phase loss fault	104
Sampling failure of compressor current	105
FOCx/APFCx overheating alarm	106
Pre-charge failure	107
DC bus over voltage	108
DC bus under voltage	109
Radiator overheat failure	110
AC input overcurrent	111
Current sensor check failed	112
Radiator temperature sensor failure	113
Illegal ID	114
High exhaust pressure failure	115
Communication failure	116

#### YMAE065

Driver hardware overcurrent	101
Compressor speed abnormal	102
Driver MCU resetting	103
Driver power input fault	104
current sensor failure	105
Overheating alarm	106

Per-charge fault	107
Bus Over voltage fault	108
Bus under voltage fault	109
Driver ISPM Setup Error	112
High exhaust pressure failure	115

## RUNNING STATUS

Press “FUNCTION” and “CONFIRM” keys for 5 seconds to enter Running Status viewing screen. The digital and analog inputs and outputs are displayed in sequence in hour display area (Area 1) by pressing “UP” and “DOWN” keys.

The modules can be switched over by pressing “TIMER” key.

Description of each running status parameters as shown in Table12

**TABLE 11 – DESCRIPTION OF RUNNING STATUS**

Running status No.	Description
A1	AI1 Unit entering water temperature
A2	AI2 Saturate temperature of suction pressure
A3	AI3 Coil temperature
A4	AI4 Ambient temperature
A5	AI5 Unit LWT
A6	AI6 Chiller LWT★
A7	AI7 Accumulator inlet temperature
A8	Reserved
A9	AI9 Compressor discharge port temperature
10	Economic entering temperature
11	Economic leaving temperature

## FAULT RESET

Press “CONFIRM” and “CANCEL” keys for 5 seconds to reset the faults manually.

### Keylock

Press “TIMER” and “DOWN” icons for 5 seconds to enter Keylock function. The “LOCK” icon will appear and all touch-keys and the physical button will be disabled while the function is activated.

Press “TIMER” and “DOWN” again to terminate the function.

### Pump Circulation

Press “COOLING” key for 5 seconds in daily display to enter Pump Circulation function. The “PUMP” icon will appear. The pump will operate with no compressor running while this function is activated.

### Low Sound Mode

Press “CONFIRM” key for 5 seconds in temperature setting display to enable Low Sound Mode. Press “FUNCTION” and “CONFIRM” keys for 5 seconds in temperature setting display to enable Night Low Sound Mode. In Night Low Sound Mode the low sound function will only be activated during 21:00 to 6:00.

### Manual Defrost

Press “COOLING” and “FUNCTION” keys for 5 seconds in temperature setting display to enter Manual Defrost setting. The modules can be selected by pressing “TIMER” and defrost will begin once pressing “CONFIRM”.

Press “CANCEL” to terminate this setting.

## SECTION 5 – MAINTENANCE

It is the responsibility of the equipment owner to provide maintenance on the system.

### IMPORTANT

If system failure occurs due to improper maintenance during the warranty period, YORK will not be liable for costs incurred to return the system to satisfactory operation. The following is intended only as a guide and covers only the unit components. It does not cover other related system components which may or may not be furnished by YORK. System components should be maintained according to the individual manufacture's recommendations as their operation will affect the operation of the unit.

### OIL CHARGE

The oil used in these compressors is pale yellow in color (POE oils). If one of the compressors in a refrigerant system fails to rotate and a replacement is needed, it is strongly recommended to clean the system and refill the oil. Examine the oil color during the process. If the oil darkens or exhibits a change in color, this may be an indication of contaminants in the refrigerant system.



**Never use the rotary compressor to pump the refrigerant system down into a vacuum. Doing so will cause internal arcing of the compressor motor which will result in failure of compressor.**

### ADD TROPICAL PREHEATING



**Air conditioning unit start up, there will be three hours compressor preheating, preheating, after the completion of the compressor to start**

### CONDENSER COILS

Dirt should not be allowed to accumulate on the con- denser coil surfaces. Cleaning should be as often as necessary to keep coils clean.



***Exercise care when cleaning the coil so that the coil fins are not damaged.***

### CHECK AND CLEAN WATER FLOW SWITCH

As impurity cannot be avoided in the water, impurities will accumulate in the water flow switch as the use time increases, which will affect the reliable operation of the water flow switch. It is suggested that the customer clean or replace the water flow switch once every two years. If the water quality of the water side system is poor, the cleaning period should be shortened or the replacement should be made.

### OPERATING PARAMETERS

Regular checks of the system should be performed to ensure that operating temperatures and pressures are within limitations, and that the operating controls are set within proper limits.

### ANTIFREEZE OF UNIT

When the unit is low in ambient temperature and a long-term shutdown, The unit must drain the water clean, otherwise the water system of the unit (including heat exchanger and water pump, etc.) will be frozen; If the unit

still needs to operate when the ambient temperature is low, please energize the unit so that the unit can automatically enter the anti-freezing operation. Single cooling unit in winter to 0 degrees need to drain water or add to meet the required concentration of ethylene glycol solution. Specific requirements for ethylene glycol solution and inhibitors should be confirmed with the pump supplier.

### **CONDENSER FAN MOTORS**

Condenser fan motors are permanently lubricated and require no maintenance.

### **OVERALL UNIT INSPECTION**

In addition to the checks listed on this page, periodic overall inspections of the unit should be accomplished to ensure proper equipment operation. Items such as loose hardware, component operation, refrigerant leaks, unusual noises, isolators, etc. should be investigated and corrected immediately.

### **Mechanical Strength**

The unit is not designed to withstand loads or stresses from adjacent equipment, pipework or structures. Additional components must not be mounted on the unit. Any such extraneous loads may cause structural failure and may result in injury to the operator, or damage to the equipment.

### **General Access**

There are a number of areas and features, which may be a hazard and potentially cause injury when working on the unit unless suitable safety precautions are taken. It is important to ensure access to the unit is restricted to suitably qualified persons who are familiar with the potential hazards and precautions necessary for safe operation and maintenance of equipment containing high temperatures, pressures and voltages.

### **Pressure Systems**

The unit contains refrigerant vapor and liquid under pressure, release of which can be a danger and cause injury. The user should ensure that care is taken during installation, operation and maintenance to avoid damage to the pressure system. No attempt should be made to gain access to the component parts of the pressure system other than by suitably trained and qualified personnel.

### **Electrical**

The unit must be grounded. No installation or maintenance work should be attempted on the electrical equipment without first switching power OFF, isolating and locking-off the power supply. Servicing and maintenance on live equipment must only be performed by suitably trained and qualified personnel. No attempt should be made to gain access to the control panel or electrical enclosures during normal operation of the unit.

### **Heat Radiation**

Some of the visible parts like discharge pipe may work under high temperatures, thus radiate high heat flux. Special attention must be paid while getting close to the unit. Touching is prohibited during normal operation.

### **Rotating Parts**

Fan guards must be fitted at all times and not removed unless the power supply has been isolated.

### **Sharp Edges**

The fins on the air-cooled condenser coils have sharp metal edges. Reasonable care should be taken when working

in contact with the coils to avoid the risk of minor abrasions and lacerations. The use of gloves is recommended.

Frame rails, panels, and other components may also have sharp edges. Reasonable care should be taken when working in contact with any components to avoid risk of minor abrasions and lacerations.

### **Refrigerants and Oils**

Refrigerants and oils used in the unit are generally non-toxic, non-flammable and non-corrosive, and pose no special safety hazards. They are pre-charged before delivery to customer and normally dispense with the need of additional charging, unless the machine is not working properly.

Use of gloves and safety glasses is, however, recommended when working on the unit. The buildup of refrigerant vapor, from a leak for example, does pose a risk of asphyxiation in confined or enclosed spaces and attention should be given to good ventilation.

### **High Temperature and Pressure Cleaning**

High temperature and pressure cleaning methods (e.g. steam cleaning) should not be used on any part of the pressure system as this may cause operation of the pressure relief device(s). Detergents and solvents, which may cause corrosion, should also be avoided.

## SECTION 6-MODBUS COMMUNICATION AGREEMENT DESCRIPTION

### MODBUS COMMUNICATION AGREEMENT DESCRIPTION

DESCRIPTION	
1	MODBUS RTU Protocol; , CRC: Cyclic Redundancy Check; ;
2	9600bps, 1 start bit, 1 stop bit, check bit-none, 8 data bits;
3	Temperature: 16-bit signed number ( -32768 ~ +32767 ) , Read: Actual temperature= Read Values/10, Write: Input data = Setting temperature×10, Unit:℃ ;
4	Buffer size: 256 Bytes
5	1) The BAS Modbus addresses of subordinates are set through HMI; (HMI Set-up:8) 2) Set DIP 301-7 to "ON" to make BAS enable. 3) Set the corresponding parameters in HMI to enable and disable the BAS Start/Stop (HMI Set-up 26) and Operating Mode functions (HMI Set-up 26) . 4) When BAS control is only, the unit must contact emergency shutdown facilities (such as enabling external interlock) to prevent BAS communication from failing to shut down units.
6	The Start/Stop Command (Register value = 0) is only used to start/stop the unit; Actual Start/Stop Status is accessible by reading Register value = 100.

### COMMUNICATION PROTOCOL SYSTEM REQUIREMENTS

Name	Function Code	Register Address	Note
Chiller Setpoint			
Chiller ON/OFF	3, 6, 16	0	0-Invalid, 1-On, 2-Off
Mode Setting	3, 6, 16	1	0-Cooling, 1-Heating, 8-Only Pump
Cool Return WT Setpoint	3, 6, 16	2	10~30
Heat Return WT Setpoint	3, 6, 16	3	20~53
Cool Leaving WT Setpoint	3, 6, 16	4	5~25
Heat Leaving WT Setpoint	3, 6, 16	5	20~58
Low Sound Mode	3, 6, 16	7	1-Enabled
Fault Reset	3, 6, 16	8	1-Enabled
Cooling Control Select	3, 6, 16	9	0-Fixed RT, 1-Fixed LT,2- Variable LT control
Heating Control Select	3, 6, 16	10	0-Fixed RT, 1-Fixed LT,2- Variable LT control
Temperature Control Cycle	3, 6, 16	11	10~120
Water Temp. Control Diff.	3, 6, 16	12	1~3
Backwater change rate control selection	3, 6, 16	14	0~6
BAS Read the module	3, 6, 16	15	1~32
Chiller Status			
Chiller ON/OFF	3	100	0-OFF, 1-ON
System Status	3	101	0-Cooling, 1-Heating, 8-Only Pump

HMI Communication status	3	103	1-ON, 0-OFF
Unit Networks Status (1-16)	3	104	bit0-16:Unit1-16, 1-ON, 0-OFF
Unit fault status (1-16)	3	109	bit0-16:Unit1-16, 1-Fault
System Return WT	3	110	°C
System Leaving WT	3	111	°C
Hot water tank temperature	3	112	°C
Ambient Temp	3	113	°C
System Loading Rate	3	114	0~100%
Unit Networks Status (17-32)	3	121	bit0-16:unit17-32, 1-On, 0-Off
Unit fault status (17-32)	3	122	bit0-16:unit17-32, 1-Fault
Total number of modules	3	123	
Fault Code			
Fault Word 1	3	1155	1. System level faults are handled by module 1 and module level by each module 2. The failure state of the module can be read and the fault word of the module can be read according to the failure module number 3. You can poll the fault word status of each module 4. See the fault code for explanation of the fault word
Fault Word 3	3	1157	
Fault Word 5	3	1159	
Fault Word 6	3	1160	
Fault Word 7	3	1161	


## FAULT DEFINITIONS

Address		Fault Name	Fault Code	Note
Fault Word 1	Bit0	Module Return Water Temperature Sensor Fault	1A	Bit0:1-Fault
	Bit1	Low Pressure Transducer Fault	2A	Bit1:1-Fault
	Bit2	Coil Temperature Sensor Fault	3A	Bit2:1-Fault
	Bit3	Ambient Temperature Sensor Fault	4A	Bit3:1-Fault
	Bit4	Unit LWT Sensor Fault	5A	Bit4:1-Fault
	Bit5	Chiller LWT Sensor Fault★	6A	Bit5:1-Fault
	Bit6	Accumulator Inlet Temperature Sensor Fault	7A	Bit6:1-Fault
	Bit8	Compressor Discharge Port Temperature Sensor Fault	9A	Bit8:1-Fault
	Bit9	Economic Entering Temperature Sensor Fault	10A	Bit9:1-Fault
	Bit10	Economic Leaving Temperature Sensor Fault	11A	Bit10:1-Fault
Fault Word 3	Bit1	Module Water Flow Switch Fault Or Water Pump Overload Alarm	2d	Bit0:1-Fault
	Bit2	High Pressure Alarm	3d	Bit2:1-Fault
	Bit4	Chiller Water Flow Switch Fault Or Water Pump Overload Alarm Failure★	5d	Bit4:1-Fault
	Bit7	External Interlock	8d	Bit7:1-Fault
	Bit8	Power Supply Protection (Only with water pump unit)	9d	Bit8:1-Fault
Fault Word 5	Bit0	Communication Failure (1# machine is host and line control, others are modules and host)	1E	Bit0:1-Fault

	Bit1	Host and BAS Communication Failure	2E	Bit1:1-Fault
	Bit3	Chiller low ambient temperature in cooling	4E	Bit3:1-Fault
	Bit5	Chiller low leaving temperature in cooling	6E	Bit5:1-Fault
	Bit6	Chiller high leaving temperature in heating	7E	Bit6:1-Fault
	Bit7	Unit not unlocked	8E	Bit7:1-Fault
	Bit8	Communication failure between principal unit and T8600 Or FCU	9E	Bit8:1-Fault
	Bit9	Winter anti-freezing protection failure alarm	10E	Bit9:1-Fault
	Bit10	Unit Low Leaving Temperature In Cooling	11E	Bit10:1-Fault
	Bit12	Unit High Leaving Temperature In Heating	13E	Bit12:1-Fault
	Bit14	Unit Low Leaving Temperature In Heating	15E	Bit14:1-Fault
Fault Word 6	Bit0	Compressor high discharge port temperature	1F	Bit0:1-Fault
	Bit8	BPHE anti-freeze protect	2F	Bit8:1-Fault
Fault Word 7	Bit1	Communication Failure Of Unit (Between Mainboard And Compressor Driver)	2P	Bit1:1-Fault
	Bit3	Mismatching Of Driver Type	4P	Bit3:1-Fault
	Bit5	Compressor Driver Alarm	6P	Bit5:1-Fault
	Bit7	Excessive Higher or Lower Speed Of Fan 1	8P	Bit7:1-Fault
	Bit8	Excessive Higher or Lower Speed Of Fan 2	9P	Bit8:1-Fault
	Bit13	Mainboard Hardware Fault	14P	Bit13:1-Fault

## TROUBLE SHOOTING

**TABLE 21 - TROUBLESHOOTING**

PROBLEM	CAUSE	SOLUTION
<p>No display on wire controller.</p> <p>Unit will not operate.</p>	<ol style="list-style-type: none"> <li>1. No power from microboard to 12VDC wire controller.</li> <li>2. No 230VAC to microboard.</li> <li>3. Communication wire defective between wire controller to unit.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check microboard power supply and the corresponding wiring.</li> <li>2. Check power supply to microboard and the corresponding wiring.</li> <li>3. Check communication wiring.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p><b>NOTE</b></p> </div> <p><b>Contact YORK Service before replacing circuit boards!</b></p>
<p><b>“Chiller Water Flow” Fault</b></p>	<ol style="list-style-type: none"> <li>1. No chilled liquid flow.</li> <li>2. Too much air in piping system.</li> <li>3. Flow switch improperly installed.</li> <li>4. Defective flow switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check chilled liquid flow.</li> <li>2. Purge the air through a release valve.</li> <li>3. Check that the flow switch is installed according to manufacturer’s instructions.</li> <li>4. Replace flow switch.</li> </ol>
<p><b>“Low Suction Pressure” Fault</b></p>	<ol style="list-style-type: none"> <li>1. Low refrigerant charge.</li> <li>2. Fouled or clogged BPHE.</li> <li>3. EEV defective.</li> <li>4. Reduced flow of chilled.</li> <li>5. Defective suction pressure transducer/low pressure switch or wiring.</li> <li>6. Fans not operating (in heating mode).</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak if necessary and add refrigerant.</li> <li>2. Clean BPHE.</li> <li>3. Check the wiring, or replace EEV.</li> <li>4. Check liquid flow rate. Check operation of pump, clean pump strainer, purge chilled liquid system of air.</li> <li>5. Replace transducer/low pressure switch or faulty wiring.</li> <li>6. Check fan wiring and communication.</li> </ol>
<p><b>“High Discharge Pressure or Compressor Overload” Fault</b></p>	<ol style="list-style-type: none"> <li>1. Condenser fans not operating or operating backwards.</li> <li>2. Too much refrigerant.</li> <li>3. Air in refrigerant system.</li> <li>4. Defective discharge pressure switch.</li> <li>5. Compressor motor locked.</li> <li>6. Compressor internal motor protector (MP) open.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check fan motor. Assure fan blows air frontward.</li> <li>2. Remove refrigerant.</li> <li>3. Evacuate and recharge system.</li> <li>4. Replace discharge pressure switch.</li> <li>5. Replace compressor.</li> <li>6. Verify refrigerant charge is not low. Verify superheat setting (3-5°C). Verify correct compressor rotation. Verify compressor is not over loaded.</li> </ol>

## TROUBLE SHOOTING (CONT'D)

**TABLE22 – TROUBLE SHOOTING (CONT'D)**

PROBLEM	CAUSE	SOLUTION
<b>“Low Leaving Water Temp” Fault</b>	<ol style="list-style-type: none"> <li>Improperly adjusted leaving chilled liquid temp. cutout (glycol only).</li> <li>Micro panel setpoint/range values improperly programmed.</li> <li>Chilled liquid flow too low.</li> <li>Defective LWT or RWT sensor (as- sure the sensor is properly installed in the bottom of the well with a generous amount of heat conductive compound).</li> </ol>	<ol style="list-style-type: none"> <li>Re-program the leaving chilled liquid temp. cutout.</li> <li>Re-adjust setpoint/range.</li> <li>Increase chilled liquid flow - refer to limitations in installation section.</li> <li> <ol style="list-style-type: none"> <li>Compare sensor against a known good temperature sensing device.</li> <li>Replace defective sensor.</li> </ol> </li> </ol>
<b>Compressor(s) Won't Start</b>	<ol style="list-style-type: none"> <li>Defective water temperature sensor.</li> <li>Overload failure.</li> <li>Driver failure.</li> <li>Compressor failure.</li> </ol>	<ol style="list-style-type: none"> <li>Compare the display with a thermometer. Should be within +/- 2 degrees.</li> <li>Replace defective part.</li> <li>Check driver running status and the flicker of LEDs.</li> <li>Diagnose cause of failure and replace.</li> </ol>
<b>Fan Protect</b>	<ol style="list-style-type: none"> <li>Power or communication loss.</li> <li>Internal fan fault.</li> </ol>	<ol style="list-style-type: none"> <li>Check the wiring;</li> <li>Contract local service for further fault analysis.</li> </ol>
<b>Lack of Cooling or Heating Effect</b>	<ol style="list-style-type: none"> <li>Fouled evaporator surface (in cooling mode). Low suction pressure will be observed.</li> <li>Fouled coil surface (in heating mode). Low suction pressure will be observed.</li> <li>Improper flow through the evaporator.</li> <li>Low refrigerant charge. Low suction pressure will be observed.</li> </ol>	<ol style="list-style-type: none"> <li>Contact the local Johnson Controls representative.</li> <li>Contact the local Johnson Controls representative.</li> <li>Reduce flow to within chiller design specs. See limitations in Installation section.</li> <li>Check subcooling and add charge as needed.</li> </ol>

## POISONOUS AND HARMFUL SUBSTANCE CONTENT TABLE UNIT

**TABLE23 –POISONOUS AND HARMFUL SUBSTANCE CONTENT TABLE UNIT**

Contents of toxic and harmful substances						
Part name	hazardous substance or element					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Compressor	×	○	○	○	○	○
Motor	×	○	○	○	○	○
Fan	○	○	○	○	○	○
Metal Parts	○	○	○	×	○	○
Valve	×	○	○	○	○	○
Pressure Transducer	×	○	○	○	○	○
Pressure Switch	×	○	○	○	○	○
Temperature Sensor	×	○	○	○	○	○
Fastener	×	○	○	×	○	○
Controller	×	○	○	○	○	○
Electrical Control Group	○	○	○	○	○	○
Heat Exchanger	○	○	○	○	○	○
Copper Tubes	○	○	○	○	○	○
Copper Fitting	○	○	○	○	○	○
Rubber Parts	○	○	○	○	○	○
Refrigerant	○	○	○	○	○	○
Gas-liquid Separator	○	○	○	○	○	○
Aluminum Foil	○	○	○	○	○	○
Water Pump	○	○	○	○	○	○
Insulated Cotton	○	○	○	○	○	○
Soundproof Sponge	○	○	○	○	○	○
Plastic Part	○	○	○	○	○	○
Foamed Plastic Part	○	○	○	○	○	○
Printed Matter	○	○	○	○	○	○
It is based on the provisions of SJ/T11364 establishment						
○: It means the toxic and harmful substances in the parts of content in all homogeneous materials under limited requirements of GB/T26572 regulations.						
X: It means the toxic and harmful substances in the parts at least in a homogeneous material content beyond the limited requirement of GB/T26572 rules, play "x" in the form, due to technical reasons at present cannot replace, follow-up with the progress of technology will gradually improve.						
1, This product is discarded after please which is separated from the living garbage, consumers have a responsibility to be sent to the qualified collection points;						
2, Recycling center will be through the appropriate method of recycling products materials;						
3, Detailed information about recycling and disposal of this product please consult the local government, scrap processing center or local distributor;						
4, This product is not the same as the period of validity of environmental protection product safety service life.						
Suitable Model : Mini Chiller						



**YORK Guangzhou Air Conditioning & Refrigeration Co., Ltd.**

**Phone: +86 763 4681111**



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