General Catalogue

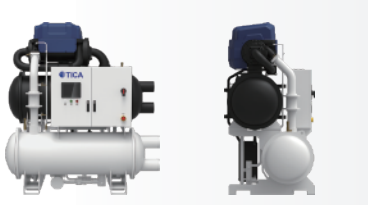
Turboe Core CHILLER

ACHIEVE YOUR VISION

CHILLER
FAN COIL
ICE TERMAL STORAGE SYSTEM
CHU & AHU
BOILER

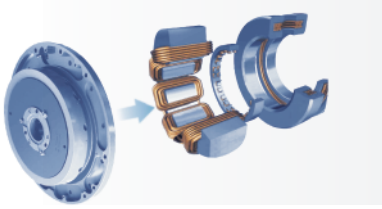
RAAF

HIGH-EFFICIENT PERFORMANCE



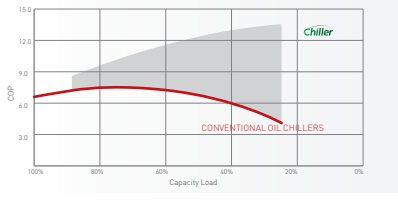
Excellent Performace

- QILE utilizes oil-free magnetic bearing compressor, eliminating mechanical friction loss and oil thermal conduction loss. Intelligent control realizes no performance degradation during long-term operation.
- With innovative struture design, easily accesible relief valve and economizer, the reliablity and efficiency is improved.



Stability & Reliability

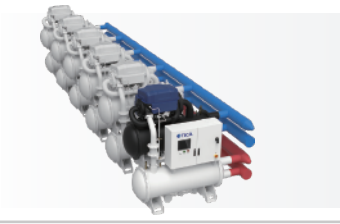
- No complicated oil system.
- Fault protection: -Generator mode enables uninterrupted operation
  -Long-life and high-impact-resistant backup bearing
- Advanced anti-surge control logic combined with a high-performance anti-surge compressor, capable of withstanding 500+ consecutive surge events.



Highly Efficiency

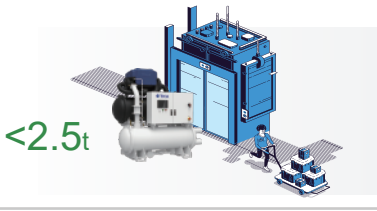
- COP under part load up to 12; energy savings up to 35% compared to traditional screw or centrifugal chillers

CONVENIVENT FOR APPLICATION



Flexible Combination

- The modular configuration allows for a 50% reduction in footprint compared to traditional oil-lubricated chillers.
- Master-slave control system enables balanced operation, load regulation, automatic redundancy, etc.
- Maxium cooling capacity up to 1600 RT with 8 modules.



Light Weight

- The entire series of units weighs less than 2.5 t, with a height not exceeding 2.3 m, allowing direct transport via 2.5-t freight elevators without the need for special disassembly.

Easy Transport

- To facilitate on-site transportation, the unit is equipped with dual-direction forklift slots (longitudinal and transverse), allowing easy positioning even in tight or confined plant rooms.

PERFORMANCE & PHYSICAL DATA

Model			TWMFM0130.1 AC1	TWMFM0150.1AC1	TWMFM0170.1AC1	TWMFM0180.1AC1	TWMFM0200.1AC1
Cooling Capacity		RT	130	150	170	180	200
		kW	457	527.4	598	632.9	703
Input Power/kW			71.3	81.9	94.1	97.9	107.9
COP			6.41	6.44	6.35	6.46	6.52
IPLV			10.63	10.94	11.16	11.04	11.34
Operating Current/A			115.1	132.9	149.6	159.8	167.5
Motor Rated Power/kW			110	110	110	120	120
Maximum Operating Current/A			138.1	159.5	179.5	191.8	201.0
Power Supply			380 V/50 Hz				
Refrigerant			R134a				
Load Regulation			10%-100% Stepless Regulation				
Compressor Amount			1				
Evaporator	Water-side Design Pressure	MPa	1.0				
	Water Flow Rate	m^3/h	78.6	90.7	102.9	108.9	120.9
	Water-side Pressure Drop	KPa	79	80	80	80	82
	Water Pipe Diameter(DN)		150	150	150	150	150
Condenser	Water-side Design Pressure	MPa	1.0				
	Water Flow Rate	m^3/h	98.3	113.4	128.6	136.1	151.1
	Water-side Pressure Drop	KPa	79	81	81	77	79
	Water Pipe Diameter(DN)		150	150	150	150	150
Size	Length	mm	2035	2035	2035	2035	2035
	Width	mm	1100	1100	1150	1150	1150
	Height	mm	2100	2100	2250	2250	2250
Weight	Shipping Weight	kg	2265	2320	2425	2450	2470
	Operating Weight	kg	2595	2670	2855	2900	2950

Note:

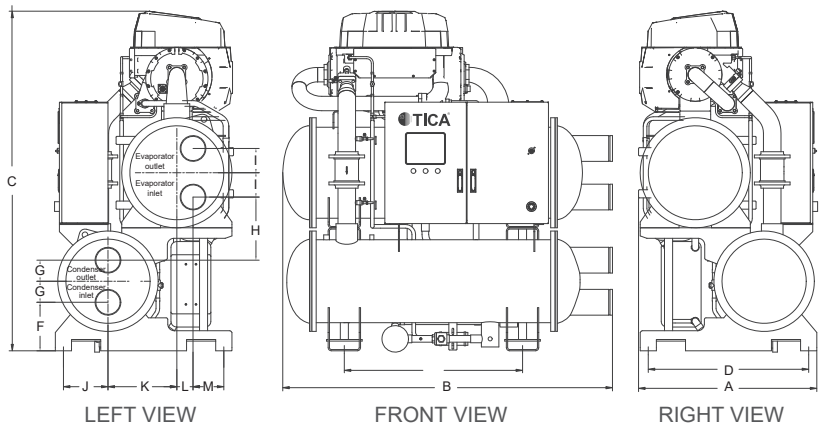
·The parameters are given in accordance with the latest version of AHRI Standard 551 / 591.

·The standard power supply is 380 V/60 Hz, with options for 400 V/50 Hz, 380 V/60 Hz and 460 V/60 Hz. Voltage fluctuation within ±10% is allowed.

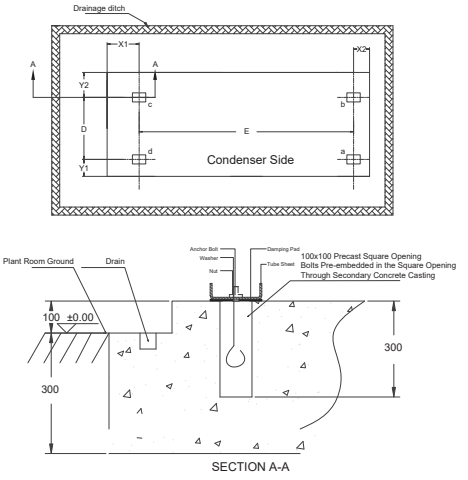
·The standard water chamber pressureis 1.0 MPa, with options for 1.6 MPa and 2.0 MPa.




Unit Dimensions



Foundation Drawing



Model	Evaporator inlet&outlet	Condenser inlet&outlet	A	B	C	D	E	F	G	H	I	J	K	L	M	X1	X2	Y1	Y2
TWMFM-130.1AC1	DN150	DN150	1100	2035	2100	990	1100	300	130	390	150	275	425	100	190	700	900	200	200
TWMFM-150.1AC1	DN150	DN150	1100	2035	2100	990	1100	300	130	390	150	275	425	100	190	700	900	200	200
TWMFM-170.1AC1	DN150	DN150	1150	2035	2250	1015	1100	330	150	420	150	300	425	150	140	700	900	200	200
TWMFM-180.1AC1	DN150	DN150	1150	2035	2250	1015	1100	330	150	420	150	300	425	150	140	700	900	200	200
TWMFM-200.1AC1	DN150	DN150	1150	2035	2250	1015	1100	330	150	420	150	300	425	150	140	700	900	200	200

Note:

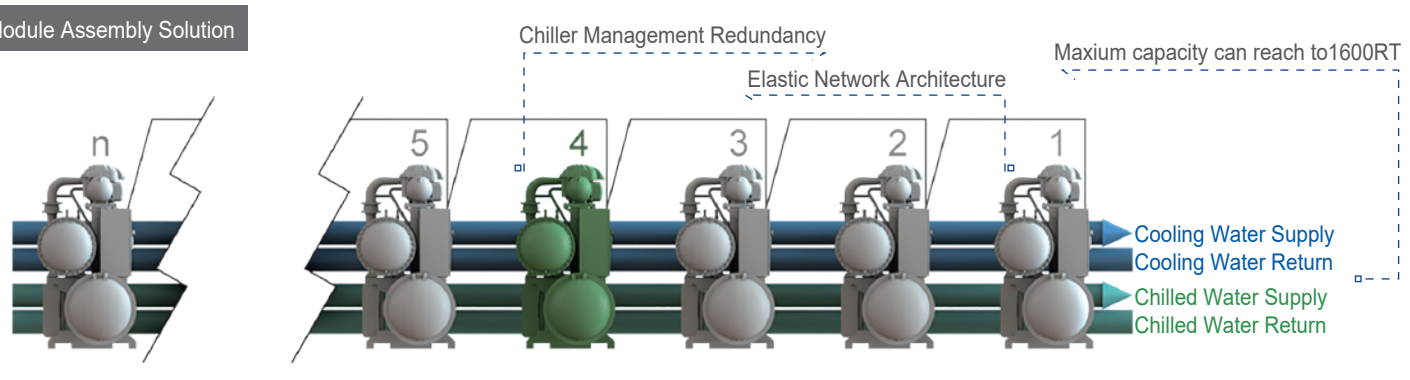
·This unit has low vibration and can be placed directly on a concrete floor.

·If the user needs to build a foundation and secure the unit with anchor bolts or expansion bolts, refer to the diagram above for installation instructions.

·If the plant room is located on a floor slab, the slab must have sufficient strength and stiffness to support the operating weight of the chiller.

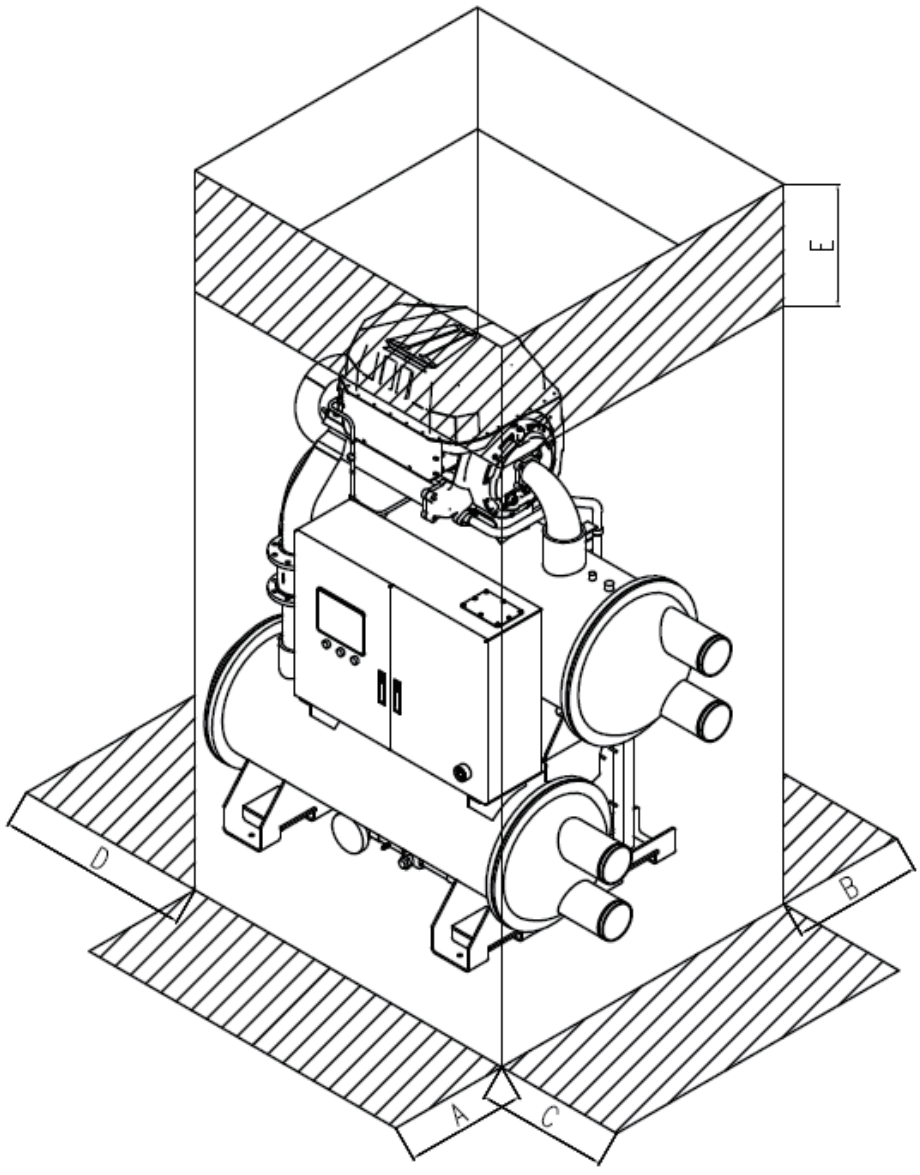
·When constructing a concrete foundation, ensure a drainage trench is built around the perimeter for easy water drainage, and the edges of the foundation should be smooth.

Module Assembly Solution






MAINTENANCE SPACE DIAGRAM



Model	A	B	C	D	E
TWMFM-130.1AC1	1000	800	700	2000	1200
TWMFM-150.1AC1	1000	800	700	2000	1200
TWMFM-170.1AC1	1000	800	700	2000	1200
TWMFM-180.1AC1	1000	800	700	2000	1200
TWMFM-180.1AC1	1000	800	700	2000	1200

Note:

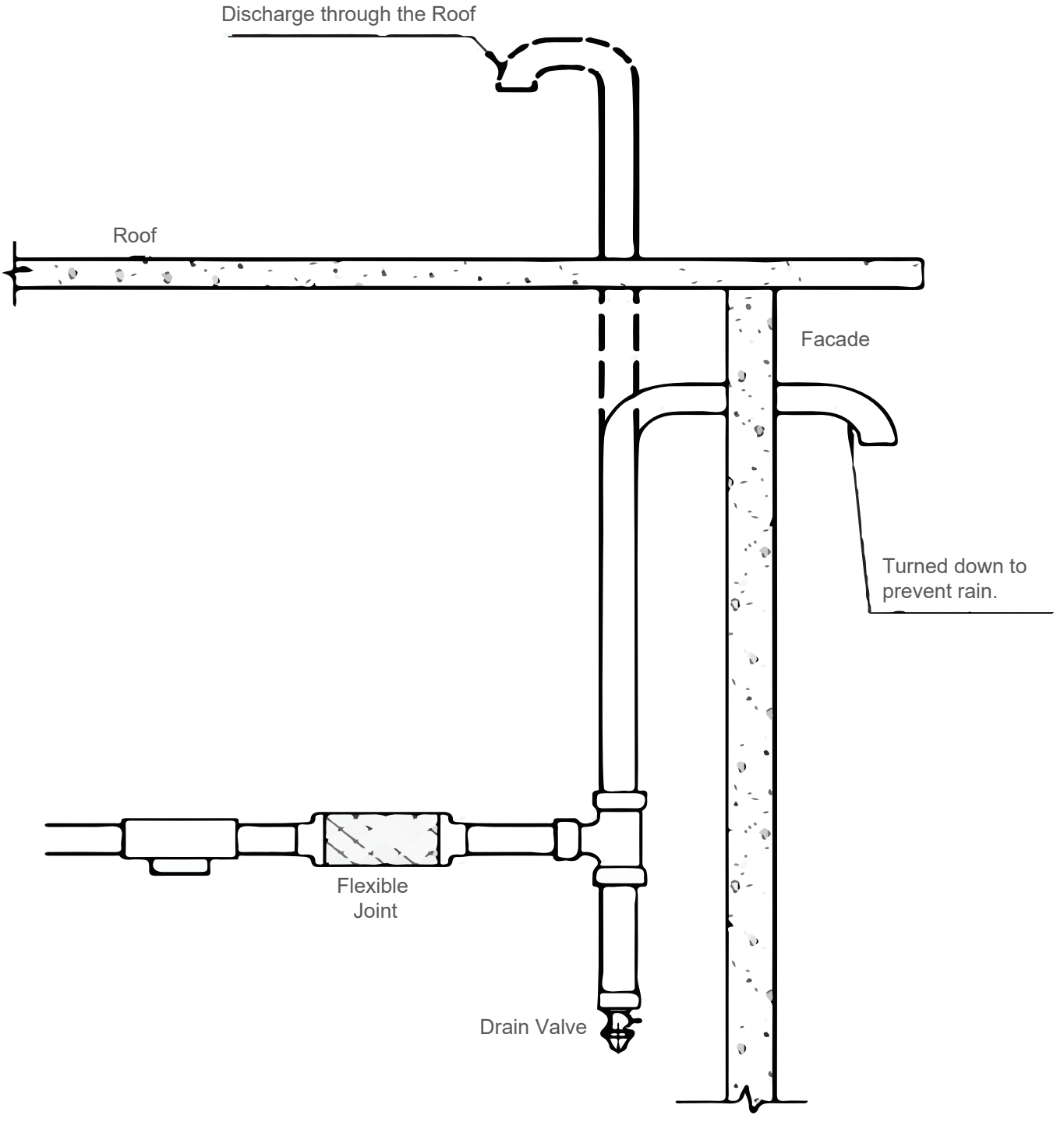
·If extra space is allowed during installation, clearance on either side of the unit can be reserved for piping connections to enable copper tube cleaning.

RELIEF VALVES

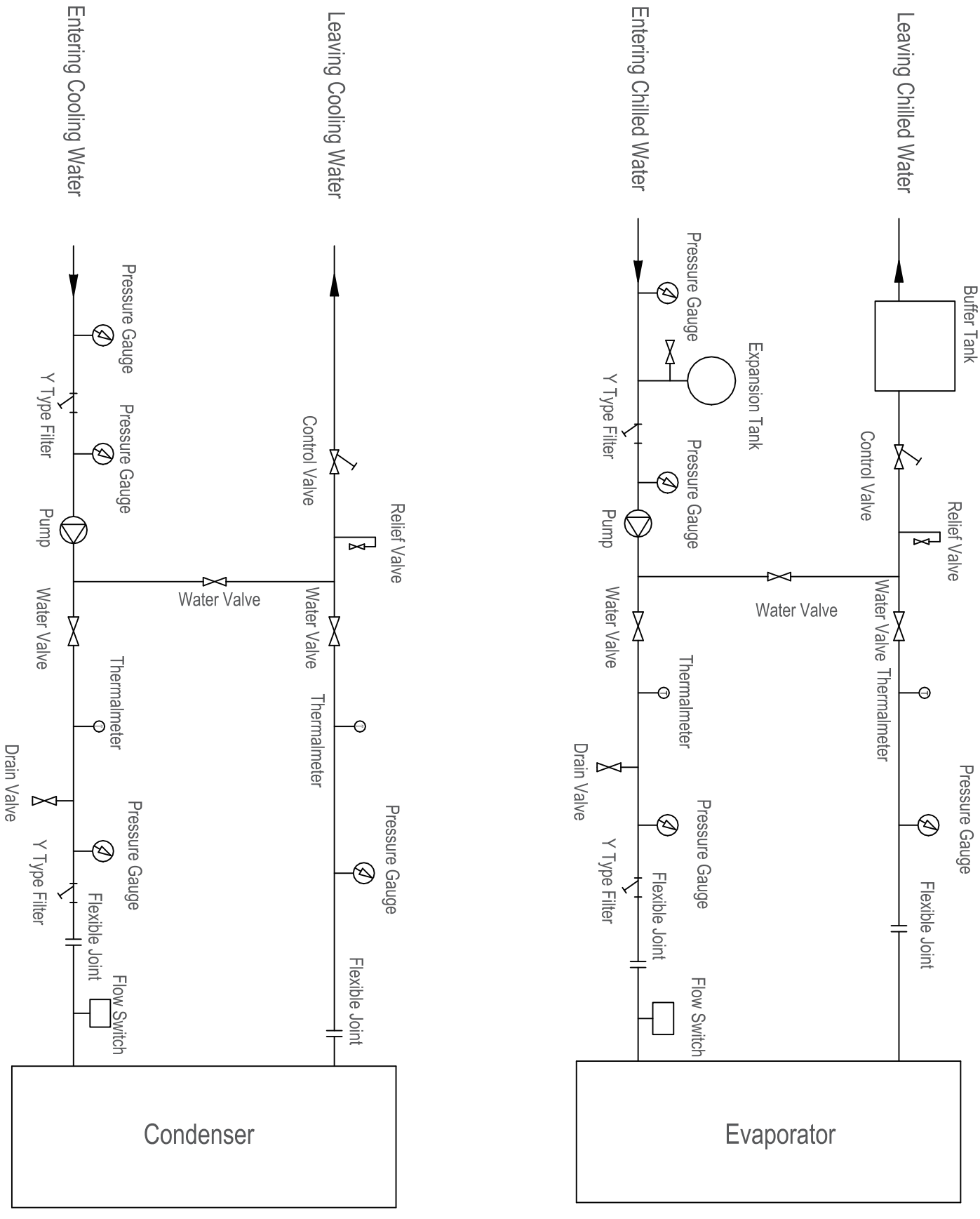
The pipe diameter should match the size of the relief valve.
If the unit uses parallel relief valves, the diameter should be selected based on the combined size of both valves.

Installation Type	Single	Parallel
Pipe Diameter(mm)	1000	800

Remove the protective cover from the safety valve.
As shown in figure below, connect the discharge port of the safety valve to an outdoor location.
Ensure that the bottom of the discharge pipe has sufficient volume to collect liquid.



WATER PIPING SYSTEM



WATER PIPING SYSTEM

Pressure Gauge

Pressure gauges should be installed on straight sections of the piping near the water chambers. There should be a minimum clearance of at least one pipe diameter from upstream or downstream components that may cause turbulence.

Filter

Filters must be installed on the inlet piping of each water chamber to prevent debris from entering and clogging the piping or damaging the water chamber. Generally, filters with a mesh size of 60 or higher are recommended.

Flexible Connector

Flexible connectors should be installed in the piping system to prevent the transfer of unit vibrations to the pipeline network. This also avoids the amplification of vibrations between the pump and the unit, which could reduce the lifespan of the piping system.

Shut-off Valve

Selected based on the pipe diameter; usually the selected valve diameter should be consistent with the unit connecting pipe.

Check Valve

Installed at the water outlet of the pump to avoid damages to the pump when water flows back; the diameter of the valve pipe should be consistent with the unit connecting pipe.

Bypass Valve

Installed between the inlet pipe and outlet pipe of the vessel; needs to be opened when cleaning pipelines.

Thermometer:

Used to check, maintain, and observe the performance of the unit; usually that with a measurement range of 0 ℃ to 100 ℃ is selected.

Pump

Pump output = L*1.1 (L - unit water flow), and the pump lift can be calculated based on the following formula:
Pump lift = {unit water resistance + least pipe length * (2% to 5%) + water resistance of the end of the most adverse path} * 1.1

Automatic Air Discharge Valve

Used to discharge air in the water system and ensure normal performance of the unit. It should be installed at the highest position of the system.

Expansion Tank

Used to accommodate the excess water, stabilize the water pressure of the system, and add water to the system. Generally, it is installed on the water return pipe, higher than the pipeline in the system, so as to ensure the normal performance of the unit. The capacity can be calculated based on the following formula:
V (capacity of the expansion water tank) = (0.03 ~ 0.034)Vc
Vc — water capacity of the system (m^3)

WATER PIPING SYSTEM

Buffer Tank

Used to adjust energy to reduce the load changes of the system when the compressor starts and stops frequently. It can improve the system efficiency and extend the service life of the unit. The capacity can be calculated based on the following formula:
V (capacity of the energy saving tank) (m^3) = (Q/27.9n) -VS
Q — cooling capacity (kW)
n —number of compressor
VS — water capacity (m^3) in pipeline and heat exchanger

Minimum Water Capacity of System

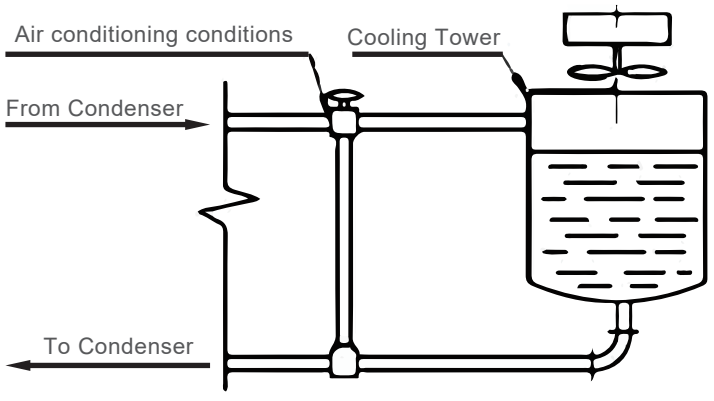
The minimum water capacity of the water circulation system is calculated by the following formula.
The minimum water capacity = Nominal cooling capacity (kW) × N (L)

Running type	N
Air conditioning conditions	3.25
Industrial conditions	6.5

Minimum water capacity of system is a necessary guarantee for stable operation and precise control of the chiller. It is usually necessary to add a baffle tank to achieve the required water capacity. A baffle is set in the baffle water tank to ensure the water fully mixed. Refer to the following examples.

Cooling Tower Bypass Circuit

When the ambient temperature is low and the unit is in operation, a bypass circuit should be installed on the cooling tower inlet piping to ensure sufficient pressure difference between the condenser and evaporator.



Differential Pressure Flow Switch

The pressure measurement points should be located as close as possible to the upper section of the inlet and outlet water pipes of the heat exchanger. Avoid taking measurements from the lower section of the pipes to prevent debris from entering the pressure tubes.
The distance between the two measurement points should be as short as possible.
There should be no valves or other flow-blocking devices between the flow switch measurement points and the heat exchanger, as this may affect measurement accuracy.

Note:

The pressure measurement points should be located as close as possible to the upper section of the inlet and outlet water pipes of the heat exchanger. Avoid taking measurements from the lower section of the pipes to prevent debris from entering the pressure tubes.
The distance between the two measurement points should be as short as possible.
There should be no valves or other flow-blocking devices between the flow switch measurement points and the heat exchanger, as this may affect measurement accuracy.

ELECTRICAL WIRING

Starter Cabinet Wiring

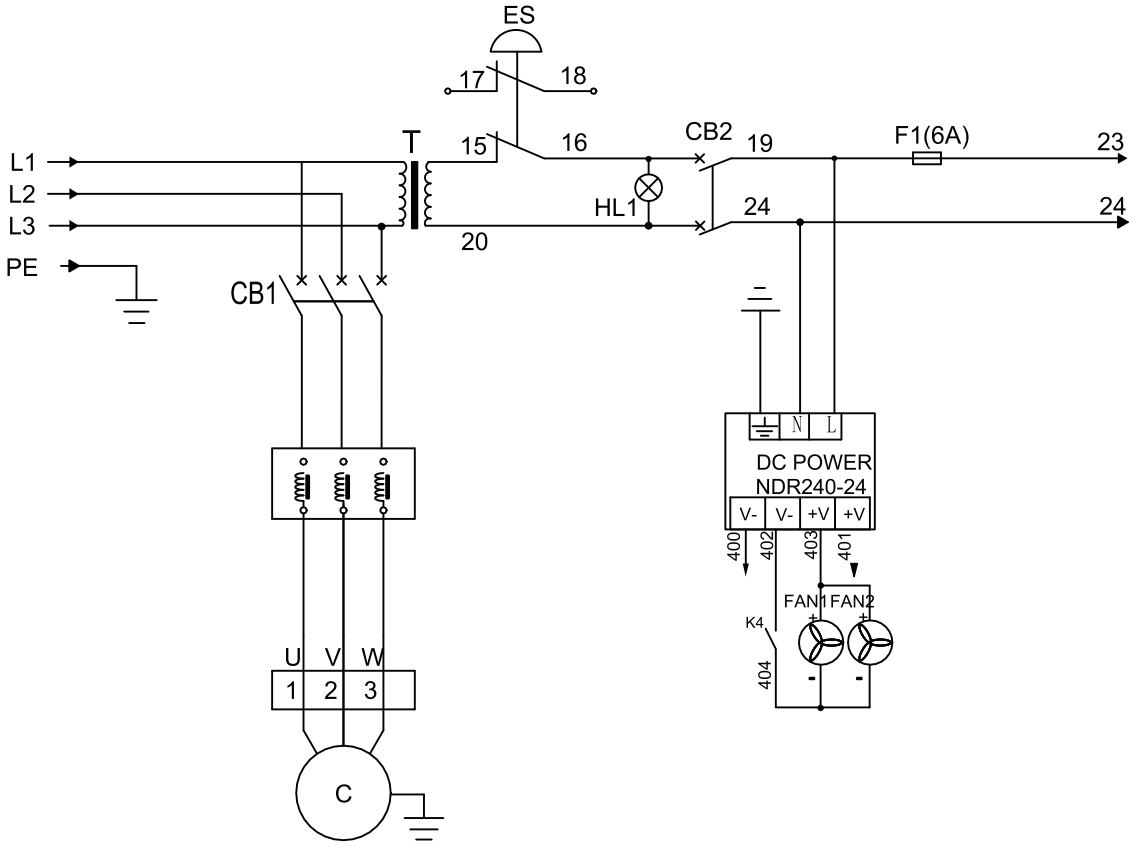
Depending on the unit model, the power cable requirements for the main motor of the magnetic bearing centrifugal chiller vary. The recommended wire quantity and cross-sectional area of power cable are shown in table below.

Model	Wire QTY and CSA
TWMFM-130.1AC1	3*50mm²+1*35mm²
TWMFM-150.1AC1	3*70mm²+1*35mm²
TWMFM-170.1AC1	3*70mm²+1*35mm²
TWMFM-180.1AC1	3*95mm²+1*50mm²
TWMFM-200.1AC1	3*95mm²+1*50mm²

1. For low-voltage wiring. The installation conditions assume cable tray routing (flat installation, spaced horizontally), an ambient temperature of 40°C, and a conductor temperature of 70°C. The cable type is PVC-insulated copper core cable.
2. If the cable material, installation method differs from the recommendations, or if the voltage drop exceeds 2% due to distance, please reselect the cable based on the unit's maximum operating current. When using other cable types, ensure the cable lug dimensions and electrical clearances comply with standards.
3. The recommended cables represent the minimum allowable specifications for the unit. The cables are to be provided by the user.
4. For parallel connections, cables of the same specification must be used (same length, same cross-sectional area, and from the same manufacturer).

The starter cabinet wiring diagram is shown as below. A three-phase four-wire system is recommended.

Power Wiring	Compressor			Transformer	Emergency Switch	Power Indication	Control Power Switch	Cooling Fan	Switching Power Supply	Fuse
	Breaker	Reactor	Motor							



ELECTRICAL WIRING

Control Cabinet Wiring

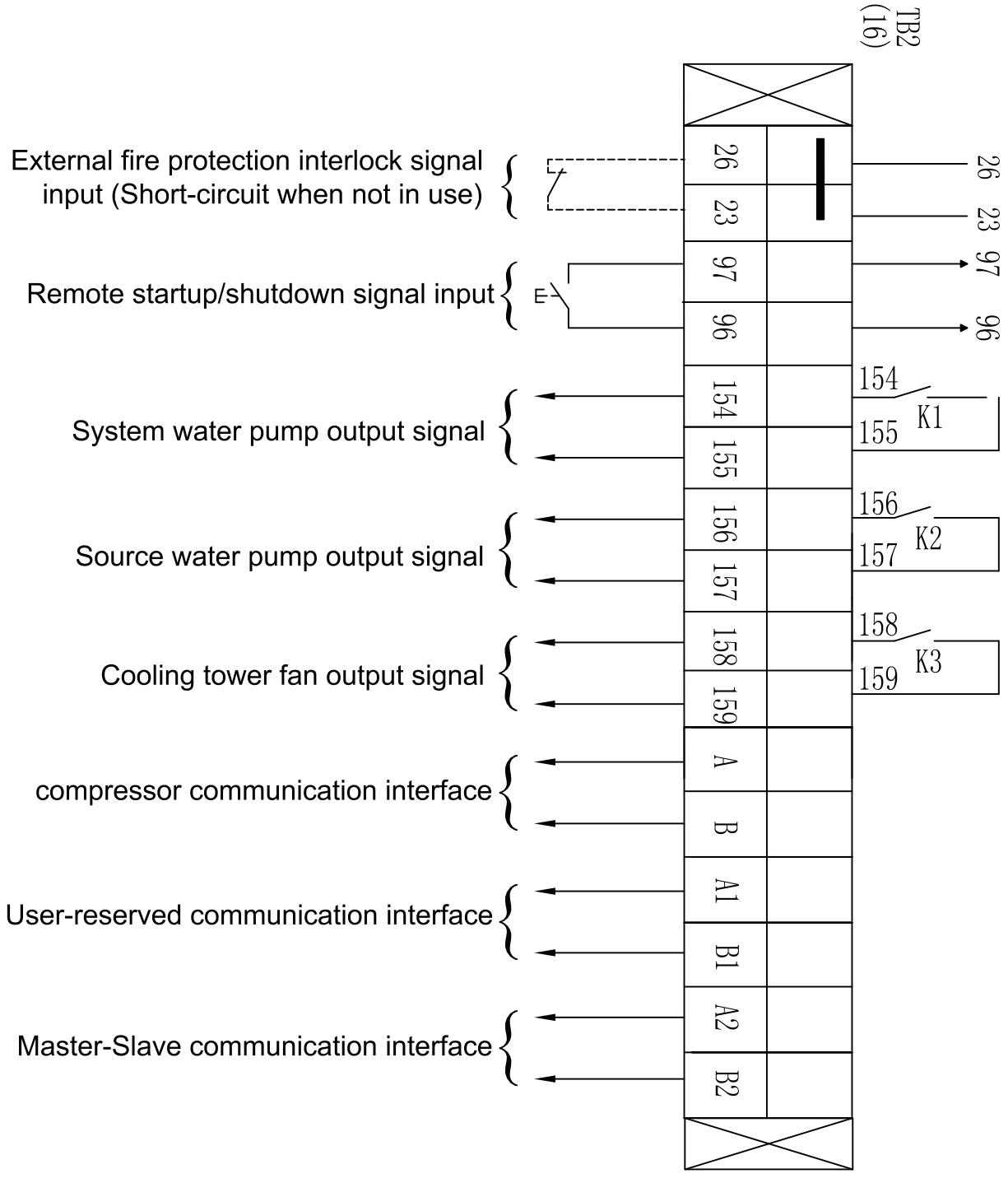
The functional terminal provided in the control cabinet for user-side connections is shown as below. For detailed wire marking, refer to the actual product documentation for final specifications.

1.The signals for the startup/shutdown of the chilled water pump, cooling water pump and cooling tower fan, along with alarm, fault, and operation output signals are all dry contact signals.

2. If the pump and cooling tower fan interlock control function is not applicable, ensure that the pumps are started before the unit is powered on.

3. The pumps and cooling tower fans must be independently powered. It is strictly prohibited to derive power from the unit's power supply lines.

4. The user-provided input signals (remote startup, remote shutdown) must be dry contacts.



LIFTING

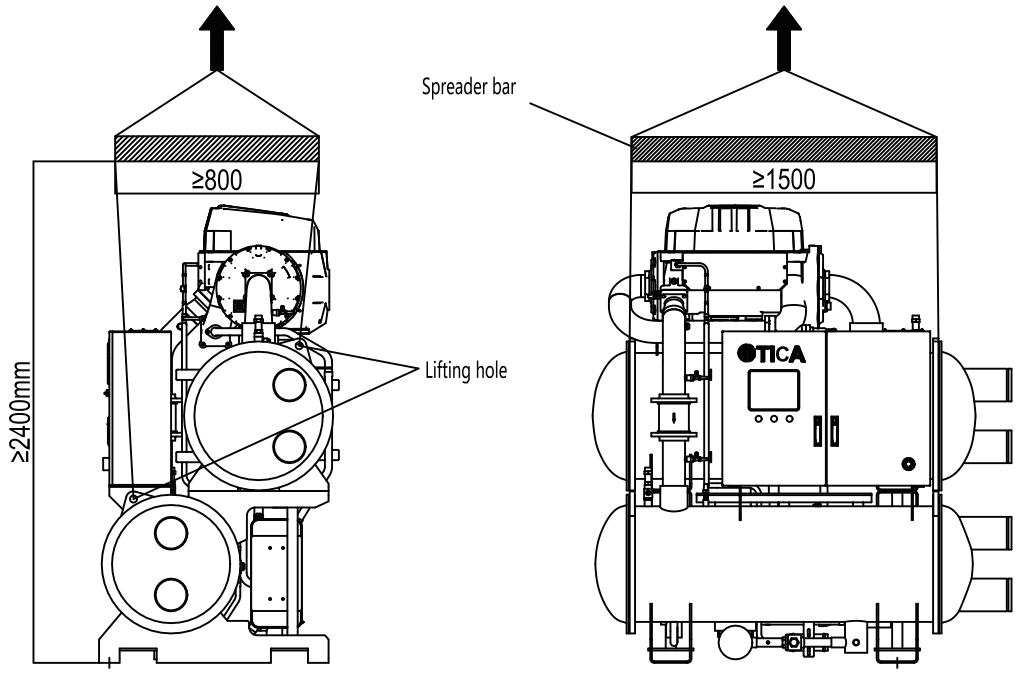
During lifting, ensure the slings have adequate load capacity and use ropes or chains with sufficient strength, securely fastened to the lifting holes. Distribute the load evenly and follow the lifting diagram instructions to avoid damaging the control cabinet or other components. Use a spreader bar during lifting and take care not to damage any accessories (refer to lifting diagram in user manual). When lifting the unit, secure it with ropes or chains attached to the lifting holes, and protect the control cabinet and other parts from damage. Requirements:

(1) Lift the unit horizontally.

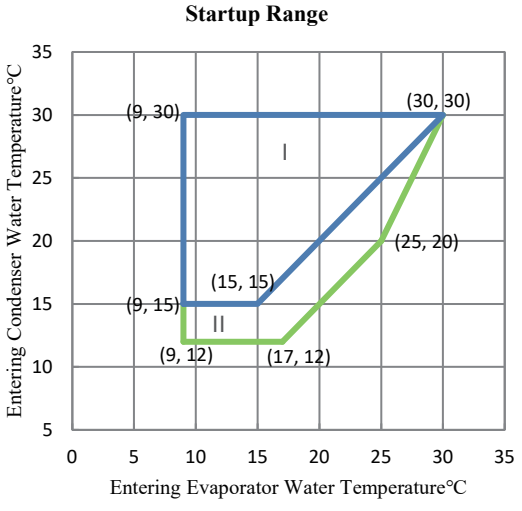
(2) The maximum allowable tilt angle is 20°.

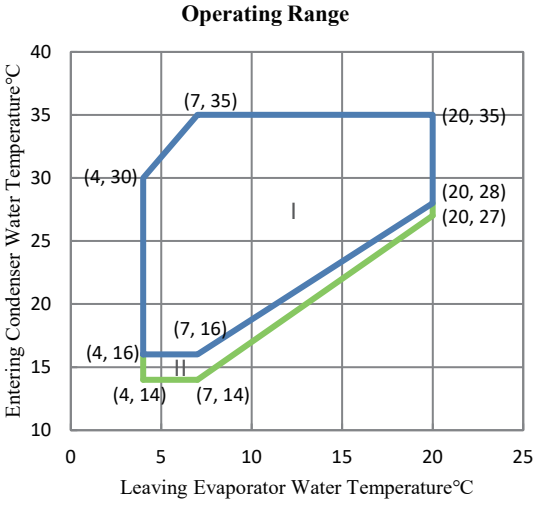
(3) Impact during handling may damage bearings and shorten the unit's lifespan. Handle with care to avoid impacts.

(4) When moving the unit with rollers, take precautions to prevent tipping.



RECOMMENDED STARTUP RANGE





I: Regular startup range;

II: Extended startup range (with user-configured three-way valve in cooling water circuit for condensing pressure control)

I: Standard full-load operating range;

II: Extended full-load operating range (with user-configured water system three-way valve in cooling water circuit for condensing pressure control)

RECOMMENDED WATER FLOW RATE RANGE

Water Flow Rate Range	Ratio to Full-load Flow Rate
Evaporator	40%-120%
Condenser	100%-120%

Note:

1. The operating range is based on the water flow rate requirements defined by AHRI standard 550/590.
2. The maximum chilled water flow rate is limited by the maximum allowable pressure drop/flow rate inside the evaporator. If the design flow rate exceeds the maximum allowable value, special customization is required.
3. Constant leaving chilled water temperature can be achieved when the flow rate varies within the allowable range, provided the flow change does not exceed 10% per minute.

ENVIRONMENTAL REQUIREMENTS

To prevent damage to the electronic components of the refrigeration unit caused by environmental factors such as moisture, excessive heat, or extreme cold, the operation and storage of the unit must comply with the environmental requirements specifiedin table below.

Operating	
Temperature	4~40°C
Humidity	≤90%，no condensation
Altitude	≤1000m
Pollution Degree	II
In Storage	
Temperature	-20℃~50℃
Humidity	≤90%，no condensation

WATER QUALITY REQUIREMENTS

Water quality inspections should be conducted monthly and must meet the following requirements.

Parameters			Baseline	Influence	
Key Parameters	pH（25℃）		6.5～8	Corrosion	Scaling
	Electrical conductivity（25℃）	μS/cm	＜800	√	√
	Cl-	mg(Cl-)/L	＜200	√	√
	SO2-	mg(SO2-)/L	＜200	√	
	Acid consumption（pH=4.8）	mg(CaCO3)/L	＜100	√	
	Total Hardness	mg(CaCO3)/L	＜200		√
Reference parameters	Fe	mg(Fe)/L	＜1.0	√	√
	S2-	mg(S2-)/L	Not detectable	√	√
	NH+	mg(NH+)/L	＜1.0	√	
	SiO2	mg(SiO2)/L	＜50		√
Note: √ indicates a contributing factor to corrosion scaling.					

OPTIONS AND ACCESSORIES

Vessels

Flanges (Victaulic® connections are standard)
Raised face flanges on either the evaporator and/or condenser is optional. Mating flanges are also provided.

Double insulation on evaporator and suction piping
For high humidity locations and low leaving chilled water temperature applications.

Dual relief valves
One valve can be inspected or serviced while the other remains operational, minimizing system downtime.

Water side vessel construction of 1.6 MPa/2.0 MPa (1.0 MPa is standard)
For high pressure water systems, typically high-rise building construction.

Automatic condenser cleaning system
Sponge ball for condenser tube cleaning.

Special vessel codes
ASME/ PED certified vessels are optional

Control Cabinet

IP55-rated control cabinet (IP20-rated is standard)
Ensures reliable performance in dusty and humid applications.

4G module
For remote monitoring and real-time data transmission. Please confirm whether it is compatible with local network requirements.

Compressor

Power supply (380 V/ 50 Hz is standard)
380 V/ 60 Hz, 400 V/ 50Hz and 460 V/ 60Hz is optional

Refrigerant (R134a is standard)
R513A and R1234ze(E) is optional

Note:

For other customized product requirements, please feel free to consult TICA.

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