

**Kiturami Bumyang Products**

Slim Type Air-Conditioner/ Room Air-Conditioner

Air / Water Cooled Packaged Air-Conditioner

Constant Temperature & Humidity Unit

Gas Heat Pump(GHP)

Energy Recovery Ventilators

Centrifugal Type Chiller

**Screw Water Chiller(Air&Water Cooled Type)**

Screw Condensing Unit

Absorption Chiller - Heater

Fan Coil Unit

Air Handling Unit

Chicago Blower

Baltimore Cooling Tower

Industrial Cooling Tower

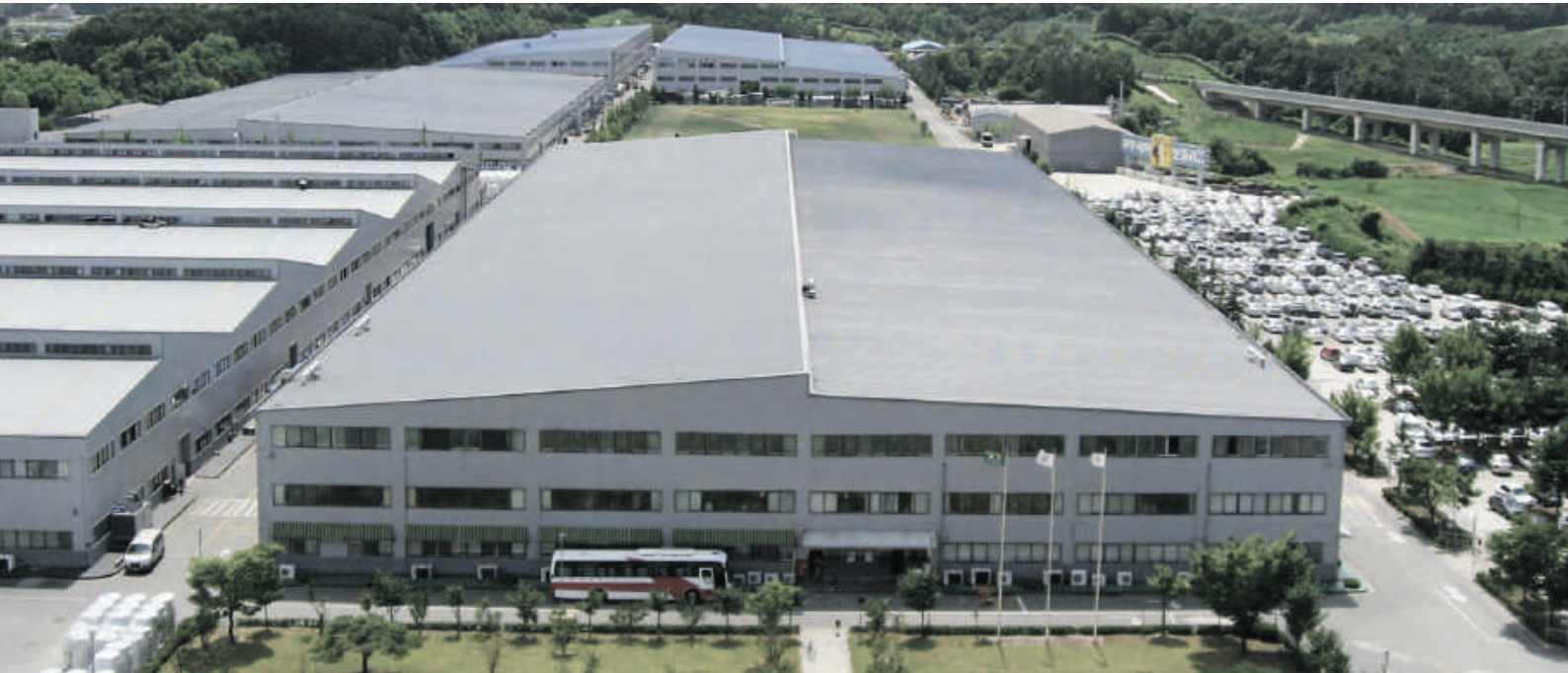
Ice Thermal Storage System

Kiturami Bumyang  
**Water Cooled Type  
Screw Chiller**



# Kiturami-Bumyang

The First HVAC Manufacturer in Korea Since - 1963



## Company Introduction

Leader of HVAC in Republic of Korea! Kiturami Bumyang!

Kiturami Bumyang which is established as Korea's FIRST HVAC equipments manufacturing company in 1963, has led HVAC industry with Customer Satisfaction Management based on trust and technology while accumulating advanced technology in HVAC field with constant domestic and foreign challenge.

Kiturami Bumyang adopts with 21st century's new paradigm High Efficiency & Low carbon Green growth on the newest technology for all products such as centrifugal chiller, screw chiller, absorption chiller/heater, air conditioner, fan & blower, cooling tower, fan coil unit and etc., and is trying hard to provide various products and excellent service to customers around the world. To achieve this, we

have built a new level of quality assurance systems, enhanced global customer service network, and established collaboration / mutual-assistance system with most successful domestic and international corporations. And we are still working now to upgrade our ability.

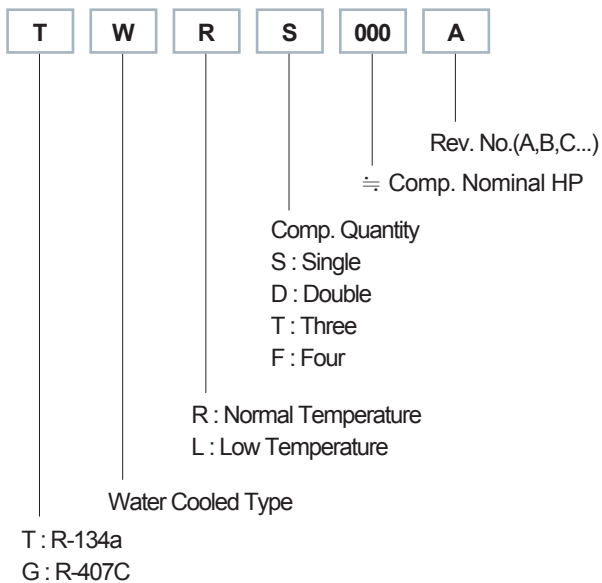
The International Standard Test Laboratory which obtained certification of KOLAS and AMCA is the cradle of technology research of Kiturami Bumyang which will lead the future, and is aiming to develop ultra energy-saving & eco-friendly products and create comfortable living space.

Kiturami Bumyang as an integrated HVAC company will ceaselessly challenge against the ever-changing environment in order to provide utmost service to the customers.





## Nomenclature



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## Introduction\_

### Mechanical Specification\_

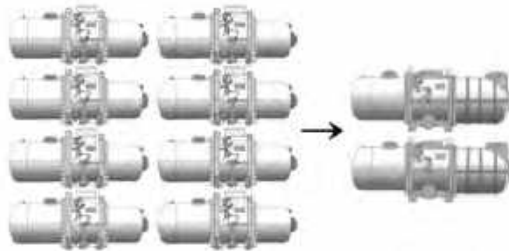
KITURAMI BUMYANG Screw Water Chiller offers a complete combination of features for customer satisfaction.

#### RELIABLE DURABILITY BASED ON WIDE EXPERIENCE

KITURAMI BUMYANG Chiller have been designed and manufactured considering of various climates in asia, middle east and africa etc.

#### VARIOUS COOLING CAPACITY MODELS

SW series are available in 30 different models from 30 to 700usRT in various power supply at nominal conditions in one, two, three and four individual refrigeration circuits.



#### HIGH-EFFICIENCY HEAT EXCHANGER

SW chiller heat exchangers are designed with latest technology and offer high-efficiency and compact design.

Usually chilled water is bypassed through a chink in baffle plates of existing evaporators but we realized 0 % bypass with our special baffle plate and maximize the efficiency of the heat exchanger.

#### SILENT OPERATION WITHOUT VIBRATION

Since a motor and a rotor are in single rotational motion causing low vibration and a silencer is located at the discharge tube to reduce operating noise level.

#### OPTIMUM CONTROL OF MICOM CONTROLLER WITH PLC FUCTION

World-famous carel controller guarantees reliability, while being easily modifiable, and the main functions are as the following

- UL and CE Certification
- Remote Control and Run/Error Staus Signal
- Precise Control Algorithm with PID control system
- 300 alams history records
- Carel and Modbus protocol built in for network

#### SAFETY DEVICES

High/Low pressure SW, freezing protection, oil level SW, Safety V/V and crank case heater etc. are used for ensuring the safety of the chillers and other equipments by shut off the unit when a trouble is detected.

##### ■ High / Low Pressure Switch

When the chiller is running under higher or lower pressure compared to design pressure, the unit is shut off.

##### ■ Safety Valve / Fusible Plug

When the pressure of condenser increases abnormally due to a fire or other reasons, safety V/V and Fusible Plug remove the refrigerant from the system.

##### ■ Freezing Protection

If the chilled water temperature decreases up to freezing temperature due to low cooling load, the chiller is shut off to protect the equipment.

##### ■ Oil Heater

Oil Heater heat the refrigerant mixed with oil in the oil tank to prevent oil foaming and to improve oil circulation.

##### ■ Over Current Relay

If the current flowing over the compressor flows exceeds the limit, it cut off the electric power.

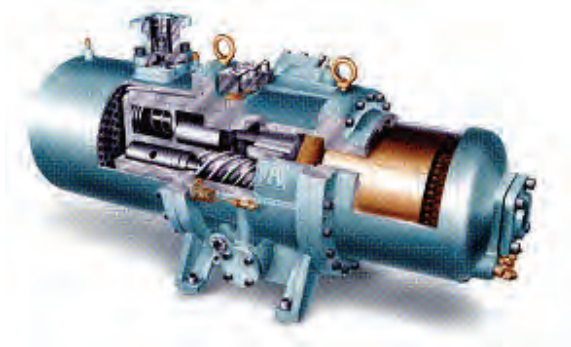
## Mechanical Specification\_

### Compressor

Compressors are fully accessible, semi-hermetic type with screw male and female rotors in the robust casing made of high strength gray cast iron.

A three-phase, two-pole squirrel cage induction motor drives the compressor.

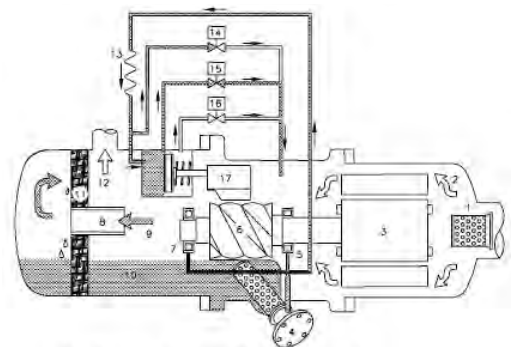
The motor rotor is located on the shaft of the male screw rotor. The screw rotors are precisely located at both the suction and discharge ends in rolling contact bearings, i.e. axial and radial bearings.



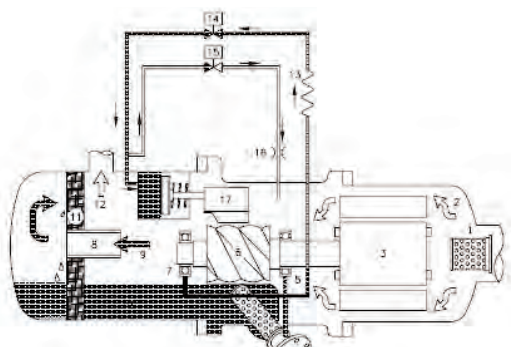
However, when any of the step solenoid valve (for 3-step/4-step capacity control system) is opened, the high pressure oil in the cylinder bypasses to the suction port, which causes the piston and the slide valve to move toward the left side, and then some of the refrigerant gas bypasses from the compression chamber back to the suction end.

As a result, the refrigeration capacity decreases because of the reduction of displacement of refrigerant gas flowing in the system.

Fig 1. Capacity Control System



4-steps capacity control



Step-less capacity control

### Capacity Control

The RC2 series screw compressors are equipped with either 3-step/4-step capacity control system or continuous (step-less) capacity control system.

Both of the capacity control systems consist of a modulation slide valve, piston rod, cylinder, piston and piston rings.

The slide valve and the piston are connected by a piston rod. The principle of operation is using the oil pressure to drive the piston in the cylinder.

See Fig 1, the lubrication oil flows from the oil sump through the oil filter cartridge and capillary then fills into the cylinder due to the positive oil pressure bigger than the right side of spring force plus the high pressure gas.

The positive pressure differential causes the piston to move toward the right side in the cylinder.

When the slide valve moves toward the right side, the effective compression volume in the compression chamber increases.

This means the displacement of refrigerant gas also increases, as a result the refrigeration capacity also increases.

## Introduction\_

### Mechanical Specification\_

#### Lubrication

The main functions of the lubrication oil in screw compressor are lubrication, internal sealing, cooling and capacity control.

The positive oil pressure in cylinder that forces the piston link the slide valve by piston rod forward and backward in compression chamber.

The design with positive pressure differential lubrication system in All series is available to omit a extra oil pump in the compressor.

The bearings used in compressor required a small but steady quantity of oil for lubrication; the oil injection into the compressing chamber creates a oil sealing film in the compressing housing for incretion the efficiency and absorbing a part of compression heat. In order to separate the oil from the mixed refrigerant gas, an oil separator is required to ensure the least amount of oil carried into the system.

Pay more attention to the oil temperature which is a very significant factor to the compressor bearings' life.

High oil temperature will reduce the oil viscosity and cause the poor lubrication and heat absorption in compressor as well.

The oil viscosity is recommended to keep over 10 mm<sup>2</sup>/s at any temperature. If the compressor operated under the critical condition, then an extra oil cooler is required.

Some high viscosity oil is recommended to apply to the high working condition.

It happens often that the return oil from evaporator is insufficient due to the high viscosity of oil which is difficult to be carried back, that causes the loss of oil in compressor. If the system encounters the oil return problem then a extra 2nd oil separator is recommended to be installed between the compressor discharge tube and condenser.

The normal oil level in the compressor oil tank should be maintained above the top of the low oil sight glass and in the middle level of high oil sight glass when compressor is running. It is recommended strongly to install the optional accessory of oil level switch to prevent from low oil level in compressor.

#### Oil Cooling Application

As described on lubricant, lubricant furthermore to lubricate bearing, also give pressure to the capacity control system.

Also between rotor's has the function to seal the clearance. If the temperature of lubrication oil is too high, could not lubricate properly to the bearing, and decrease the life-cycle of bearing, the capacity control system also would failed, or decrease volume ratio.

#### Liquid Injection System Application

Liquid injection system is used to reduce the discharge temperature of refrigerant gas, according to the installed position could be defined as auxiliary winding cooling, or chamber cooling. Liquid injection expansion valve could be high temperature type and low temperature type.

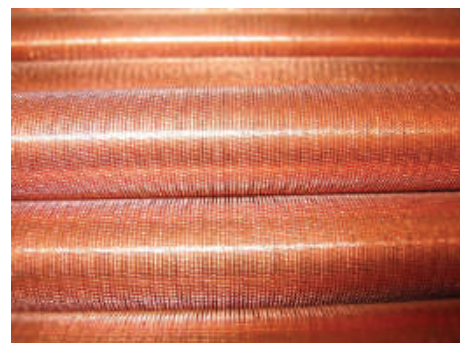
#### Condenser

Condensers are of the shell-and-tube type and fabricated from 99.9% purity seamless phosphorus deoxidized copper tube with baffle plates supporting the structure. The baffle is also used to distribute the refrigerant gas flow properly for most efficient heat transfer. The shells are made with carbon steel pipes for pressure pipings.

Each tube will be roller expanded into the tube sheets providing a leak proof seal, and be individually replaceable.

The condenser will have refrigerant relief devices to meet the requirements of the ASHRAE 15 Safety Code for Mechanical Refrigeration.

Thermo Excel C-Tube



## Mechanical Specification\_

### Evaporator

Evaporators are of the shell-and-tube Type and fabricated from 99.9% purity seamless phosphorus deoxidized copper tube with baffle plates supporting the structure.

The shells are made with carbon steel pipes and designed for proper working pressure on the refrigerant side. Each tube will be roller expanded into the tube sheets providing a leak proof seal, and be individually replaceable.

Water velocity through the tubes will not exceed 2.5m/s.

The evaporators will have refrigerant relief devices to meet the requirements of the ASHRAE 15 Safety Code for Mechanical Refrigeration.

Corrugated Tube



### Marine Water Box

Marine water boxes allow service access for cleaning of the heat exchanger tubes without the need to break the water piping.

Bolted-on covers are arranged for convenient access.

Marine water boxes are available for condenser and evaporator.

### Electric Expansion Valve

Kiturami Bumyang chillers use electronic expansion valve for precise control refrigerant mass flow.

Electronic expansion valve improves EER (Energy Efficiency Ratio) at full & part load conditions.

Also it improves temperature control & increases the range of operating conditions.

### Electric Control Panel

The unit mounted IP54 control panel enclosure consists of all starting, operating, and safety controls and operation status shall be displayed on the panel to check the errors and condition of the system.

Micom Controller is applied to make the chiller operate most efficiently, and if two compressors are used, they alternately run (the former starting compressor stops earlier than the latter) to balance the running time and extend the chillers' life.

Inlet/outlet temperatures of chilled water, shutdown of compressor, remote drive, operation time setting, operation condition of chilled water pump etc. are indicated and malfunctions are recorded.

Standard Starting Method is Star - Delta, and the others need to be discussed. Automatic current breaker shall be installed in Micro computer control panel.

### Refrigerant Circuit

The unit shall have two or more refrigerant circuit, completely independent of each other.

Each circuit shall be equipped with one compressor with integral oil separator, a factory-mounted control circuit transformer, electronic expansion valve, compressor discharge shutoff valve and check valve, replaceable core filter-dryers, sight glass with moisture indicator. Each circuit shall be capable of operating independently, not being disable in the event of fault on the other circuit.

### Thermal Insulation

The chiller's cold surfaces should be insulated with a NBR(nitile butadiene rubber) insulation sufficient to prevent condensation. A chiller can be factory insulated with 25 mm(1) or 34mm(1-1/3) thick insulation.

The insulation will normally prevent condensation in environments with dry bulb temperatures of 10 C to 35 C and humidities up to 75%(25 mm) or 95%(34 mm). The insulation is painted and surface is flexible and reasonably resistant to wear.

### Ice Storage

With a positive displacement rotary screw compressor, the Kiturami Bumyang water chiller can easily cool low temperature brine down to -15 C.

## Introduction\_

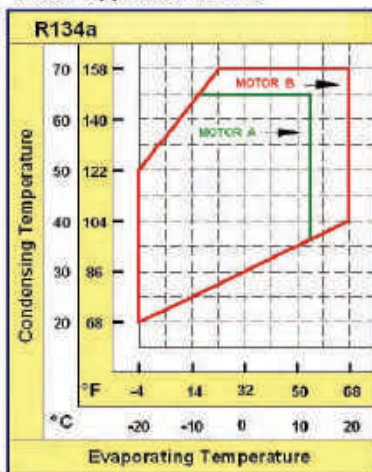
### Main Component Features\_

#### Operating Limits

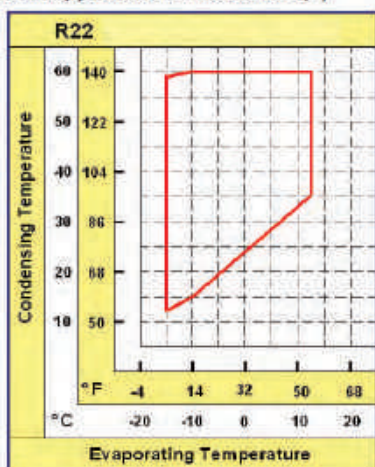
The operating limits shown below are based on saturated suction and discharge operating conditions, for continuous operation over extended periods of time. It is important to operate within these limits to maintain proper compressor life.

Operating at extra low saturated suction temperature, may cause oil management and motor cooling problems, and operating at extra high saturated condensing temperature will shorten the compressor life due to insufficient motor and compressor chamber cooling.

R134a Application Limits



R22 Application Limits-RC2-B(F)



### pCO<sub>3</sub> Controller\_

#### pCO<sub>3</sub> CONTROLLER



pCO<sub>3</sub> represents the most advanced offering by CAREL in the field of programmable controllers. pCO<sub>3</sub> is designed for many air-conditioning and refrigeration applications.

It comes in various sizes, according to the I/O and power requirements (Small, Medium, Large, Extra Large).

All the boards feature a 32-byte microprocessor, and consequently the calculation power and operation processing speed have been significantly increased.

As for all the pCO series controllers, pCO<sub>3</sub> comes in a plastic case that ensures a high index of protection and reduces the risk of electrostatic discharges due to incorrect handling. In addition, assembly is simplified by the DIN rail mounting system, allowing significant saving in wiring and assembly times.

Given the increasing demand for integration, pCO<sub>3</sub> can interface with many of the most commonly-used serial communication standards, and using optional cards, can be integrated into the most widespread BMS systems.

pCO<sub>3</sub> include connection to ratiometric pressure sensors; integration of pGD technology for the Built-In terminal; upgraded program-ming key; 3 serial ports: a serial one, pLAN and two optional, Field Bus and BMS, available with different communication protocols.

All of these features ensure a level of excellence in esponding to the needs of the HVAC/R market.



## pCO<sub>2</sub> Controller

### VARIOUS TEMPERATURE SETPOINT

Single, double and several water temperature can be set by the set point menu.

Customers can control the running temperature with various temperature as Dual setpoint(Day/Night) and Several setpoint(each time).

When using dual setpoint, non-power switch contact should to B5 and BC5 terminal of J3 connector of main circuit board (pCO<sub>2</sub>).

A wide setpoint temperature range is available with -10°C~17°C up to four switching cycles, i.e. four time bands, can be defined over a day.

Each day of the week can be programmed independently from the others; nonetheless, for faster programming within the week, the settings defined for one day can be copied to another.

The chiller can be shut off by OFF button, Timer, Alarm and Remote Control. When using remote operation mode, the following matters shall be observed to prevent the circuit failure, by a result of noise during switch input wiring. non-power switch contact should be connected to B4 and BC4 terminal of J3 connector of main circuit board. And when using this program the following

Switch input wiring shall be wired 10cm distant from power electric wire. If the switch input wiring is 10m longer, non-power source contact relay shall be used for wiring.

The switch input wiring shall not be longer than 100m.

The area controller can directly control the activation and deactivation of a chiller via a dedicated relay.

In addition, it provides a 0-10 V signal proportional to the offset applied to the chiller temperature set point, calculated by the area controller based on the compensation algorithm.

A digital input is reserved for any chiller alarms.

Operating time of compressors can be seen on the screen and operating compressors can be choosed to prevent overload on one compressor.

And also alarm times can be set seperately to each compressor.

### PASSWORD

Access to some of the menus is protected by a four-number password: specifically, the list shown in the previous section; in addition, two different passwords, paragraph describes the screens with PW1 and PW2, can be defined to limit access to groups of different screens.

### LANGUAGE

When the unit is switched on, by default a screen is displayed for selecting the language. This screen is displayed for 30 seconds, after which the application automatically opens the main menu. The language can be selected at any time, as follows:

- Press PRG (the LED on the PRG button will come on) and select the SERVICE menu;
- Select the LANGUAGE sub-menu;
- press ENTER and select the desired language;
- press ENTER to confirm.

The initial language selection screen can then be disabled:

- Press PRG (the LED on the PRG button will come on) and select the SERVICE menu;
- Select the LANGUAGE sub-menu;
- Scroll the menu to the page for enabling the initial screen
- press ENTER to enable or disable the screen.

## Water Cooled Type(R-134a)

### Standard Specification(50Hz)

#### ↘ TWRS 020~040A

Specification		Model	TWRS 020A	TWRS 030A	TWRS 035A	TWRS 040A	
Cooling Capacity		kW	55.6	78.9	101.9	113.6	
		BTU/h	189,800	269,300	347,900	387,800	
		usRT	15.8	22.4	28.9	32.3	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	14.4	18.9	23.6	26.4
	Running Current	380	V	25.4	34.0	43.2	47.1
		400	V	24.1	32.3	41.0	44.7
415		V	23.3	31.1	39.6	43.1	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	159	226	292	326	
	Pressure Drop	KPa	30	45	36	46	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	201	280	360	401	
	Pressure Drop	KPa	24	27	43	38	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		33%(STARTING), 66 ~ 100%				25%, 50 ~ 100%	
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, FUSIBLE PLUG					
Piping Connection	Chilled Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Cooling Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	26	26	30	40	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	7	7	7	8	
Weight	Net		kg	850	910	1,015	1,150
	Operating		kg	960	1,020	1,145	1,310

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(50Hz)

### TWRS 055~100A

Specification		Model	TWRS 055A	TWRS 065A	TWRS 085A	TWRS 100A	
Cooling Capacity		kW	147.5	191.2	245.8	289.0	
		BTU/h	503,600	652,800	839,200	986,700	
		usRT	41.9	54.3	69.9	82.1	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	35.2	43.0	56.8	63.3
	Running Current	380	V	62.2	75.9	96.7	108.8
		400	V	59.1	72.1	91.9	103.4
415		V	57.0	69.5	88.5	99.6	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	150			300	
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	423	548	705	828	
	Pressure Drop	KPa	39	33	40	44	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	524	671	867	1,010	
	Pressure Drop	KPa	20	14	25	30	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		25%(STARTING), 50 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	14	16	15	18	
Weight	Net		kg	1,650	2,030	2,200	2,650
	Operating		kg	1,860	2,300	2,540	3,120

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-134a)

### Standard Specification(50Hz)

#### ↘ TWRS 115~165A

Specification		Model	TWRS 115A	TWRS 130A	TWRS 165A	
Cooling Capacity		kW	336.7	381	484.4	
		BTU/h	1,149,600	1,300,800	1,653,900	
		usRT	95.7	108.3	137.7	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz			
	Power consumption		kW	73.7	81.3	102.7
	Running Current	380	V	125.8	139.9	176.9
		400	V	119.5	132.9	168.1
		415	V	115.2	128.1	162.0
Compressor	Type		SEMI-HERMETIC SCREW			
	Oil Heater	W	300			
	Starting Method		Y-Δ STARTING			
Evaporator	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	965	1,092	1,389	
	Pressure Drop	KPa	31	31	45	
	Ref. Max Pressure	MPa	0.9			
	Water Max Pressure	MPa	1.0			
Condenser	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	1,176	1,325	1,683	
	Pressure Drop	KPa	29	30	36	
	Ref. Max Pressure	MPa	1.6			
	Water Max Pressure	MPa	1.0			
Refrigerant Control		EXPANSION VALVE				
Control Capacity		25%, 50 ~ 100%	35%, 50 ~ 100%	30%, 50 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE				
Piping Connection	Chilled Water		125A (5B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	150A (6B)	
	Drain		25A (1B)			
Pefrigerant	Type		R - 134a			
	Charged Volume	kg	120	140	150	
Lubricant	Type		CPI SOLEST 120			
	Charged Volume	ℓ	23	23	28	
Weight	Net		3,200	3,720	4,100	
	Operating		3,780	4,370	4,880	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(50Hz)

### TWRD 060~110A

Specification		Model	TWRD 060A	TWRD 070A	TWRD 080A	TWRD 110A	
Cooling Capacity		kW	156.6	206.4	227.8	302.2	
		BTU/h	534,600	704,700	777,800	1,031,800	
		usRT	44.5	58.6	64.7	85.9	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	36.8	46.0	53.2	70.6
	Running Current	380	V	66.4	84.6	94.4	124.6
		400	V	63.1	80.4	89.7	118.4
415		V	60.8	77.5	86.4	114.1	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	2 × 150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	449	592	653	866	
	Pressure Drop	KPa	43	36	36	46	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	554	724	806	1,069	
	Pressure Drop	KPa	23	17	23	30	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		16.5%(STARTING), 33 ~ 100%			12.5%(STARTING), 25 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT					
Piping Connection			FUSIBLE PLUG		SAFETY VALVE		
	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
Drain		25A (1B)					
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 7	2 × 7	2 × 8	2 × 14	
Weight	Net	kg	1,650	1,940	2,200	2,650	
	Operating	kg	1,860	2,210	2,540	3,120	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-134a)

### Standard Specification(50Hz)

#### ✂️ TWRD 130~230A

Specification		Model	TWRD 130A	TWRD 170A	TWRD 200A	TWRD 230A	
Cooling Capacity		kW	396.4	502.6	578.0	673.4	
		BTU/h	1,353,400	1,716,000	1,973,500	2,299,200	
		usRT	112.7	142.9	164.3	191.5	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	85.2	112.4	126.6	147.4
	Running Current	380	V	150.4	191.6	217.6	251.6
		400	V	142.9	182.0	206.7	239.0
		415	V	137.7	175.4	199.2	230.4
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	2 × 150		2 × 300		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,136	1,441	1,657	1,930	
	Pressure Drop	KPa	32	45	42	27	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,381	1,763	2,020	2,353	
	Pressure Drop	KPa	32	36	28	29	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		12.5%(STARTING), 25 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		150A (6B)	150A (6B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	2 × 125A (5B)	2 × 150A (6B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	140	150	200	240	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 16	2 × 15	2 × 18	2 × 23	
Weight	Net	kg	3,800	4,100	6,300	7,400	
	Operating	kg	4,450	4,880	7,240	8,560	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(50Hz)

### ✂️ TWRD 260~330A, TWRT 105~120A

Specification		Model	TWRD 260A	TWRD 330A	TWRT 105A	TWRT 120A	
Cooling Capacity		kW	771.6	968.8	313.5	344.7	
		BTU/h	2,634,500	3,307,800	1,070,400	1,176,900	
		usRT	219.4	275.5	89.1	98.0	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	163.2	205.4	70.5	78.9
	Running Current	380	V	280.6	353.8	129.0	140.7
		400	V	266.6	336.1	122.6	133.7
		415	V	256.9	324.0	118.1	128.8
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	2 × 300		3 × 150		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	2,212	2,777	899	988	
	Pressure Drop	KPa	52	39	45	40	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	2,680	3,366	1,101	1,214	
	Pressure Drop	KPa	31	36	34	32	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		17.5%, 35 ~ 100%	15%, 30 ~ 100%	11%, 22 ~ 100%	8.3%, 16.7 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT					
Piping Connection			SAFETY VALVE		FUSIBLE PLUG		
	Chilled Water		150A (6B)	200A (8B)	125A (5B)	125A (5B)	
	Cooling Water		2 × 150A (6B)	2 × 150A (6B)	125A (5B)	150A (6B)	
Drain		25A (1B)					
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	280	300	100	120	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 23	2 × 28	3 × 7	3 × 8	
Weight	Net		kg	7,640	9,200	2,515	3,200
	Operating		kg	8,940	10,760	2,775	3,510

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-134a)

### Standard Specification(50Hz)

#### ↘ TWRP 140~460A

Specification		Model	TWRP 140A	TWRP 160A	TWRP 400A	TWRP 460A	
Cooling Capacity		kW	412.8	455.6	1,132.4	1,313.2	
		BTU/h	1,409,400	1,555,600	3,866,400	4,483,800	
		usRT	117.3	129.5	322.0	373.4	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	92.0	106.4	252.4	285.2
	Running Current	380	V	169.2	188.8	433.6	488.4
		400	V	160.7	179.4	411.9	464.0
		415	V	154.9	172.9	397.0	447.2
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	4 × 150		4 × 300		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,183	1,306	3,246	3,765	
	Pressure Drop	KPa	36	36	33	44	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,447	1,611	3,970	4,582	
	Pressure Drop	KPa	17	23	42	49	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		8.25%, 16.5 ~ 100%		6.25%(STARTING), 12.5 ~ 100%			
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY,					
		PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT					
		FUSIBLE PLUG		SAFETY VALVE			
Piping Connection	Chilled Water		150A (6B)	150A (6B)	200A (8B)	200A (8B)	
	Cooling Water		2 × 100A (4B)	2 × 125A (5B)	2 × 150A (6B)	2 × 150A (6B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	150	160	330	360	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	4 × 7	4 × 8	4 × 18	4 × 23	
Weight	Net	kg	3,880	4,400	9,500	9,700	
	Operating	kg	4,420	5,080	11,060	11,260	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.



## Standard Specification(60Hz)

### ✂️ TWRS 020~040A

Specification		Model	TWRS 020A	TWRS 030A	TWRS 035A	TWRS 040A	
Cooling Capacity		kW	65.0	92.3	120.3	134.5	
		BTU/h	221,900	315,100	410,700	459,200	
		usRT	18.4	26.2	34.2	38.2	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	17.0	22.3	27.9	31.3
	Running Current	380	V	29.2	38.9	49.2	54.0
		400	V	25.2	33.6	42.5	46.6
415		V	24.1	32.1	40.6	44.6	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	186	265	345	386	
	Pressure Drop	KPa	38	58	46	58	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	235	329	425	475	
	Pressure Drop	KPa	29	32	53	47	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		33%(STARTING), 66 ~ 100%				25%, 50 ~ 100%	
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, FUSIBLE PLUG					
Piping Connection	Chilled Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Cooling Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	26	26	30	40	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	7	7	7	8	
Weight	Net		kg	850	910	1,015	1,150
	Operating		kg	960	1,020	1,145	1,310

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-134a)

### Standard Specification(60Hz)

#### ↘ TWRS 055~100A

Specification		Model	TWRS 055A	TWRS 065A	TWRS 085A	TWRS 100A	
Cooling Capacity		kW	172.1	223.4	287.0	338.6	
		BTU/h	587,600	762,700	979,900	1,156,100	
		usRT	48.9	63.5	81.6	96.2	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	41.6	50.7	67.1	77.2
	Running Current	380	V	72.0	87.7	113.3	130.8
		400	V	62.2	75.7	97.9	113.0
415		V	59.5	72.4	93.6	108.1	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	150			300	
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	493	640	823	971	
	Pressure Drop	KPa	50	42	51	56	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	613	786	1,015	1,192	
	Pressure Drop	KPa	25	18	30	37	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		25%(STARTING), 50 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	14	16	15	18	
Weight	Net		kg	1,650	2,030	2,200	
	Operating		kg	1,860	2,300	2,540	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(60Hz)

### TWRS 115~165A

Specification		Model	TWRS 115A	TWRS 130A	TWRS 165A	
Cooling Capacity		kW	400.1	446.2	566.5	
		BTU/h	1,366,100	1,523,500	1,934,200	
		usRT	113.7	126.8	161.1	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz			
	Power consumption		kW	87.1	99	125.2
	Running Current	380	V	147.3	167.7	210.5
		400	V	127.2	144.8	181.8
		415	V	121.7	138.5	173.9
Compressor	Type		SEMI-HERMETIC SCREW			
	Oil Heater	W	300			
	Starting Method		Y-Δ STARTING			
Evaporator	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	1,147	1,279	1,624	
	Pressure Drop	KPa	40	40	57	
	Ref. Max Pressure	MPa	0.9			
	Water Max Pressure	MPa	1.0			
Condenser	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	1,397	1,563	1,983	
	Pressure Drop	KPa	36	38	45	
	Ref. Max Pressure	MPa	1.6			
	Water Max Pressure	MPa	1.0			
Refrigerant Control		EXPANSION VALVE				
Control Capacity		25%, 50 ~ 100%	35%, 50 ~ 100%	30%, 50 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE				
Piping Connection	Chilled Water		125A (5B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	150A (6B)	
	Drain		25A (1B)			
Pefrigerant	Type		R - 134a			
	Charged Volume	kg	120	140	150	
Lubricant	Type		CPI SOLEST 120			
	Charged Volume	ℓ	23	23	28	
Weight	Net	kg	3,200	3,720	4,100	
	Operating	kg	3,780	4,370	4,880	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-134a)

### Standard Specification(60Hz)

#### TWRD 060~110A

Specification		Model	TWRD 060A	TWRD 070A	TWRD 080A	TWRD 110A	
Cooling Capacity		kW	180.0	237.0	266.8	359.0	
		BTU/h	614,500	809,200	910,900	1,225,700	
		usRT	51.1	67.4	75.8	102.0	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	44.8	56.0	62.6	83.6
	Running Current	380	V	77.8	98.4	108.2	144.4
		400	V	67.2	85.0	93.4	124.7
415		V	64.3	81.3	89.4	119.3	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	2 × 150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	516	679	765	1,029	
	Pressure Drop	KPa	55	45	45	59	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	644	840	944	1,269	
	Pressure Drop	KPa	27	21	28	37	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		16.5%(STARTING), 33 ~ 100%			12.5%(STARTING), 25 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT					
Piping Connection			FUSIBLE PLUG			SAFETY VALVE	
	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
Drain		25A (1B)					
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 7	2 × 7	2 × 8	2 × 14	
Weight	Net	kg	1,650	1,940	2,200	2,650	
	Operating	kg	1,860	2,210	2,540	3,120	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(60Hz)

### TWRD 130~230A

Specification		Model	TWRD 130A	TWRD 170A	TWRD 200A	TWRD 230A	
Cooling Capacity		kW	464.0	594.6	677.2	800.2	
		BTU/h	1,584,200	2,030,200	2,312,200	2,732,200	
		usRT	131.9	169.0	192.5	227.5	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	103.6	133.0	154.4	174.2
	Running Current	380	V	179.0	224.6	261.6	294.6
		400	V	154.6	194.0	225.9	254.4
415		V	147.9	185.5	216.1	243.4	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	2 × 150		2 × 300		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,330	1,705	1,941	2,294	
	Pressure Drop	KPa	41	57	52	34	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,627	2,086	2,384	2,793	
	Pressure Drop	KPa	40	46	34	36	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		12.5%(STARTING), 25 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		150A (6B)	150A (6B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	2 × 125A (5B)	2 × 150A (6B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	140	150	200	240	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 16	2 × 15	2 × 18	2 × 23	
Weight	Net	kg	3,800	4,100	6,300	7,400	
	Operating	kg	4,450	4,880	7,240	8,560	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-134a)

### Standard Specification(60Hz)

#### ✂️ TWRD 260~330A, TWRT 105~120A

Specification		Model	TWRD 260A	TWRD 330A	TWRT 105A	TWRT 120A	
Cooling Capacity		kW	904.2	1,133.0	372.9	404.7	
		BTU/h	3,087,300	3,868,500	1,273,200	1,381,800	
		usRT	257.1	322.2	106.0	115.0	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	198.6	250.4	83.1	96.0
	Running Current	380	V	336.4	421.0	146.7	165.6
		400	V	290.5	363.6	126.7	143.0
		415	V	277.9	347.8	121.2	136.8
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	2 × 300		3 × 150		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	2,592	3,248	1,069	1,160	
	Pressure Drop	KPa	67	51	57	52	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	3,161	3,966	1,307	1,435	
	Pressure Drop	KPa	39	45	43	40	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		17.5%, 35 ~ 100%	15%, 30 ~ 100%	11%, 22 ~ 100%	8.3%, 16.7 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT					
Piping Connection			SAFETY VALVE		FUSIBLE PLUG		
	Chilled Water		150A (6B)	200A (8B)	125A (5B)	125A (5B)	
	Cooling Water		2 × 150A (6B)	2 × 150A (6B)	125A (5B)	150A (6B)	
Drain		25A (1B)					
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	280	300	100	120	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 23	2 × 28	3 × 7	3 × 8	
Weight	Net	kg	7,640	9,200	2,515	3,200	
	Operating	kg	8,940	10,760	2,775	3,510	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(60Hz)

### TWRF 140~460A

Specification		Model	TWRF 140A	TWRF 160A	TWRF 400A	TWRF 460A	
Cooling Capacity		kW	474.0	533.6	1,338.4	1,524.8	
		BTU/h	1,618,400	1,821,900	4,569,800	5,206,300	
		usRT	134.8	151.7	380.6	433.6	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	112.0	125.2	298.0	347.6
	Running Current	380	V	196.8	216.4	505.6	587.6
		400	V	170.0	186.9	436.7	507.5
		415	V	162.6	178.8	417.7	485.4
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	4 × 150		4 × 300		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,359	1,530	3,837	4,371	
	Pressure Drop	KPa	45	45	43	56	
	Ref. Max Pressure	MPa	0.9				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,680	1,889	4,691	5,368	
	Pressure Drop	KPa	21	28	53	60	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		8.25%, 16.5 ~ 100%		6.25%(STARTING), 12.5 ~ 100%			
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT					
Piping Connection			FUSIBLE PLUG		SAFETY VALVE		
	Chilled Water		150A (6B)	150A (6B)	200A (8B)	200A (8B)	
	Cooling Water		2 × 100A (4B)	2 × 125A (5B)	2 × 150A (6B)	2 × 150A (6B)	
Drain		25A (1B)					
Pefrigerant	Type		R - 134a				
	Charged Volume	kg	150	160	330	360	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	4 × 7	4 × 8	4 × 18	4 × 23	
Weight	Net	kg	3,880	4,400	9,500	9,700	
	Operating	kg	4,420	5,080	11,060	11,260	

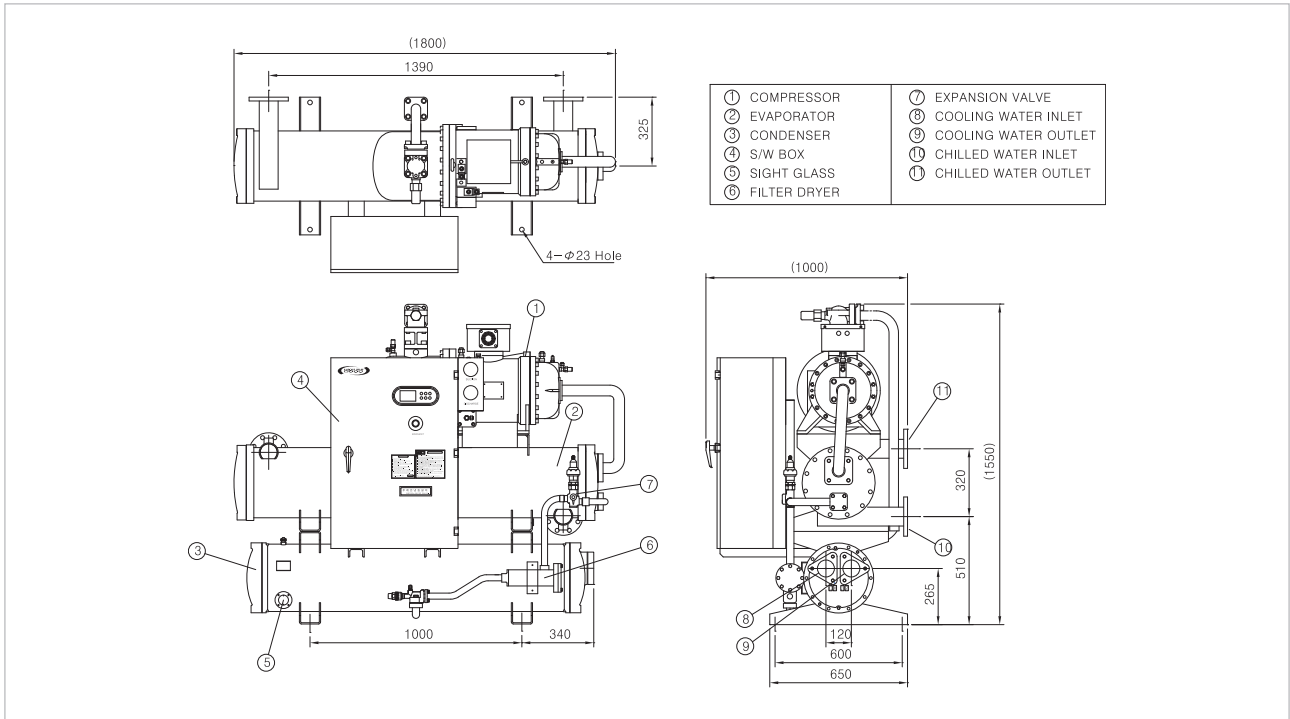
- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

**Kiturami-Bumyang  
Water Cooled Screw Chiller**

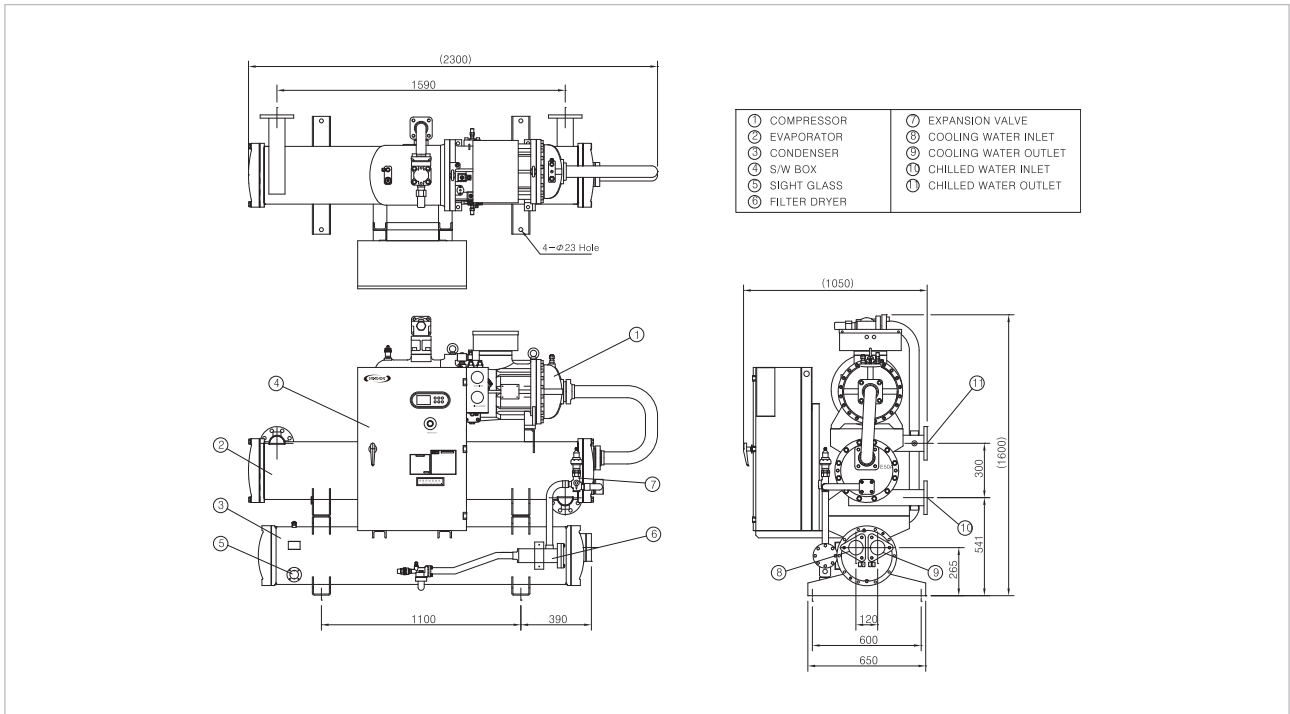
**Water Cooled Type(R-134a)**

**Demension Data\_**

**TWR(I,L)S 020, 030A**



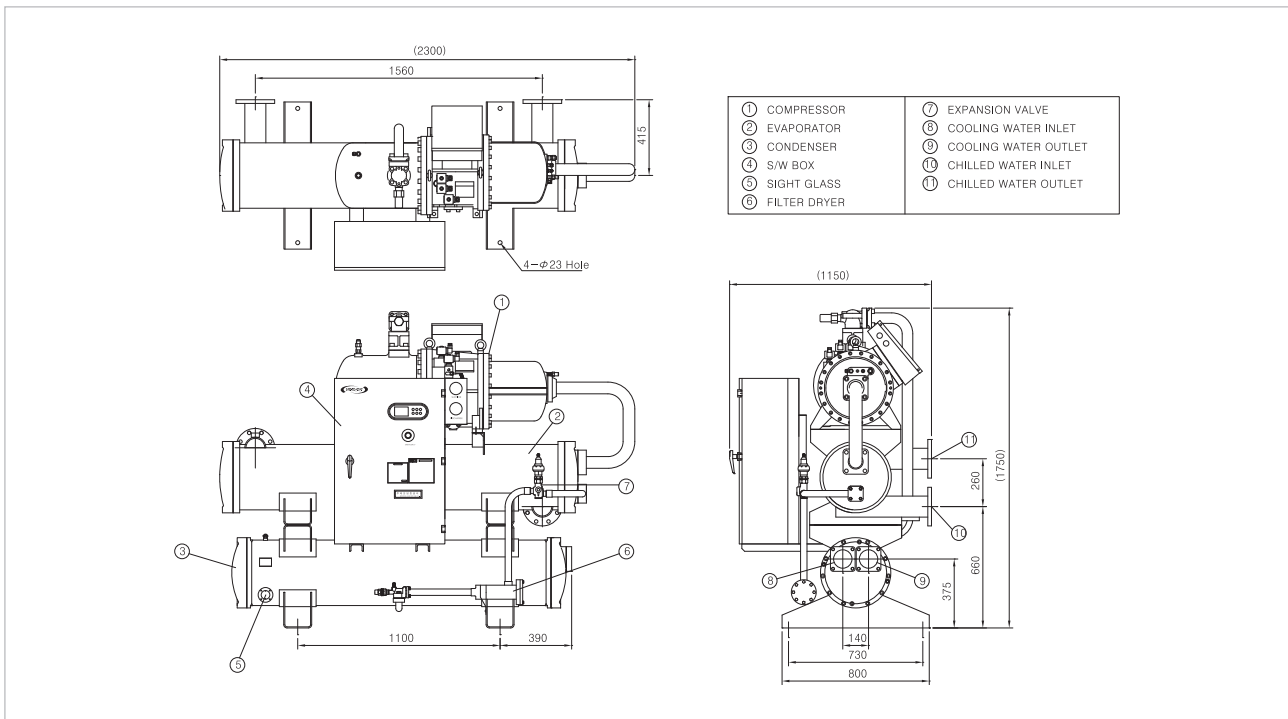
**TWR(I,L)S 035A**



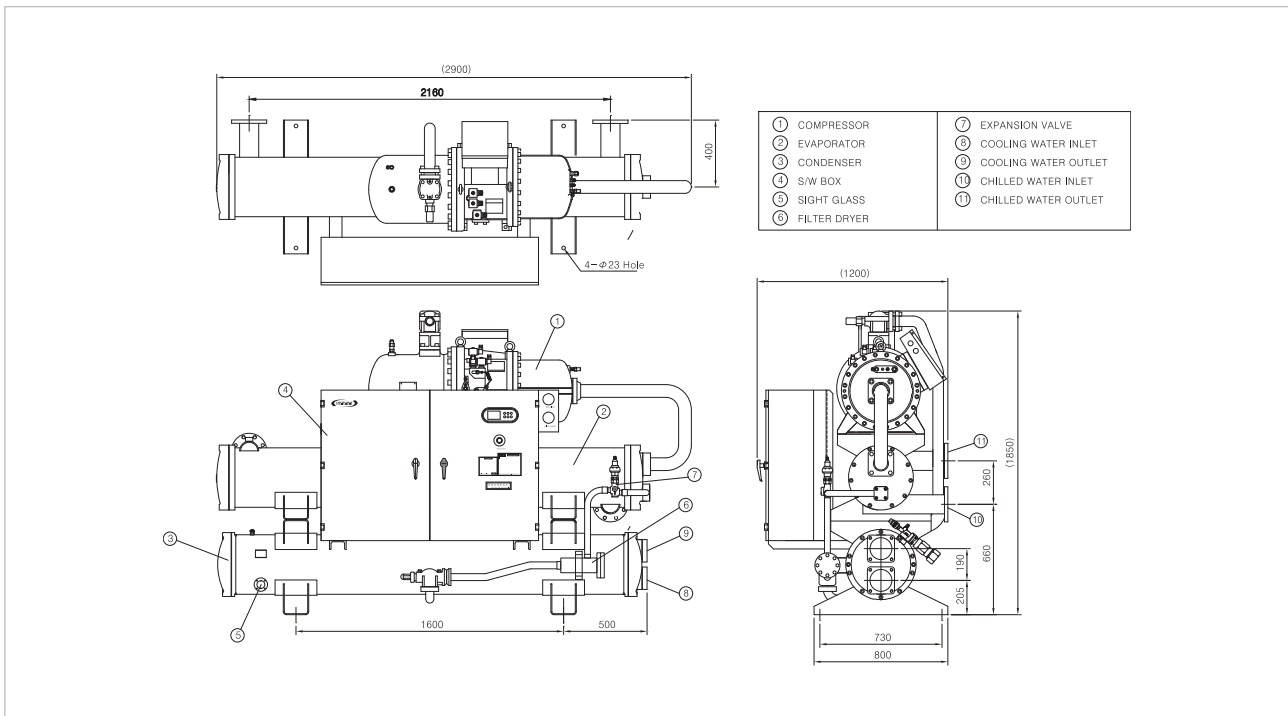


## Demension Data\_

### TWR(I,L)S 040A



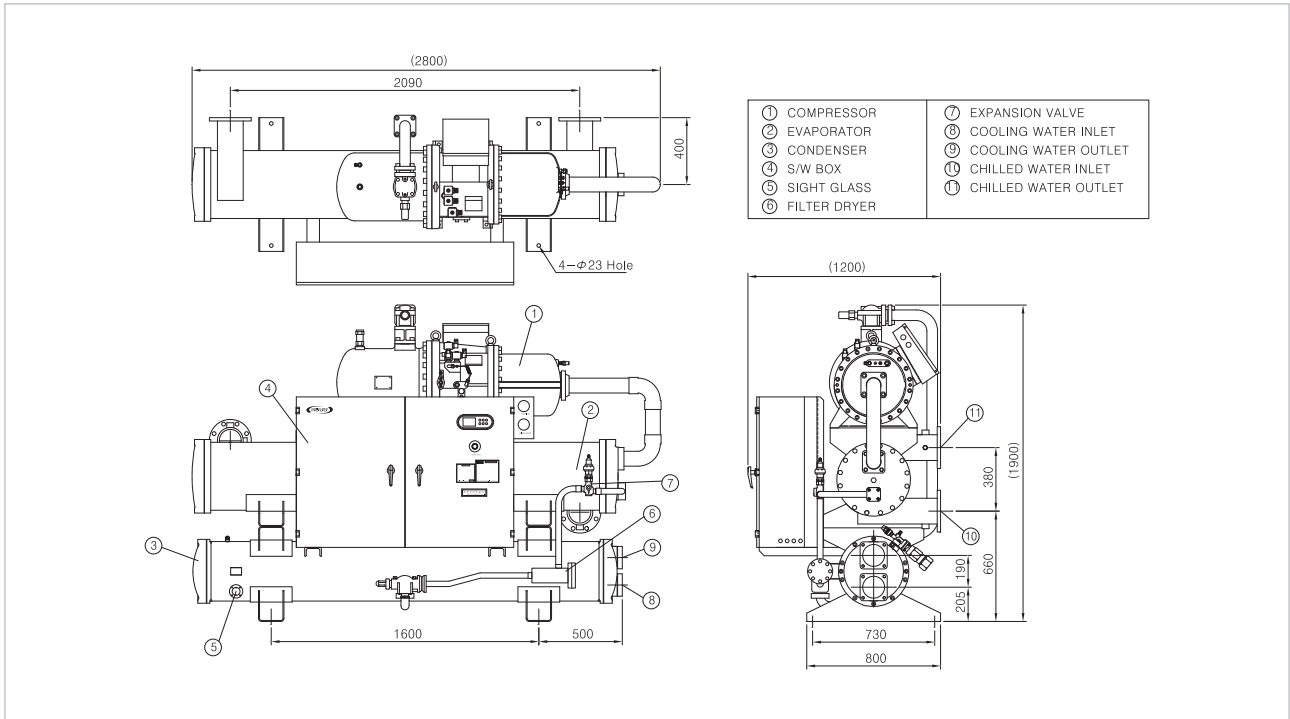
### TWR(I,L)S 055A



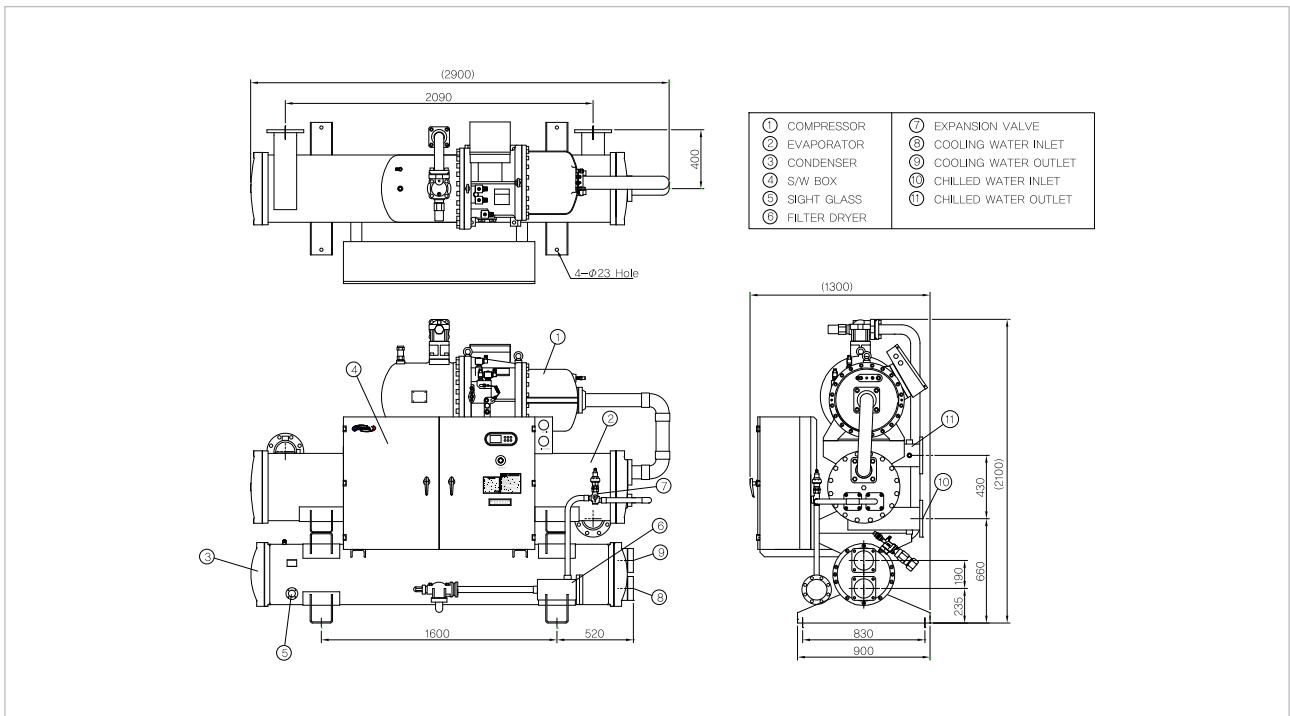
## Water Cooled Type(R-134a)

### Demension Data\_

#### TWR(I,L)S 065A

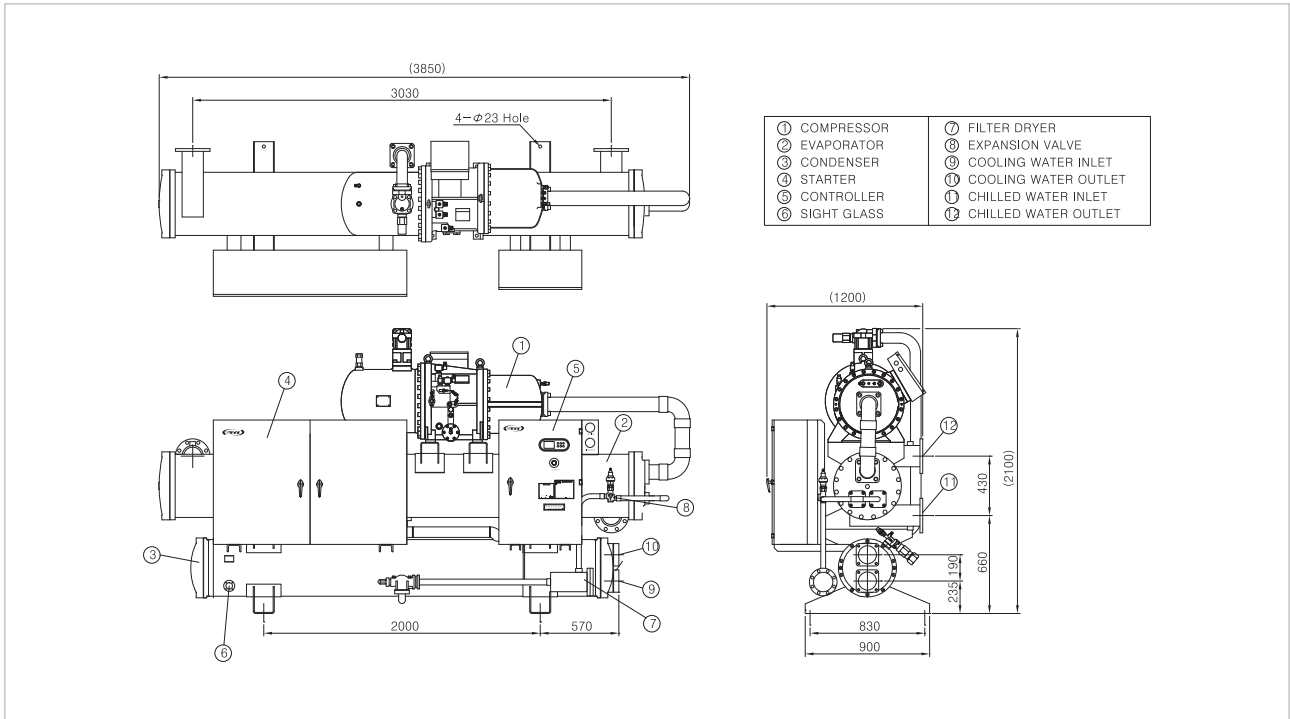


#### TWR(I,L)S 085A

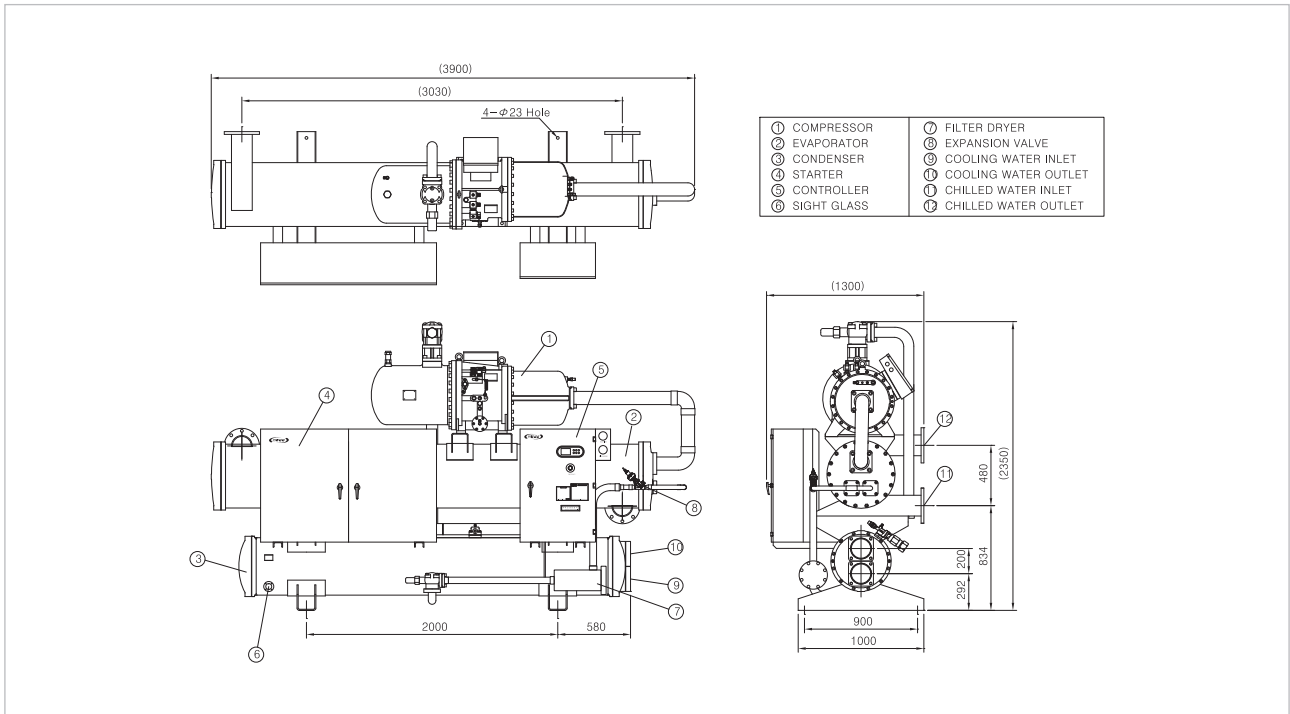


## Demension Data\_

### TWR(I,L)S 100A



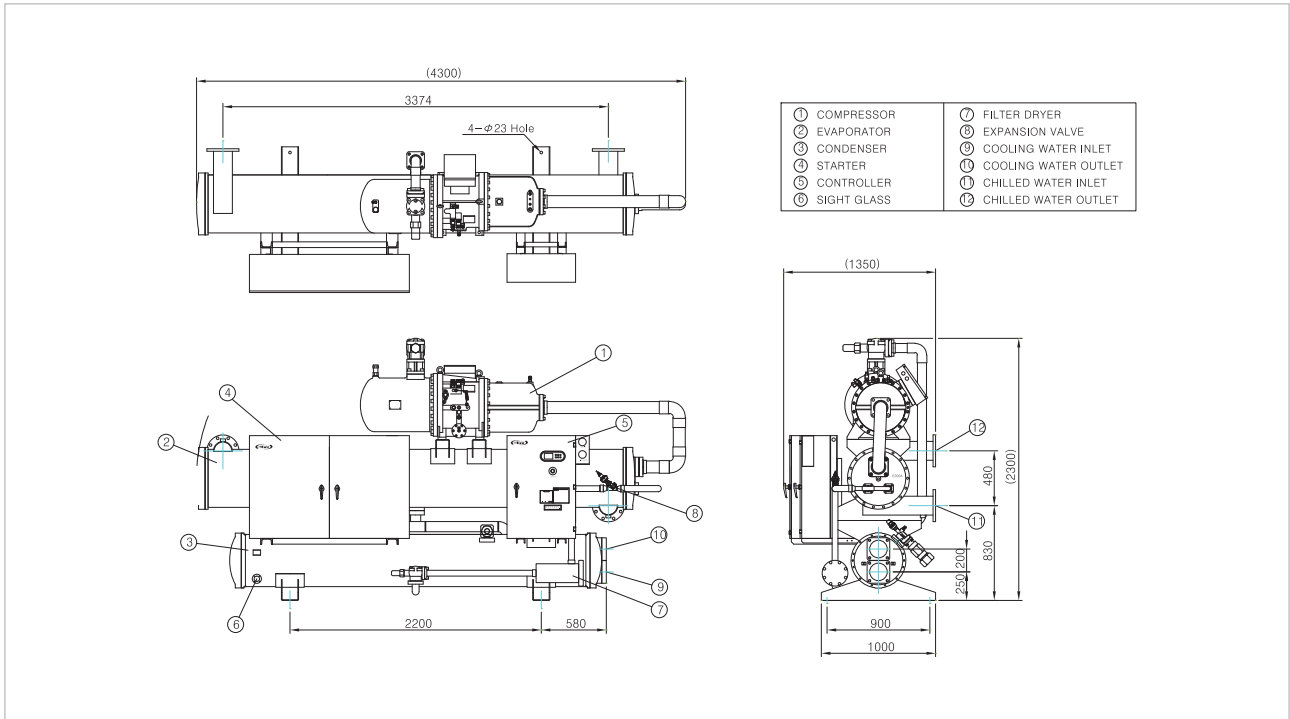
### TWR(I,L)S 115A



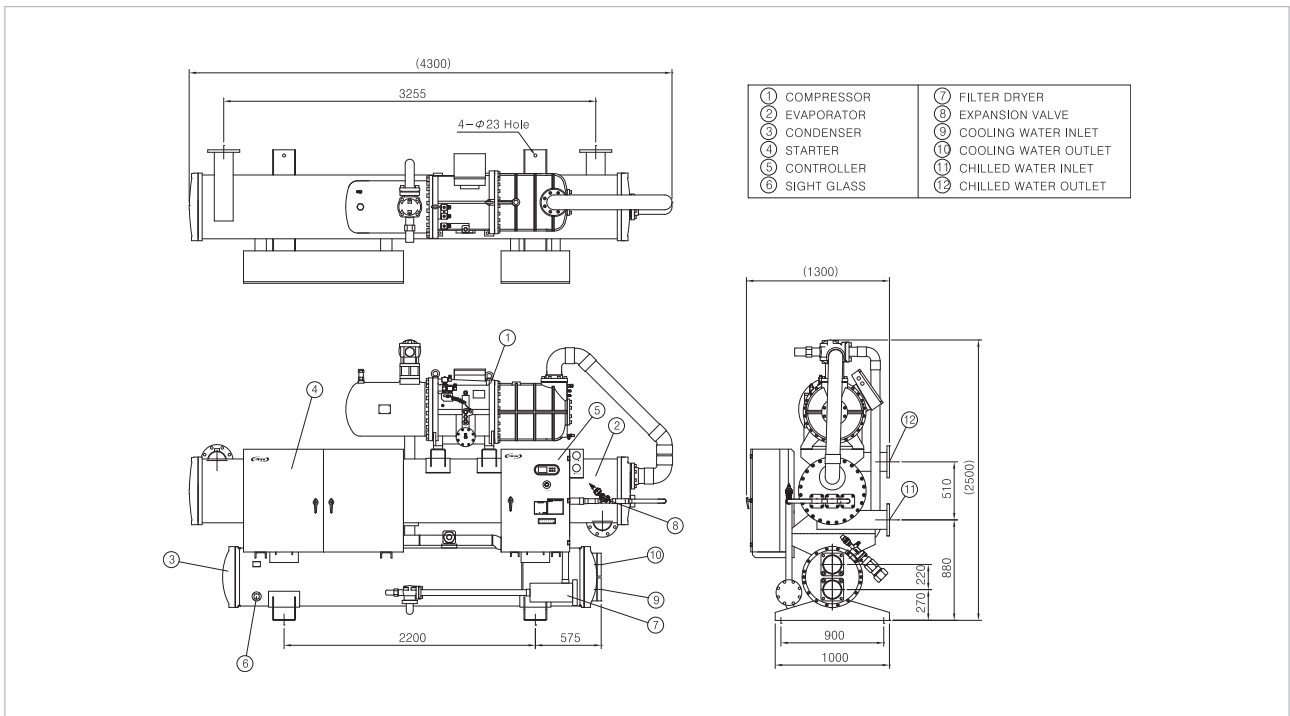
## Water Cooled Type(R-134a)

### Demension Data\_

#### TWR(I,L)S 130A

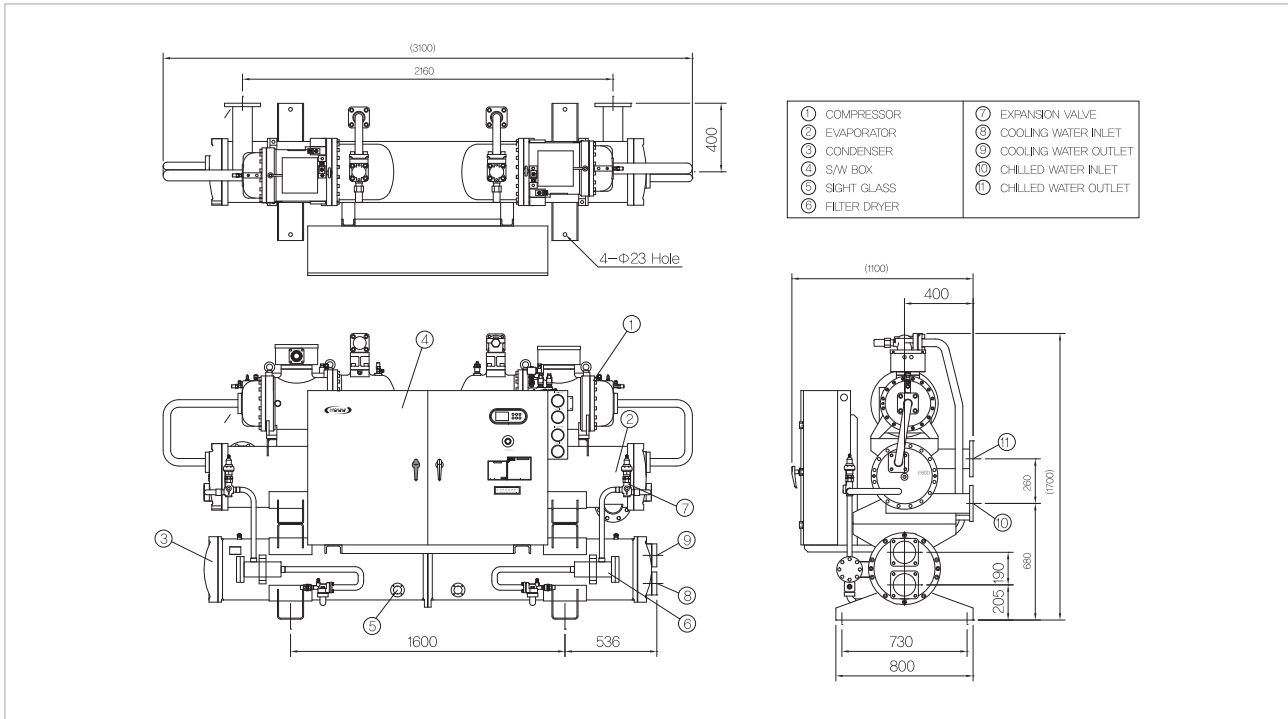


#### TWR(I,L)S 165A

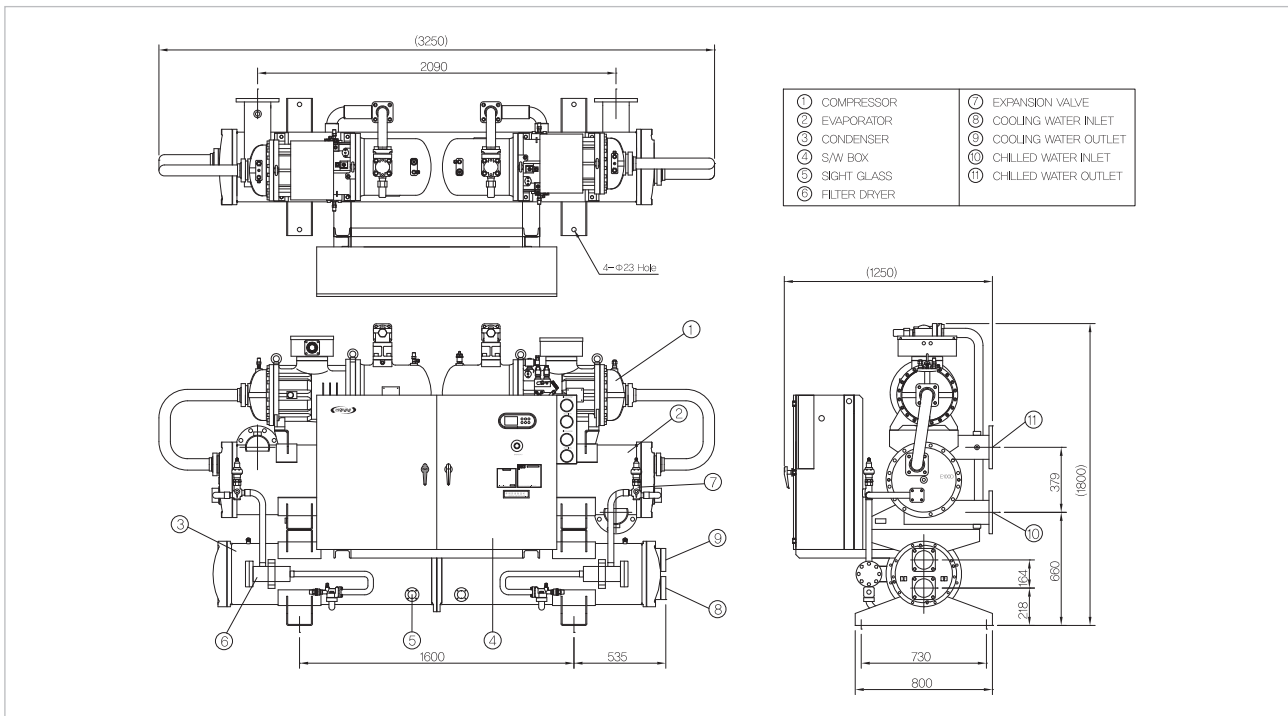


## Demension Data\_

### TWR(I,L)D 060A



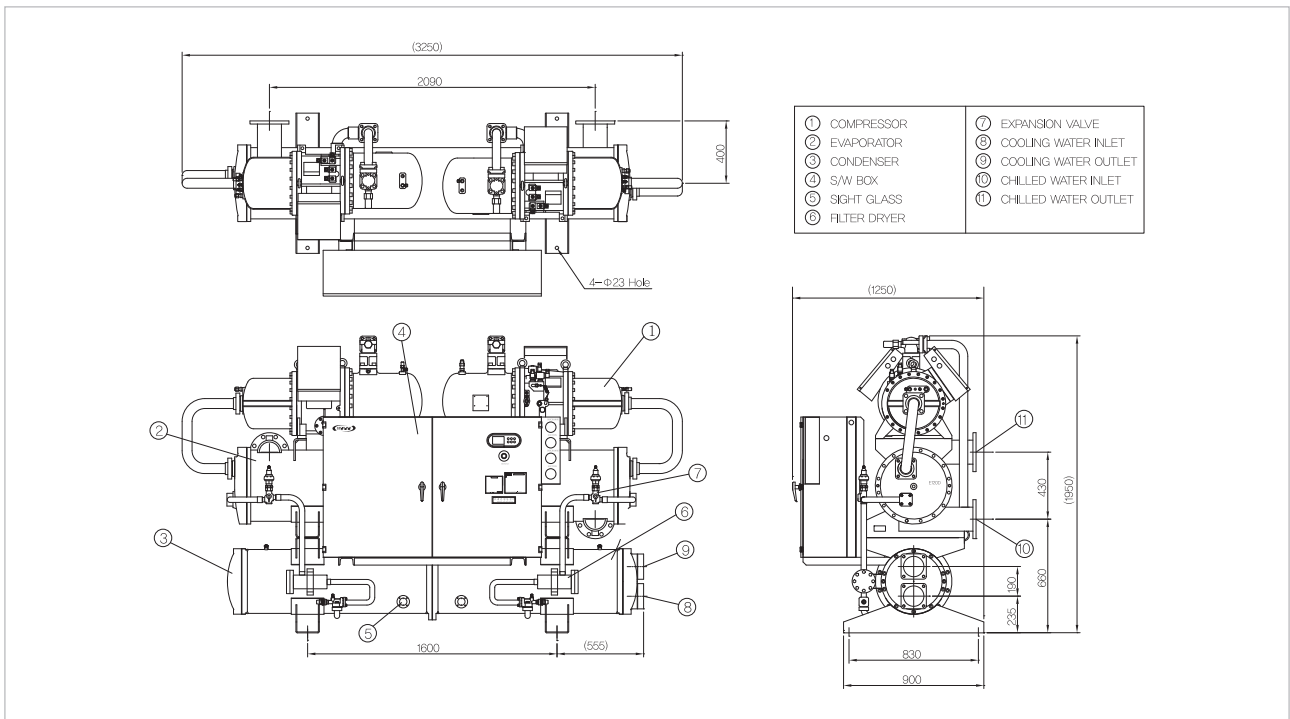
### TWR(I,L)D 070A



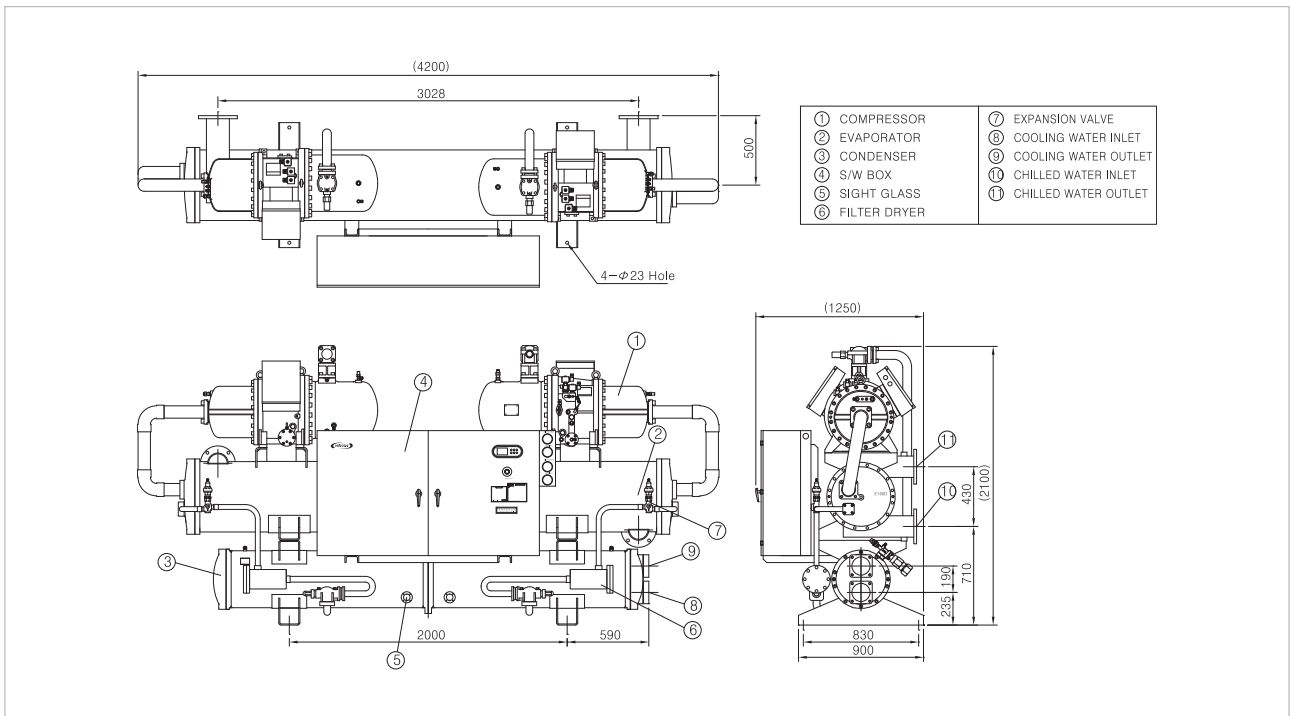
## Water Cooled Type(R-134a)

### Demension Data\_

#### TWR(I,L)D 080A

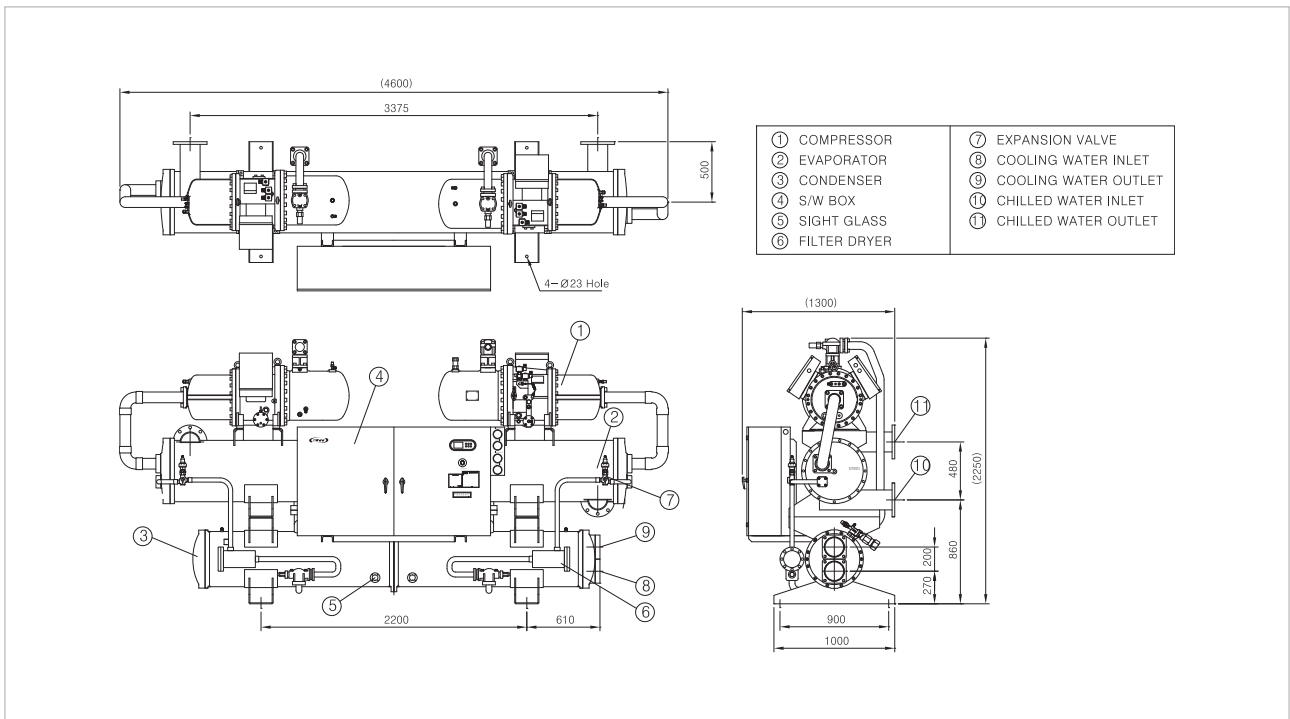


#### TWR(I,L)D 110A

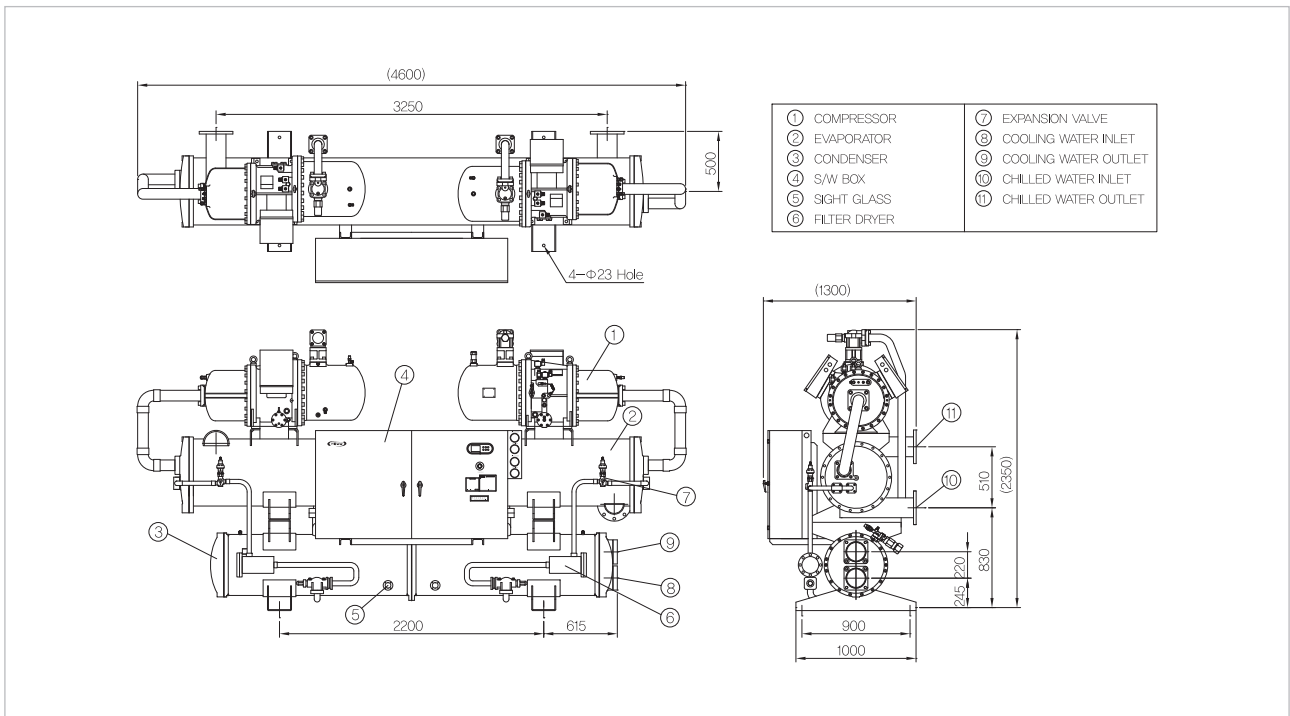


## Dimension Data\_

### TWR(I,L)D 130A



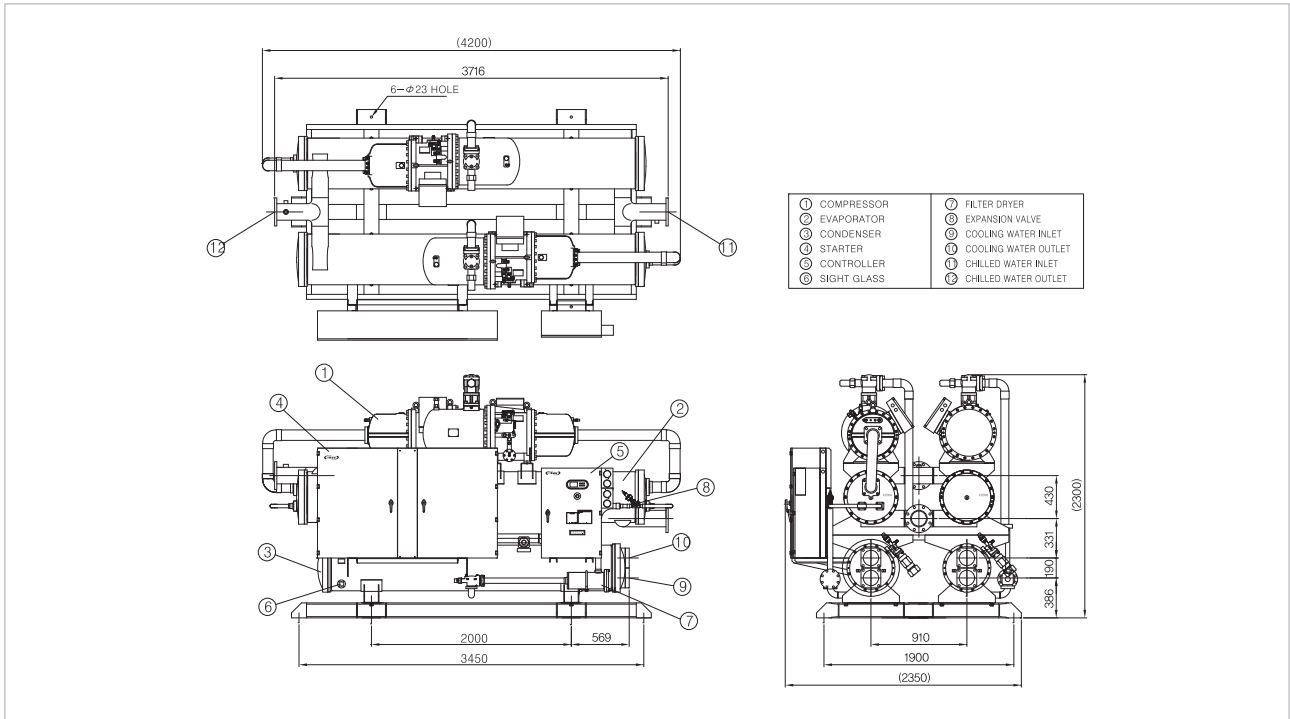
### TWR(I,L)D 170A



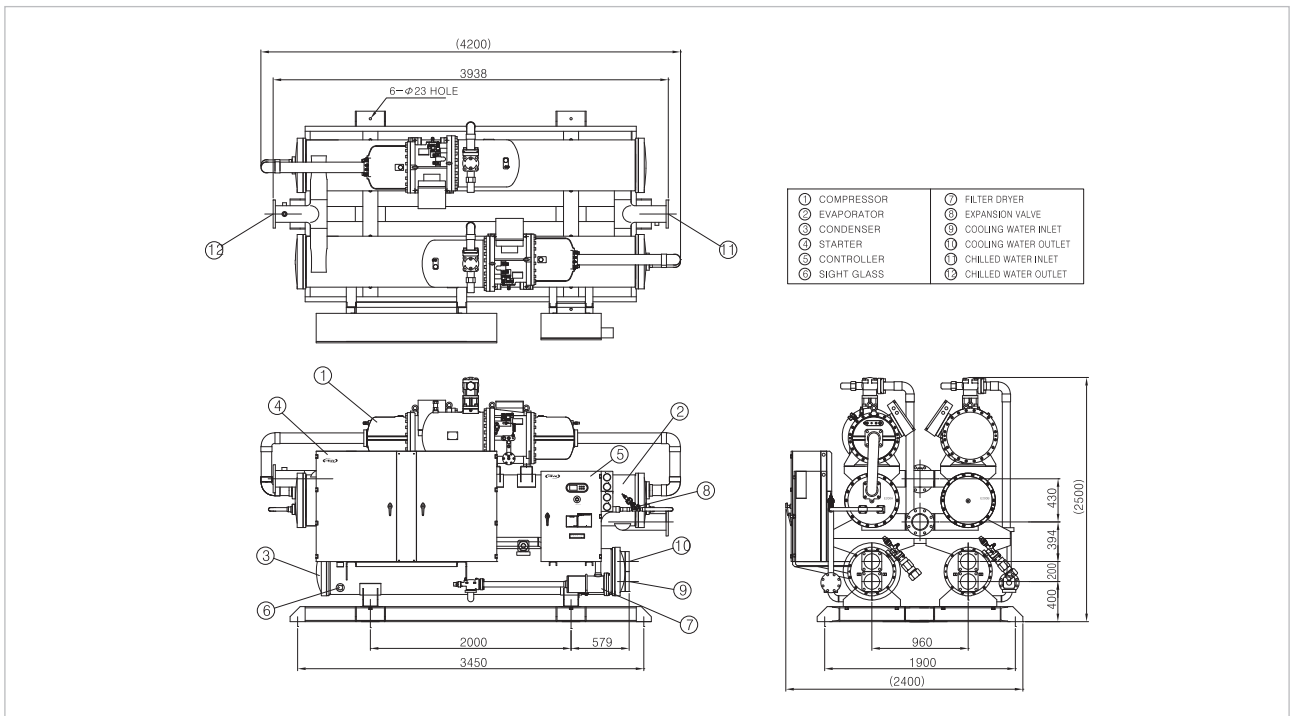
## Water Cooled Type(R-134a)

### Demension Data\_

#### TWR(I,L)D 200A



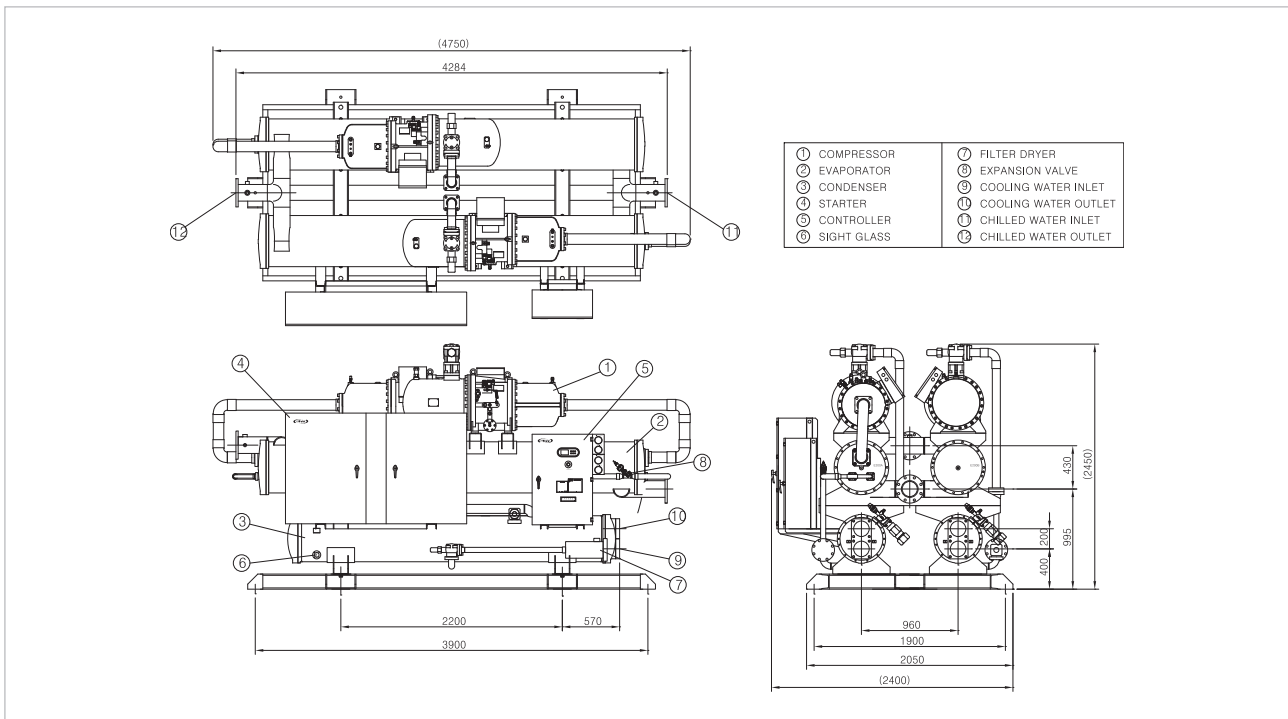
#### TWR(I,L)D 230A



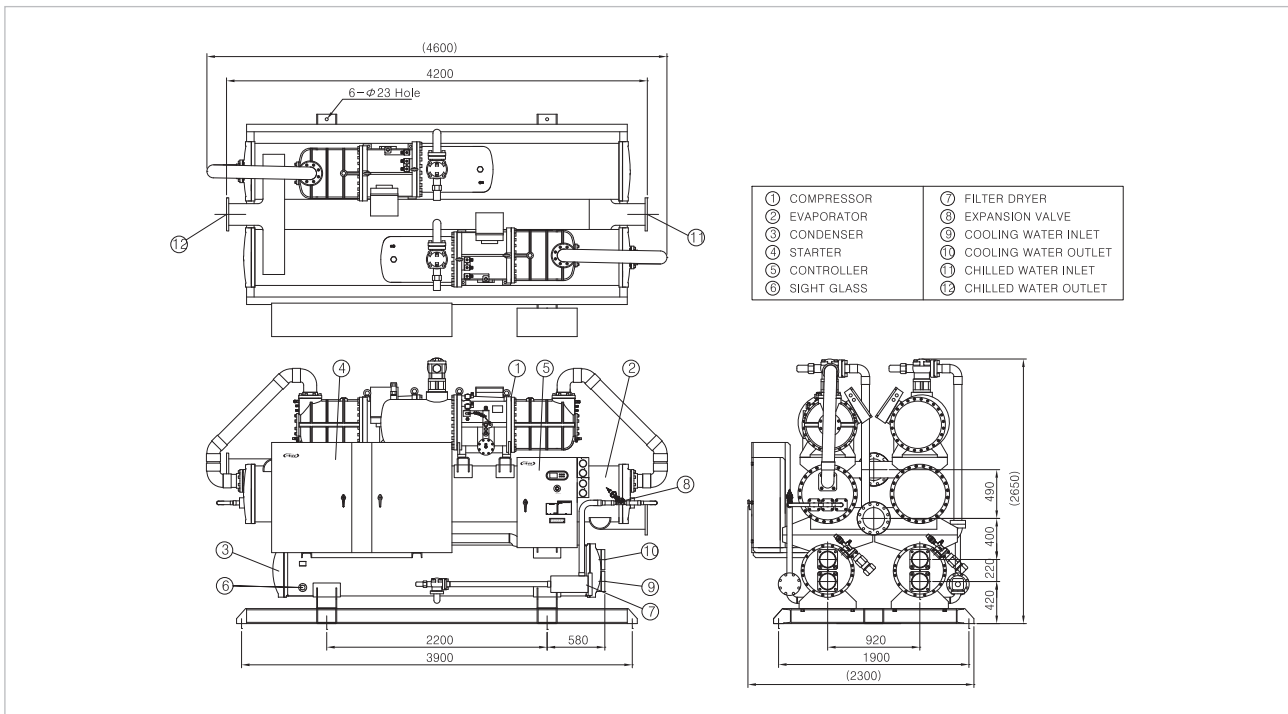


## Demension Data\_

### TWR(I,L)D 260A



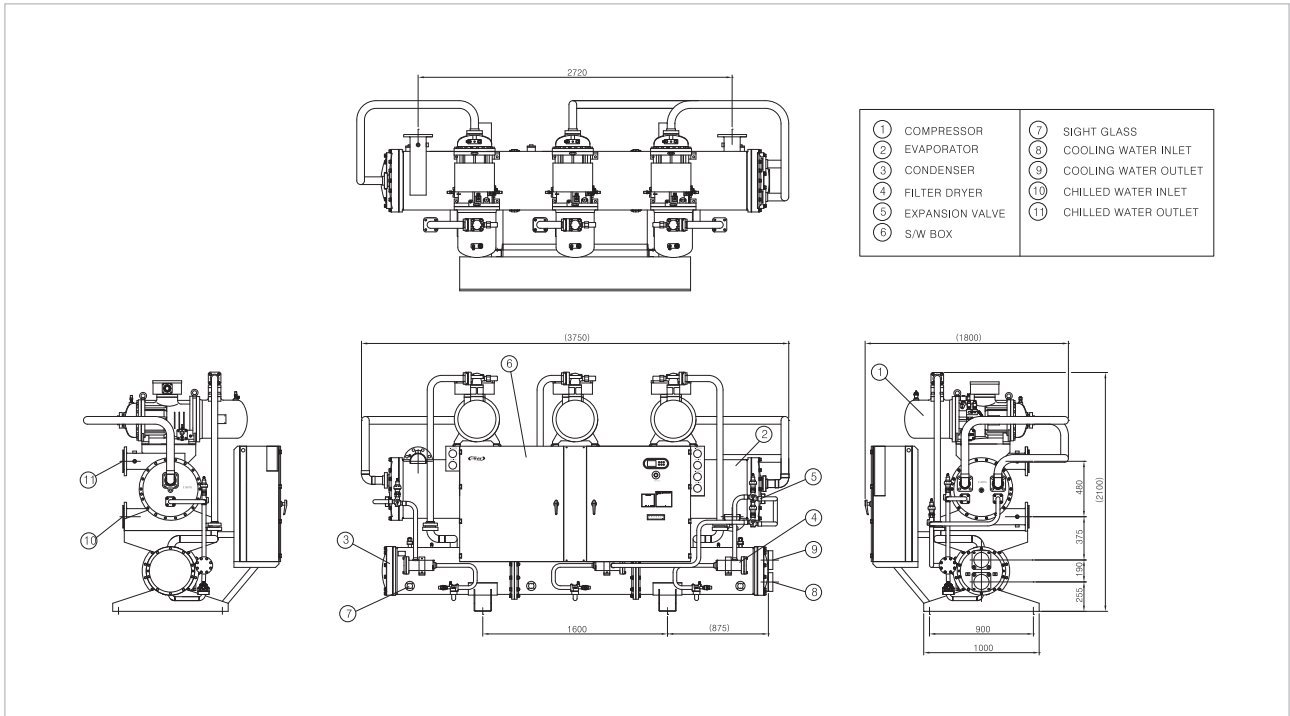
### TWR(I,L)D 330A



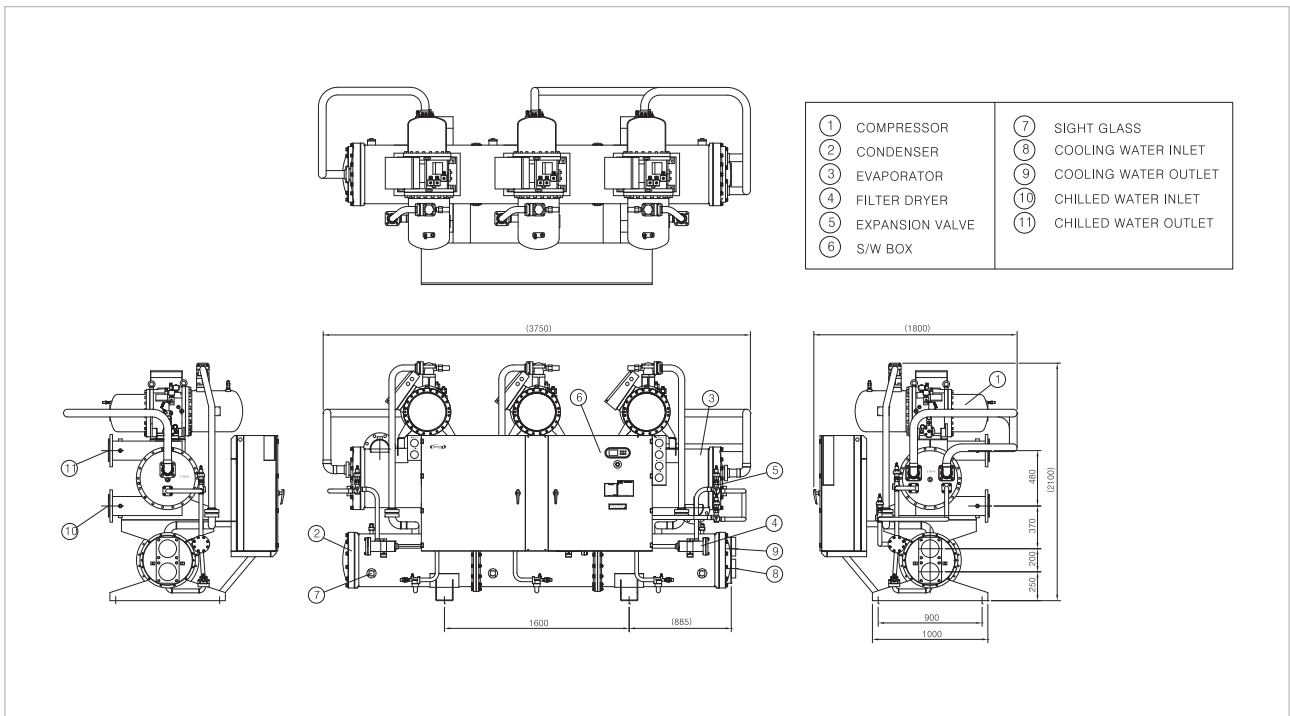
## Water Cooled Type(R-134a)

### Demension Data\_

#### TWR(I,L)T 105A

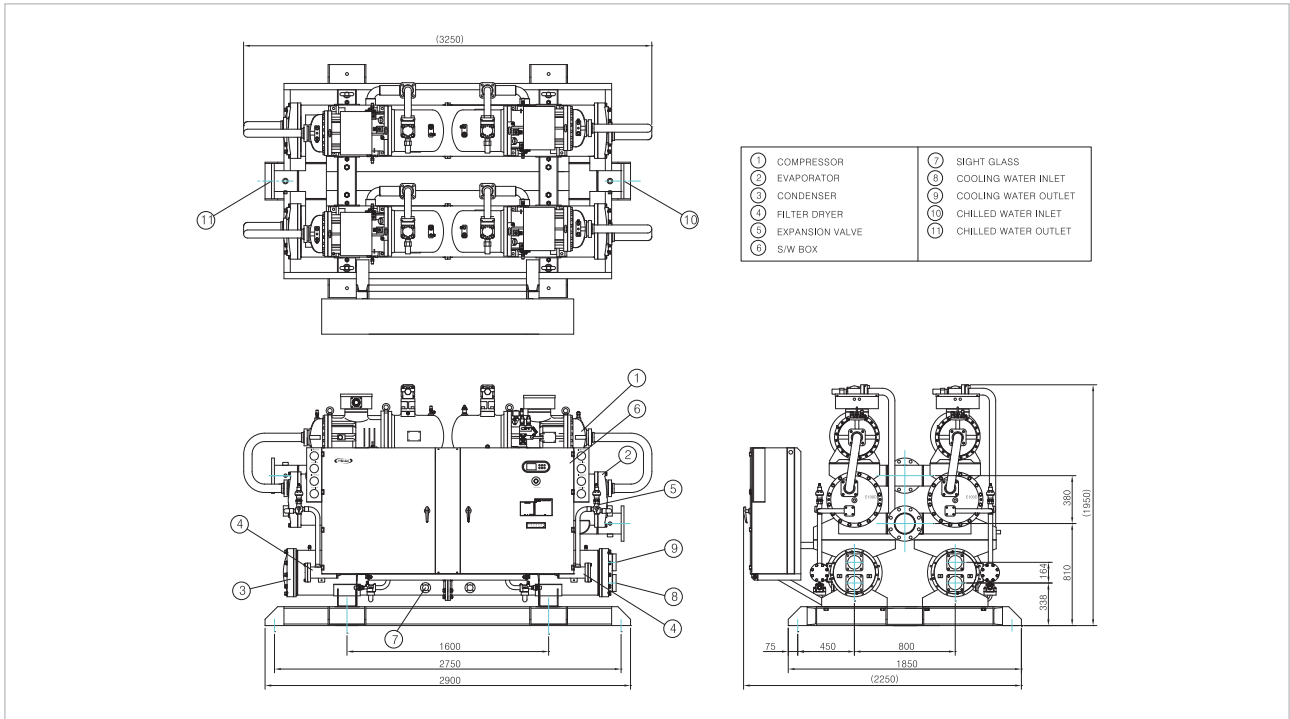


#### TWR(I,L)T 120A

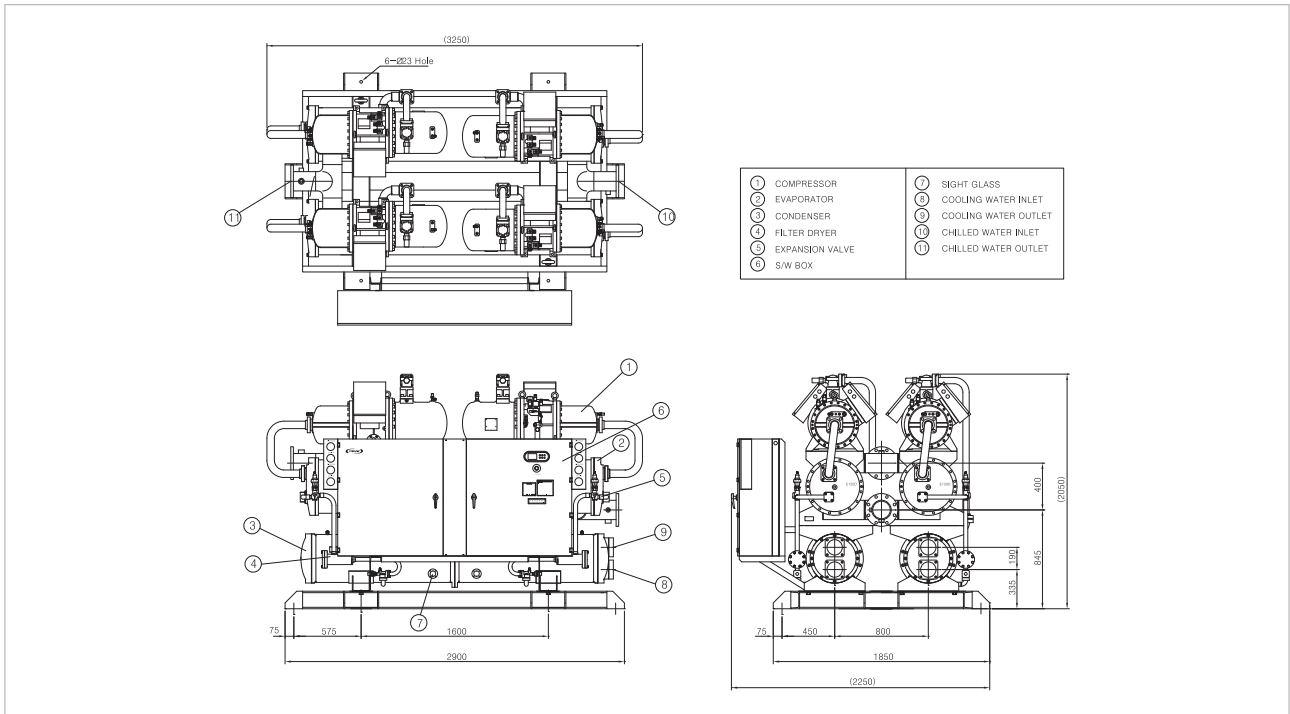


## Demension Data\_

### TWR(I,L)F 140A



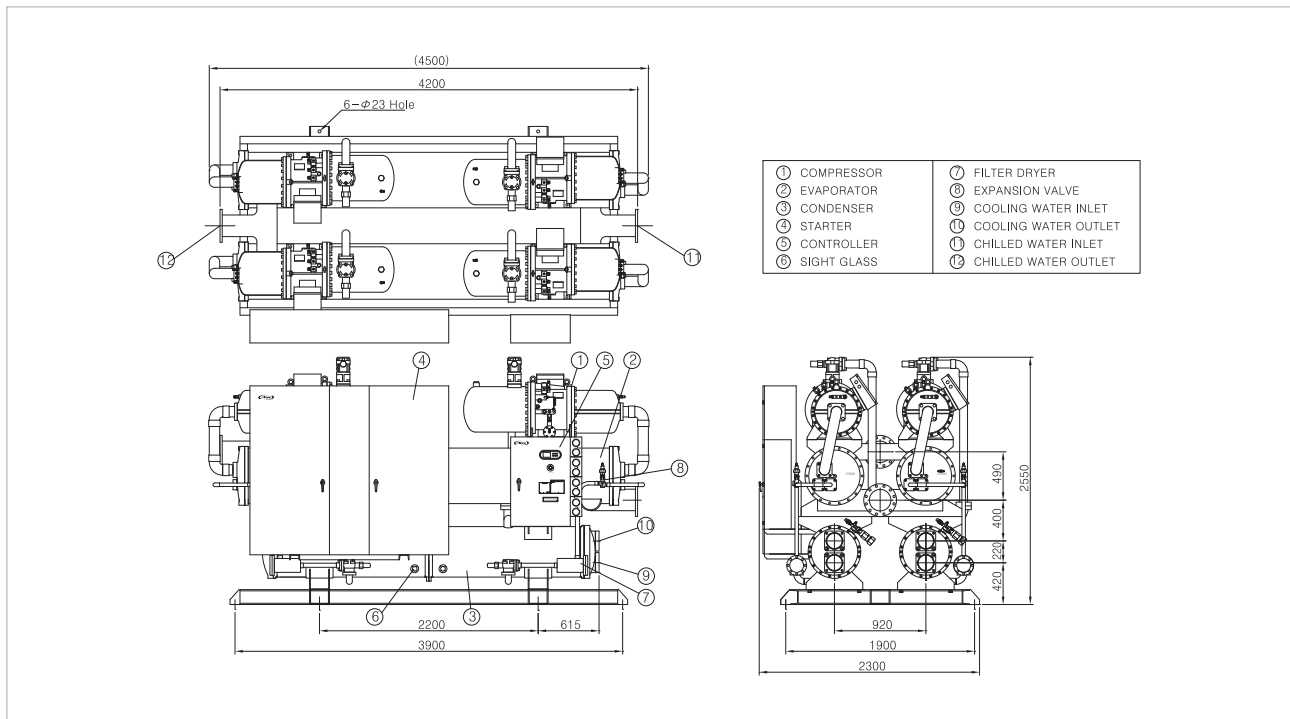
### TWR(I,L)F 160A



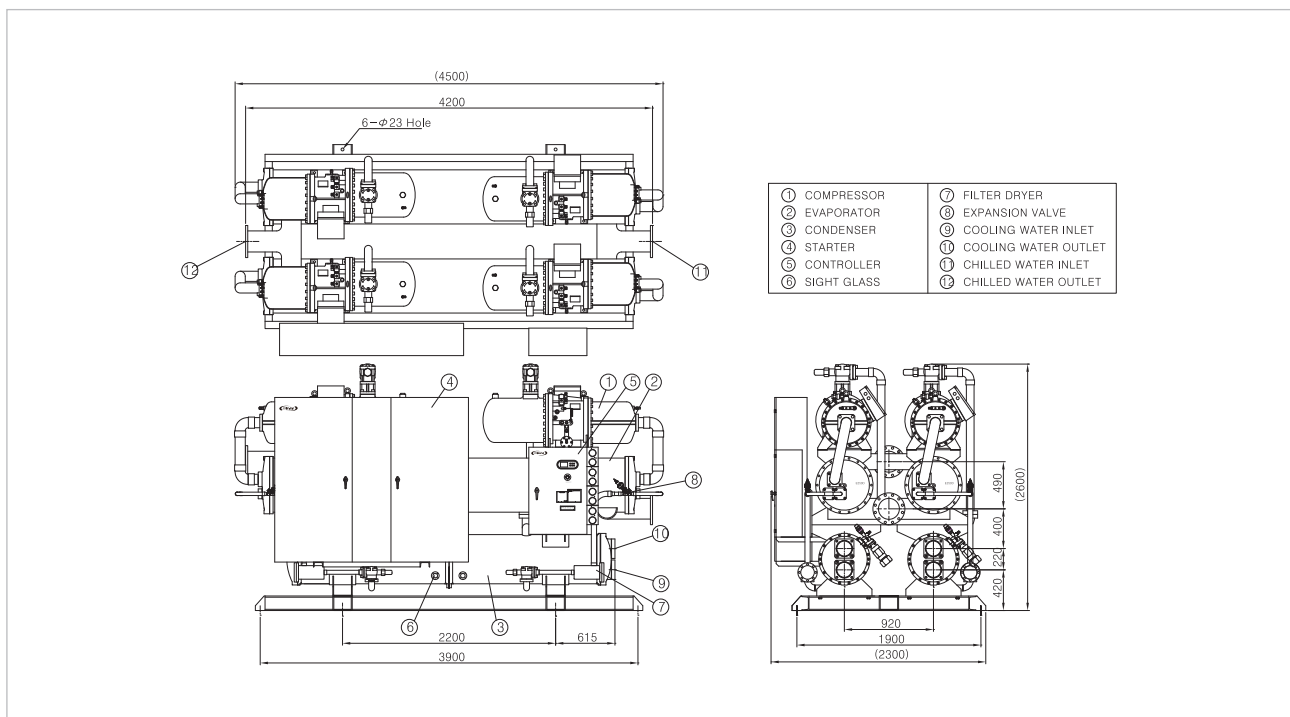
## Water Cooled Type(R-134a)

### Demension Data\_

#### TWR(I,L)F 400A



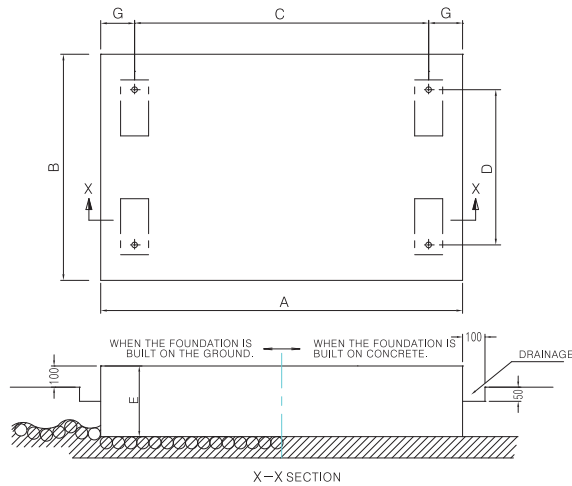
#### TWR(I,L)F 460A



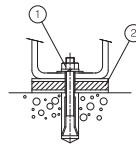
# Installation & Application Data

## TWR(I,L)S 020~165A

<PLANT>



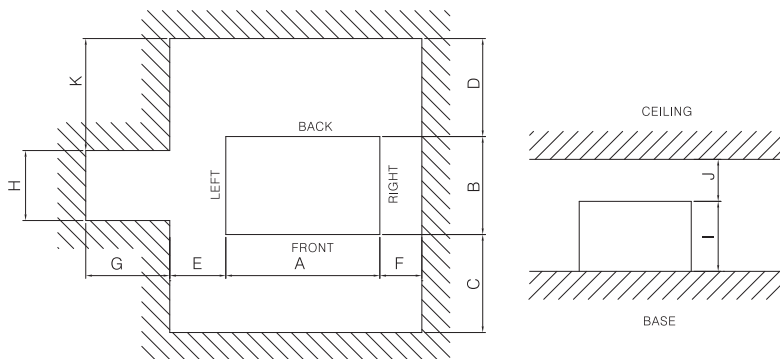
NO	MODEL	A	B	C	D	E	G	ANCHOR BOLT
1	TW+S 020A	1800	1000	1000	600	300	400	M16 x 150L
2	025A	1800	1050	1000	600	300	400	
3	035A	2100	1050	1100	600	300	500	
4	040A	2100	1200	1100	730	300	500	
5	055A	3200	1200	1600	730	350	800	
6	065A	3200	1200	1600	730	350	800	
7	085A	3200	1300	1600	830	400	800	
8	100A	4000	1300	2000	830	400	1000	
9	115A	4200	1300	2000	900	400	1100	
10	130A	4400	1300	2200	900	400	1100	
11	165A	4400	1300	2200	900	400	1100	



THE METHOD OF BASE CONSTRUCTION WORK

NOTE.  
 1)THE MAKER SUPPLIES THE ANCHOR BOLT, ISOLATION PAD.  
 2)THE BASE CONSTRUCTION SHOULD BE WORKED BY A CUSTOMER.

<SPACE>



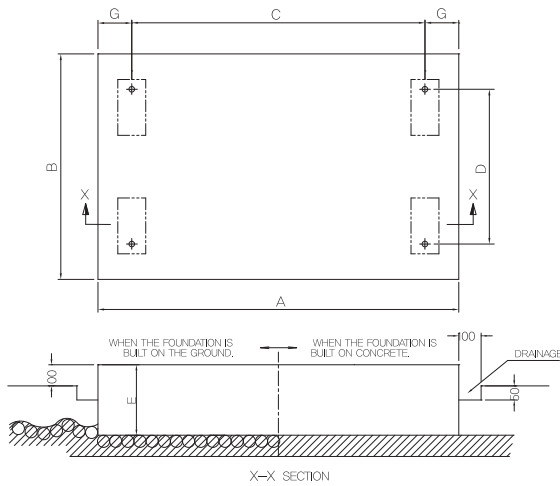
NO	MODEL	A	B	C	D	E	F	G	H	I	J	K
1	TW+S 020A	1800	1000	1500	800	600	800	1300	450	1550	1000	1300
2	025A	1800	1000	1500	800	600	800	1300	450	1550	1000	1300
3	035A	2300	1050	1100	800	600	800	1700	450	1600	1000	1300
4	040A	2300	1150	1500	800	600	800	1800	500	1750	1000	1350
5	055A	2900	1200	1500	1000	800	1000	2000	500	1850	1100	1450
6	065A	2800	1200	1500	1000	800	1000	2000	500	1900	1100	1530
7	085A	2900	1300	1500	1000	800	1000	2000	500	2100	1200	1530
8	100A	3850	1200	1500	1000	1000	1000	2800	600	2100	1300	1500
9	115A	3900	1300	1500	1000	1000	1200	3000	700	2350	1400	1475
10	130A	4300	1350	1500	1000	1000	1200	3300	700	2300	1400	1475
11	165A	4300	1300	1500	1000	1000	1200	3400	700	2500	1400	1475

**Water Cooled Type(R-134a)**

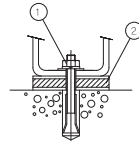
**Installation & Application Data**

**TWR(I,L)D 060~170A, TWR(I,L)T 105, 120A**

PLANT



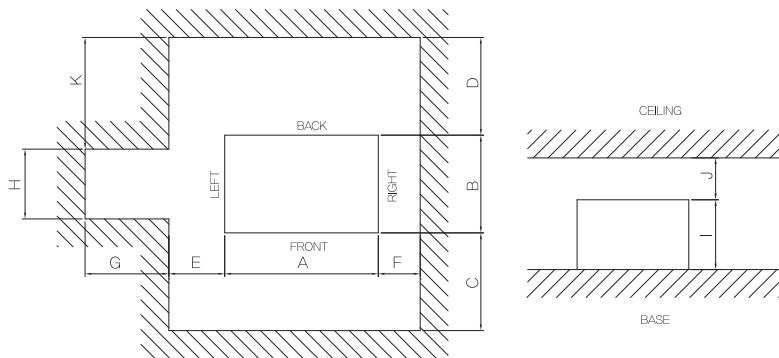
NO	MODEL	A	B	C	D	E	G	ANCHOR BOLT
1	TW*D 060A	3200	1200	1600	730	350	800	M16 x 150L
2	070A	3200	1300	1600	730	350	800	
3	080A	3200	1300	1600	830	400	800	
4	110A	4200	1300	2000	830	400	1100	
5	130A	4400	1300	2200	900	400	1100	
6	170A	4400	1300	2200	900	400	1100	
7	TW*T 105A	4200	1300	1600	900	400	1300	
8	120A	4200	1300	1600	900	400	1300	



NOTE.  
 1)THE MAKER SUPPLIES THE ANCHOR BOLT, ISOLATION PAD.  
 2)THE BASE CONSTRUCTION SHOULD BE WORKED BY A CUSTOMER.

THE METHOD OF BASE CONSTRUCTION WORK

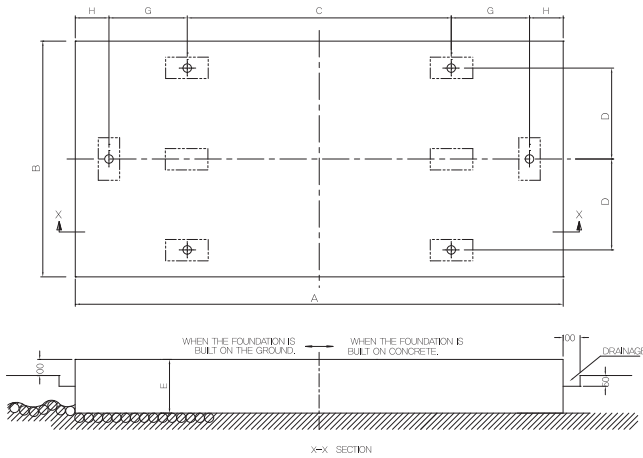
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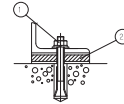
NO	MODEL	A	B	C	D	E	F	G	H	I	J	K
1	TW*D 060A	3100	1100	1500	1000	800	1000	2400	400	1700	1100	1450
2	070A	3250	1250	1500	1000	800	1000	2400	450	1800	1100	1530
3	080A	3250	1250	1500	1000	800	1000	2550	450	1950	1200	1530
4	110A	4200	1250	1500	1000	1000	1200	3300	600	2100	1400	1475
5	130A	4600	1300	1500	1000	1000	1200	3700	600	2250	1400	1475
6	170A	4600	1300	1500	1000	1000	1200	3700	600	2350	1400	1475
7	TW*T 105A	3750	1800	1500	1000	1000	1200	2700	600	2100	1400	1475
8	120A	3750	1800	1500	1000	1000	1200	2700	600	2100	1400	1475

**TWR(I,L)D 200~330A, TWR(I,L)F 140~460A**

(PLANT)



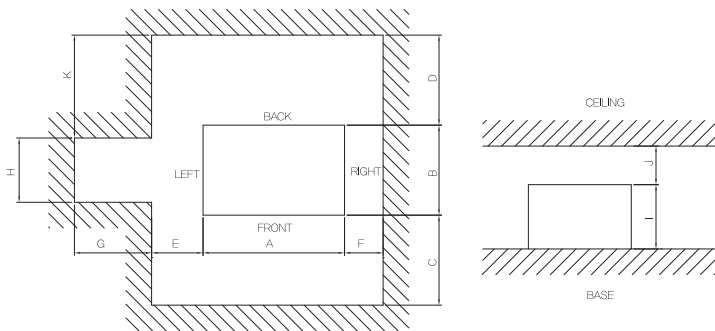
NO	MODEL	A	B	C	D	E	G	H	ANCHOR BOLT
1	TW*D200A	3950	2400	2000	950	400	725	250	M16 x 150L
2	230A	3950	2400	2000	950	400	725	250	
3	260A	4400	2400	2200	950	400	850	250	
4	330A	4400	2400	2200	950	400	850	250	
5	TW*F140A	3250	2200	1600	850	400	575	250	
6	160A	3250	2200	1600	850	400	575	250	
7	400A	4400	2400	2200	950	400	850	250	
8	460A	4400	2400	2200	950	400	850	250	



THE METHOD OF BASE CONSTRUCTION WORK

NOTE) 1,THE MAKER SUPPLIES THE ANCHOR BOLT.  
2,THE BASE CONSTRUCTION SHOULD BE WORKED BY A CUSTOMER.

(SPACE)



NO	MODEL	A	B	C	D	E	F	G	H	I	J	K
1	TW*D200A	4200	2350	1500	1000	1000	1200	3200	1300	2300	1300	1550
2	230A	4200	2400	1500	1000	1000	1200	3300	1300	2500	1400	1550
3	260A	4750	2400	1500	1000	1000	1200	3700	1300	2450	1400	1550
4	330A	4600	2300	1500	1000	1000	1200	3700	1400	2650	1500	1550
5	TW*F140A	3250	2250	1500	1000	1000	1200	3000	1300	1950	1300	1500
6	160A	3250	2250	1500	1000	1000	1200	3000	1300	2050	1300	1500
7	400A	4500	2300	1500	1000	1000	1200	3600	1400	2550	1400	1550
8	460A	4500	2300	1500	1000	1000	1200	3600	1400	2600	1400	1550

## Water Cooled Type(R-407C)

### Standard Specification(50Hz)

#### GWRS 030~060A

Specification		Model	GWRS 030A	GWRS 040A	GWRS 050A	GWRS 060A	
Cooling Capacity		kW	85.4	115.5	146.0	166.8	
		BTU/h	291,500	394,300	498,500	569,500	
		usRT	24.2	32.8	41.5	47.4	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	22.3	29.4	36.4	41.1
	Running Current	380	V	38.8	51.4	65.0	71.7
		400	V	36.9	48.8	61.8	68.1
415		V	35.5	47.1	59.5	65.7	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	245	331	419	478	
	Pressure Drop	KPa	27	41	33	38	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	309	415	523	596	
	Pressure Drop	KPa	22	25	39	34	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		33%(STARTING), 66 ~ 100%				25%, 50 ~ 100%	
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT					
		FUSIBLE PLUG			SAFETY VALVE		
Piping Connection	Chilled Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Cooling Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	26	26	30	40	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	7	7	7	8	
Weight	Net	kg	850	910	1,015	1,150	
	Operating	kg	960	1,020	1,145	1,310	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.



## Standard Specification(50Hz)

### GWRS 080~150A

Specification		Model	GWRS 080A	GWRS 100A	GWRS 125A	GWRS 150A	
Cooling Capacity		kW	219.8	282.4	353.8	431.5	
		BTU/h	750,400	964,200	1,208,000	1,473,300	
		usRT	62.5	80.3	100.6	122.7	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	54.7	67.0	85.7	99.1
	Running Current	380	V	95.0	115.1	145.0	167.8
		400	V	90.3	109.3	137.8	159.4
415		V	87.0	105.4	132.8	153.6	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	150			300	
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	630	810	1,014	1,237	
	Pressure Drop	KPa	32	27	33	36	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	787	1,002	1,260	1,521	
	Pressure Drop	KPa	18	13	23	27	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		25%(STARTING), 50 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	14	16	15	18	
Weight	Net		kg	1,650	2,030	2,200	2,650
	Operating		kg	1,860	2,300	2,540	3,120

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-407C)

### Standard Specification(50Hz)

#### GWRS 175~250A

Specification		Model	GWRS 175A	GWRS 200A	GWRS 250A	
Cooling Capacity		kW	503.3	565.8	721.9	
		BTU/h	1,718,400	1,931,800	2,464,800	
		usRT	143.1	160.9	205.3	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz			
	Power consumption		kW	116.3	128.7	164.1
	Running Current	380	V	197.0	217.9	275.3
		400	V	187.2	207.0	261.5
		415	V	180.4	199.5	252.1
Compressor	Type		SEMI-HERMETIC SCREW			
	Oil Heater	W	300			
	Starting Method		Y-Δ STARTING			
Evaporator	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	1,443	1,622	2,069	
	Pressure Drop	KPa	25	25	37	
	Ref. Max Pressure	MPa	1.6			
	Water Max Pressure	MPa	1.0			
Condenser	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	1,776	1,991	2,540	
	Pressure Drop	KPa	26	27	33	
	Ref. Max Pressure	MPa	2.7			
	Water Max Pressure	MPa	1.0			
Refrigerant Control		EXPANSION VALVE				
Control Capacity		25%, 50 ~ 100%	35%, 50 ~ 100%	30%, 50 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE				
Piping Connection	Chilled Water		125A (5B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	150A (6B)	
	Drain		25A (1B)			
Pefrigerant	Type		R-407C			
	Charged Volume	kg	120	140	150	
Lubricant	Type		CPI SOLEST 120			
	Charged Volume	ℓ	23	23	28	
Weight	Net	kg	3,200	3,720	4,100	
	Operating	kg	3,780	4,370	4,880	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(50Hz)

### GWRD 080~160A

Specification		Model	GWRD 080A	GWRD 100A	GWRD 120A	GWRD 160A	
Cooling Capacity		kW	226.0	291.8	334.2	450.0	
		BTU/h	771,600	996,300	1,141,100	1,536,400	
		usRT	64.2	82.9	95.0	127.9	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	59.0	73.0	82.6	110.0
	Running Current	380	V	103.0	130.2	144.0	190.8
		400	V	97.9	123.7	136.8	181.3
415		V	94.3	119.2	131.9	174.7	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	2 × 150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	648	836	958	1,290	
	Pressure Drop	KPa	35	29	29	38	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	817	1,046	1,195	1,605	
	Pressure Drop	KPa	21	15	21	27	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		16.5%(STARTING), 33 ~ 100%			12.5%(STARTING), 25 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 7	2 × 7	2 × 8	2 × 14	
Weight	Net		kg	1,650	1,940	2,200	
	Operating		kg	1,860	2,210	2,540	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-407C)

### Standard Specification(50Hz)

#### ↘ GWRD 200~350A

Specification		Model	GWRD 200A	GWRD 250A	GWRD 300A	GWRD 350A	
Cooling Capacity		kW	585.4	723.4	863.0	1,006.6	
		BTU/h	1,998,800	2,469,900	2,946,600	3,436,900	
		usRT	166.4	205.7	245.4	286.2	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	133.0	170.0	198.2	232.6
	Running Current	380	V	228.6	287.6	335.6	394.0
		400	V	217.2	273.2	318.8	374.3
		415	V	209.3	263.3	307.3	360.8
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	2 × 150		2 × 300		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,678	2,074	2,474	2,886	
	Pressure Drop	KPa	26	37	34	23	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	2,059	2,561	3,042	3,552	
	Pressure Drop	KPa	29	33	25	26	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		12.5%(STARTING), 25 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		150A (6B)	150A (6B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	2 × 125A (5B)	2 × 150A (6B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	150	160	200	240	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 16	2 × 15	2 × 18	2 × 23	
Weight	Net	kg	3,800	4,100	6,300	7,400	
	Operating	kg	4,450	4,880	7,240	8,560	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(50Hz)

### ↘ GWRD 400~500A, GWRT 150~180A

Specification		Model	GWRD 400A	GWRD 500A	GWRT 150A	GWRT 180A	
Cooling Capacity		kW	1,145.0	1,443.8	449.1	506.4	
		BTU/h	3,909,500	4,929,700	1,533,400	1,729,000	
		usRT	325.6	410.6	127.7	144.0	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	258.6	328.2	108.9	123.0
	Running Current	380	V	437.8	550.6	194.4	214.2
		400	V	415.9	523.1	184.7	203.5
415		V	400.9	504.2	178.0	196.1	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	2 × 300		3 × 150		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	3,282	4,139	1,287	1,452	
	Pressure Drop	KPa	43	32	37	33	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	4,024	5,080	1,600	1,804	
	Pressure Drop	KPa	28	33	31	29	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		17.5%, 35 ~ 100%	15%, 30 ~ 100%	11%, 22 ~ 100%	8.3%, 16.7 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		150A (6B)	200A (8B)	125A (5B)	125A (5B)	
	Cooling Water		2 × 150A (6B)	2 × 150A (6B)	125A (5B)	150A (6B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	280	300	100	120	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	2 × 23	2 × 28	3 × 7	3 × 8	
Weight	Net		kg	7,640	9,200	2,515	3,200
	Operating		kg	8,940	10,760	2,775	3,510

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-407C)

### Standard Specification(50Hz)

#### ✂ GWRF 200~700A

Specification		Model	GWRF 200A	GWRF 240A	GWRF 600A	GWRF 700A	
Cooling Capacity		kW	583.6	668.4	1,692.8	1,939.2	
		BTU/h	1,992,600	2,282,200	5,779,900	6,621,200	
		usRT	165.9	190.0	481.4	551.4	
Power Source	Power Source		3 Ph 380 / 400 / 415 V 50 Hz				
	Power consumption		kW	146.0	165.2	393.6	462.4
	Running Current	380	V	260.4	288.0	667.2	783.6
		400	V	247.4	273.6	633.8	744.4
415		V	238.4	263.7	610.9	717.5	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	4 × 150		4 × 300		
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	1,673	1,916	4,853	5,559	
	Pressure Drop	KPa	29	29	27	36	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	2,092	2,390	5,981	6,885	
	Pressure Drop	KPa	15	21	38	44	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		8.25%, 16.5 ~ 100%		6.25%(STARTING), 12.5 ~ 100%			
Safety Parts		DUAL PRESSURE SWITCH, DEFROSTER, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DEFROSTER, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		150A (6B)	150A (6B)	200A (8B)	200A (8B)	
	Cooling Water		2 × 100A (4B)	2 × 125A (5B)	2 × 150A (6B)	2 × 150A (6B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	150	160	330	360	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	4 × 7	4 × 8	4 × 18	4 × 23	
Weight	Net	kg	3,880	4,400	9,500	9,700	
	Operating	kg	4,420	5,080	11,060	11,260	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Standard Specification(60Hz)

### GWRS 030~060A

Specification		Model	GWRS 030A	GWRS 040A	GWRS 050A	GWRS 060A	
Cooling Capacity		kW	96.2	130.2	166.1	190.2	
		BTU/h	328,400	444,500	567,100	649,400	
		usRT	27.3	37.0	47.2	54.0	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	27.0	35.7	44.3	50.1
	Running Current	380	V	45.9	60.8	76.4	85.1
		400	V	39.6	52.5	66.0	73.5
415		V	37.9	50.2	63.1	70.3	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater		W	150			
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	276	373	476	545	
	Pressure Drop	KPa	38	58	46	53	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	353	476	603	689	
	Pressure Drop	KPa	29	32	53	47	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		33%(STARTING), 66 ~ 100%				25%, 50 ~ 100%	
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT					
		FUSIBLE PLUG			SAFETY VALVE		
Piping Connection	Chilled Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
	Cooling Water		80A (3B)	80A (3B)	80A (3B)	100A (4B)	
Drain		25A (1B)					
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	26	26	30	40	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	7	7	7	8	
Weight	Net	kg	850	910	1,015	1,150	
	Operating	kg	960	1,020	1,145	1,310	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.

## Water Cooled Type(R-407C)

### Standard Specification(60Hz)

#### GWRS 080~150A

Specification		Model	GWRS 080A	GWRS 100A	GWRS 125A	GWRS 150A	
Cooling Capacity		kW	247.2	318.1	398.0	493.9	
		BTU/h	844,000	1,086,100	1,358,900	1,686,300	
		usRT	70.3	90.4	113.1	140.4	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz				
	Power consumption		kW	66.4	81.2	104.0	120.6
	Running Current	380	V	113.3	137.8	175.4	203.4
		400	V	97.9	119.0	151.5	175.7
415		V	93.6	113.8	144.9	168.0	
Compressor	Type		SEMI-HERMETIC SCREW				
	Oil Heater	W	150			300	
	Starting Method		Y-Δ STARTING				
Evaporator	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	709	912	1,141	1,416	
	Pressure Drop	KPa	45	38	46	51	
	Ref. Max Pressure	MPa	1.6				
	Water Max Pressure	MPa	1.0				
Condenser	Type		SHELL & TUBE TYPE				
	Water Flow Rate	LPM	899	1,145	1,439	1,762	
	Pressure Drop	KPa	25	18	30	37	
	Ref. Max Pressure	MPa	2.7				
	Water Max Pressure	MPa	1.0				
Refrigerant Control		EXPANSION VALVE					
Control Capacity		25%(STARTING), 50 ~ 100%					
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE					
Piping Connection	Chilled Water		100A (4B)	125A (5B)	125A (5B)	125A (5B)	
	Cooling Water		100A (4B)	100A (4B)	125A (5B)	125A (5B)	
	Drain		25A (1B)				
Pefrigerant	Type		R - 407C				
	Charged Volume	kg	60	75	80	100	
Lubricant	Type		CPI SOLEST 120				
	Charged Volume	ℓ	14	16	15	18	
Weight	Net	kg	1,650	2,030	2,200	2,650	
	Operating	kg	1,860	2,300	2,540	3,120	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.



## Standard Specification(60Hz)

### GWRS 175~250A

Specification		Model	GWRS 175A	GWRS 200A	GWRS 250A	
Cooling Capacity		kW	576.0	647.3	824.7	
		BTU/h	1,966,700	2,210,100	2,815,800	
		usRT	163.8	184.0	234.5	
Power Source	Power Source		3 Ph 380 / 440 / 460 V 60 Hz			
	Power consumption		kW	141.6	156.3	199.8
	Running Current	380	V	238.7	263.6	333.4
		400	V	206.2	227.7	287.9
		415	V	197.2	217.8	275.4
Compressor	Type		SEMI-HERMETIC SCREW			
	Oil Heater	W	300			
	Starting Method		Y-Δ Starting			
Evaporator	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	1,651	1,856	2,364	
	Pressure Drop	KPa	36	36	52	
	Ref. Max Pressure	MPa	1.6			
	Water Max Pressure	MPa	1.0			
Condenser	Type		SHELL & TUBE TYPE			
	Water Flow Rate	LPM	2,057	2,304	2,937	
	Pressure Drop	KPa	36	38	45	
	Ref. Max Pressure	MPa	2.7			
	Water Max Pressure	MPa	1.0			
Refrigerant Control		EXPANSION VALVE				
Control Capacity		25%, 50 ~ 100%	35%, 50 ~ 100%	30%, 50 ~ 100%		
Safety Parts		DUAL PRESSURE SWITCH, FREEZE-UP PROTECTOR, OVER CURRENT RELAY, PHASE REVERSAL PROTECTOR, DISCHARGE GAS & INTERNAL THERMOSTAT, SAFETY VALVE				
Piping Connection	Chilled Water		125A (5B)	150A (6B)	150A (6B)	
	Cooling Water		150A (6B)	150A (6B)	150A (6B)	
	Drain		25A (1B)			
Pefrigerant	Type		R - 407C			
	Charged Volume	kg	120	140	150	
Lubricant	Type		CPI SOLEST 120			
	Charged Volume	ℓ	23	23	28	
Weight	Net		3,200	3,720	4,100	
	Operating		3,780	4,370	4,880	

- ※ Note
1. Inlet/outlet temp. of chilled water : 12/7°C(53.6/44.6°F)
  2. Inlet/outlet temp. of cooling water : 30/35°C(86/95°F)
  3. Fouling factor : 0.000086m<sup>2</sup>C/W(0.00049ft<sup>2</sup>C/BTU)
  4. These specifications are subject to alternation for technical improvment without notice.