



# Product Catalog

Air Cooled Chiller and Heat Pump

**e-Koolman** model: 075~200

R410A, 50Hz



May 2018

**PKGP-PRC006-EN**



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# Features and Benefits

## Introduction

Using the leading high-efficiency hermetic scroll compressor and evaporator technology, e-Koolman provides you a stable, reliable and highly efficient operation. Matched with a large variety of fan coils of different sizes it can be widely used in top grade apartments, luxury villas, office buildings, small-sized restaurants, retail stores and hotels to create a comfortable and delightful indoor environment.

## State-of-the-art appearance

e-Koolman boasts of its state-of-the-art appearance. The contemporary appearance, designed by expert designers, will be naturally integrated with the surrounding environment and will definitely display your prominent taste.

## Small footprint

As a result of the particular slim design (standard type is 500mm thick while mini type is only 393mm thick), the unit can be installed directly on the veranda, rooftop or ground without the need to have a plant room.

## Available options

Unit with pressurized water tank is available to meet various requirements.

## Easy installation

Each chiller has factory charged oil and refrigerant for reducing field labor and materials costs. All units are factory run tested. Only power supply and water piping are required to be connected on the jobsite.

## Environmentally friendly refrigerant

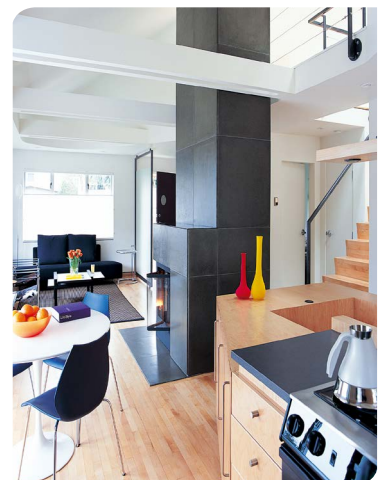
All models are charged with R410A refrigerant.

## Free of Cooling Tower

Heat dissipation in the way of air cycle eliminates the need for cooling water tower. Thus, not only does it save the cost and space for cooling tower it also eliminates water shortage concerns.

## Reliable Performance

Operation performance is certified by Eurovent.



# Mechanical Specifications

## General

e-Koolman air-cooled liquid chiller is designed to couple with fan coil units and air handling units for residential and light commercial air conditioning applications. Units are composed of scroll compressor (s), plate type evaporator, finned-coppertube and aluminum condenser, axial fan assembly, expansion valve, four-way reversal valve (heat pump only), indoor Cooling/Heating control switch, water flow switch, filter dryer, sight-glass, built-in water pump, galvanized sheet metal housing with powder paint and factory mounted controls. Optional fittings include pressurized water tank system.



## Compressor

Depending on capacity range, units come with single or double scroll compressors to cater for changing demand and efficient part load operations.

## Evaporator

Evaporator is a compact brazed plate heat exchanger with AISI 316 stainless plates and adapters. A 20-mesh strainer is installed at the water inlet to protect the evaporator and unit against fouling. The strainer (factory provided, field installed) can be removed for cleaning.



## Housing

All parts are fabricated to precision by state-of-the-art CNC machines. The frame design allows all panels to be removed for service without affecting the structure of the unit. The panels are made of galvanized steel plate with powder paint. All panels are internally insulated with single layer foam cell in order to reduce noise and vibration.

## Water pump

Pump is Rotodynamic pumps and adopts a mechanical shaft seal. Motor is fan cooled (TEFC), 2-pole induction type. Pump is installed in the unit to save installation space and also to reduce noise level.



## Controls and protection devices

The controller contains all the basic electrical protection devices including electromagnetic switches, relays and current overload protectors. The automatic control devices consist of high and low pressure switches, thermostatic and anti-freeze cutouts, which improve and protect the unit's normal operation. In addition, the preset low temperature protection command can start the machine automatically to protect the water pipes from freezing.

## LCD microprocessor-based controller

Precise temperature control of inlet chilled water, operation modes and system protection are provided by the long-range controller. In addition, the password can be set and any abnormal condition will be monitored and captured to facilitate quick repair and normal operation. In addition, the interlocking function of the two-way valve is available.



## Air-cooled condenser

The unit comes with air-cooled fin-tube U or V shaped condensers. Copper tubes are of the 3/8" diameter, seamless type. Fins are aluminum with efficient Wavy fin. Copper tubes are expanded mechanically to bond with the fins for effective heat transfer. Light-weight axial flow fan(s) is (are) driven by high efficiency, low speed, low noise motor(s) to ensure quiet and reliable operations.

## Operating limits

	Cooling mode	Heating mode
mini	21°C	-7°C
max	43°C	21°C
Leaving water temperature		
	Cooling mode	Heating mode
mini	5°C	40°C
max	15°C	50°C

# Model Nomenclatures

C   G   A   R   0   7   5   5   R   B   N   A   R   R   N   C  
 1   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16

Digit 1,2,3 CGA = Air-Cooled Chiller and Heat Pump

Digit 4 Model

R = Heat Pump

Digit 5,6,7 Model

075   150

100   200

120

Digit 8 Power Supply

5 = 380V/50Hz/3ph

Digit 9 Manufacturing Code (defaulted by factory)

R = R410A

Digit 10 Controller

B = Microprocessor-based adjustable water temperature controller

Digit 11 Water Side Electric Heater

N = None

Digit 12 Service Sequence

A = The first time

Digit 13 Water Pump for Unit

R = With Pump inside (standard)

N = Without Pump

Digit 14 Applicable Ambient Temperature

R = Standard ambient temperature/Blue-fin

Digit 15 Fitting Options

N = None (Standard Unit)

Digit 16 Other option

C = Eurovent Certified

# Performance Data



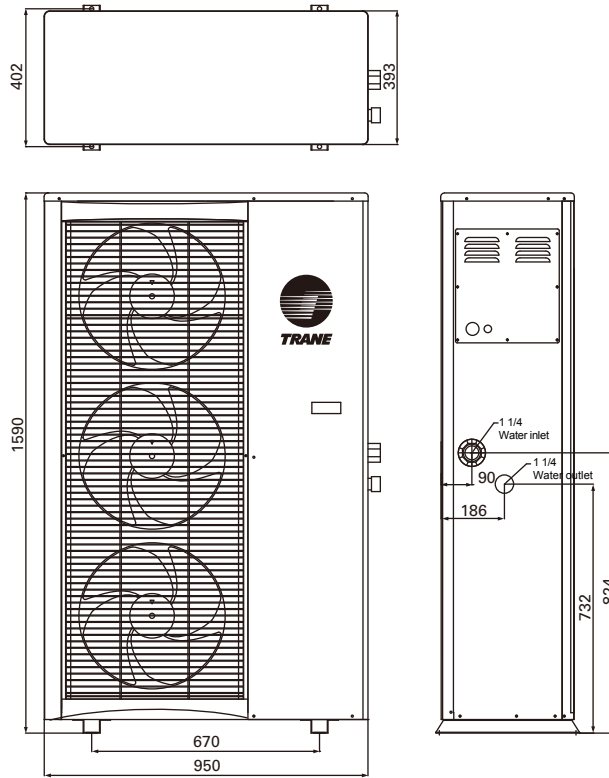
Model		CGAR0755R BNARRNC	CGAR1005R BNARRNC	CGAR1205R BNARRNC	CGAR1505R BNARRNC	CGAR2005R BNARRNC	
Cooling Capacity	Kal/Hr	19106	22820	31711	42301	46348	
	kW	22.19	26.50	36.83	49.13	58.83	
Heating Capacity	Kal/Hr	20716	25252	35766	45418	51178	
	kW	24.06	29.33	41.54	52.75	59.44	
Power Supply	V	380-415V/50HZ/3	380-415V/50HZ/3	380-415V/50HZ/3	380-415V/50HZ/3	380-415V/50HZ/3	
Compressor	Number	1	2	2	2	2	
	Rated Current(C/H)	A	13.77/13.43	8.2/8.3	11.2/11.3	14.9/15.2	17/17.1
	Locked Rotor Current	A	110	82	100	110	140
	Power Input(C/H)	KW	7.27/7.02	4.43/4.25	5.85/5.7	7.3/7.55	8.48/8.15
Type	Hermetic Scroll compressor						
Fan	Number	3	1	2	2	2	
	Rated Current	A	0.7	1.6	1.6	4.2	4.2
	Power Input	kW	0.06	0.6	0.6	0.8	1.5
Water Pump	Number			1			
	Rated Current	A	1.45	1.45	3.26	2.4	3.8
	Power Input	kW	0.55	0.74	1.44	1.41	1.92
	Discharge Head	m	18.99	16.07	18.05	16.28	26.18
Type	Plate type heat exchanger						
Evaporator	Water Flow (C/H)	m <sup>3</sup> /h	4.08/4.25	4.85/5.11	6.62/6.96	8.45/9.20	9.46/10.28
Protective Device	Overheat protection, High and Low Pressure Protection						
Lubricant	Type	PVE68					
	Charge	L	1.57	1.57	1.57	2.66	2.66
Refrigerant	Type	R410a					
	Charge	kg	4.4	3.0+3.0	3.8+3.8	4.8+4.8	5.0+5.0
Unit Dimensions	mm	950*393*1590	1290*500*1900		1990*500*1900		
Water Connection (FPT)	inch	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/2"	
Direction of Connection		Right	Left or Right	Left or Right	Front	Front	
Operation Weight	Kg	202	449	530	540	540	

Note:

- 1.Cooling Mode Conditions (Evap. 12°C/7°C - Air. 35°C).
- 2.Heating Mode Condition (Evap. 40°C/45°C - Air. DB/WB 7°C/6°C).
- 3.The unit is tested and certified under EN14511:2013 & EN14825:2013.

# Dimensions

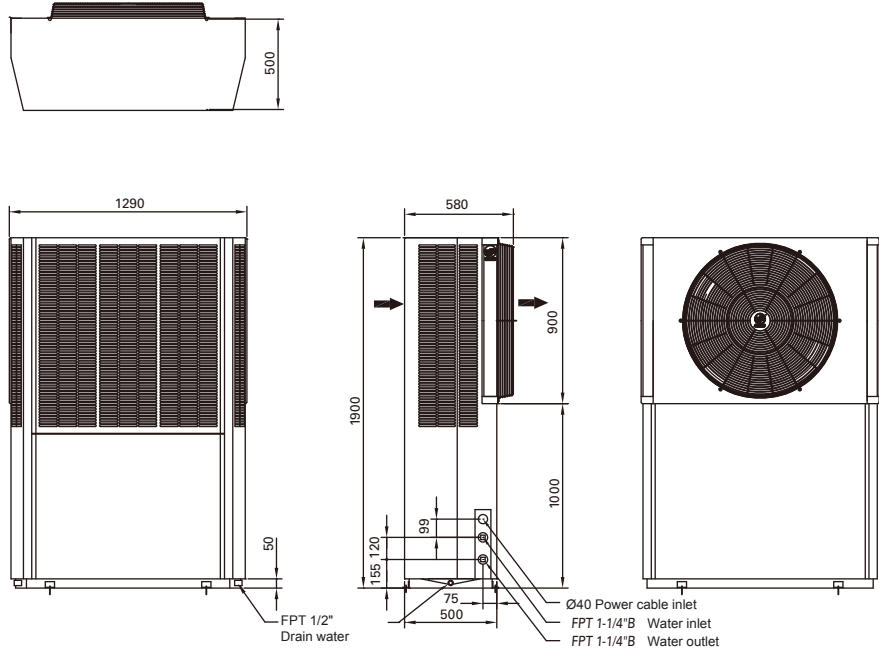
CGAR0755R (Unit: mm)



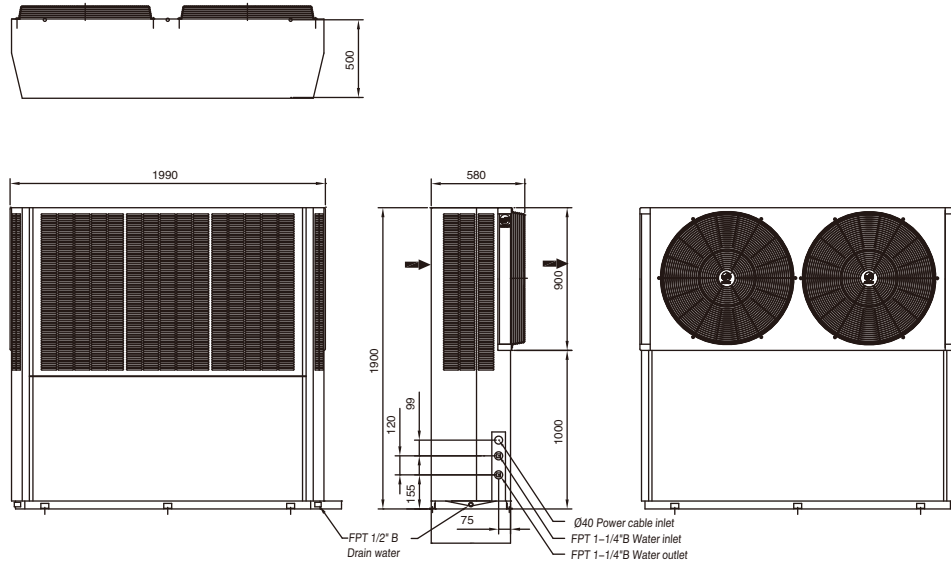


## Dimensions

CGAR1005R (Unit: mm)

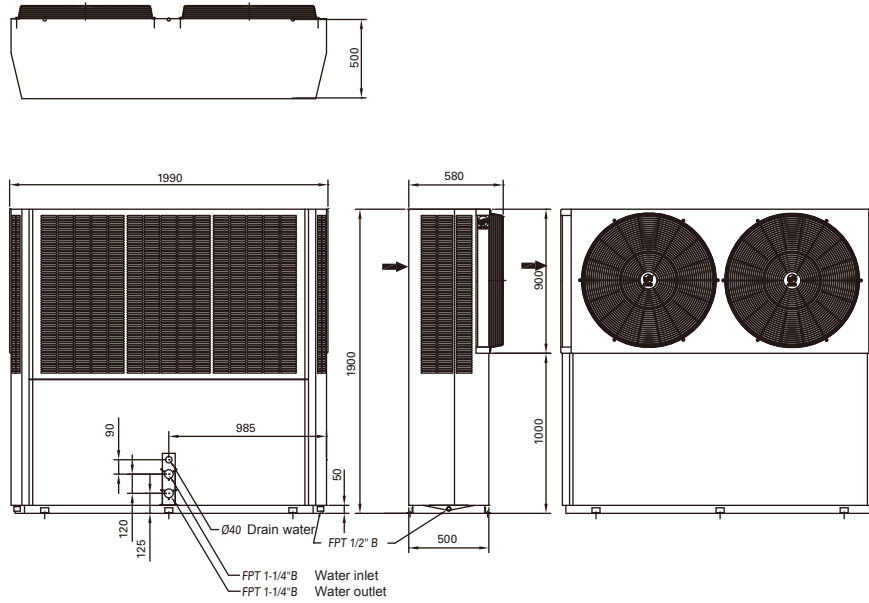


CGAR1205R (Unit: mm)

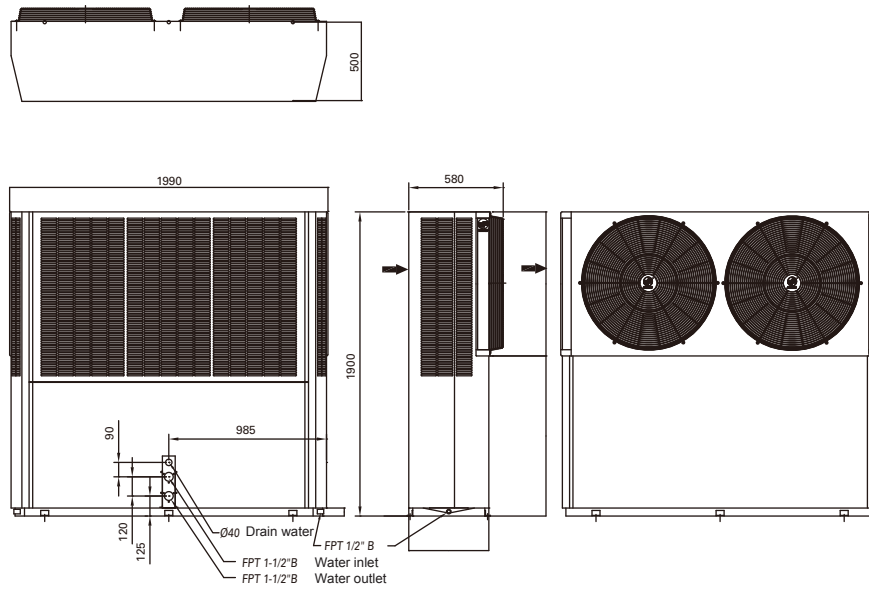




CGAR1505R (Unit: mm)



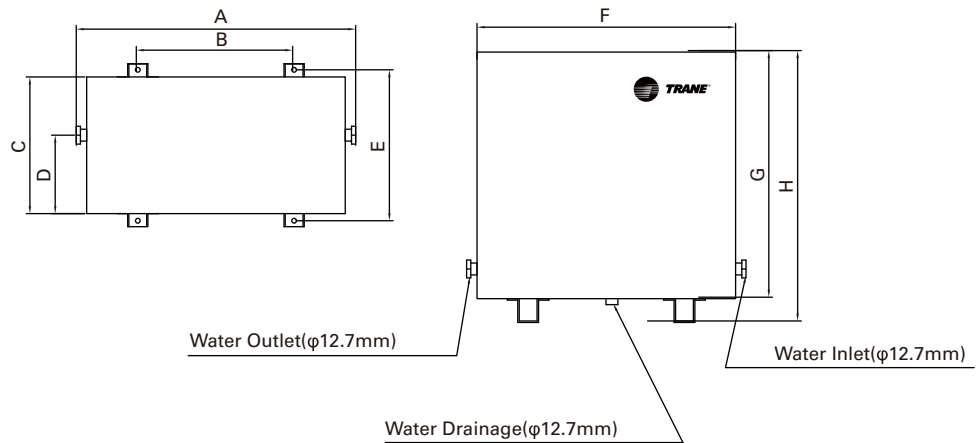
CGAR2005R (Unit: mm)



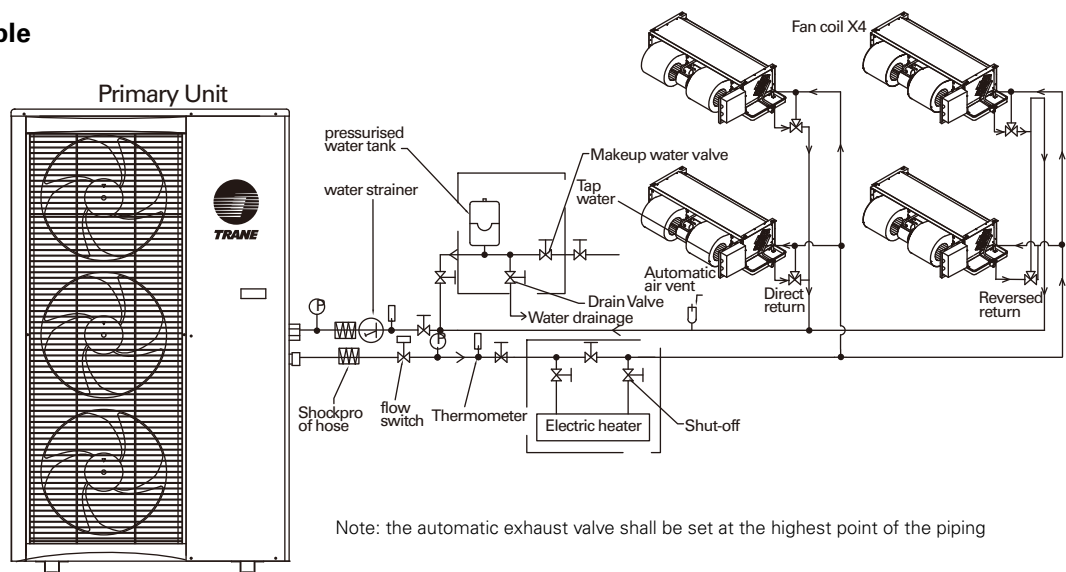
## Dimensions

### Pressure water tank (Option Unit:mm)

Model	Size							
	A	B	C	D	E	F	G	H
WTANK-5	470	263	230	182	254	435	415	455
WTANK-12	620	400	324	162	356	569	440	475



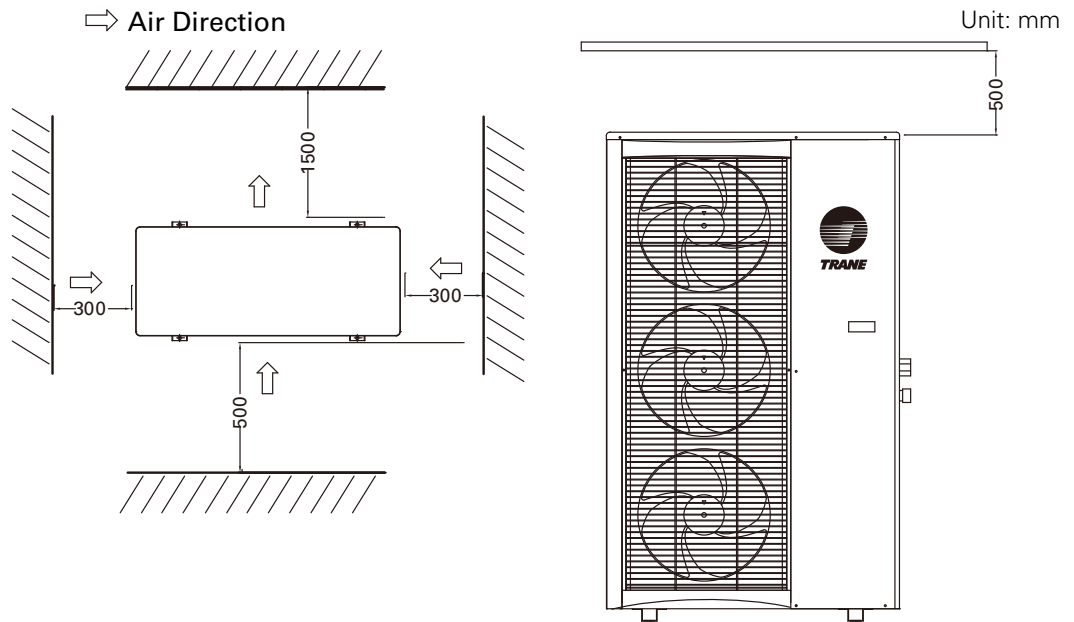
### Installation Example



#### Description of the principle of the pressurized water tank:

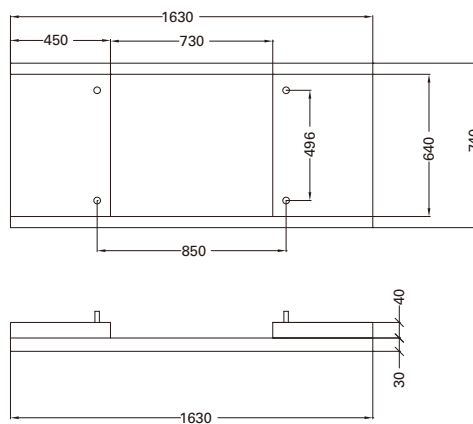
1. In order to avoid the pipe cracking due to the system over pressure resulting from the change of ambient temperature and also to avoid the water hammer in the pipes, a pressurized water tank shall be installed for system.
2. In order to avoid the excessively high or low pressure in the pipe, an automatic feed water valve and an automatic drain valve are included in the pressurized water tank. The feed water pressure can be adjusted based on the field situation.
3. An open expansion tank shall be installed at the highest position of system.

# Service and Maintenance Space Requirement

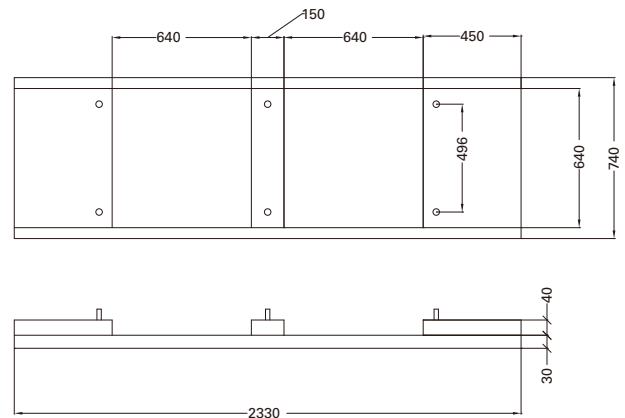


## Installation dimensions

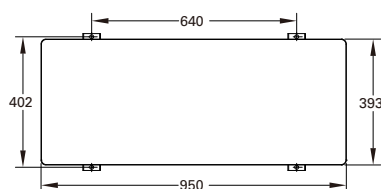
CGAR1005R



CGAR1205R/1505R/2005R



CGAR0755R



# Electrical Specifications

## Electrical specifications -50Hz

MODEL	Power supply (V/Hz/Ph)	Full load current of water pump FLA(A)	Full load current of chiller unit FLA(A)	Rated current of the fan RLA(A)	Minimum current of the water unit circuitMCA(A)	Recommended fuse specification REC(A)	Maximum specification of the fuse FMS(A)	Minimum specification of the power supply copper core wire diameter (mm <sup>2</sup> )
0755R	380-415/50/3	1.4	14	1.5	20.4	23.9	34.4	6
1005R	380-415/50/3	1.4	16.4	1.6	23.5	27.6	39.9	6
1205R	380-415/50/3	3.26	22.4	3.2	34.46	40.06	58.5	10
1505R	380-415/50/3	2.6	24.6	8.4	41.75	47.9	61.15	10
2005R	380-415/50/3	3.2	26.6	8.4	44.85	51.5	68.7	16

- The difference between the power voltage and the standard voltage shall not exceed 10 percent of the standard value.
- Rated current(RLA)=the current of the machine under the ARI or UL standard conditions
- Minimum circuit current(MCA)=maximum loadx1.25+sum of the extra load (to decide the diameter of the wire)
- Recommended fuse specification(REC)=maximum loadx1.5+sum of the extra load (to select the fuse closest in specification)
- Maximum fuse specification(MFS)=maximum loadx2.25+sum of the extra load (to select the fuse same or smaller in specification)

## LCD microprocessor-based controller



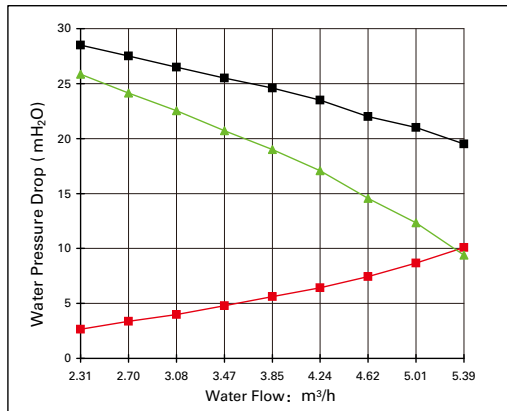
### 1. System function

- Cooling/heating switch
- Compressor and pump protection
- Two-way valve interlock
- Refrigerant high pressure protection for the plate heat exchanger
- EWT display/setting
- Timing on/off time
- Refrigerant system high/low pressure protection
- Anti-freeze protection of water system and plate heat exchanger in winter
- Malfunction alarm
- System operating status
- Defrosting interval/operation time setting

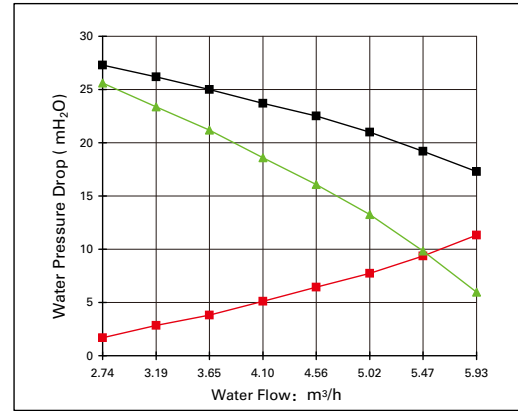
### 2. The factory provides standard length of 10 meters for the LCD controller.

# Water Pressure Drop Curve

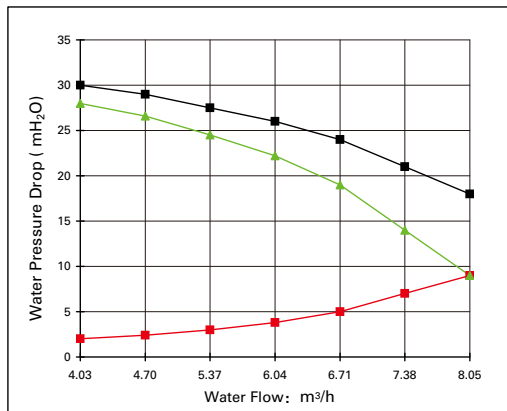
CGAR0755



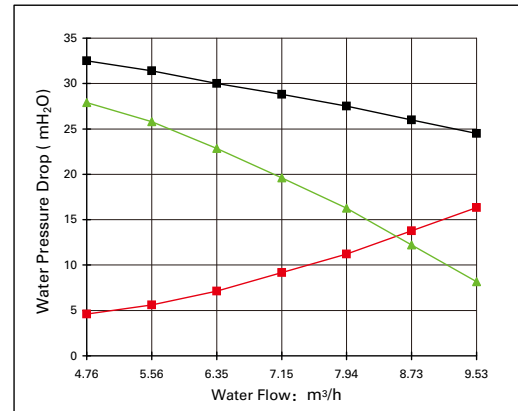
CGAR1005



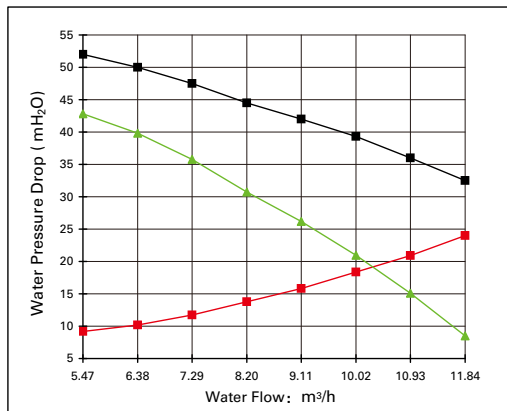
CGAR1205



CGAR1505



CGAR2005



Pump Head     
  Internal Pressure Drop     
  Allowable External Pressure Drop



## Water Pressure Drop Curve

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### Water flow rate

unit: m<sup>3</sup>/h

Type	Lower limit of flow	Rated flow	Upper limit of flow	Connection Dimension
CGAR0755	4.08	4.08	5.30	1 1/4"
CGAR1005	3.17	4.85	0.91	1 1/4"
CGAR1205	4.33	6.62	8.60	1 1/4"
CGAR1505	5.53	8.45	10.99	1 1/4"
CGAR2005	6.19	9.46	12.31	1 1/2"

### Water pressure drop

To measure the water pressure difference between the water inlet and outlet of the unit (including pump), pump head at a particular water flow rate may be read off from the pump head curve. Refer to curves to design piping system for standard models with pumps.

The inner water pressure drop of the unit without a pump (the pump is installed outside of the unit) should basically follow the graphs shown in the Water pressure drop curve section. Refer to curves to design piping system for models without pumps.

### Water flow

The chilled water flow through the unit shall be rated between the upper and lower limit listed in the table. If the chilled water flow is below the lower limit, the discontinuous water flow will reduce the evaporator heat transfer and make the expansion valve out of control or exceptional low-pressure shutdown. Contrarily, the inner parts of the evaporator will be eroded if the water flow is higher than the upper limit.





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