TOSHIBA

Leading Innovation >>>

General Catalogue 2012-7

Circulating hot water heat pump

CAONS7

Circulating Hot Water Heat Pump

That Expands the Applications of Heat Pump to Various Manufacturing Processes

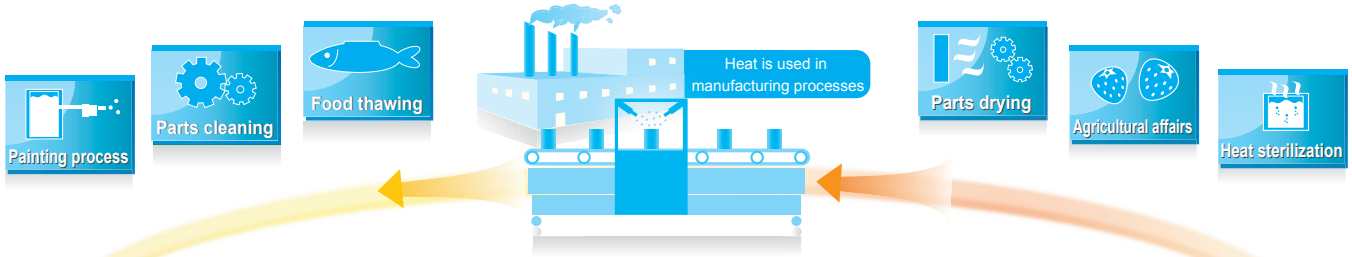
DEBUT

CAONS Series

700 140 45



CAONS expands the applications of heat pumps



CAONS keeps heat of circulating hot water

Wide lineup of CAONS covers various temperature ranges and capacities
You can choose CAONS according to the application to your manufacturing processes

CAONS circulating hot water heat pump provides solutions

Change! 1 Steam boiler → Heat pump

Effective use of renewable energy, "Aero-Thermal Energy"

Change! 2 Centralization → Decentralization

CAONS helps reduce heat loss from pipes

Principle of operation of CAONS

2. Evaporator

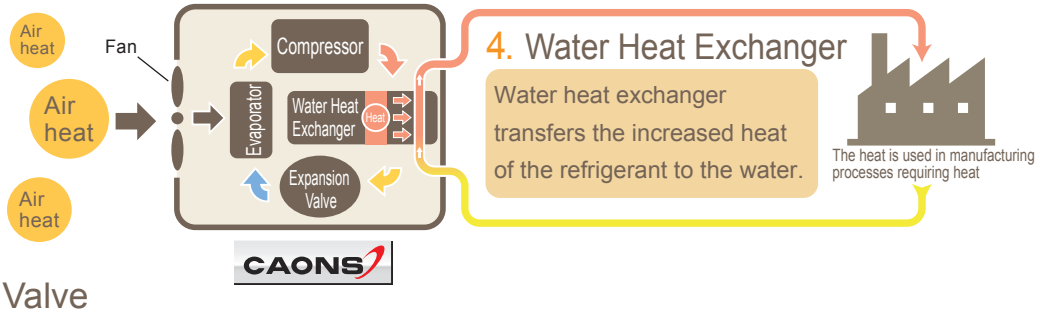
Evaporator accumulates the air heat collected by the fan to transfer the heat to the refrigerant.

3. Compressor

Compressor compresses the refrigerant carrying the heat to further raise the temperature of the refrigerant.

1. Fan

Rotating fan gathers air heat warmed by the solar heat.



4. Water Heat Exchanger

Water heat exchanger transfers the increased heat of the refrigerant to the water.

The heat is used in manufacturing processes requiring heat

6. Expansion Valve

Expansion valve optimizes the condition of the refrigerant that has lost its heat to transfer air heat to the refrigerant.

The hot water heated by the heat pump unit is circulated and used in manufacturing processes.






CAONS delivers hot water over an extended temperature range

■ Leaving water temperature range of CAONS 45, 140 and 700

CAONS 140 The industry's first 90°C Air-source type circulating thermal heat pump outlet water temperature
* For an air-source circulating thermal heat pump, as of June 2012 (as surveyed by Toshiba Carrier)

CAONS Series 45

CAONS delivers low temperature hot water of 30°C

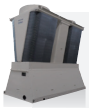
30°C min — Fermentation and Maturation — Parts cleaning — 64°C max

CAONS Series 140

CAONS is suitable for processes requiring an extended temperature range above 70°C, such as heat sterilization, washing, degreasing and dissolving processes

50°C min — Parts moulding and drying — Sterilization — 90°C max

CAONS Series 700



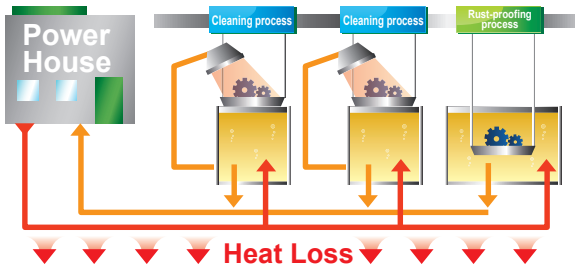
CAONS 700 is best for facilities using heated water and large-capacity manufacturing processes

50°C min — 90°C max

A distributed installation delivers a faster return on investment

Introduce CAONS to your current manufacturing processes step by step

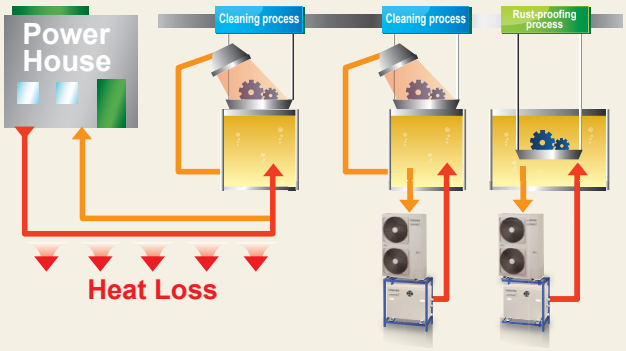
Conventional centralized installation system



Steam-type centralized installation system has large-loss of heat during transportation
•Heat loss from pipes •Exhaust and drain loss
A lot of workload for maintenance
•Labour costs for maintenance workers

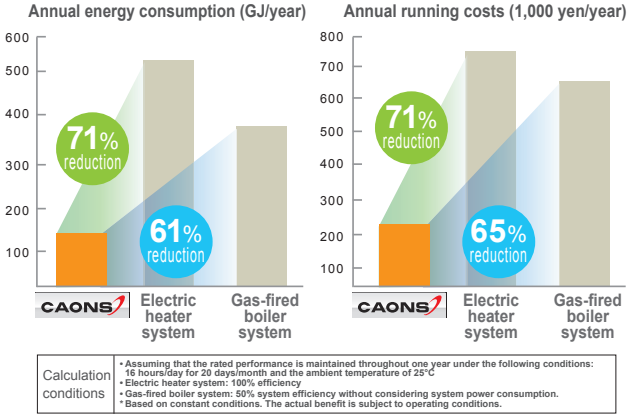
If CAONS with heat pump is introduced...

Distributed installation system using CAONS (CAONS 140)



Installing CAONS in each work site can minimize the heat loss
•Reduction in loss from pipes •Reduction in exhaust and drain loss

■Examples of Introduction Effectiveness



Calculation conditions	• Assuming that the rated performance is maintained throughout one year under the following conditions: 16 hours/day for 20 days/month and the ambient temperature of 25°C • Electric heater system: 100% efficiency • Gas-fired boiler system: 50% system efficiency without considering system power consumption. * Based on constant conditions. The actual benefit is subject to operating conditions.

Large model 700kW

CAONS Series 700

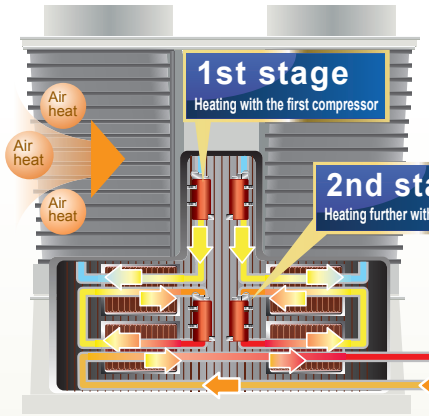
Ideal for large-scale processes requiring large amounts of heat

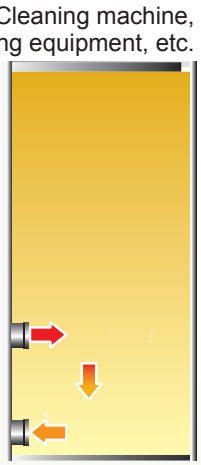
CAONS 700 delivers reduction in energy consumption, 70 kW capacity, and 90°C hot water

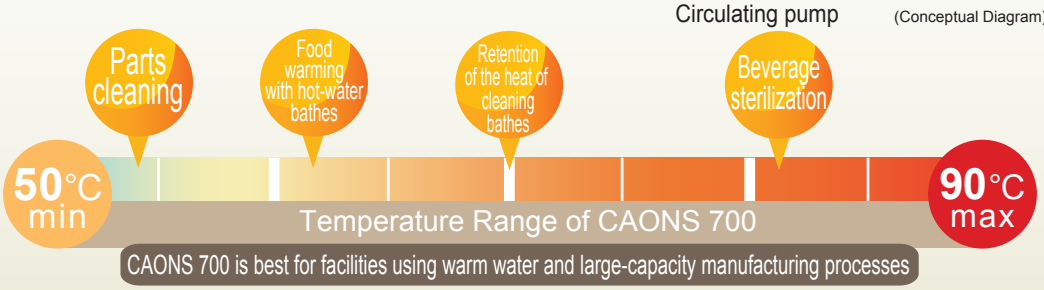
Air to Air Defrost operation in the winter

That does not draw heat from the circulating hot water

One circuit gathers heat, and the other circuit utilizes it to perform an inverse-cycle defrosting operation





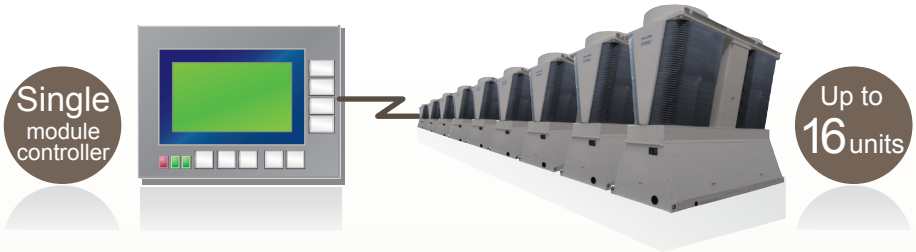


CAONS 700 is best for facilities using warm water and large-capacity manufacturing processes

Extended operation range of the heat pump using DC twin rotary compressors with the world's largest capacity inverter

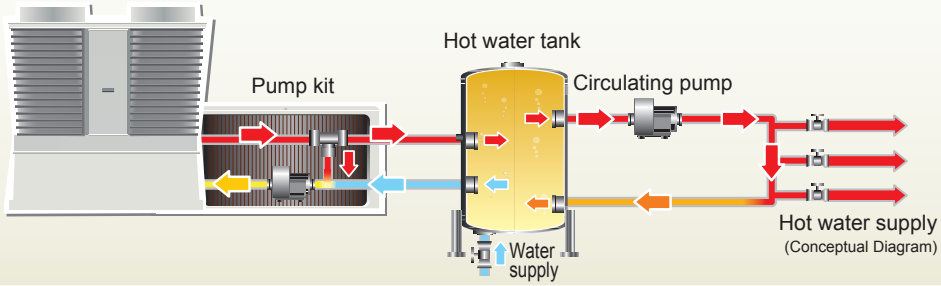
- **Twin rotary compressor with large-capacity inverter**
  Operable under various pressure difference conditions and incorporates a two-stage refrigerant circuit that provides high-temperature water circulation while saving energy
- **Extended variable performance range**
  Highly efficient low-load operation at the minimum frequency of 15 Hz
- **Wide range and High performance**
  Energy saving performance is improved by the high performance at partial-load that is achieved by the highly efficient DC motor and the rotary compressor

Management of large-scale heating processes using one module controller



CAONS group control allows a system with a maximum power of 1,120 kW.

Using Pump kit (option) allows once-through operation



The temperature of makeup water can be increased by controlling the water flow rate with a pump and a three-way valve located inside the pump kit.
(maximum temperature difference of 85°C)

■Specifications

Circulating hot water heat pump CAONS 700

Model	HWC-H7001H
Dimensions (W × D × H)	1080 mm × 2070 mm × 2300 mm
Rated supply voltage	3-phase 200 V or 400 V (compatible with 50 Hz/60 Hz mains)
Heating capacity	70.0 kW *1
COP	3.6 *2
Maximum outlet water temperature	90°C

■Main functions

- ON/OFF Input
- Demand input
- Pump interlock
- Heater interlock
- External temperature setting input
- External temperature sensor input
- External flow rate input
- Operation output
- Failure output
- Joint pump operation output
- Joint heater operation output
- Operation capacity output

*1 Conditions: Performances under normal conditions (ambient dry-bulb and wet-bulb temperatures respectively of 16°C and 12°C, inlet water temperature 58°C, and outlet water temperature 65°C). * Performances are subject to change according to the ambient and inlet water temperatures
*2 Conditions: Ambient dry-bulb and wet-bulb temperatures respectively of 25°C and 21°C, inlet water temperature 58°C, and outlet water temperature 65°C

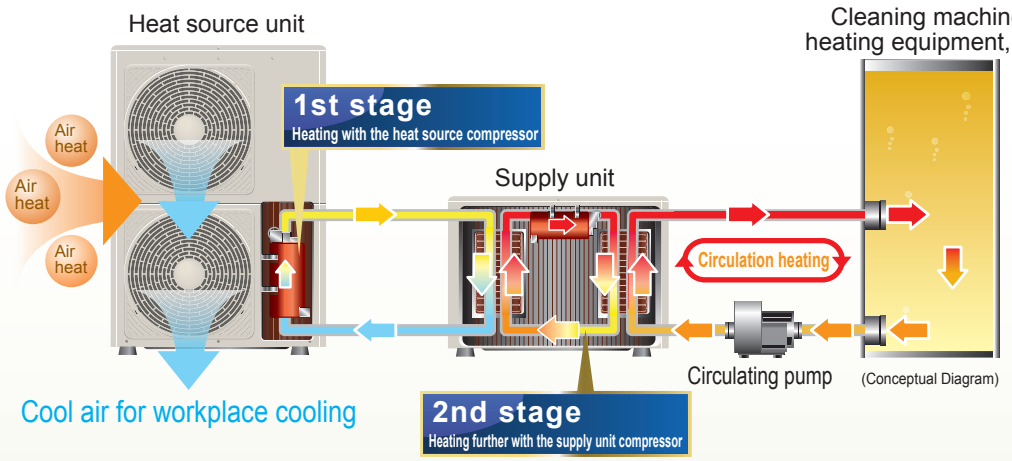
Medium model 14 kW

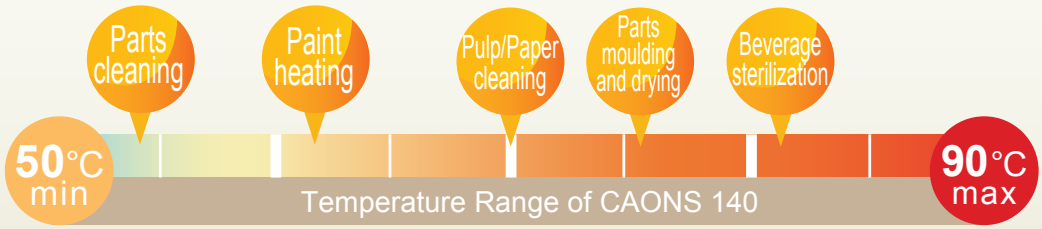
CAONS Series

140

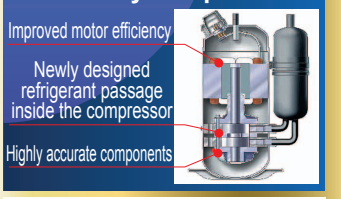
Reduced footprint and greater installation flexibility due to separate heat source and supply units

CAONS 140 delivers 14 kW capacity and 90°C water





Incorporates two DC twin rotary compressors



- **Highly efficient inverter compressor is used**
  Applying the inverter technology established in Toshiba air conditioners realizes high-efficiency and high-reliability
- **Incorporates two compressors**
  Two individual refrigerant cycles are optimally controlled and heated in two stages

Reduced footprint and excellent installation property

Installation flexibility due to Compact size

Reduced footprint and Design flexibility

Extended maximum piping length enhances design flexibility

Provides great flexibility in installation according to your manufacturing line layouts

Double stacking provides a reduction in foot print

The installation footprint is further reduced when many units are used

Specifications

Circulating hot water heat pump CAONS 140

System model name	HWC-H1401S	
Model	Heat source unit HWC-H1401H	Supply unit HWC-H1401XH
Dimensions (W × D × H)	900 mm × 320 mm × 1340 mm	900 mm × 320 mm × 700 mm
Rated supply voltage	3-phase 200 V (compatible with 50 Hz/60 Hz mains)	
Heating capacity	14.0 kW *1	
COP	3.5 *2	
Maximum outlet water temperature	90°C	

*1 Conditions: Performances under normal conditions (ambient dry-bulb and wet-bulb temperatures respectively of 16°C and 12°C, inlet water temperature 60°C, and outlet water temperature 65°C). * Performances are subject to change according to the ambient and inlet water temperatures
*2 Conditions: Ambient dry-bulb and wet-bulb temperatures respectively of 25°C and 21°C, inlet water temperature 60°C, and outlet water temperature 65°C

Main functions

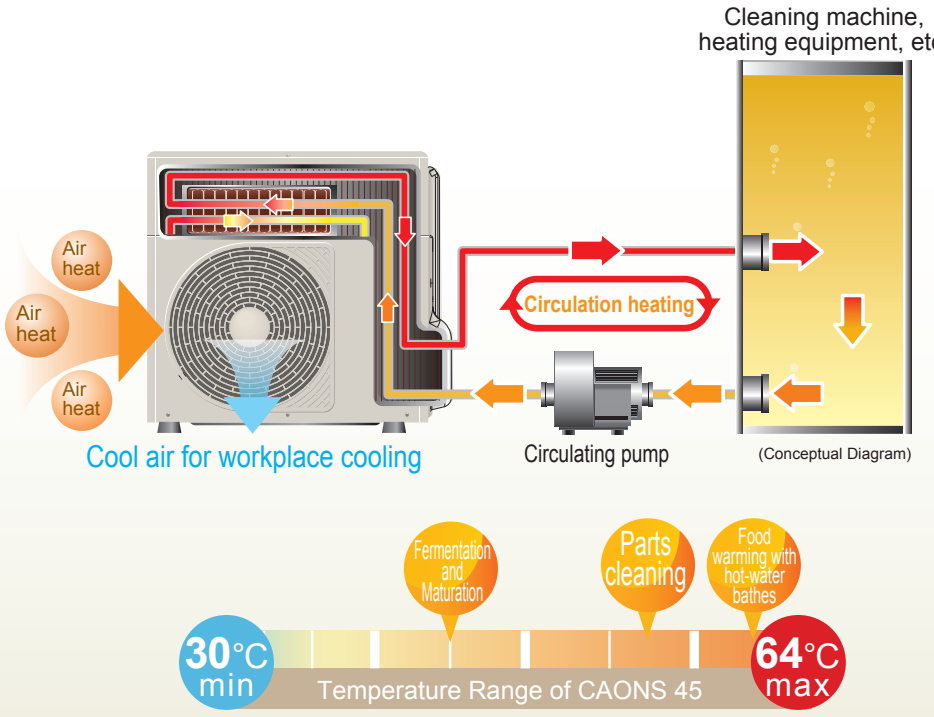
- ON/OFF Input
- Pump interlock input
- External temperature setting input
- External temperature sensor input
- External flow rate input
- Operation output
- Failure output
- Circulating pump control
- Operation input switching
- Heater control setting
- Joint operation (Up to 4 units)

Small model 4.5KW

CAONS Series 45

Entry-level compact model specifically designed for temperatures around 60°C

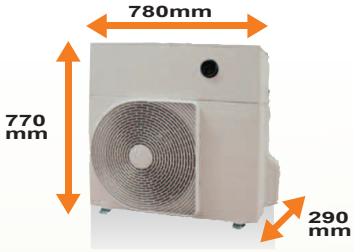
Entry-level compact model with high-efficiency



Highly efficient heat-resistant DC twin rotary compressor

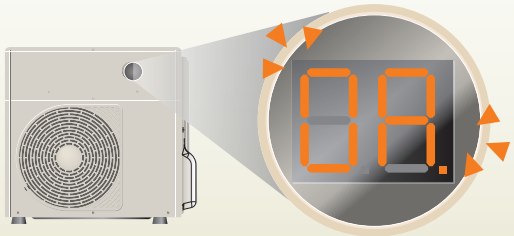
- **Highly efficient inverter compressor is used**
  The DC twin rotary compressor realizes optimal operation according to the load and high energy-saving performance
- **Improved reliability**
  The high efficient compressor proven in Toshiba home air conditioners includes a heat-resistant motor and highly reliable sliding components

Compact design is suitable for installation at various sites



Compact body with dimensions of 770 mm (H) × 780 mm (W) × 290 mm (D) is suitable for installation at various sites. CAONS 45 can be installed in a narrow space in the manufacturing equipment.

Operates without a remote controller and provides an error code checking window that shows the operational condition



In case of error, the error code blinks on the window to show the fault condition

Turning on the circuit switch can operate CAONS 45 automatically at the set temperature. You can check the operational condition easily from the checking window. In case of error, the error code blinks on the window to warn you of the operational condition.

■Specifications

Circulating hot water heat pump CAONS 45

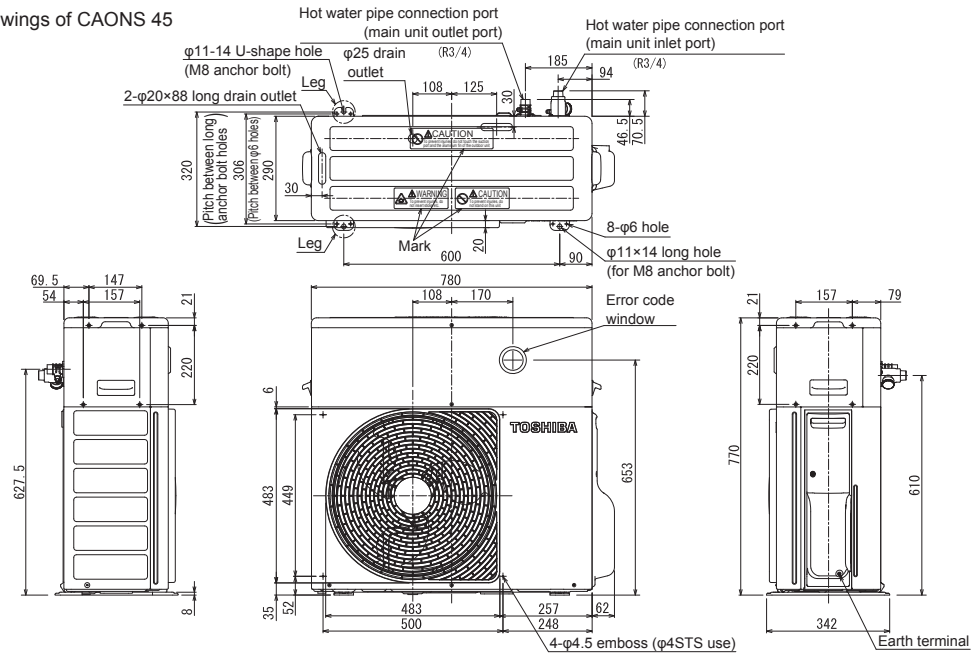
Model	HWC-H451H
Dimensions (W × D × H)	780 mm × 290 mm × 770 mm
Rated supply voltage	3-phase 200V (compatible with 50 Hz/60 Hz mains)
Heating capacity	4.5 kW *1
COP	2.5 *2
Maximum outlet water temperature	64°C

*1 Conditions: Performances under normal conditions (ambient dry-bulb and wet-bulb temperatures respectively of 16°C and 12°C, inlet water temperature 60°C, and outlet water temperature 64°C) are specified. * Performances are subject to change according to the ambient and inlet water temperature
*2 Conditions: Ambient dry-bulb and wet-bulb temperatures respectively of 25°C and 21°C, inlet water temperature 60°C, and outlet water temperature 64°C

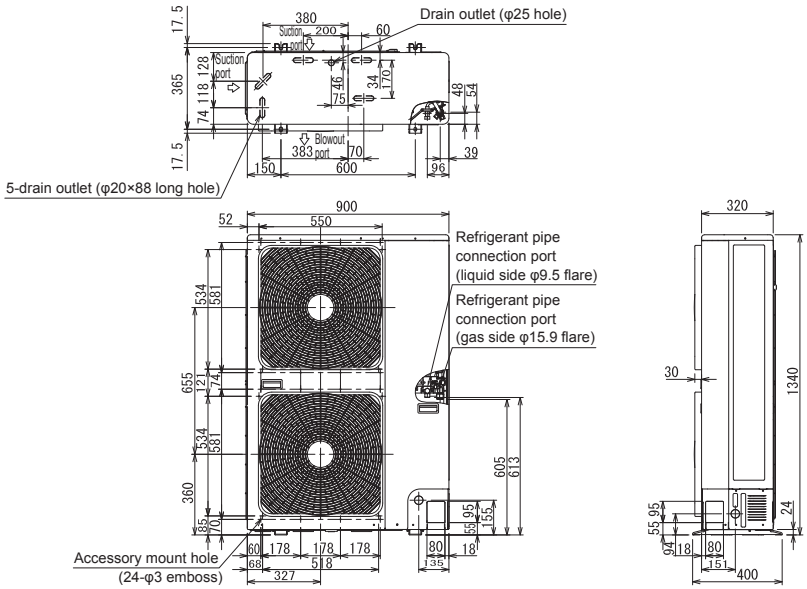
■Main functions

- Failure output
- Error code checking window

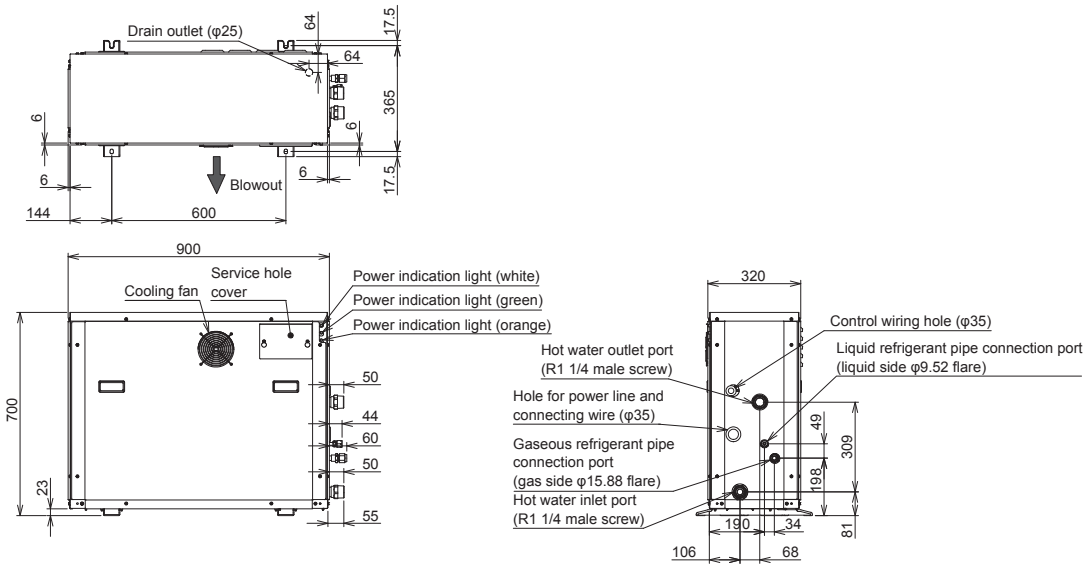
■ Outside dimension drawings of CAONS 45



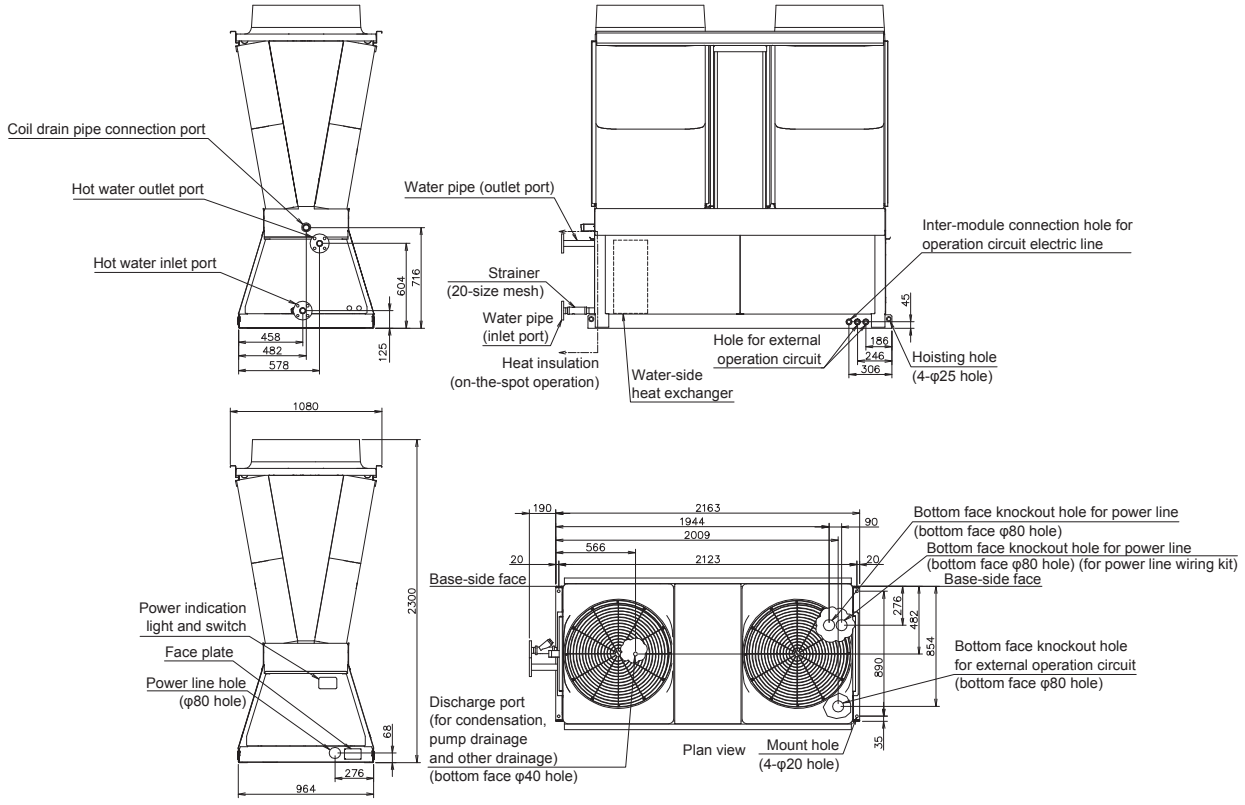
■ Outside dimension drawings of CAONS 140 heat source unit



■ Outside dimension drawings of CAONS 140 supply unit



■ Outside dimension drawings of CAONS 700



Safety Precautions

Never use anything other than the specified coolant (when refilling or changing). Toshiba shall not be liable to any failure of this product or serious impairment in safety that may be caused when anything other than the specified coolant is used.

- Before use, carefully read the "Usage/Construction Instruction Manual" for information on proper usage.
- To prevent a machine failure, do not modify the product.
- The circulating thermal heat pumps described on this catalogue are industrial heat source equipment. Do not use the product for direct heating-up of tap water. (CAONS 700 can be used for heating up low temperature water using Pump kit (option).)
- Fix main unit legs with specified anchor bolt. Otherwise, the main unit falls in the event of an earthquake etc., which may result in injuries.
- To prevent a fire, do not place gas products, inflammable materials, and combustible materials near the circulating thermal heat pumps.
- Before diagnosis or repairing of failures, make sure that the earth cable is connected to the earth terminal of the main unit. Otherwise, it may cause an electric shock in the event of electric leakage.
- Wiring for the product is carried out using specified routing and an earth leakage circuit breaker shall be installed in the wiring. Check occasionally that the earth leakage circuit breaker is operable so as to prevent a risk of electric shock in the event of a failure or electric leakage.
- Install a drainage system to discharge the drainage from the product during operation. In the event of leakage of drainage, serious damage may occur.
- The heat exchanger may corrode when the product is used in the acidic or alkaline atmosphere.
- Since this product is designed for Japan use only, it will not be used overseas. After-sales service is not offered overseas.
- Take anti-freezing measures for the product.

TOSHIBA CARRIER CORPORATION

http://www.toshiba-carrier.co.jp/

• The content of this catalogue is as of July 2012.
• Specifications described in this catalogue may be subject to change without notice.
• Actual product may differ from photography printed on this catalogue.