



HOTELS



OFFICES



RESIDENCES



CAHV-P500YA-HPB

Mitsubishi Electric - A Leading Manufacturer of Hot Water Heat Pumps

Mitsubishi Electric has been designing and manufacturing commercial hot water heat pumps since 1970.

We were one of the first manufacturers in Japan to utilize heat pump technology to provide hot water, and also the first manufacturer to develop R407C products, which can supply hot water of up to 70°C, high enough to eliminate legionella bacteria.

We quickly rose to the forefront of the hot water supply industry in Japan - a position we still enjoy today.

Our products are mainly used in commercial applications, such as hotels, hospitals, and nursing homes, where they are providing highly reliable performance.

From this position as a leading manufacturer in the hot water supply industry, we are proud to introduce our new highly efficient hot water heat pump system.

70°C
High temperature

COP
Over 4*

*COP 4.13
Outdoor temp.: 7°C DB/ 6°C WB
Outlet water temp.: 35°C

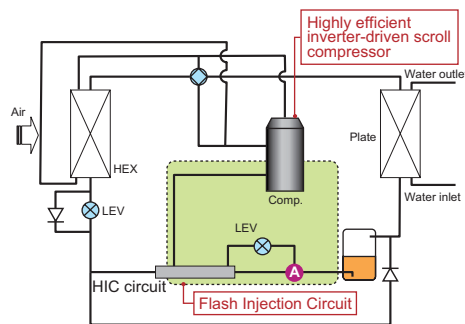
Built-in inverter-driven scroll compressor



Highly efficient

High performance even at low outdoor temp.

Flash Injection Circuit



Two-phase refrigerant is separated into liquid refrigerant and gas refrigerant at the point of A. Liquid refrigerant, whose pressure is reduced by the linear expansion valve (LEV), exchanges heat in the HIC circuit and become gas-liquid two-phase refrigerant. This two-phase refrigerant flows into the injection port in the compressor for controlling the increase of the discharge temperature. Therefore the optimal amount of refrigerant can be provided to the system via the compressor, which makes it possible to provide hot water of 70 °C.

Backup function

Rotation function

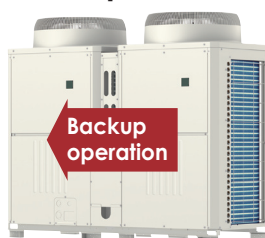
The hot water heat pump ensures an exceptionally high level of reliability through a backup function.* If either of the compressors malfunction, the other compressor maintains operation to avoid a complete stop of the system.

A rotation function is also available. When two or more units are in the system, the unit runs alternately, ensuring an optimum product lifecycle for both component units.

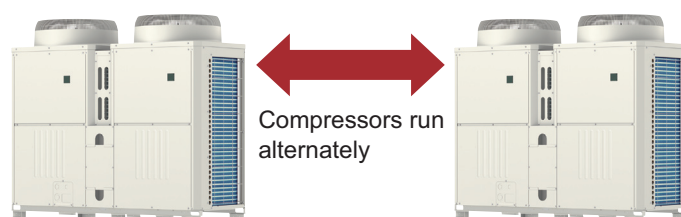
*If the main circuit board malfunctions, the backup function and rotation function are not available.

*Capacity drops by 50%.

Backup function



Rotation function



Depending on settings, the rotation function is available for units.

Case Study

The previous oil boiler, which was installed for more than ten years, malfunctioned frequently. When we built a new annex in 2005, we decided to renew the system. We initially thought about a gas system; however, considering safety and reliability, we decided to install an electric system. We have now been using the Mitsubishi Electric hot water heat pump for more than five years. No malfunction has occurred, and we are satisfied with its safety.



Owner's Voice

- Application :** Nursing home
- Country :** Japan
- Installed :** June, 2005
- System :** Hot water heat pump 20HP x 1

*Our previous model sold in Japan.

Operable even at -20°C

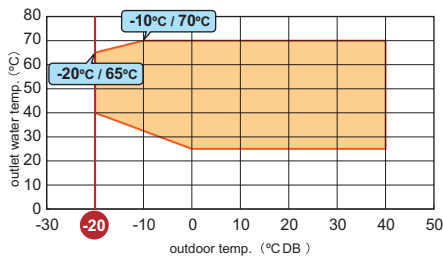
The hot water heat pump can be operated at outdoor temp. between -20°C and 40°C.

It delivers precise comfort even on the coldest days of the year.

Less space

A smaller footprint has been achieved through developing a new highly efficient heat exchanger with low pressure loss.

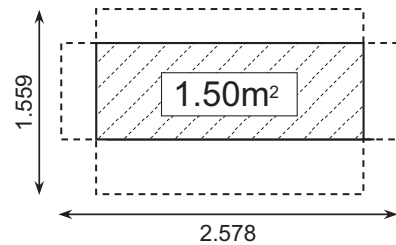
Range of operation temperature and outlet water temperature



During defrosting, two compressors, which are equipped within one unit, run alternately resulting in less drop in outlet water temperature.

Installation footprint of 3.54m²*

*Installation footprint for one unit including service space.



Wide variety of external input/output

Various system configurations are available.

- Two external output for backup heater
- Analog input to control capacity
- Defrost signal

* Refer to the Data Book for other functions.

60 Pa External static pressure

Ducting can be connected to the inlet or outlet of the outdoor unit. Either "60 Pa" or "0 Pa" can be selected.

* The factory setting is "0 Pa."

51dB(A)* Low sound pressure level

Lower sound pressure levels have been achieved thanks to the development of a new fan.

Other features

- Ozone friendly; R407C refrigerant is used.
- The system is equipped with "Efficiency Priority Mode" and "Capacity Priority Mode." With "Capacity Priority Mode" is more effective when used with a boiler because the boiler's fuel cost and CO₂ emissions can be reduced.

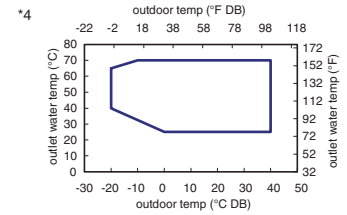
*Based on theoretical calculations for a distance of 10m.

· The hot water heat pump has been awarded the Promotion Award of the Heat Pump and Thermal Storage Technology Center of Japan in the 2011 Electric Load Leveling Equipment and Systems.

Specifications

| | | | |
|---|----------------------------|---|--|
| Model | | CAHV-P500YA-HPB | |
| Power Source | | 3-phase 4-wire 380-400-415V 50/60Hz | |
| Capacity *1 | | kW | 45 |
| | | kcal/h | 38700 |
| | | BTU/h | 153540 |
| | Power input | kW | 12.9 |
| | Current input | A | 21.78-20.69-19.94 |
| Capacity *2 | | kW | 45 |
| | | kcal/h | 38700 |
| | | BTU/h | 153540 |
| | Power input | kW | 25.6 |
| | Current input | A | 43.17-41.01-39.53 |
| COP (kW / kW) | | 3.49 | |
| Maximum current input *3 | | A | 57.77-54.88-52.90 |
| Water pressure drop *1 | | 12.9kPa (1.87psi) | |
| Temp range | Outlet water temp *4 | 25~70°C 77~158°F | |
| | Outdoor temp *4 | D.B | -20~40°C -4~104°F |
| | | | |
| Circulating water volume range | | 7.5 m³/h-15.0m³/h | |
| Sound Pressure level (measured in anechoic room) *1 | | dB (A) | 59 |
| Sound Pressure level (measured in anechoic room) *3 | | dB (A) | 63 |
| Diameter of water pipe | Inlet | mm (in.) | 38.1 (Rc 1 1/2") screw |
| | Outlet | mm (in.) | 38.1 (Rc 1 1/2") screw |
| External finish | | Acrylic painted steel plate <MUNSELL 5Y 8/1 or similar> | |
| External dimension H x W x D | | mm | 1710 (without legs 1650) x 1978 x 759 |
| | | in. | 67.3 (without legs 65.0) x 77.9 x 29.9 |
| Net weight | | kg (lb) | 526 (1160) |
| Accessories | | Y strainer Rc 1 1/2 | |
| Design Pressure | R407C | MPa | 3.85 |
| | Water | MPa | 1.0 |
| Drawing | Wiring | KC94G723X01 | |
| | External | KC94G195X01 | |
| Heat exchanger | Water side | stainless steel plate and copper brazing | |
| | Air side | Plate fin and copper tube | |
| Compressor | Type | Inverter scroll hermetic compressor | |
| | Maker | MITSUBISHI ELECTRIC CORPORATION | |
| | Starting method | Inverter | |
| | Motor output | kW | 7.5 x 2 |
| | Case heater | kW | 0.045 x 2 |
| | Lubricant | MEL32 | |
| | FAN | Air flow rate | m³/min |
| | | L/s | 3083 x 2 |
| | | cfm | 6532 x 2 |
| | External static press *5 | 0Pa, 60Pa (0mmHzO/6.1mmHzO) | |
| | Type x Quantity | Propeller fan x 2 | |
| | Control, Driving mechanism | Inverter-control, Direct-driven by motor | |
| | Motor output | kW | 0.46 x 2 |
| HIC circuit (HIC:Heat inter-Changer) | | Copper pipe | |
| Protection | High pressure protection | High pres.Sensor & High pres.Switch at 3.85MPa (643psi) | |
| | Inverter circuit | Over-heat protection, Over current protection | |
| | Compressor | Over-heat protection | |
| | Fan motor | Thermal switch | |
| Defrosting method | | Auto-defrost mode (Reversed refrigerant circle) | |
| Refrigerant | Type x original charge | R407C x 5.5(kg) x 2 | |
| | Control | LEV and HIC circuit | |

- *1 Under Normal heating conditions at outdoor temp, 7°C DB/6°C WB(44.6°F DB/42.8°F WB) outlet water temp 45°C(113°F), inlet water temp 40°C(104°F)
- *2 Under Heating conditions at outdoor temp, 7°C DB/6°C WB(44.6°F DB/42.8°F WB), outlet water temp 70°C (158°F)
- *3 Under Heating conditions at outdoor temp, 7°C DB/6°C WB(44.6°F DB/42.8°F WB) when this unit is set to capacity priority mode by non-voltage B contact



Outdoor temp -20°C DB/ Outlet water temp 40~65°C
 (Outdoor temp -4°F DB/ Outlet water temp 104°F~149°F)
 Outdoor temp -10°C DB/ Outlet water temp 33°C~70°C
 (Outdoor temp 14°F DB/ Outlet water temp 91°F~158°F)
 Outdoor temp 0°C DB/ Outlet water temp 25°C~70°C
 (Outdoor temp 32°F DB/ Outlet water temp 77°F~158°F)

- *5 Dip SW on the unit control board need to be changed.
- * Due to continuing improvement, the above specifications may be subject to change without notice.
- * Please don't use the steel material for the water piping material.
- * Please always make water circulate or pull out the circulation water completely when not using it.
- * Please do not use groundwater and well water.
- * Install the unit in an environment where the wet bulb temp will not exceed 32°C (89.6°F).
- * The water circuit must use the closed circuit.

Unit converter

kcal =kW x 860
 BTU/h =kW x 3,412
 cfm =m³/min x 35.31
 lb =kg/0.4536

<PAR-W21MAA>



Up to 16 units can be controlled with one remote controller.

<External input/output from the unit>

*The unit can be operated and the operation status can be monitored with external input/output terminals.



FM33568 / ISO 9001;2008

The Air Conditioning & Refrigeration Systems Works acquired ISO 9001 certification under Series 9000 of the International Standard Organization (ISO) based on a review of Quality management for the production of refrigeration and air conditioning equipment.

ISO Authorization System
 The ISO 9000 series is a plant authorization system relating to quality management as stipulated by the ISO. ISO 9001 certifies quality management based on the "design, development, production, installation and auxiliary services" for products built at an authorized plant.



The Air Conditioning & Refrigeration Systems Works acquired environmental management system standard ISO 14001 certification.

The ISO 14000 series is a set of standards applying to environmental protection set by the International Standard Organization (ISO). Registered on March 10, 1998.

Warning

- Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.
 - Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, during repair, or at the time of disposal of the unit.
 - It may also be in violation of applicable laws.
- MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.

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<http://Global.MitsubishiElectric.com>