

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.

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.



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

*Our previous model sold in Japan.



70°C
High temperature

COP
Over 4*

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

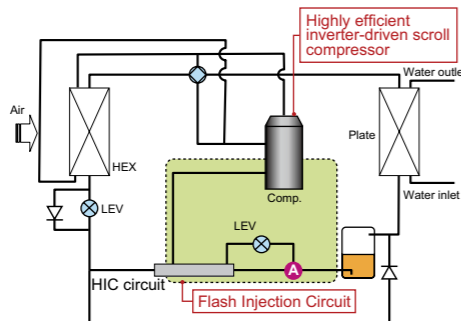
Built-in inverter-driven scroll compressor



A "Flash Injection Circuit," which is designed for our ZUBADAN CITY MULTI air conditioning system for cold regions, is incorporated in our new hot water heat pump. Through utilizing this advanced "Flash Injection Circuit" and the latest high-efficiency compressor, the hot water heat pump is able to provide hot water of 70°C, and with better retention of capacity at low outdoor temperatures.

High performance even at low outdoor temp.

Flash Injection Circuit

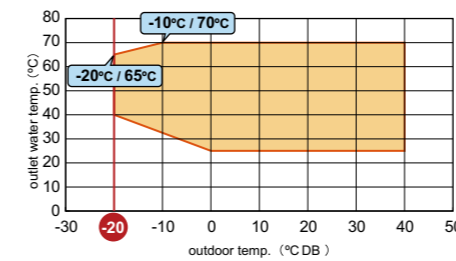


Two-phase refrigerant is separated into liquid refrigerant and gas refrigerant at the point of A. Liquid refrigerant, whose pressure is reduced by the linear expansion valve (LEV), exchanges heat in the HIC circuit and become gas-liquid two-phase refrigerant. This two-phase refrigerant flows into the 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.

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.

Range of operation temperature and outlet water temperature



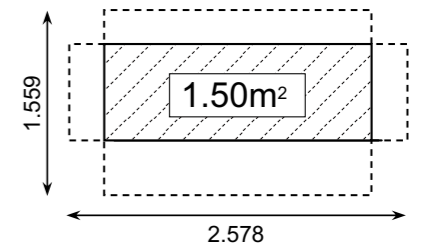
During defrosting, two compressors, which are equipped within one unit, run alternately resulting in less drop in outlet water temperature.

Less space

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

Installation footprint of 3.54m²*

*Installation footprint for one unit including service space.



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%.

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

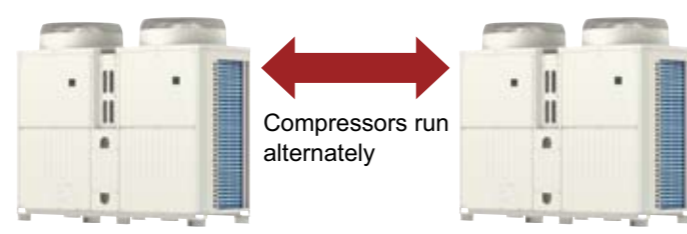
Ducting can be connected to the inlet or outlet of the outdoor unit. Either "60 Pa" or "0 Pa" can be selected.

* The factory setting is "0 Pa."

Backup function



Rotation function



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

51 dB(A)* Low sound pressure level

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

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

Other features

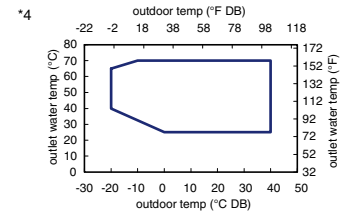
- Ozone friendly; R407C refrigerant is used.
- The system is equipped with "Efficiency Priority Mode" and "Capacity Priority Mode." With "Capacity Priority Mode" is more effective when used with a boiler because the boiler's fuel cost and CO₂ emissions can be reduced.

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	185 x 2	
		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)				
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).

MITSUBISHI ELECTRIC CORPORATION

<http://Global.MitsubishiElectric.com>