

**HOT WATER HEAT PUMP**



QAHV-N560YA-HPB

HEALTH  
CLUBS

HOTELS



HEALTH CLUBS



HOTELS



SHOPPING MALLS



FACTORIES

SHOPPING  
MALLS

FACTORIES

# mitsubishi electric's HOT WATER HEAT PUMP SERIES, QAHV,

Our solution to hot water supply for commercial & industrial applications

90°C  
High  
temperature

## Main features of QAHV

- 1) Utilizes natural refrigerant (CO<sub>2</sub>)
- 2) High efficiency (Achieved COP 3.88 \*)
- 3) Supplies high temp. hot water of up to 90°C
- 4) Operable even at low outdoor temp of -25°C

\*Under normal heating conditions at outdoor temp: 16°CDB/12°CWB, inlet water temp 17°C, outlet water temp 65°C



CO<sub>2</sub>  
refrigerant

## Why is CO<sub>2</sub> (R744) used?

QAHV adopts CO<sub>2</sub> (R744) as a refrigerant, environment-friendly natural refrigerant, which does not destroy the ozone layer (ODP=0) and has significantly low global warming potential (GWP=1). With the natural refrigerant, QAHV can contribute to the reduction of CO<sub>2</sub> emissions.

\*ODP: Ozone Depletion Potential, GWP: Global Warming Potential

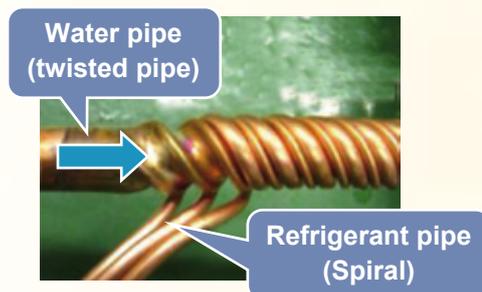
High  
efficiency

## High energy saving with our unique technology

QAHV utilizes a twisted & spiral gas cooler which is Mitsubishi Electric's unique technology. The 3 connected refrigerant pipes are wound around the twisted water pipe, which maximizes heat transfer. The continuous spiral grooves in the twisted pipe accelerates the turbulence effect of water and also helps to reduce pressure loss within the heat exchanger which contribute to enhance efficiency.

Equipped with the latest inverter scroll compressor, QAHV can significantly increase the annual efficiency which fixed speed systems can not match.

### ▶ Twisted & spiral gas cooler

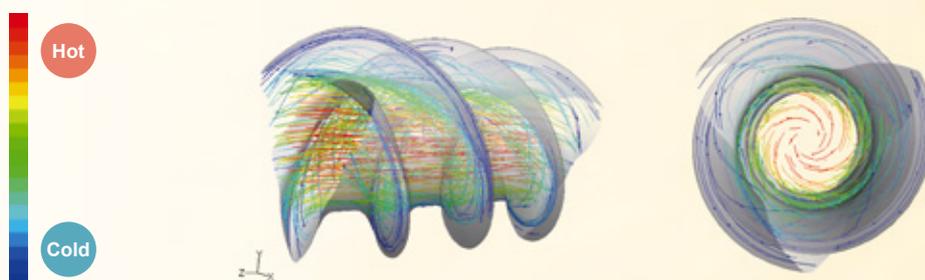


### | Cut section



Using twist pipes as water pipes and running the refrigerant pipes along their grooves help increasing the heat-conductive area, allowing for better heat transfer.

### | Water flow & water temperature distribution



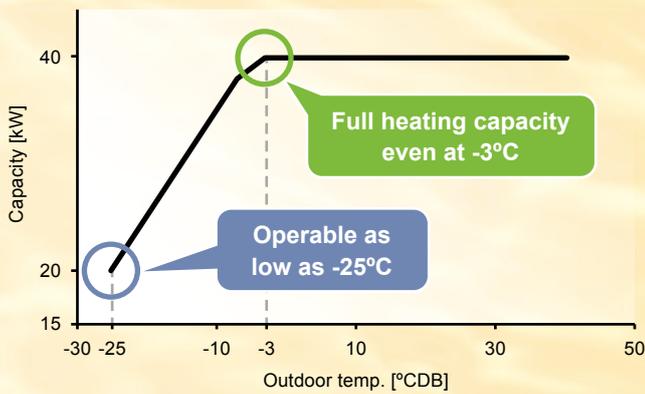
As a leading manufacture of air-to-water heat pumps, we have developed QAHV, the latest innovation in Mitsubishi Electric's comprehensive lineup of Hot Water Heat Pump products. QAHV has been specifically designed to produce high volume hot water and is suitable for commercial and industrial application where hot water demand is high. By adopting the Mitsubishi Electric's unique technology, QAHV can ensure highly reliable performance as well as high heating capacity even at low outdoor temperatures.



## Bringing a year round hyper heating capacity to extreme climate

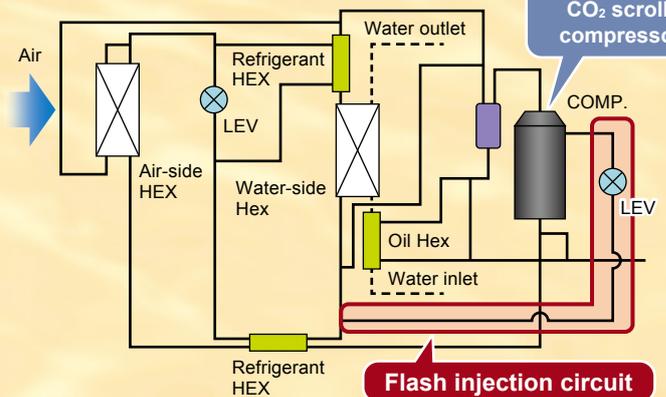
QAHV is able to provide full heating capacity even at ambient temperatures of -3°C. Furthermore, the unit is operable and can supply 90°C hot water in ambient temperatures as low as -25°C. The technology behind this is a Flash injection circuit which provides optimum amount of refrigerant to the system via a compressor through a specially designed injection port to ensure a particularly stable operation.

### Stable Heating Capacity even at low temperature



High performance even at low outdoor temp.

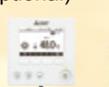
Highly efficient inverter-driven CO<sub>2</sub> scroll compressor



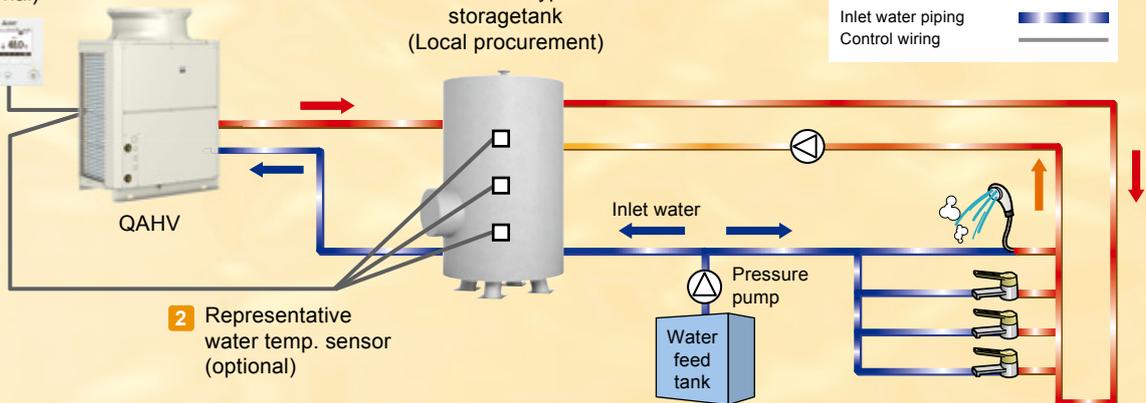
Flash injection circuit

### QAHV System Schematic image

1 Remote controller (optional)



Hermetic type storagetank (Local procurement)



2 Representative water temp. sensor (optional)

### Optional Parts

Description	Image	Model name	Remarks
1 Remote Controller		PAR-W31MAA-J	The unit remote controller for QAHV
2 Representative water temperature sensor		TW-TH16-E	The water temperature sensor for QAHV

## ► Specifications

Model		QAHV-N560YA-HPB		
		Interval	Wintertime	
Power Source		3-phase 4-wire 380-400-415 V 50Hz		
Outdoor temp	°C	DB: 16, WB: 12	DB: 7, WB: 6	
Capacity	kW	40.0 (56.0 *1)	40.0	
Inlet water temp	°C	17.0	9.0	
Outlet water temp	°C	65.0	65.0	
Outlet water volume	L/min	11.9	10.2	
Power input	kW	10.31	11.0	
Current input	A	16.9	19.0	
COP (kW/kW)		3.88	3.65	
Compressor		11 kw × 1 (hermetic)		
FAN		0.92 kW		
Heat exchanger (Water side)		Copper tube coil		
Heat exchanger (Air side)		Plate fin and copper tube		
Refrigerant control		LEV		
Refrigerant		CO <sub>2</sub> (R744) 6.5 kg		
Lubricant		PAG (polyalkylene glycol)		
Case heater (Compressor)		45 W × 1		
Electric heater (Antifreeze)		12 W × 4		
Pump		0.1 kW		
Control method	Operation control	Remote control		
	Operation mode change	Remote control or automatic control by optional hot-water temp sensor		
	Capacity control	Compressor Inverter-control		
	Outlet water temp control	Pump Inverter-control		
	Defrosting method	Hotgas		
Protection		High pres. Switch, Overcurrent protection (compressor), Discharge gas tharmal sensor, Tharmal switch (Fan motor), Power module tharmal sensor		
Accessories		-		
External finish		MUNSELL 5Y 8/1 or similar		
Sound Pressure level *2	dB<A>	56 <58>		
Maximum current input	A	33.8		
Striking current	A	-		
Net weight	kg	400		
Operating mass	kg	406		
Range of use	Outdoor temp	°C	-25~43	
	Outlet water temp *3 *6	°C	55~90	
	Inlet water temp *7 *8	°C	5~63	
	Inlet water pressure	kPa	0~500	
	allowable external pump head	kPa	77 (at 17 L/min)	
Water quality		JRA GL02E-1994		

- \*1 Capacity of ( ) is max capacity from the control board. Please refer to the technical manual.
- \*2 The value of noise is mesured 1m away from in front of the unit and 1.5 m high in a no sound room.  
< > is the value of wintertime (factory setting).  
Actually the value of noise is larger than 3~5 dB by noise of an environment and reflection.
- \*3 Actually Outlet water temperature changes in ±5°C from the target temperature.  
When inlet water temperature is larger than 30°C, Outlet water temperature is sometimes automatically saved to protect the unit.
- \*4 To feed water, use a force pump.  
Do not connect to city water directly.
- \*5 Please do not use groundwater and well water.
- \*6 The Recommended setting temperature in Hot water storage mode is 65°C (factory setting).  
It may occur that actual temperature in tank doesn't become the target temperature.
- \*7 In the system using the Heating up mode, a setting upper limit level of the restarting temperature with the water temperature drop in the tank is 61°C.
- \*8 Do not use if the increase speed of the inlet water temperature becomes instantly more than 5 K/min or continuously more than 1 K/min.



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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