MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow eco Changes

HOT WATER HEAT PUMP

FOR HEALTH CLUBS

FOR HOTELS

FOR SHOPPING MALLS

FOR FACTORIES

HOT WATER HEAT PUMP

Air Source Heat Pump

CO_2 refrigerant

Model

QAHV-N560YA-HPB(-BS)

QG2

Mitsubishi Electric's Hot Water Heat Pump Series, QAHV,

Our solution to hot water supply for commercial & industrial applications

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.

90°C High temperature

Main features of QAHV

1) Utilizes natural refrigerant (CO_2)
2) High efficiency (Achieved COP 3.88 *1)
3) Supplies high temp. hot water of up to 90°C *2
4) Operable even at low outdoor temp of -25°C

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

*2 Maximum outlet hot water temp on secondary side is 80°C.

CO_2 refrigerant

Why is CO_2 (R744) used?

QAHV adopts CO_2 (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_2 emissions.

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

High efficiency

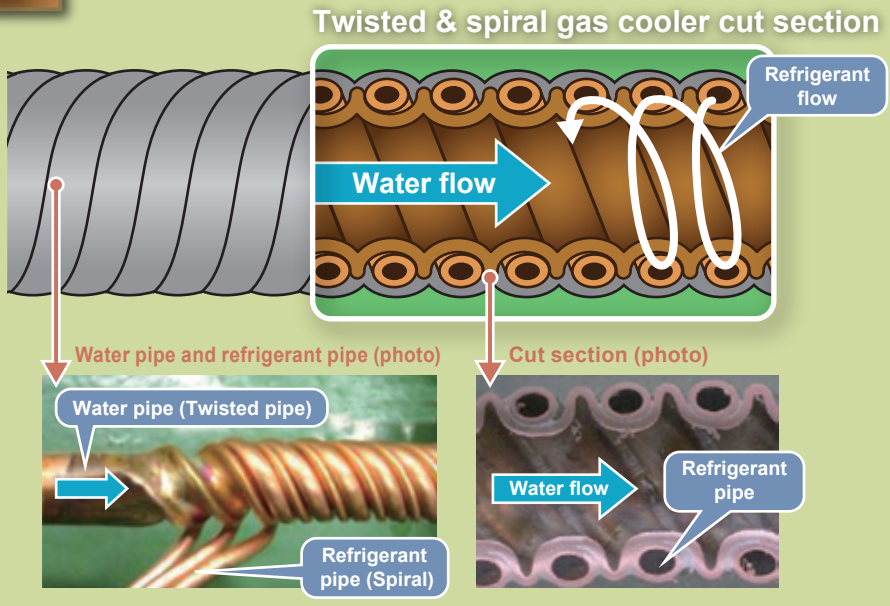
High energy saving with our unique technology

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

Patented technology

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.



Operable even at -25°C

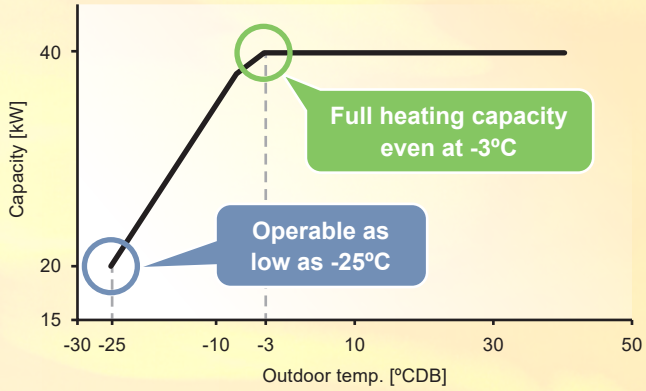
Bringing a year round hyper heating capacity to extreme climate

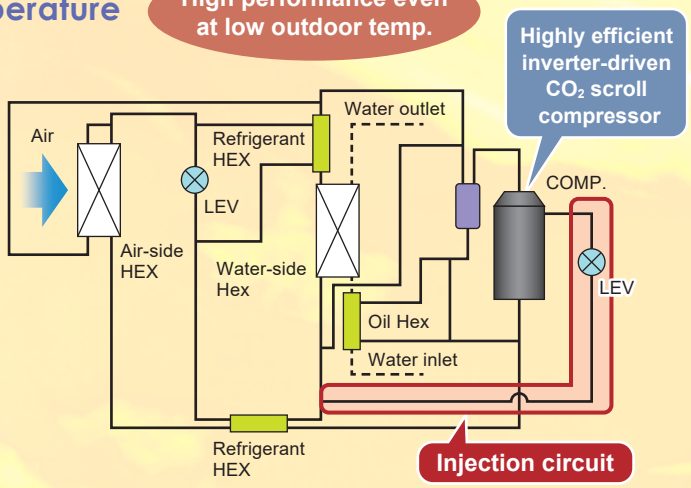
QAHV is able to provide full heating capacity even at ambient temperatures of -3°C. Furthermore, the unit is operable and can supply 90°C*1 hot water in ambient temperatures as low as -25°C. The technology behind this is an injection circuit which provides optimum amount of refrigerant to the system via a compressor through a specially designed injection port to ensure a particularly stable operation.

*1 Maximum outlet hot water temp on secondary side is 80°C.

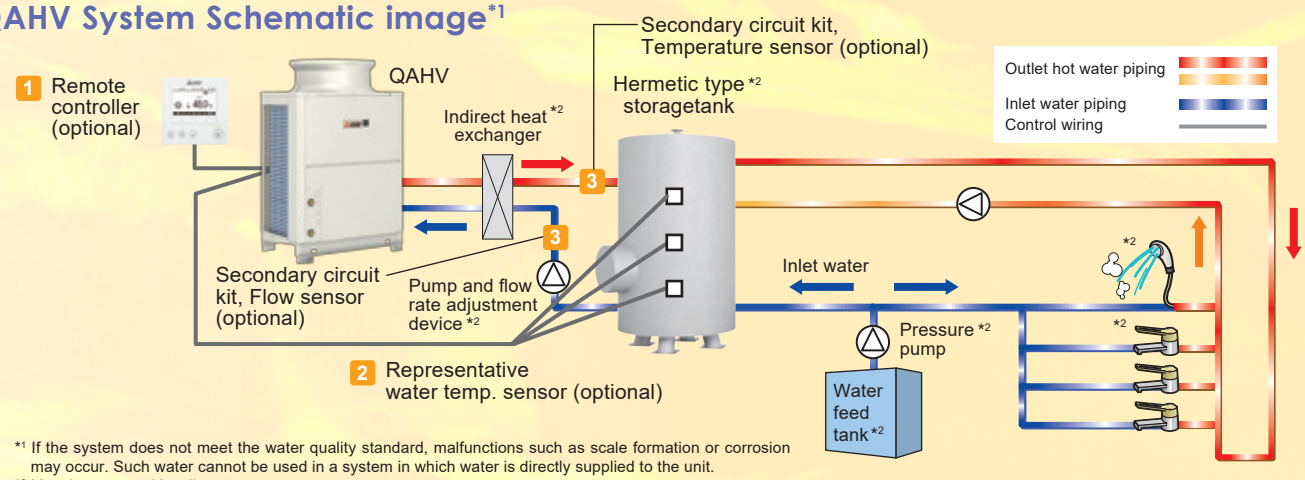
Stable Heating Capacity even at low temperature

High performance even at low outdoor temp.





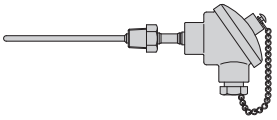
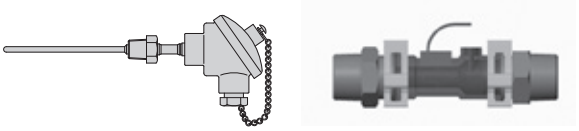
QAHV System Schematic image*1



*1 If the system does not meet the water quality standard, malfunctions such as scale formation or corrosion may occur. Such water cannot be used in a system in which water is directly supplied to the unit.
*2 Must be procured locally.

Optional Parts for QAHV

Optional Parts

Description	Image	Model name
1 Remote Controller		PAR-W31MAA-J
2 Representative water temperature sensor		TW-TH16-E
3 Secondary circuit kit *1 (Temperature sensor, Flow sensor)		Q-1SCK

By incorporating the secondary circuit control to the QAHV, the need to assemble a pump control on site is eliminated. This has simplified the system configuration in which the amount of water used exceeds the Water Quality Standards for QAHV.

*1 For more detailed information, please refer to DATA BOOK. The pump control system on the load side needs to be installed on site.

Specifications

Model			QAHV-N560YA-HPB(-BS)
Power Source			3-phase 4-wire 380-400-415V 50Hz
Capacity *1		kW	40
		kcal/h	34400
		Btu/h	136480
	Power input	kW	10.31
	Current input	A	17.8-16.9-16.3
	COP (kW/kW)		3.88
Capacity *2		kW	40
		kcal/h	34400
		Btu/h	136480
	Power input	kW	10.97
	Current input	A	20.0-19.0-18.3
	COP (kW/kW)		3.65
Capacity *3		kW	40
		kcal/h	34400
		Btu/h	136480
	Power input	kW	11.60
	Current input	A	20.4-19.4-18.7
	COP (kW/kW)		3.44
Maximum current input		A	33.80
Allowable external pump head			77kPa
Temperature range	Inlet water temp		5~63°C 41~145.4°F
	Outlet water temp		55~90°C (Secondary side control enabled: 55 to 80ºC) 131~194°F (Secondary side control enabled: 131 to 176ºF)
	Outdoor temp	D.B.	-25~43°C -13~109.4°F
Sound Pressure level (measured 1m below the unit in an anechoic room) *1		dB (A)	56
Water pipe diameter and type	Inlet	mm (in.)	19.05 (Rc 3/4"), screw pipe
	Outlet	mm (in.)	19.05 (Rc 3/4"), screw pipe
External finish			Acrylic painted steel plate <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D		mm	1837 (1777 not including legs) x 1220 x 760
		in.	72.3 (69.9 not including legs) x 48.0
Net weight		kg (lbs)	400 (882)
Design Pressure	R744	MPa	14
	Water	MPa	0.5
Heat exchanger	Water-side		Copper tube coil
	Air-side		Plate fin and copper tube
Compressor	Type		Inverter scroll hermetic compressor
	Maker		MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter
	Motor output	kW	11.0
	Case heater	kW	0.045
	Lubricant		PAG
FAN	Air flow rate	m^3/min	220
		L/s	3666
		cfm	7768
	Type x Quantity		Propeller fan
	Control, Driving mechanism		Inverter-control, Direct-driven by motor
	Motor output	kW	0.92
HIC (HIC: Heat inter-changer) circuit			Copper pipe
Protection	High pressure protection		High pres.Sensor & High pres.Switch at 14MPa (643psi)
	Inverter circuit		Overheat and overcurrent protection
	Compressor		Overheat protection
	Fan motor		Thermal switch
Defrosting method			Auto-defrost mode (Hot gas)
Refrigerant	Type x original charge		R744 x 6.5
	Flow and temperature control		LEV

Notes:
*1.Under Normal heating conditions at the outdoor temp, 16°CDB/12°CWB (60.8°FDB/53.6°FWB), the outlet water temperature 65°C (149°F), and the inlet water temperature 17°C (62.6°F)
*2.Under Normal heating conditions at the outdoor temp, 7°CDB/6°CWB (44.6°FDB/42.8°FWB), the outlet water temperature 65°C (149°F), and the inlet water temperature 9°C (48.2°F)
*3.Under Normal heating conditions at the outdoor temp, 7°CDB/6°CWB(44.6°FDB/42.8°FWB), the outlet water temperature 65°C(149°F), and the inlet water temperature 15°C(59.0°F)
*Due to continuing improvements, specifications may be subject to change without notice
*Do not use steel pipes as water pipes.
*Keep the water circulated at all times. Blow the water out of the pipes if the unit will not be used for an extended period time.
*Do not use ground water or well water
*Do not install the unit in an environment where the wet bulb temperature exceeds 32°C
*The water circuit must use the closed circuit
*There is a possibility that the unit may abnormally stop when it operates outside its operating range. Provide backup (ex.boiler start with error display output signal (blue CN511 1-3)) for abnormal stop.

Unit converter
kcal/h = kW x 860 BTU/h = kW x 3,412 cfm = m^3/min x 35.31 lbs = kg/0.4536

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