

Hot Water Heat Pump Catalogue





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There's a lot to consider when choosing heating for your home and many factors that may help you decide. Hot water heat pumps are endorsed by government agencies and consumer advocacy groups as one of the most efficient heating forms available.

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For underfloor heating and/or sanitary hot water.



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For underfloor heating, sanitary hot water, swimming pools or spa pools.

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For underfloor heating, pre-heating sanitary hot water, swimming pools or spa pools. Can be installed in conjunction with City Multi commercial VRF air conditioning.



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12.5kW Hot Water Module. Flexibility to create large systems for sanitary hot water. Can be installed in conjunction with City Multi commercial VRF air conditioning.



CAHV Series p.13

45kW Packaged Hot Water Heat Pump. Can be combined for a maximum system of 70kW.
For underfloor heating and sanitary hot water.

Hot Water Heat Pump Selection Guide p.14

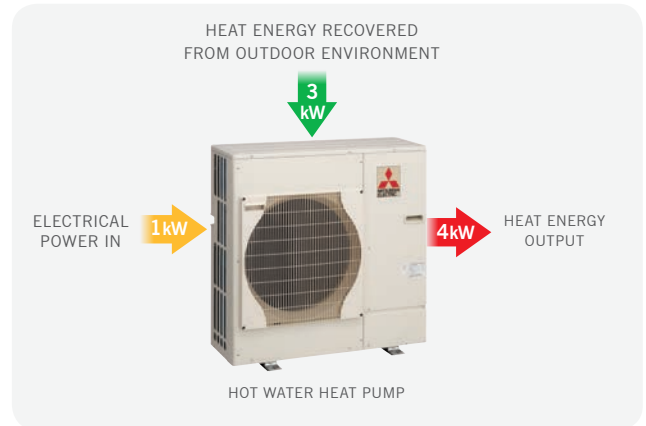
Sizing guide for underfloor heating, swimming pools and spa pools.

Hot Water Cylinders p.14

New Zealand made hot water cylinders manufactured to the highest standards complete with heat exchanger coil designed specifically for use with Mitsubishi Electric hot water heat pumps.

How Efficient Is A Hot Water Heat Pump?

A Co-Efficient of Performance (COP) is a ratio of heat energy produced compared to electrical energy consumed by an appliance. The higher the COP, the less energy is consumed to produce the same amount of heat. A comparison of COPs shows that electric heating has a COP of 1; meaning for every 1kW of energy consumed only 1kW of heat is produced. Gas heating is even lower at 0.85, which means for every 1kW consumed only 0.85kW of useful heat is produced.

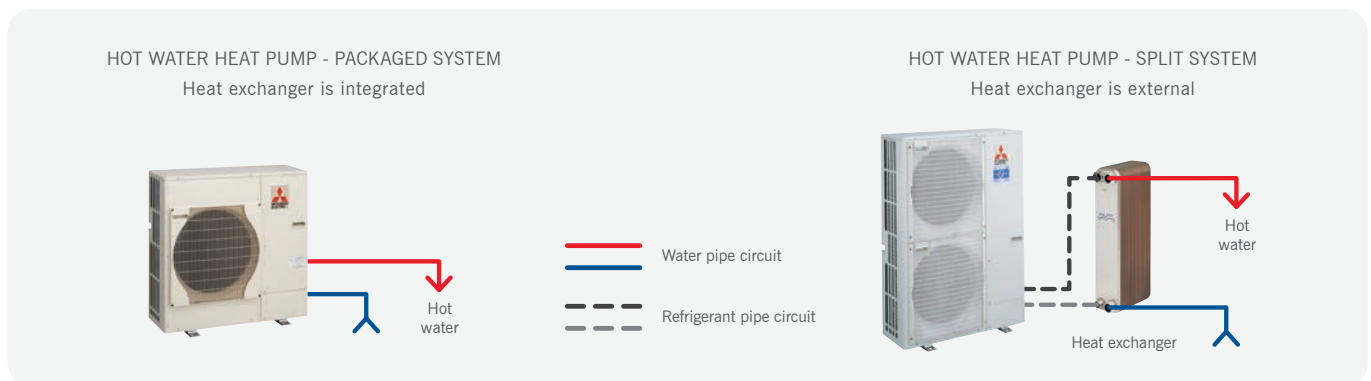


Mitsubishi Electric Hot Water Heat Pumps are extremely energy efficient and can achieve COPs between 3-4, meaning they can produce 3-4kW of heat for every 1kW consumed. As no fossil fuels are directly burnt in the operation of a heat pump, CO₂ emissions are also greatly reduced in comparison to gas or oil-fired boilers.

How Do Hot Water Heat Pumps Work?

Hot Water Heat Pumps work on a similar principal to a refrigerator; they are able to absorb energy from the surrounding outdoor air and transfer this energy into a refrigerant. The heat energy is upgraded using a refrigerant cycle and this renewable energy is transferred into the water. The R410A refrigerant used in Mitsubishi Electric Hot Water Heat Pumps has zero ozone depletion potential. This refrigerant allows useful heat energy to be absorbed even when the outdoor conditions drop below freezing.

There are two types of hot water heat pump systems: A packaged system - which has the heat exchanger integrated with the outdoor unit, and a split system - which has the heat exchanger positioned right where the hot water is required.



Why Choose A Hot Water Heat Pump?

Mitsubishi Electric Hot Water Heat Pumps are one of the most efficient ways to heat water all year round. A highly efficient inverter system utilising an environmentally friendly refrigerant allows the system to continue providing heat even in sub zero outdoor temperatures.

According to the Energy Efficiency and Conservation Authority (EECA), hot water usage accounts for up to 30% of a home's annual power bill. Hot Water Heat Pumps can provide energy efficient solutions for all applications where water is heated or cooled.

Unique Benefits of Hot Water Heat Pumps



Energy Efficiency

Hot water heat pumps offer the highest levels of energy efficiency with the ability to provide 3-4kW of heat energy for every 1kW used.



Lowest Running Costs

The more energy efficient a heating system is, the cheaper it is to run. Hot water heat pumps offer the cheapest available kW/h rate for hot water heating.



Weather Compensation

Weather compensation can detect changes in outdoor ambient conditions, allowing the hot water heat pump to adjust the water temperature. This ensures the right comfort temperature is produced without excess energy wastage.



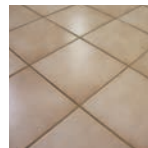
Convenient Comfort

Hot water heat pumps supply hot water which delivers radiant heat energy to floor and potable water systems. Easy to use controls allow you to adjust temperature settings at the touch of a button.



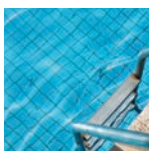
Multi Functional

Hot water heat pumps can be installed for a range of applications, from swimming pool and spa pool heating, to sanitary hot water, under floor heating and fan coil cooling.



Unobtrusive Heating

There is no need to worry about furniture placement or wasting valuable floor space, as heat produced from a radiant floor slab warms evenly no matter how the room is arranged.



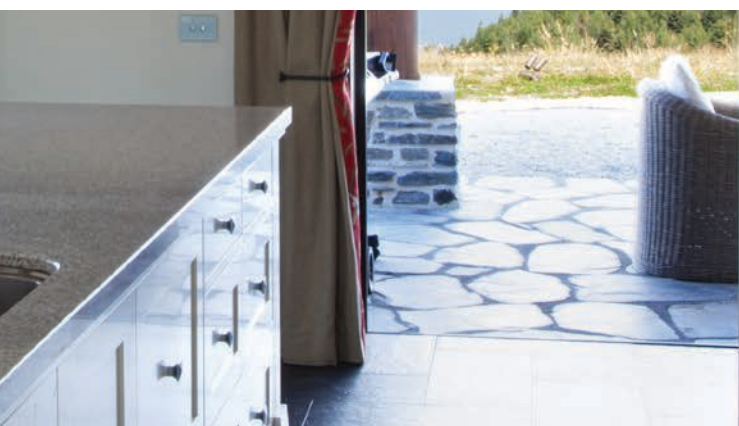
Year Round Heating

Hot water heat pumps provide energy efficient water heating year round, operating effectively in both high and low outdoor ambient temperatures.



Safety

Hot water heat pumps are the perfect option when you have children and pets. As there are no hot surfaces, they are an extremely safe heating option.



Ultimate Control

PAR-W21 7 Day Timer & PUAZ Water Flow Interfaces

PAR-W21 :: 7 Day Timer / Controller

This is an easy to use, fully functional wall mounted controller developed by Mitsubishi Electric specifically for water heating and cooling.



Features:

- Large LCD screen with 7 day timer function
- ON/OFF: Runs and stops the operation of a group of units
- Temperature control
- Function Modes: Hot Water / Heating / Eco / Anti-freeze / Cooling
- Weekly Timer: ON / OFF / Up to 6 water temperature settings can be programmed per day
- Language selection
- Full diagnostic function
- External inputs: Mode / Temperature / ON / OFF
- External outputs: Operation / Fault / Defrost
- Operation locking function

Water Flow Temperature Interface

PAC-IF031 Interface

PUHZ Series only

This advanced interface excels in multiple use applications. The PAC-IF031 water flow temperature controller allows Mitsubishi Electric PUHZ Series Hot Water Heat Pumps to heat sanitary hot water by intelligently switching between the heat pump and the electrical immersion element in the hot water cylinder. This ensures that the water in your hot water cylinder is kept at the ideal temperature of 55°C to kill bacteria such as Legionella.

Multiple sensors monitor hot water applications simultaneously to ensure maximum efficiency is achieved and that all applications are suitably addressed by the single heat pump. The interface will prioritise the hot water cylinder's heating requirements, and can direct heating to the cylinder and stop secondary functions such as under floor heating. The PAC-IF031 continuously measures the rate of temperature increase in the hot water cylinder. If required, the PAC-IF031 interface can utilise an electric immersion element to "top up" the hot water cylinder.

CASE STUDY :: Nelson Home with Sanitary Hot Water and Underfloor Heating

Just one energy efficient Mitsubishi Electric Hot Water Heat Pump system is needed to simultaneously heat 226m² of floor area and priority heat the 250 litre hot water cylinder via the PAC-IF031 interface in this family home. Floor coverings in the home include carpet, tiles and vinyl planking. The addition of 30mm polystyrene insulation under the concrete slab improves heating response time and reduce running costs.

"The system performs well beyond our expectations and the power bill is very acceptable"
- Maurice & Grace Win

16kW Hot Water Heat Pump Solution:

- PUHZ-RP140VHA Hot Water Heat Pump
- ACH70-50H Heat Exchanger
- PAC-IF031 Interface
- PAR-W21 Controller

Other components:

System Sensors (thermistors), Under Floor Heating System, Hot Water Cylinder with coil heat exchanger (solar ready type). Three way diverting valve and actuator, primary side pump, expansion vessel, fill valve, safety valve, IR Valve, and auto air vent.



Packaged and Split Systems 5.0~16.0kW

PUHZ Series Hot Water Heat Pumps

PUHZ SERIES

5.0~16.0kW (55-60°C)

- Reliable, year-round water heating
- Inverter driven for maximum energy efficiency
- Water flow temperatures up to 60°C
- Operation in outdoor temperatures as low as -25°C
- Environmentally friendly R410a refrigerant
- Easy to use LCD Wall Controller with 7 Day Timer
- “Eco” heating mode for outdoor ambient temperature compensation
- Cooling mode available
- Compact design

PUHZ-HW140 Special Features:



- Heat interchange circuit for maximum system heat recovery
- Flash injection circuit and a third port on the compressor for superior low ambient heating performance

16kW PUHZ Series Solution



INSTALLATIONS

Spa Pools

Spa pools consume more power than many swimming pools, due to higher temperatures and potential heat losses. Installing a Hot Water Heat Pump to an existing spa pool can significantly reduce your heating costs. Power consumption can be reduced by 3 to 4 times.



Note: A range of Titanium coil / PVC shell heat exchangers are matched to the PUHZ hot water heat pump units. This removes any risk of corrosion-related damage due to salt or chlorine water treatment and simplifies pool water pipe work.

Swimming Pools

Many swimming pools are used in only the warmest summer months and remain unused for the rest of the year. Installing a Hot Water Heat Pump can enable you to enjoy your swimming pool year-round!



Note: A range of Titanium coil / PVC shell heat exchangers are matched to the PUHZ hot water heat pump units. This removes any risk of corrosion-related damage due to salt or chlorine water treatment and simplifies pool water pipe work.

Underfloor Heating

Underfloor Heating Systems are used in many homes to heat flooring areas. These systems use warm water circulated through pipes buried in the floor slab and deliver radiant energy to heat the rooms, providing the ultimate in comfort.



Connecting a Mitsubishi Electric Hot Water Heat Pump to an Underfloor Heating System is simple, as most existing Underfloor Systems include the necessary in-floor water pipes, distribution manifolds, pumps and controls. The water from the Hot Water Heat Pump is piped to the underfloor heating panel, and is circulated through the underfloor heating system. The heating temperature is controlled by either the underfloor system controller, which is supplied by the heating installer, or by the Mitsubishi Electric Hot Water Heat Pump wall-mounted controller which provides individual system set up requirements.

Sanitary Hot Water

On both new and existing installations, Mitsubishi Electric PUHZ Series Hot Water Heat Pumps combined with the PAC-IF031 Water Flow Temperature Controller allow heating of sanitary hot water by intelligently switching between the heat pump and the electrical immersion element in the hot water cylinder. This ensures that the water is kept at the ideal temperature of 55°C in the cylinder to kill bacteria such as Legionella.



Designed for Mitsubishi Electric hot water heat pumps we have a range of low and mains pressure hot water cylinders fitted with heat exchanger coils. Refer to p.14 for more information.

Existing installations may require an additional heat exchanger external to the cylinder, unless it's a coiled or 'solar ready' type.

Packaged System 5.0~14.0kW

PUHZ-(H)W Series Hot Water Heat Pump

Outlet Temperature

Guaranteed Operation

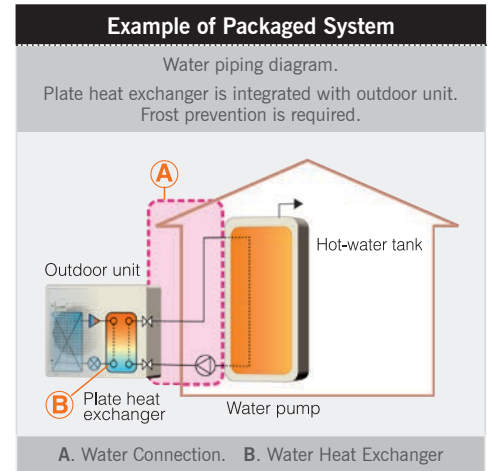


PUHZ-(H)W Series :: Built In Heat Exchanger

Mitsubishi Electric Hot Water Heat Pumps are designed to both heat or cool water. The PUHZ-(H)W Series has three packaged systems to choose from: PUHZ-W50 with 5kW of heating for smaller applications such as small underfloor heating system and hot water cylinders, PUHZ-W85 with 9kW of heating for medium-sized underfloor heating systems and hot water cylinders, and PUHZ-HW140 with 14kW of heating for larger underfloor installations and hot water cylinders.

The PUHZ-(H)W packaged system comes complete with an internal 316 stainless steel brazed plate heat exchanger. This allows for easy installation of connecting water pipes. The system is controlled by the PAR-W21 LCD wall 7 day timer/controller and an advanced PAC-IF031 interface for multiple use applications, such as sanitary hot water heating by intelligently switching between the heat pump and the electrical immersion element in the hot water cylinder.

Note: Ancillary equipment such as water pumps and expansion tanks are to be provided separately by the installer, and selected to meet the individual system pressure and flow requirements.



Specifications

TYPE			Packaged Hot Water Heat Pump			
			Water Heating or Cooling			
MODEL			PUHZ-W50VHA	PUHZ-W85VHA	PUHZ-HW140VHA	
Return water temperature range	Heating	°C	+5 ~ +59 (+60 max.)	+5 ~ +59 (+60 max.)	+10 ~ +59 (+60 max.)	
	Cooling	°C	(+5 min.) +8 ~ +28	(+5 min.) +8 ~ +28	+8 ~ +28	
Water pipe size		inch	1" (BSP Parallel Thread)	1" (BSP Parallel Thread)	1" (BSP Parallel Thread)	
Water flow rate range		l/min	6.5 ~ 14.3	10.0 ~ 25.8	17.9 - 40.1	
Controller	PAR-W21 (PAC-IF031 Interface Unit)					
Power supply			1-Phase, 230V, 50Hz	1-Phase, 230V, 50Hz	1-Phase, 230V, 50Hz	
Max. current / Breaker size		A	13 / 16	23 / 25	35 / 40	
Dimensions	WxDxH	mm	950 x 330 x 740	950 x 330 x 943	1020 x 330 x 1350	
Weight		kg	64	77	134	
HEATING	Heating (A7/W35) *	Capacity	kW	(Min.1.5 ~) 5.0	(Min.2.7 ~) 9.0	14.0
		COP		4.10	3.85	4.19
		Power input	kW	1.22 ¹²	2.34 ¹²	3.34 ¹²
	Heating (A2/W35) *	Capacity	kW	(Min.1.5 ~) 5.0	(Min.2.6 ~) 8.5	14.0
		COP		3.13	2.95	3.18
		Power input	kW	1.60 ¹²	2.88 ¹²	4.40 ¹²
	Noise level (SPL)		dBA	46 ¹¹	48 ¹¹	53 ¹¹
Nominal water flow rate		l/min	14.3	25.8	40.1	
Running current (A7/W35)		A	5.4	10.3	14.9	
Pressure difference (Water circuit)		kPa	12	20	9	
COOLING	Cooling (A35/W7) *	Capacity	kW	4.5	7.5	12.5
		EER (COP)		2.94	2.39	2.59
		Power input	kW	1.53 ¹²	3.14 ¹²	4.82 ¹²
	Cooling (A35/W18) *	Capacity	kW	4.5	7.5	12.5
		EER (COP)		4.13	3.87	4.01
		Power input	kW	1.09 ¹²	1.94 ¹²	3.12 ¹²
	Noise level (SPL)		dBA	45 ¹¹	48 ¹¹	53 ¹¹
Nominal water flow rate		l/min	12.9	21.5	35.8	
Running current (A35/W7)		A	6.8	13.7	21.5	
Pressure difference (Water circuit)		kPa	10	15	7	
Guaranteed operating range	Heating	°C	-15 ~ +35	-20 ~ +35	-25 ~ +35	
	Cooling	°C	-5 ¹³ ~ +46	-5 ¹³ ~ +46	-5 ¹³ ~ +46	
Pump input (Based on EN14511)	Heating	kW	0.01	0.03	0.02	
	Cooling	kW	0.01	0.02	0.02	

*1 At distance of 1m from outdoor unit.

*2 Based on EN14511, power input figures include pump input figures at the bottom of the table.

*3 Cooling operation at -15°C outdoor temperature is possible by using the optional air outlet guide.

* Nominal operating condition	(A7/W35)	(A2/W35)	(A35/W7)	(A35/W18)
Outside air temperature (Dry-bulb)	+7°C	+2°C	+35°C	+35°C
Outside air temperature (Wet-bulb)	+6°C	+1°C	+24°C	+24°C
Water temperature (inlet/outlet)	+30 / 35°C	- / 35°C	+12 / 7°C	+12 / 18°C



PAR-W21
LCD Wall Mounted
7 Day Timer/Controller



PUHZ-W50VHA
Heating: 5.0 kW



PUHZ-W85VHA
Heating: 9.0 kW



PUHZ-HW140VHA
Heating: 14.0 kW

Split System 8.0~16.0kW

PUHZ-RP Series Hot Water Heat Pump

Outlet Temperature



Guaranteed Operation

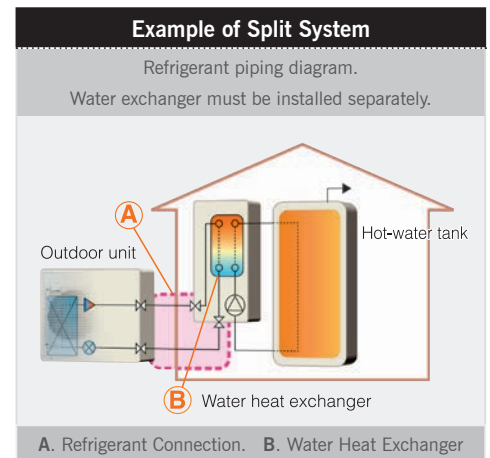


PUHZ-RP Series :: External Heat Exchanger

Mitsubishi Electric Hot Water Heat Pumps are designed to both heat or cool water. You can choose from: 11.2kW, 14.0kW or 16.0kW of heating - suitable for larger underfloor heating and swimming pools which also have an additional 8kW option.

The PUHZ-RP split system requires an external heat exchanger. The flexibility of this system allows the installer to position the heat exchanger right where the hot water is required for both new and retro-fit installations. Either an Alfa Laval ACH70-50H brazed plate 316 stainless steel type heat exchanger for underfloor and sanitary hot water heating or the Vaportec HXTi with high density plastics and a titanium coil heat exchanger for swimming and spa pool heating will require mounting and installation of refrigerant pipe work to the PUHZ-RP outdoor unit. The system is controlled by the PAR-W21 LCD wall 7 day timer/controller and an advanced PAC-IF031 interface for multiple use applications, such as sanitary hot water heating by intelligently switching between the heat pump and the electrical immersion element in the hot water cylinder.

Note: Ancillary equipment such as water pumps and expansion tanks are to be provided separately by the installer, and selected to meet the individual system pressure and flow requirements. This system is supplied with the Alfa Laval ACH70-50H or Vaportec HXTi Heat Exchanger.



Specifications

TYPE			Split System Hot Water Heat Pump				
			Water Heating or Cooling				
MODEL			PUHZ-RP71VKA	PUHZ-RP100VKA	PUHZ-RP125VKA	PUHZ-RP140VKA	
Return water temperature range	Heating	°C	+20 ~ +55 (max. +55)				
	Cooling	°C	+5 ~ +25				
Controller			PAR-W21 (PAC-IF031 Interface Unit)				
Power supply			1-Phase, 230V, 50Hz				
Max. current / Breaker size		A	19 / 25	28 / 32	28 / 32	29.5 / 40	
Dimensions	WxDxH	mm	950 x 330(+30) x 973		1050 x 330(+30) x 1338		
Weight		kg	68		116		
HEATING	Heating (A7/W35) *	Capacity	kW	8.0	11.2	14.0	16.0
		COP		4.21	4.21	4.15	3.90
	Power input	kW	1.90 ^{*2}	2.66 ^{*2}	3.37 ^{*2}	4.10 ^{*2}	
	Noise level (SPL)		dBA	48 ^{*1}	51 ^{*1}	52 ^{*1}	52 ^{*1}
	Nominal water flow rate		l/min	22.9	32.1	40.1	45.9
Running current	(A7/W35)	A	9.46	12.4	16.0	19.9	
COOLING	Cooling (A35/W7) *	Capacity	kW	6.6	9.1	12.0	12.5
		EER (COP)		2.55	2.75	2.35	2.32
	Power input	kW	5.59 ^{*2}	3.31 ^{*2}	5.10 ^{*2}	5.38 ^{*2}	
	Noise level (SPL)		dBA	47 ^{*1}	49 ^{*1}	50 ^{*1}	51 ^{*1}
	Nominal water flow rate		l/min	18.9	26.1	34.4	35.8
Running current	(A35/W7)	A	9.05	12.5	15.5	19.7	
Guaranteed operating range	Heating	°C	-11 ~ +35	-20 ~ +35	-20 ~ +35	-20 ~ +35	
	Cooling	°C	-5 ^{*3} ~ +46	-5 ^{*3} ~ +46	-5 ^{*3} ~ +46	-5 ^{*3} ~ +46	
UNDER-FLOOR HEAT EXCHANGER	MODEL	Alfa Laval	N/A	ACH70-50H			
	Water pressure drop	@ 40°C	kPa	-	6	9	12
	Water flow rate range	@ 40°C	l/min	-	31.8	40.2	45.6
	Water pipe size		inch	-	1" copper water pipe		
	Liquid / Gas pipe size		inch	-	3/8" and 5/8"		
	Dimensions	WxDxH	mm	-	112 x 125 x 526		
Weight		kg	-	10.8			
SWIMMING / SPA POOL HEAT EXCHANGER	MODEL	Vaportec	HXTi 4	HXTi 6	HXTi 6	HXTi 8	
	Water pipe size		mm	50mm PVC			
	Liquid / Gas pipe size		inch	3/8" and 5/8"			
	Dimensions	WxDxH	mm	165 x 235 x 640			
	Weight		kg	3.4	3.9	3.9	4.4

*1 At distance of 1m from outdoor unit.

*2 Power input figures do NOT include pump input figures as pump input depends on local system configuration.

*3 Cooling operation at -15°C outdoor temperature is possible by using the optional air outlet guide.

Note: Split type specifications are just examples of the case in which units are connected to a plate heat exchanger produced by Alfa Laval. Actual specifications depend on local system configuration. The specifications above are based on Alfa Laval ACH70-50H Heat Exchanger being used.

* Nominal operating condition	(A7/W35)	(A35/W7)
Outside air temperature (Dry-bulb)	+7°C	+35°C
Outside air temperature (Wet-bulb)	+6°C	+24°C
Water temperature (inlet/outlet)	+30 / 35°C	+12 / 7°C



PAR-W21
LCD Wall Mounted
7 Day Timer/Controller



PUHZ-RP71VKA
Heating: 8.0 kW



PUHZ-RP100VKA
Heating: 11.2 kW

PUHZ-RP125VKA
Heating: 14.0 kW

PUHZ-RP140VKA
Heating: 16.0 kW



Vaportec HXTi Heat Exchanger
Alfa Laval ACH70-50H Heat Exchanger

CITY MULTI Case Studies

CASE STUDY :: Online Control - Wellington to Nelson

Although Nelson is the sun capital of New Zealand, this does not mean that it is forever summer! The Abel Tasman region is also a winter haven and as such, heating was a key consideration for a corporate Wellington family when building their holiday home at Kaiteriteri Beach near Nelson. City Multi VRF Air Conditioning Systems quietly and efficiently take care of not only the room heating and cooling, but also the hot water used for underfloor heating of polished concrete floors on both levels of this house.

The Mitsubishi Electric AG-150A Control System has a large colour LCD panel for controlling all the aspects of the home's heating and ventilation systems, including the underfloor heating system. This web enabled controller has allowed the owners to maintain complete control of their remote residence through the control system's online accessibility. The system's remote controllability and high operating efficiency means pre-heating or even pre-cooling the home is both simple and cost effective.

AG-150A Centralised and Web Central Controller with LCD Touch Screen, also available in white.



CASE STUDY :: Cromwell Medical Centre

The design brief for this new medical centre was to provide a highly energy efficient building that would best suit the needs of a variety of medical professions all housed under one roof. The air conditioning and ventilation system needed to provide comfort with economy all year round which is no mean feat when outside ambient temperatures range from a winter low of -10°C to a summer high over 35°C.

City Multi R2 Systems were largely used throughout the building to provide the air conditioning, but the largest system also had a PWFY-BU water heating unit to provide heat recovery from the air conditioning load into the sanitary hot water system. Hot water usage is high due to the clinics many basins, so this is a good example of 'time of use based energy savings'.

1x PWFY-P100VM-E-BU hot water module connected to a PURY-YHM-A heat recovery system heats the sanitary hot water.



CITY MULTI VRF Commercial 12.5~25.0kW

PWY Series Hot Water Modules

PWY~AU SERIES 12.5~25.0kW (45°C)

- Reliable, year-round water heating
- Inverter driven for maximum energy efficiency
- Water temperatures up to 45°C
- Operation at outdoor temperatures as low as -20°C
- Environmentally friendly R410a refrigerant
- Easy to use LCD Wall Controller with 7 Day Timer
- Cooling mode selectable
- Heat recovery from air conditioning system in cooling mode on R2 Systems
- Modular design allows flexibility to create very large systems

PWY~BU SERIES 12.5kW (70°C)

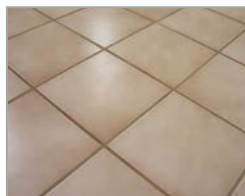
- Reliable, year-round water heating
- Inverter driven for maximum energy efficiency
- Water temperatures up to 70°C
- Suitable for sanitary water heating when using secondary heat exchanger or solar ready coiled tank.
- Operation at outdoor temperatures as low as -20°C
- Environmentally friendly R410a and R134a refrigerants
- Easy to use LCD Wall Controller with 7 Day Timer
- Heat recovery from air conditioning system in cooling mode on R2 Systems
- Modular design allows flexibility to create larger systems

INSTALLATIONS

Mitsubishi Electric Commercial Water Solutions require engineering input from your Mitsubishi Electric Specialist.

Underfloor Heating

Underfloor Heating Systems are used in many applications to heat either the entire space, or specific areas as required. These systems use warm water circulated through pipes buried in the floor slab and deliver radiant energy to heat controlled spaces, providing the ultimate in comfort for the occupants.



Connecting a Mitsubishi Electric Hot Water Heat Pump to an Underfloor Heating System is simple, as most existing Underfloor Systems include the necessary in-floor water pipes, distribution manifolds, pumps and controls. The water from the Hot Water Heat Pump is piped to the underfloor heating panel, and is circulated through the Underfloor Heating System. The space heating temperature is controlled by the underfloor system controller, which is supplied by the heating installer. The Mitsubishi Electric Hot Water Heat Pump wall-mounted controller allows the water flow temperatures to be set for the individual system modes and set up requirements, ie. Heating / Heating Eco / Hot Water.

Sanitary Hot Water

The new Mitsubishi Electric PWY~AU and PWY~BU Water Heating Units allow water to be pre-heated, and even fully heated, by using the waste heat energy normally lost to the atmosphere from a commercial air conditioning system. It is also possible to provide the same heating from a stand-alone PWY system to heat water up to 70°C. Depending on the system required and whether an existing system is used to recover energy, this offers energy savings from 300 – 550%.



Swimming Pools

Many swimming pools are used in only the warmest summer months and remain unused for the rest of the year. Installing a Hot Water Heat Pump can enable you to enjoy your swimming pool year-round!



Hydroponics

Most hydroponic growing systems require their water or nutrient solutions to be heated to a specific temperature dependant on the crop. The heated water is then pumped around the growing beds to provide both heat and nutrients to the plants. As the Heat Pump controller can be set to accurately control the water flow temperature, sensitive crops are easily cared for. With the ability to alter the temperature remotely, the Heat Pump can be interfaced with most greenhouse controllers and hydroponic growing systems. The advanced "Eco Mode" allows flow temperature compensation based on outside air temperature to ensure the highest possible energy efficiency.

Aquaculture

Aquaculture systems often require both heating and cooling depending on the species and time of year. For example, Paua cultivated on land and indoors will require some heat in winter, and often need cooling in summer time.

Water Chilling

Water chilling is available down to a flow temperature of 6°C, from a capacity of 4.5-14kW in the PUHZ range and from 20kW in the PWY range. The systems require external pumps and, depending on application, a brine or antifreeze solution will be required to prevent freezing of the plate heat exchanger. Applications include small process and liquid data cooling, and chilled water for selected fan coil units.

CITY MULTI VRF 12.5~25.0kW

PWFY-P~AU Series Hot Water Module

Outlet Temperature

Guaranteed Operation

Hot Water
45°C

Water Heating at
-20°C

PWFY-P~AU Series :: Water Heating 10~45°C and Cooling 10~30-35°C

VRF Water Heating Units are the latest technological breakthrough from the Mitsubishi Electric City Multi Range, with the ability to heat or cool water more efficiently than ever before. The PWFY-P~AU indoor modules can be installed in conjunction with standard City Multi VRF air conditioning indoor units, creating huge potential for heat recovery.

Available in two sizes: PWFY-P100VM-E-AU (12.5kW heating / 11.2kW cooling) and PWFY-P200VM-E-AU (25.0kW heating / 22.4kW cooling) which are modular to allow creation of larger solutions. Suitable applications for pre-heating sanitary water (through energy recovery), swimming pools, underfloor heating, low temperature hot water for fan coil units and convectors, hydroponics, aquaculture and water chilling.

The AU Series water heating and cooling unit utilise a 316 stainless steel plate heat exchanger with the ability to sense flow or return water temperature with a dip-switch setting. PWFY-P~AU units can be connected to either City Multi Y or R2 Series outdoor units (The smallest VRF hot water system is therefore 25kW of heating). Inputs: ON/OFF, Mode, Set Temp, Pump Interface. Outputs: ON/OFF, Error, Defrost.

Technology

PWFY-P~AU units work perfectly to provide heating and cooling to fan coil units, panel heaters, or under floor heating systems. Its advantages include high-efficiency operation with our standard City Multi Y Series system and heat recovery operation when used with our City Multi R2 Series system.

CITY MULTI VRF Commercial Design

Mitsubishi Electric's CITY MULTI Series has the flexibility to adapt efficiently to any building requirement. A wide line up of indoor units and simple piping systems enable an easy fit to even the most complex configurations. And both R2 and Y-Series systems can be simply operated through a central controller. With it's flexible system architecture, easy operation and energy saving technology CITY MULTI offers an ideal blend of comfort, efficiency and economy. Please contact the Mitsubishi Electric City Multi representative in your area for a unique design solution.



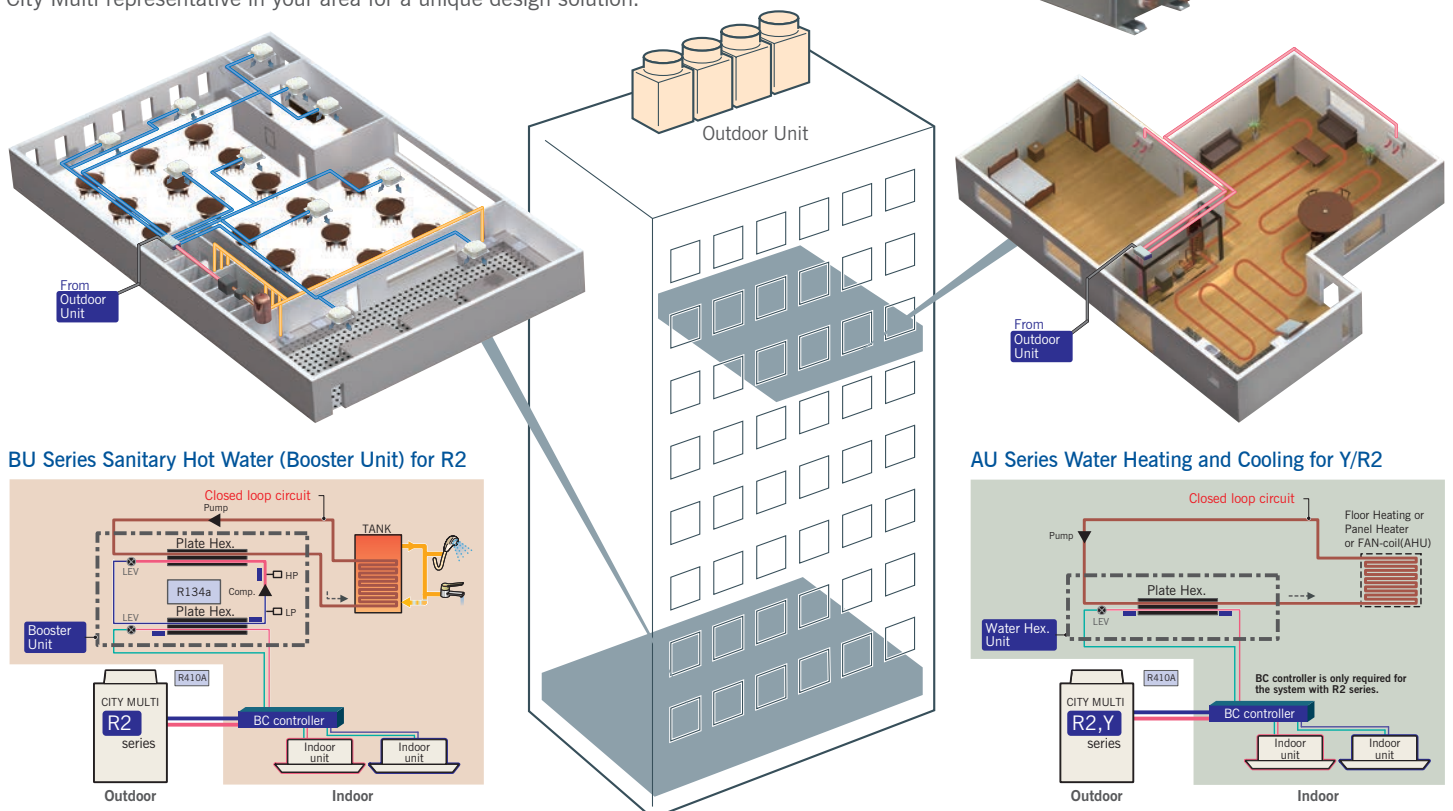
PAR-W21
LCD Wall Mounted
7 Day Timer/Controller



PWFY-P100VM-E-BU
Heating: 12.5 kW

PWFY-P100VM-E-AU
Heating: 12.5 kW
Cooling: 11.2 kW

PWFY-P200VM-E-AU
Heating: 25.0 kW
Cooling: 22.4 kW



CITY MULTI VRF 12.5kW

PWFY-P~BU Series Hot Water Module

Outlet Temperature

Guaranteed Operation



PWFY-P~BU Series :: Sanitary Water Heating of 10~70°C

VRF Water Heating Units are the latest technological breakthrough from the Mitsubishi Electric City Multi Range, with the ability to heat water more efficiently than ever before. The PWFY-P~BU indoor modules can be installed in conjunction with standard City Multi VRF air conditioning indoor units, creating huge potential for heat recovery.

Available in one size: PWFY-P100VM-E-BU (12.5kW heating) which is modular to allow creation of larger solutions. Sanitary water heating has suitable applications in:

hotels and motels, apartments, commercial kitchens and laundries, office buildings, food processing industry, heat recovery from air conditioning systems into sanitary water storage, and direct sanitary water heating is also possible.

The BU Series water heating unit is perfect for sanitary hot water, with excellent heat recovery possibilities. It houses a second compressor running on R134A refrigerant creating a cascade circuit between two plate heat exchangers. With the ability to sense flow or return water temperature with a dip-switch setting, these units can only be connected to City Multi R2 Series outdoor units. (The smallest stand alone VRF hot water system is therefore 25kW of heating). Heat recovery from air conditioning systems into sanitary water storage and direct sanitary water heating is also possible. Heat recovery technology taps into and utilises otherwise wasted heat energy, extracted from areas of a building that require cooling, providing heating for hot water. Recovering the heat in this manner maximises the efficiency of the system all year round, therefore increasing energy savings and substantially lowering running costs. Inputs: ON/OFF, Set Temp, Pump Interface. Outputs: ON/OFF, Error, Defrost.

Heat Recovery Technology

PWFY-P~BU units benefit from the heat recovery operation of the City Multi R2 Series system, converting energy from the air conditioning to temperatures suitable for heating water, and allowing simultaneous heat recovery from the air conditioned space. This enables the highest possible COP performance.

Specifications

TYPE			Split System Hot Water Heat Pump		
			Water Heating		Water Heating and Cooling
MODEL			PWFY-P100VM-E-BU	PWFY-P100VM-E1-AU	PWFY-P200VM-E1-AU
Outlet water temperature (max.)	Heating	°C	+70	+45	+45
Return water temperature range	Heating	°C	+10 ~ +70	+10 ~ +45	+10 ~ +45
	Cooling	°C	N/A	+10 ~ +30	+10 ~ +35
Circulating water (Operation Volume Range)		m3/h	0.6 ~ 2.15	1.1 ~ 2.15	1.8 ~ 4.4
Controller	PAR-W21				
Power supply	1-Phase, 230V, 50Hz				
Dimensions	WxDxH	mm	450 x 300 x 800 (785 without legs)		
Weight		kg	64	39	42
Noise level (measured in anechoic room)		dBA	44	29	29
Connectable outdoor unit	Total capacity	50~100% of outdoor unit capacity			
	Series	PURY-(E)P-Y(S)HM-A(-BS)	PURY-(E)P-Y(S)HM-A(-BS) PUHY-(E)P-Y(S)HM-A(-BS)	PURY-(E)P-Y(S)HM-A(-BS) PUHY-(E)P-Y(S)HM-A(-BS)	
HEATING	Capacity *1	kW	12.5	12.5	25.0
	Power input *3	kW	2.48	0.015	0.015
	Running current *3	A	11.12	0.065	0.065
COOLING	Capacity *2	kW	N/A	11.2	22.4
	Power input *3	kW	N/A	0.015	0.015
	Running current *3	A	N/A	0.065	0.065
Diameter of refrigerant pipe (Brazed connection)	Liquid	mm	ø9.52	ø9.52	ø9.52
	Gas	mm	ø15.88	ø15.88	ø15.88
Diameter of water pipe (Screw connection)	Inlet	mm	ø19.05	ø19.05	ø19.05
	Outlet	mm	ø19.05	ø19.05	ø19.05

* Install the unit in an environment where the wet bulb temperature will not exceed 32°C

* Due to continuing improvement, these specifications may be subject to change without notice.

* The PWFY indoor unit is not designed for outside installations.

*1 Nominal heating conditions
Outdoor Temp. : 7°CDB/6°CWB (45°FDB / 43°FWB)
Pipe length: 7.5 m
Level difference: 0m
Inlet water Temp 30°C

*2 Nominal cooling conditions
Outdoor Temp. : 35°CDB (95°FDB)
Pipe length: 7.5 m
Level difference: 0m
Inlet water Temp 23°C

*3 Power input figures are for the hot water heating indoor unit only.

For more information and detailed specifications of the available outdoor units, please contact the Mitsubishi Electric City Multi representative in your area for a unique design solution.

CONNECTABLE OUTDOOR UNITS

TYPE			R2 Series, Simultaneous Heating & Cooling	Y Series, Heating or Cooling
SERIES			PURY-(E)P-Y(S)JM-A(-BS)	PUHY-(E)P-Y(S)JM-A(-BS)
Connectable indoor units			1 to 50 (depending on the capacity of outdoor unit)	
Guaranteed outdoor operating range	Heating	°C	-20 ~ +32	-20 ~ +15.5
	Cooling	°C	-5 ~ +43	-5 ~ +43
Power supply			3-Phase, 380-400-415V, 50Hz	
HEATING	Available Capacity Range in Series	kW	25.0 ~ 100.0	25.0 ~ 156.5
	Available COP Range in Series		4.30 ~ 3.60	4.40 ~ 3.64
COOLING	Available Capacity Range in Series	kW	22.4 ~ 90.0	22.4 ~ 140.0
	Available EER (COP) Range in Series		4.25 ~ 3.02	4.32 ~ 3.03



PURY-P200YJM-A
R2 Outdoor Unit

CITY MULTI VRF 45.0kW

CAHV Series Packaged Hot Water Heat Pump

Outlet Temperature

Guaranteed Operation



CAHV Series :: Sanitary Water Heating of 25~70°C

The Zubadan CAHV packaged hot water heat pump is designed to provide hot water up to 70°C with an ambient outdoor temperature as low as -10°C and a minimal drop-off down to -20°C, making it an ideal replacement for a boiler system or, better still, an uncompromising method of heating sanitary hot water for commercial applications. This unit utilizes the unique flash injection technology seen in the City Multi Zubadan air conditioning range.

Built In Heat Exchanger Hot Water Heat Pump CAHV-P500YA-HPB: Comes complete with an internal 316 stainless steel brazed plate heat exchanger. This allows for easy installation of connecting water pipes to where the hot water is required.

Backup and Rotation Functions	Priority Modes
Hot Water Heat Pump ensures an exceptionally high level of reliability by utilising "Backup Function*". If either of the compressors malfunction, the other compressor keeps operating to avoid a complete stop of the system. "Rotation Function" is also available. When two or more units are in the system, the unit runs alternatively to ensure an optimum product life cycle for both of its component units. *If the main circuit board is at fault, backup function and rotation function are not available. Capacity drops by 50%.	With "Capacity Priority Mode", the hot water heat pump can provide a maximum capacity of over 70kW. "Capacity Priority Mode" is more effective when used with a boiler because fuel costs and CO ₂ emission from a boiler can be reduced.

Specifications

ZUBADAN		Packaged Hot Water Heat Pump		
		Water Heating		
MODEL		CAHV-P500YA-HPB (-BS)		
Outlet water temperature range	Heating °C	+25~ +70		
Diameter of water pipe (Screw connection)	Inlet inch	1 1/2"		
	Outlet inch	1 1/2"		
Water flow rate range	m ³ /h	7.5 -15.0		
Water pressure drop (A7/W45) *	kPa	12.9		
Controller		PAR-W21		
Power supply		3-phase 4-wire 380-400-415V 50/60Hz		
Max. current	A	57.77 - 54.88 - 52.90		
Dimensions	WxDxH mm	1,978 x 759 x 1,710 (without legs 1,650)		
Weight	kg	526		
Refrigerant		R407C × 5.5(kg) × 2		
HEATING	Heating (A7/W35) *	Capacity kW	45.0	
		COP	4.13	
		Power input kW	10.9 ⁻²²	
	Heating (A7/W45) *	Capacity kW	45.0	
		COP	3.49	
		Power input kW	12.9 ⁻²²	
	Heating (A7/W70) *	Capacity kW	45.0	
		COP	1.76	
		Power input kW	25.6 ⁻²²	
		Noise level (SPL) dBA	59 ⁻¹¹	
		Nominal water flow rate l/min	40.1	
		Running current (A7/W70) * A	43.17 - 41.01 - 39.53	
	Pressure difference (Water circuit) kPa	9		
Guaranteed operating range	Heating °C	-20 ~ +40		
Design Pressure	R407C MPa	3.85		
	Water MPa	1.0		
Heat exchanger	Water side	Stainless steel plate and copper brazing		
	Air side	Plate fin and copper tube		

* Nominal operating condition	(A7/W45)	(A7/W45)	(A7/W70)
Outside air temperature (Dry-bulb)	+7°C	+7°C	+7°C
Outside air temperature (Wet-bulb)	+6°C	+6°C	+6°C
Water temperature (inlet/outlet)	+30 / 35°C	+40 / 45°C	+NA / 70°C

* At distance of 1m from outdoor unit.

* Due to continuing improvement, the above specifications may be subject to change without notice.

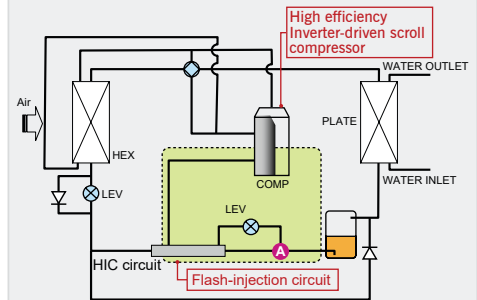
* Please don't use the steel material for the water piping material.

* Please do not use groundwater and well water.

Zubadan Technology

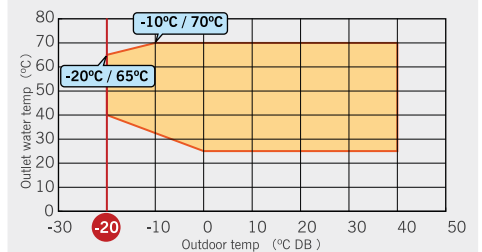
Flash-injection Circuit

"Flash-injection Circuit", which is designed for our ZUBADAN CITY MULTI (air conditioning system for cold regions), is mounted in our new Hot Water Heat Pump. By utilizing our advanced "Flash-injection Circuit" and the latest high-efficiency compressor, Hot Water Heat Pump provides hot water upto 70°C, and produces less capacity drop at low outdoor temperature.



Two-phase refrigerant is separated into liquid refrigerant and gas refrigerant at point A. Liquid refrigerant, whose pressure is reduced by LEV (Linear Expansion Valve), exchanges heat in the HIC circuit and become gas-liquid two-phase refrigerant. The two-phase refrigerant flows into the injection port of the compressor for controlling the increase of 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.

Range of operation temperature and outlet water temperature. Delivering precise comfort even in the coldest days of the year down to -20°C.



During defrost operation, two compressors, which are equipped within one unit, run alternatively and result in smaller drop in outlet water temperature.



PAR-W21
LCD Wall Mounted
7 Day Timer/Controller



CAHV-P500YA-HPB
Heating: 45.0 kW

* Please always make water circulate or pull out the circulation water completely when not using it.

* Install the unit in an environment where the wet bulb temperature will not exceed 32°C.

* The water circuit must use the closed circuit.

Hot Water Heat Pump Sizing

Use this guide to estimate your heating requirements, however units should not be purchased without advice from your heating or pool specialist.

Every application is as individual as its owner. An incorrect selection may lead to unnecessary power consumption or a system with insufficient heating capability.

Underfloor Heating

The amount of heat required will vary depending on location and the construction of your home. Therefore, every house requires a different calculation to heat the desired area. The maps to the right are designed as a guide. First, calculate the floor area of the house requiring heating to be installed. Remember to deduct areas under cupboards, garages etc. Take the area (m²) and multiply it by the factor in your region on the appropriate map. Your underfloor heating specialist will be able to give you a more accurate assessment of your heating requirements.

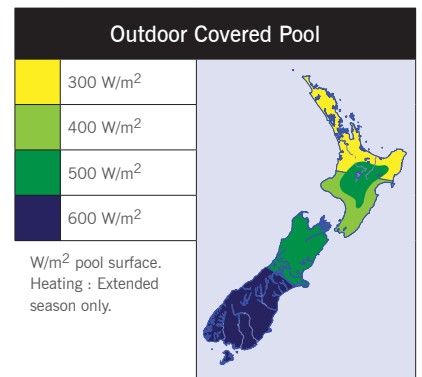
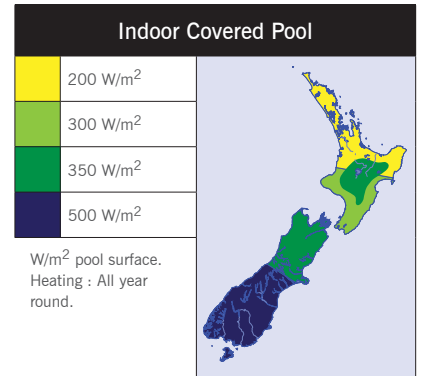
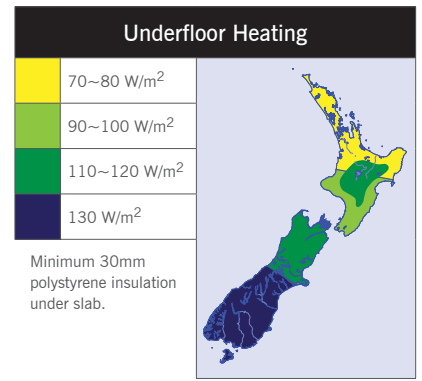
Spa Pools

We have a new Titanium Coil/PVC Shell heat exchanger to effectively heat where aggressive chemical treatment is present. This is matched to one of our PUHZ-RP Hot Water Heat Pump units. Alternatively use our PUHZ-W50 with an intermediate water to water heat exchanger.

Swimming Pools

Hot Water Heat Pumps enable outdoor swimming pools to be heated to a comfortable temperature to extend their use year round. Indoor pools also benefit from heating because they don't receive the same solar gain as outdoor pools in the summer, and can be heated during winter to provide year round swimming. The heat pump size required depends on environmental aspects of the pool, including location and construction, temperature of the pool, and the air temperature. The most important factor is the pool water surface area as this is where heat is lost through evaporation. Installing a pool cover is the best way to retain this heat.

Due to the large number of variables, a simple calculation of heat pump capacity is not always possible. We recommend you check our website or contact a competent installer to have your pool heating requirement carefully assessed.



Hot Water Cylinders

New Zealand made hot water cylinders manufactured to the highest standards, complete with heat exchanger coil designed specifically for Mitsubishi Electric hot water heat pumps. Cylinders come supplied with all water connections on the front and include standard 3kW electric element and thermostat. Sensor pockets are correctly positioned for the HWHP cylinder temperature sensor.

	MODEL	Capacity	Dimensions (ØxH) mm
Mains pressure stainless steel A grade cylinders.	BDTH300C20	300 Litre	560 x 1920
	BDTH350C20	350 Litre	560 x 2200
	MODEL	Capacity	Dimensions (WxDxH) mm
Medium pressure (120kpa) copper A grade cylinders.	BDTMG180C20	180 Litre	560 x 1240
	BDTMG225C20	225 Litre	560 x 1520
	BDTMG270C20	270 Litre	560 x 1800
	BDTMG300C20	300 Litre	560 x 1980



Warranty

Mitsubishi Electric Hot Water Heat Pumps come with a 1 year parts, labour and compressor warranty. Alfa Laval and Vaportec Heat Exchangers come with a 1 year parts warranty. Warranty does not cover areas with hard water unless a water softener is fitted. Warranty does not cover heat exchangers used in pool applications where the water pH and chlorine levels fall outside those advised in the technical information. Warranty conditions apply. Please be aware of these conditions prior to purchasing.



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