



Advanced Air-to-Water Heat Pump Solutions





Ecodan and R32 – Next Generation Heating, Cooling and Hot Water System



Increasing energy bills, coupled with the need to efficiently regulate the temperature of our homes and heat hot water is driving the demand for innovative products. Mitsubishi Electric has utilised their expertise and industry-leading technology to develop the R32 range of Ecodan – a super energy efficient air-to-water heat pump solution that combines both hot water and room heating in one system.

On average, hot water and home heating combined account for over $67\%^{*1}$ of the overall energy bill in New Zealand homes

Domestic heating is therefore an obvious area to target in reducing energy bills. This is especially pertinent during the winter months, where a combination of taking longer, hotter showers and the increased need for a warm and dry home, typically drives up power bills. An Ecodan Heat Pump System can help reduce your heating and hot water bill when compared to gas and direct electric systems.

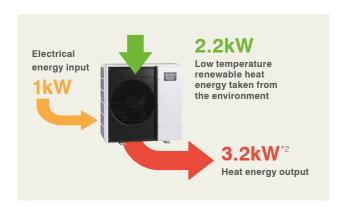
What is Ecodan?

Ecodan is an advanced air-to-water heat pump system that cleverly combines the hot water heating for a home with energy efficient whole home central heating and cooling. Heat pumps use electricity to draw low grade heat energy from the outdoor air, and transfer it to refrigerant which in turn heats water for domestic use and space heating.



The efficiency of a heat pump is known as the Coefficient of Performance or COP. This is a ratio of the heat delivered to power consumed. For every 1kW of electrical input energy, Ecodan absorbs renewable heat energy from the outdoor air to provide the home with an average of at least 3.2kW*2 of heat output. Compared to typical gas and direct electric heating systems that can

have higher running costs with COPs as low as 0.80*3, Ecodan provides an energy efficient alternative.



Heat pumps are super efficient at heating homes, so why not use the same technology to heat water?

Many years ago when heat pumps were first introduced to New Zealand, it did not take long for Kiwis to quickly embrace this super energy efficient technology to keep their homes and families warm all winter long.

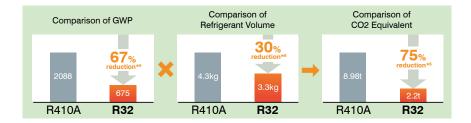
So it should come as no surprise that the same heat pump technology that revolutionised home heating in New Zealand can be just as effective and efficient at heating your hot water.

Savings on your hot water and heating costs could be up to 70%*4 when compared to traditional water heating.

- *1 Based on data sourced from EECA New Zealand.
- *2 As independently tested by BSRIA based upon BS EN14511 Part 3 standard rating conditions. Due to the method of operation, the performance of heat pumps will vary based upon the temperature of the heat source and the requirements of the heat delivered. The BS EN14511 testing relates to the heat pump performance only and not the entire heating system.
- *3 Based on manufacturer information for gas instant hot water heater (noncondensing).
- *4 Estimated using COP data based on BS EN14511 standard rating conditions. 7°C outdoor temp, 35°C outlet water temp. The BS EN14511 testing relates to the heat pump performance only and not the entire heating system.

Reduced Environmental Impact with R32 Refrigerant

R32 has a global warming potential (GWP) one third that of conventional R410A refrigerant. The use of the R32-compatible compressor and advanced control system allows for 30% reduction in refrigerant volume and approximately 75% reduction in CO₂ equivalent in some models.



An Environmentally Conscious Refrigerant!

- One third the GWP of R410A models
- Zero Ozone depletion
- Reduced ETS Levy Charges
- R32 refrigerant has a GWP of only 675

The Ultra Quiet Ecodan Outdoor Units Take Hot Water Heat Pumps to the Next Level

Our market-leading Ecodan Hot Water Heat Pumps offer superb style, energy efficiency and low sound levels. Designed especially for residential applications the 6.0kW, 8.5kW and 11.2kW units are up to 3dBA quieter than previous models, making them the perfect choice for high density housing.



^{*5} Source: IPCC 4th assessment report, global warming potential (GWP) 100-year-value. Comparison of R410A and R32 based on Regulation (EU) no 517/2014.

Corrosion Proof Outdoor Units

As standard, the Ecodan range of outdoor units comes with Mitsubishi Electric's Coastal Protection Surface Treatment (-BS), providing enhanced protection for outdoor units in New Zealand's harsh environment.

All Coastal Protection models are manufactured to a comprehensive corrosion-proof salt-resistant specification, that protects against corrosion damage experienced throughout New Zealand. Specifications include powder coated, galvanized internal/external panels and frames as well as heat exchanger coils with twin-coatings of aqueous heat dried amino alkyd resin.



^{*6} Source: R410A, PUHZ-HW140VHA2 R32: PUZ-HWM140VHA.

^{*7} Measured at 1m from the front of the outdoor unit and 1.5m from ground level. Applicable to PUZ-WM60VAA and PUZ-WM85VAA.

Ecodan Central Heating with Domestic Hot Water Systems

Ecodan is a highly energy efficient hot water heat pump system comprised of an outdoor hot water heat pump and an indoor component – either a hydrobox or a cylinder. A reliable total home heating solution, using radiators, fan coils and/or underfloor heating in conjunction with a hot water supply, that provides year-round comfort with advanced control.

With proven Mitsubishi Electric Technology, Ecodan is designed for New Zealand conditions; maintaining high performance during the winter months when heating is in high demand

Whether you need central whole home heating, hot water or both, the Ecodan Hydrobox and Cylinder Systems can provide the perfect solution.

Both the hydrobox and cylinder are compatible with the Ecodan Air-to-Water (ATW) Hydronic outdoor units ranging from 5kW to 14kW, perfect for your home or light commercial applications.

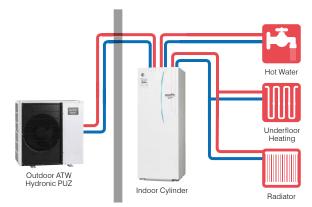
Packaged Cylinder System

The packaged cylinder offers a highly adaptable heating and cooling solution for retrofit or new builds. With a range of outdoor units from 5kW to 14kW, there is a combination for all regions of New Zealand. Through the use of environmentally conscious R32 refrigerant, FTC6 controls and advanced plate heat exchanger technology, the Ecodan Range provides high performance and fast heat-up times. The cylinders are completely pre-plumbed and wired for ease of installation and can provide space heating as well as cooling and hot water to your home.

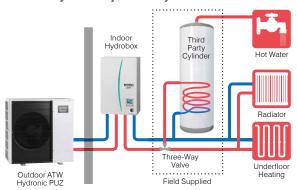
Packaged Hydrobox System

With options for space heating, domestic hot water production or both, the Ecodan Hydrobox is a small form factor heating and cooling powerhouse. Now through the use of R32 refrigerant, the hydrobox is an environmentally conscious choice for whole home heating and cooling. The hydrobox can be connected to underfloor, fan coils and/or radiators to provide a whole home central heating solution. For users wanting potable hot water, the hydrobox can be connected to a third party coiled cylinder.

ATW Hydronic Cylinder System



ATW Hydronic Hydrobox System



Ecodan Technology, Smart Energy Monitoring and System Management

State-of-the-art energy monitoring and management of the Ecodan Heat Pump System means families have the visibility and freedom to efficiently manage their overall household power consumption for heating and hot water. Energy monitoring ensures households can take advantage of off-peak tariffs where available, providing them the opportunity to save even more on their power bill.

Smart Energy Monitoring

View electricity consumption and heat output on the remote controller. End users can now easily check the following:

- Consumed electrical energy for space heating, cooling and domestic hot water (kWh).
- Delivered energy for space heating, cooling and domestic hot water (kWh).

Other Features

- Daily, monthly and yearly data are stored and can be displayed using the main remote controller.
- External power meter and heat meter can be connected for accurate measurement.
- An SD card is included for storing usage data.





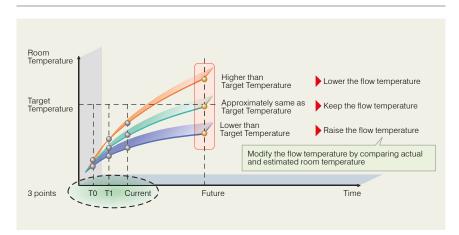




Auto Adaptation

Our advanced Auto Adaptation
Function measures the room
temperature and outdoor
temperature, calculating the
required heating for the room. The
flow temperature is automatically
controlled according to the
required heating, while optimal
room temperature is maintained
at all times; ensuring appropriate
heating capacity and preventing
energy wastage.

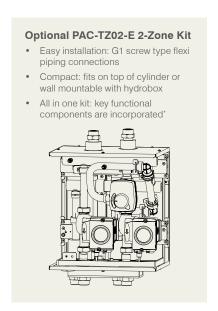
Future Room Temperature Estimation

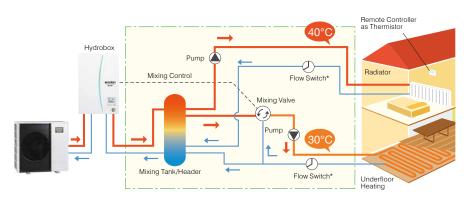


By estimating future changes in room temperature, the system works to prevent unnecessary increases and decreases in the flow temperature. Auto Adaptation maximises both comfort and energy savings.

2-Zone Control Allows You to Simultaneously Control Two Different Temperature Zones

The system can adjust and maintain two flow temperatures when different temperatures are required for different rooms. For example, controlling a flow temperature of 40°C for the bedroom radiators and another flow temperature of 30°C for the living room underfloor heating.





Hot Water and Heating Control with Third Party Heat Exchanger

For hot water and heating systems that require integrating separate heat exchangers with our range of outdoor units.*1

FTC6		PAC-IF071B-E
DIMENSIONS (mm)	Width	393
	Depth	86.7
	Height	422
WEIGHT (KG)		3.7
ELECTRICAL DATA	Electrical Supply	Powered by Outdoor Unit (230V)
	Phase	Single

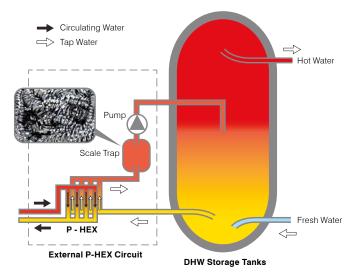


Plate Heat Exchanger and Patented Scale Trap Technology*2

In conventional systems, there is a risk of calcium scale building up on the plate heat exchanger if it is exposed to tap water directly; therefore making it difficult to heat tap water.

To resolve this problem, Ecodan Cylinders and Hydroboxes are equipped with a "Scale Trap" that catches calcium nuclei in the tap water before it has a chance to grow into large scales.

In the case of special localised conditions such as very hard tap water, please consult a specialist before installation.



- *1 When paired with Hydronic outdoor unit, PAC-FS01-E Flow Sensor is required.
- *2 Only available on cylinders made by Mitsubishi Electric

^{*}Flow switch not included – field supplied.

Zubadan – Reliable Performance in Low Temperature Outdoor Conditions

Zubadan* provides powerful heating in cold regions. The 14.0kW Zubadan models rated heating capacity is maintained even in outdoor temperatures as low as -10°C, guaranteeing total home comfort when you need it most.

Zubadan Inverter Technology

New-generation Zubadan* Inverter Technology provides powerful heating in cold regions where heat pump performance can diminish. With Zubadan, rated heating capacity is maintained even in outdoor temperatures as low as -10°C, with guaranteed heating operation at -28°C. Zubadan guarantees a warm, comfortable home when you need it most. Furthermore, Zubadan can provide even faster tank heat-up times in low ambient temperatures compared to standard models.



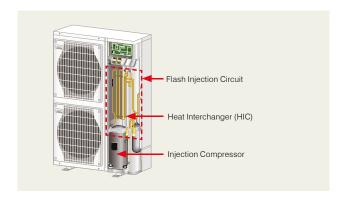


^{*} Zubadan only available on specific models – see specification tables page 9.

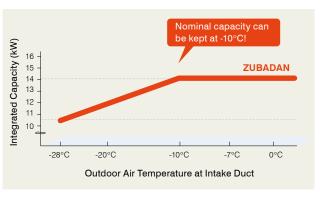
Flash Injection Technology

The Flash Injection Circuit is an original Mitsubishi Electric Technology. A heat exchange process at the heat interchanger transforms liquid refrigerant into a two-phase, gas-liquid state and then compresses the gas-liquid refrigerant at the injection compressor. This circuit secures a sufficient flow rate of refrigerant for heating when outdoor temperatures are very low.

Thanks to an improved heat interchanger and the introduction of a new injection compressor, the Flash Injection Circuit is now more powerful then ever.



Benefits of Zubadan



Example: PUZ-HWM140VHA (according to EN 14511).

Ecodan ATW Hydronic Hot Water Heat Pumps



PUZ-WM Outdoor Units

Our range of Ecodan ATW (air-to-water) Hydronic Hot Water Heat Pumps are available in 5kW, 6kW, 8.5kW and 11.2kW capacities. Designed to suit a wide range of heating and cooling applications, these models offer a viable solution for the varying requirements that domestic and light commercial applications demand.

Key Features

- Self-contained unit, only requiring water and electric connections
- Single phase power supply with a low starting current
- Coastal Protection standard across Ecodan outdoor range
- Low maintenance and quiet operation
- Compact single fan design
- Capable of water temperature up to 60°C in Heating Mode

Domestic Applications

- Heating and domestic hot water
- Suits a vast majority of NZ homes

Commercial Applications

- · Small retail outlets
- Dental and doctors' surgeries
- Public sector and commercial buildings







PUZ-WM60VAA-BS



PUZ-WM85VAA-BS



PUZ-WM112VAA-BS

OUTDOOR UNIT			PUZ-WM50VHA-BS	PUZ-WM60VAA-BS	PUZ-WM85VAA-BS	PUZ-WM112VAA-BS
	Capacity	[kW]	5.00	6.00	8.50	11.20
HEATING*1 (A7/W35)	Power Input	[kW]	1.00	1.19	1.77	2.38
(, ,	COP		5.00	5.06	4.80	4.70
	Capacity	[kW]	5.00	6.00	8.50	11.20
HEATING* ² (A2/W35)	Power Input	[kW]	1.35	1.60	2.42	3.26
(12,1100)	COP		3.70	3.75	3.51	3.44
	Outdoor Connection		1" BSP Parallel Thread ISO 228/1-G1B			
WATER DATA	Heating Flow Rate Range	[L/min]	6.5 to 14.3	8.6 to 17.2	10.8 to 24.4	14.4 to 32.1*4
	Heating Flow Temperature Range	[°C]	20 - 60	20 - 60	20 - 60	20 – 60
	Cooling Flow Temperature Range	[°C]	5 – 25	5 – 25	5 – 25	5 – 25
OPERATING OUTDOOR	Heating	[°C DB]	-20 ~ +24°C	-20 ∼ +24°C	-20 ~ +24°C	-25 ~ +24°C
TEMPERATURE RANGE	DHW	[°C DB]	-20 ∼ +35°C	-20 ∼ +35°C	-20 ∼ +35°C	-25 ∼ +35°C
NOISE	SPL at 1M *1	[dBA]	52	45	45	47
REFRIGERANT DATA	Туре		R32	R32	R32	R32
	Charge	[kg]	2.0	2.2	2.2	3.0
DIMENSIONS	Width	[mm]	950	1050	1050	1050
	Depth	[mm]	330+30*3	480	480	480
	Height	[mm]	943	1020	1020	1020
WEIGHT		[kg]	71	98	98	119
	Electrical Supply		1Ph, 230V, 50Hz	1Ph, 230V, 50Hz	1Ph, 230V, 50Hz	1Ph, 230V, 50Hz
ELECTRICAL DATA	Maximum Current	[A]	13	13	22	28
	Fuse Rating	[A]	16	16	25	32

^{*1} Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 35°C, inlet water temp 30°C as tested to BS EN14511.

^{*2} Under normal heating conditions at outdoor temp: 2°CDB / 1°CWB, outlet water temp 35°C, inlet water temp 30°C.

^{*3} Grille.

 $^{^{\}star}4$ When connected to hydrobox/cylinder, max flow rate is limited to 27.7 L/min.

Zubadan ATW Hydronic Hot Water Heat Pumps



PUZ-HWM ZUBADAN Outdoor Units

The R32 Zubadan ATW (air-to-water) Hydronic Hot Water Heat Pump Range is available in 14kW models. Designed to suit a wide range of heating applications, these models maintain full heat capacity as ambient temperatures drop right down to -10°C. Proven in cold climate areas such as Mount Ruapehu and Central Otago, Zubadan Systems won't let you down in the cold.

Key Features

- Self-contained unit, only requiring water and electric connections
- Available in single and three phase power supply
- Coastal Protection standard across Ecodan outdoor range
- Low maintenance and quiet operation
- Capable of water temperature up to 60°C in Heating Mode
- Operates in outside temperatures as low as -28°C with Zubadan Technology



PUZ-HWM140VHA-BS



PUZ-HWM140YHA-BS

			ZUBADAN	ZUBADAN
OUTDOOR UNIT			PUZ-HWM140VHA-BS	PUZ-HWM140YHA-BS
	Capacity	[kW]	14	14
HEATING*1 (A7/W35)	Power Input	[kW]	3.14	3.14
(, 2 ,	COP		4.46	4.46
	Capacity	[kW]	14	14
HEATING*2 (A2/W35)	Power Input	[kW]	4.44	4.44
(2,	COP		3.15	3.15
	Outdoor Connection		1" BSP Parallel Thread ISO 228/1-G1B	1" BSP Parallel Thread ISO 228/1-G1B
MATER DATA	Heating Flow Rate Range	[L/min]	17.9 to 40.1*4	17.9 to 40.1*4
WATER DATA	Heating Flow Temperature Range	[°C]	20 - 60	20 - 60
	Cooling Flow Temperature Range	[°C]	5 - 25	5 - 25
OPERATING OUTDOOR TEMPERATURE	Heating	[°C DB]	-28 ~ +21	-28 ∼ +21
RANGE	DHW	[°C DB]	-28 ~ +35	-28 ~ +35
NOISE	SPL at 1M*1	[dBA]	53	53
REFRIGERANT DATA	Туре		R32	R32
	Charge	[kg]	3.3	3.3
	Width	[mm]	1020	1020
DIMENSIONS	Depth	[mm]	330+30*3	330+30*3
	Height	[mm]	1350	1350
WEIGHT			132	143
ELECTRICAL DATA	Electrical Supply		1Ph, 230V, 50Hz	3Ph, 400V, 50Hz
	Maximum Current	[A]	35	13
	Fuse Rating	[A]	40	16

^{*1} Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 35°C, inlet water temp 30°C as tested to BS EN14511.

^{*2} Under normal heating conditions at outdoor temp: 2°CDB / 1°CWB, outlet water temp 35°C, inlet water temp 30°C.

^{*3} Grille

^{*4} When connected to hydrobox/cylinder, max flow rate is limited to 27.7 L/min.

Cylinder for Ecodan R32 ATW Hydronic Units



Ecodan Cylinder

The Ecodan Cylinder offers a highly adaptable heating solution for retrofit or new builds. Available in 200L and 300L, there is an Ecodan Cylinder to fulfill any household requirements. Designed specifically by Mitsubishi Electric to integrate with the Ecodan ATW (air-to-water) Hydronic Hot Water Heat Pump Range, the cylinder provides improved performance and faster heat-up times through the use of plate heat exchanger technology.

Fast commissioning via an SD card with energy monitoring functions built-in.

Key Features

- Simple graphical control
- Optional 2-Zone Space Heating Control
- Scale Trap Technology
- Floor Dry-Up Mode
- Pre-plumbed and wired for faster installation
- · SD card commissioning
- Energy monitoring as standard
- Compatible with home automation via Modbus





EHPT20X-VM6D

ERPT30X-VM6ED

CYLINDER				EHPT20X-VM6D"	ERPT30X-VM6ED
CYLINDER TYPE				Hydronic, heating only	Hydronic, heating and cooling
OUTDOOR CAPACITY RANGE (Nominal) [kW]			[kW]	5 - 14	8.5 - 14
NOMINAL HOT	WATER VOLUME		[L]	200	300
HEATING OPER	ATING DANGE	HEATING FLOW TEMP	20°C - 60°C		20°C - 60°C
HEATING OPEN	ATTING HANGE	DHW		40°C - 60°C	40°C - 60°C
COOLING OPER	RATION RANGE			N/A	5°C - 25°C
SOUND PRESSU	JRE LEVEL AT 1M		[dBA]	28	28
Max Flow Rate		Max Flow Rate	[L/min]	36.9	36.9
		Primary Pump		UPM3k 15-75 130	UPM3k 15-75 130
WATER DATA		Sanitary Hot Water Pump		UPSO 15-60 130 CIL2	UPSO 15-60 130 CIL2
WATER DATA		Connection Size (Heating / DHW)		28 / 22 (mm) compression	28 / 22 (mm) compression
		Primary Expansion Vessel	[L]	12	N/A
		Charge Pressure	[Bar]	1	N/A
		Control Thermistor	[°C]	1 - 80	1 - 80
	Water Circuit	Pressure Relief Valve	[Bar]	3	3
WATER SAFETY		Flow Sensor Min Flow Rate	[L/min]	5.0	5.0
DEVICES	DHW Cylinder	Control Thermistor	[°C]	0 - 75	0 - 75
		Pressure Relief Valve	[Bar]	10	10
		Legionella Prevention	[°C]	60 - 70	60 - 70
		Width	[mm]	595	595
DIMENSIONS		Depth	[mm]	680	680
		Height	[mm]	1600	2050
WEIGHT (EMPT)	//FULL)		[kg]	94/301	108/415
	Control Board (Optionally Powered	Electrical Supply		1Ph, 230V, 50 Hz	1Ph, 230V, 50 Hz
	by Outdoor Unit)	Breaker	[A]	10	10
ELECTRICAL	Booster Heater	Electrical Supply		1Ph, 230V, 50 Hz	1Ph, 230V, 50 Hz
DATA		Capacity	[kW]	2+4	2+4
		Max Running Current	[A]	26	26
		Breaker	[A]	32	32
MECHANICAL Z	ONES			DHW and 1 Heating Zone*2	DHW and 1 Heating Zone*2

Cylinder includes: Flow Temperature Controller (FTC6) with Main Controller and Temperature Sensors, Pumps & Valves for Zone 1 and DHW use, Flow Sensor, Plate Heat Exchanger, Scale Trap, Booster Heater and Expansion Vessel. Expansion vessel not included in ERPT30X-VM6ED.

^{*1} Available in Reversible (Heating & Cooling) Model.

^{*2} Optional 2-Zone Accessory Pack available.

Hydrobox for Ecodan R32 ATW Hydronic Units



Ecodan Hydrobox

With options for space heating, domestic hot water production or both, the Ecodan Hydrobox is a small form factor heating and cooling powerhouse. Now through the use of R32 refrigerant, the hydrobox is an environmentally conscious choice for whole home heating and cooling. The hydrobox can be connected to underfloor, fan coils and/or radiators to provide a whole home central heating solution. For users wanting potable hot water, the hydrobox can be connected to a third party coiled cylinder.

Key Features

- Simple graphical control
- Optional 2-Zone Space Heating Control
- Floor Dry-Up Mode
- Pre-plumbed and wired for faster installation
- SD card commissioning
- · Energy monitoring as standard
- Compatible with home automation via Modbus



ERPX-VM6D

HYDROBOX	ERPX-VM6D			
HYDROBOX TYPE	Hydronic			
OUTDOOR CAPACITY RANGE (Nominal) [kW]				5 - 14
HEATING OPERATING R.	ANGE	Heating Flow Temperature	[°C]	20 - 60
COOLING OPERATING F	RANGE	Cooling Flow Temperature	[°C]	5 - 25
SOUND PRESSURE LEV	EL AT 1M		[dBA]	28
WATER DATA		Max Flow Rate [L/min] Primary Pump		36.9
				Grundfos UPM 3K 15-75 130
		Connection Size (Heating / DHW)		1" BSP Parallel male thread ISO 228/1 - G1A
		Primary Expansion Vessel	[L]	10
		Charge Pressure [Bar]		1
WATER OAFETY	Water Circuit	Control Thermistor	[°C]	1 - 80
WATER SAFETY DEVICES		Pressure Relief Valve	[Bar]	3
5211020		Flow Sensor Min Flow Rate	[L/min]	5.0
		Width	[mm]	530
DIMENSIONS		Depth [mm]		360
		Height	[mm]	800
WEIGHT EMPTY / FULL			[kg]	34 / 38
	Control Board (Optionally	Electrical Supply		1Ph, 230V, 50Hz
	Powered by Outdoor Unit)	Breaker	[A]	10
		Electrical Supply		1Ph, 230V, 50Hz
	Booster Heater	Capacity	[kW]	2+4
	(Optionally Powered if Required)	Max Running Current	[A]	26
	aqaiioa)	Breaker	[A]	32

Hydrobox includes: Flow Temperature Controller (FTC6) with Main Controller and Temperature Sensors, Water Circulation Pump, Flow Sensor, Booster Heater and Expansion Vessel.

Third Party Cylinders

We offer a range of New Zealand made hot water cylinders manufactured to the highest standards, complete with a heat exchanger coil designed specifically for Mitsubishi Electric Hot Water Heat Pump Hydrobox Systems. Cylinders are supplied as standard with all water connections on the front and include standard electric element, thermostat and TPR valve. Sensor pockets are correctly positioned for the cylinder temperature sensor. There are sizes for mains pressure cylinders or buffer tanks up to 500 litres.





Manufactured in the United Kingdom

The Mitsubishi Electric manufacturing facility in Livingston, Scotland produces Ecodan Air Source Heat Pumps, Controls and Cylinders for the UK and European markets and includes a purpose-built Ecodan testing facility.

Black Diamond Technologies and Mitsubishi Electric – an Exclusive Partnership Since 1981

100% NZ OWNED The Mitsubishi Electric Product Range has been exclusively distributed by 100% locally Owned and Operated Black Diamond Technologies Limited for over 40 years in New Zealand.

The combination of an internationally trusted brand with the comfort of a locally owned and operated company means that you will always get the best products, the best local service and the best local support.

Based in Wellington with a further 4 support offices throughout New Zealand, Black Diamond Technologies Limited is here to help.



Our Vision – Creating New Zealand's Sustainable Future

Black Diamond Technologies Limited in partnership with Mitsubishi Electric, strives to develop and introduce new technologies for New Zealanders that will make our lives more comfortable while also creating a greener tomorrow.



Mitsubishi Electric Heat Pumps are installed through an extensive network of trained specialist dealers. This ensures you are supported with a superior level of product and installation quality.



Full 5 Year Warranty

Every Ecodan Air Source Heat Pump comes with a full 5 year warranty as standard, subject to the following conditions:

- The Ecodan purchase and installation is registered with BDT.
- The Ecodan must be installed and commissioned by a trained BDT installer.

For more information please visit our website or call our Customer Service Team.

www.mitsubishi-electric.co.nz | 0800 784 382



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