

Residential Product Group



Ecodan Air Source Heat Pumps

What does it involve?

Presented by

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Scottish Manufacturing



Mitsubishi Electric are proud to be recognised as a UK manufacturer for both heating and air conditioning products

Our UK factory is based in Livingston, Scotland. We offer regular factory tours to our corporate clients. This is an opportunity to visit with a group of corporate clients or on a bespoke trip to the facilities and witness first-hand the manufacturing and assembly of heating and air conditioning units and our R&D facilities. You will be able to see examples of the lean manufacturing procedures which are used throughout all of Mitsubishi Electric's factories worldwide.



Organise a tour

To find out more about our factory tours and to learn about upcoming tour dates [please contact us](#)

Manufacturing and R&D for Europe in Livingston

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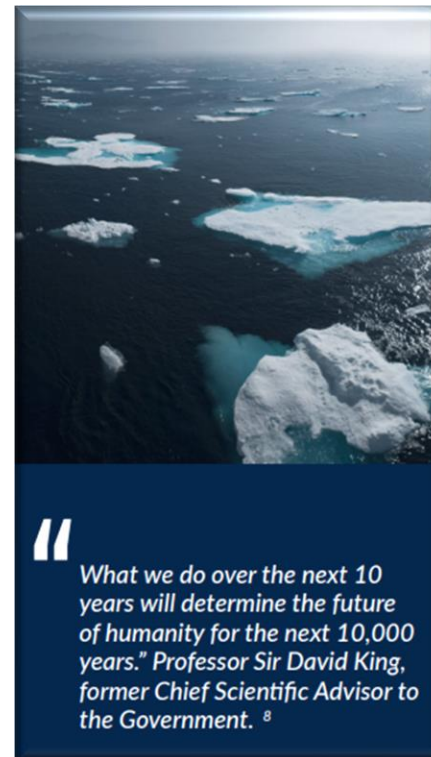
Manufacturing and R&D for Europe in Livingston

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The Netzero challenge

- June 2019 NetZero passed into law
- 80% reduction from 1990 levels
- Immediate and widespread action
- The way we heat buildings must change



What are the drivers?

- New build is essential for the growth of the heat pump market over the next few years, which looks like it will be driven by the Building Regulation changes.
- Following this, to meet the 600,000 units per year across the UK target deployment increase will need to come through retrofit of existing homes also.
- Research by the CCC showed heat pumps can be cost-comparable to gas boilers in new build already.
- Avoids the need for costly-retrofit at a later date.
- Quickly increase the deployment of low-carbon heat and combined with the retrofit market will help build the scale needed for net zero.



A report for the Committee on Climate Change

The costs and benefits of tighter standards for new buildings

Final report

2019

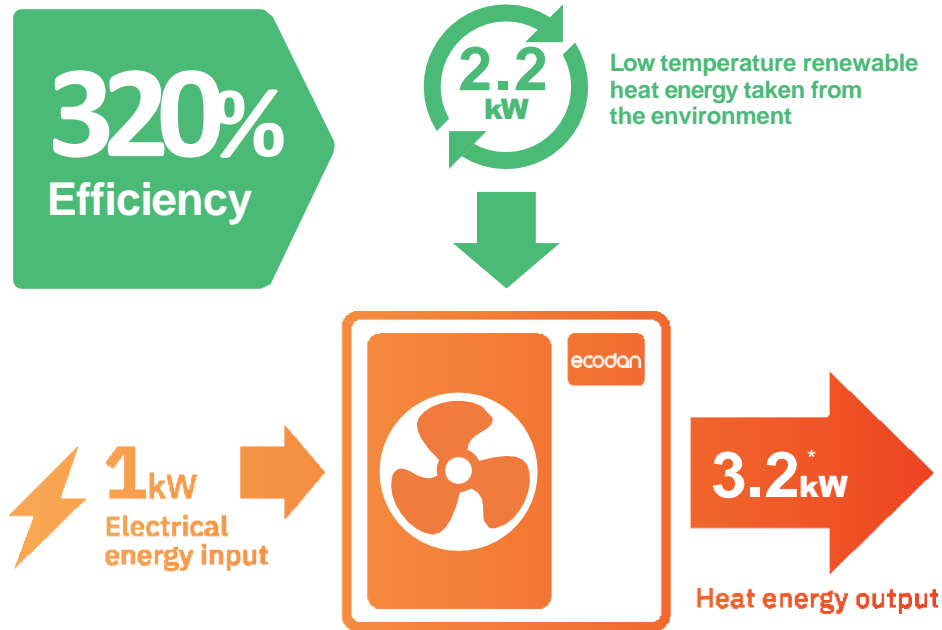
 Currie & Brown

Roadmap for heat pump deployment

- 2020: 35000 heat pumps installed
- 600k installs annually by 2028!
- CCC say 19 million required by 2050
- Trajectory of change...



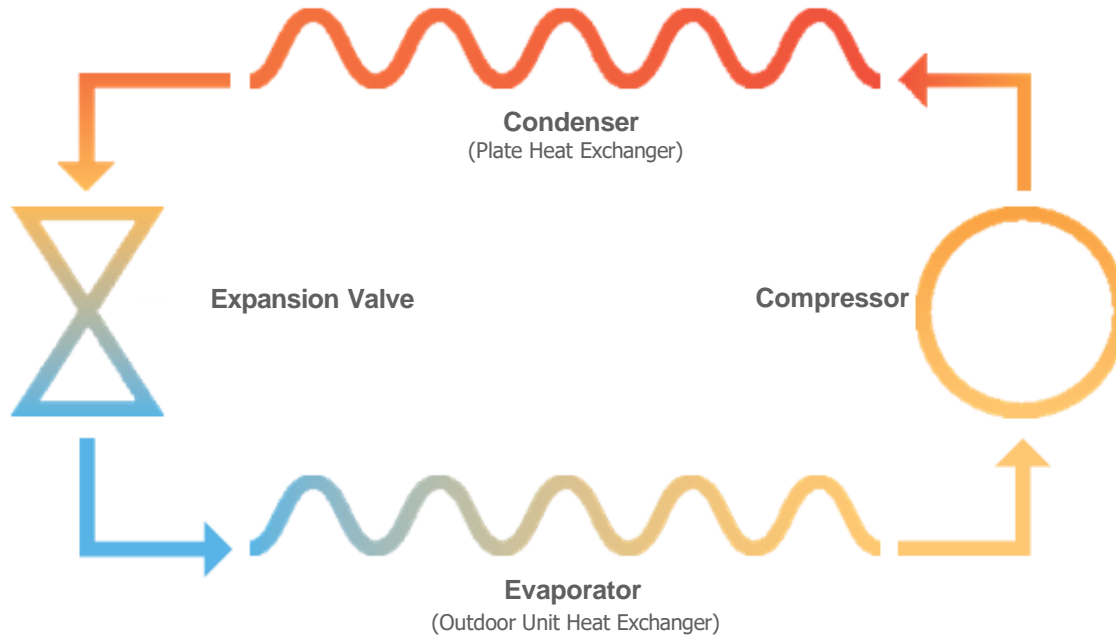
What is a Heat Pump?



A modern, energy efficient alternative to a fossil fueled boiler that uses renewable energy & low carbon electricity to heat space & water.

How Does a Heat Pump Work?

Vapour Compression Cycle



Refrigerant boils at -46°C meaning that even in temperatures of -20°C , there is still enough energy in the outdoor air to convert it to gas.

When you compress a gas it gets warmer – this warmth can be transferred via a heat exchanger to heat buildings & sanitary hot water.

Ecodan Training

Blended Online Learning

Accredited Ecodan Installer Requirements

Part 1 – Design & Application

- ✓ The Partner Programme - requirements and benefits
- ✓ Environmental and legal implications
- ✓ Heat pump technology - how the system works
- ✓ Coefficients of performance COPs
- ✓ The Ecodan equipment range
- ✓ Ecodan controls
- ✓ Basic heat loss calculations
- ✓ System sizing
- ✓ Equipment selection - heat emitters, pumps, hot water cylinders etc.
- ✓ Weather considerations
- ✓ Annual maintenance

Part 2 – Installation & Commissioning

- ✓ Legislation - F Gas requirements, Gas safe etc.
- ✓ Ecodan / S plan integration
- ✓ Installation requirements - electrical, plumbing, location etc.
- ✓ Commissioning
- ✓ Water system requirements
- ✓ Programming the controls
- ✓ System monitoring
- ✓ Commissioning faults - common faults and probable causes

+ unvented cylinder cert & insurance

Optional: Part 3 – Service & Maintenance + Part 5 - Hands On (part 2 & 3 completion necessary)

Online & Hands On Training

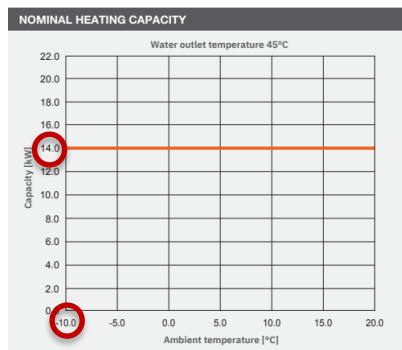
- online Learning Management System (LMS Platform)
- currently training around 400 engineers a month with 97% satisfaction rating
- full access for 12 months – attendees can log back in to access materials
- downloadable training material for offline use
- training centers:
 - Hatfield
 - Manchester
 - Scotland (coming end October 2023)



Ecodan Performance

minimal performance drop – 14kW means 14kW, even at -10°C

Mitsubishi Example



■ PUZ-HWM140VHA(-BS) PUZ-HWM140YHA(-BS)

Water outlet temperature [°C]	25		35		40		45		50		55		60	
	Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
-28	-	-	9.1	1.60	8.8	1.45	8.5	1.30	-	-	-	-	-	-
-25	-	-	10.0	1.65	9.7	1.50	9.3	1.35	-	-	-	-	-	-
-20	-	-	12.0	1.75	11.6	1.60	11.2	1.45	-	-	-	-	-	-
-16	-	-	14.0	1.85	13.5	1.70	13.1	1.55	12.8	1.45	12.0	1.30	-	-
-10	14.6	2.40	14.4	2.25	14.2	2.10	14.0	1.90	14.0	1.85	14.0	1.75	-	-
Max	-7	16.1	2.70	15.9	2.50	15.7	2.30	15.5	2.10	14.7	2.05	14.0	1.95	-
	-7	18.5	3.25	16.3	3.00	16.0	2.75	15.8	2.50	15.1	2.45	14.3	2.35	14.0
	-7	18.8	4.70	16.6	4.25	16.4	3.80	16.1	3.30	15.4	2.90	14.0	2.50	14.0
	12	17.1	5.25	16.8	4.90	16.6	4.55	16.4	4.20	15.6	3.70	14.8	3.20	14.1
	15	18.5	5.35	18.2	5.00	17.9	4.75	17.7	4.50	16.9	4.00	16.0	3.50	15.2
	20	21.1	7.25	20.8	6.50	20.5	5.75	20.2	4.95	19.3	4.40	18.3	3.80	17.3
	20													

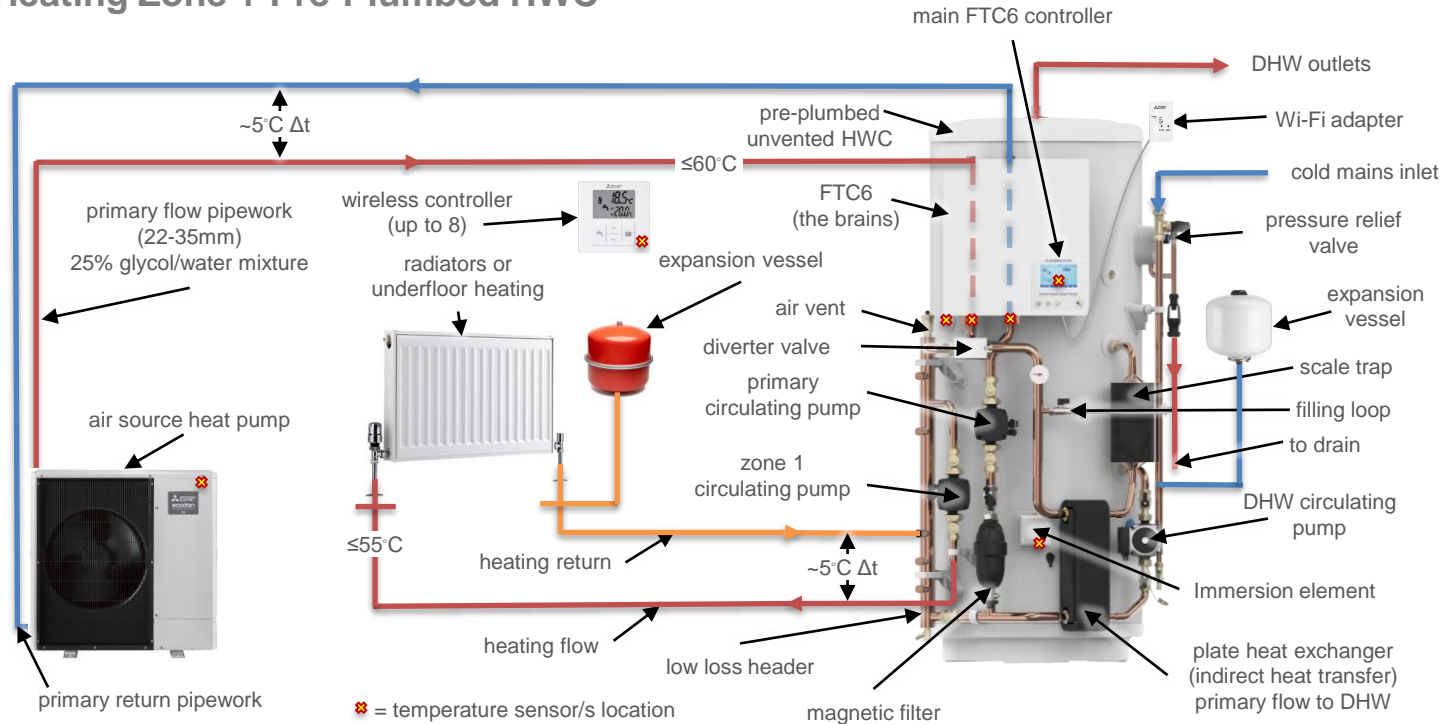
ASHP heat output (kW) varies at different flow and outdoor temperatures – it's good practice to check the output for the application & design conditions.

Competitor Example

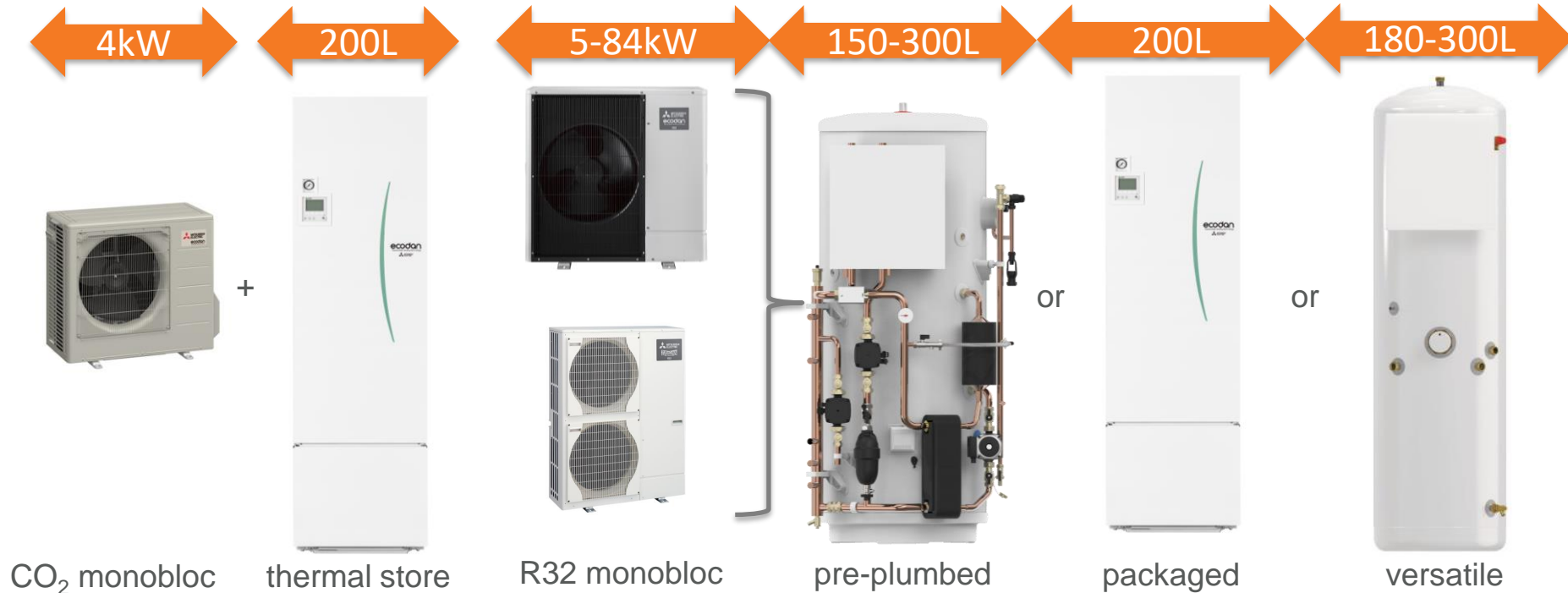
		35°C flow		40°C flow		45°C flow		50°C flow		55°C flow	
		Output	SCOP	Output	SCOP	Output	SCOP	Output	SCOP	Output	SCOP
3.5kW	-5°C	4.2	4.41	4.1	4.03	4	3.65	3.9	3.37	3.8	3.10
	-3°C	4.6		4.4		4.3		4.2		4	
	0°C	4.7		4.7		4.6		4.5		4.4	
	2°C	4.9		4.9		4.9		4.7		4.6	
5kW	-5°C	6.3	4.48	6	4.13	5.6	3.77	5.5	3.41	5.4	3.06
	-3°C	6.8		6.4		6.1		5.9		5.8	
	0°C	6.9		6.7		6.6		6.4		6.2	
	2°C	7.1		6.9		6.9		6.7		6.5	
7kW	-5°C	8.2	4.36	8.1	4.13	8	3.91	7.5	3.65	7	3.39
	-3°C	8.8		8.6		8.4		7.9		7.4	
	0°C	9.5		9.3		9.1		8.6		8.1	
	2°C	10		9.8		9.6		9		8.5	
10kW	-5°C	9.9	5.03	9.7	4.58	9.4	4.13	9.1	3.85	8.8	3.58
	-3°C	10.7		10.3		10		9.6		9.2	
	0°C	11.9		11.6		11.3		10.7		10.2	
	2°C	12.8		12.5		12.1		11.5		10.9	
12kW	-5°C	13.1	4.88	12.8	4.55	12.5	4.21	11.7	3.92	10.8	3.63
	-3°C	13.9		13.4		12.9		12.1		11.1	
	0°C	15.2		14.6		14.1		13.2		12.3	
	2°C	16		15.5		14.9		13.9		13	

Typical Ecodan Application

1 Heating Zone + Pre-Plumbed HWC

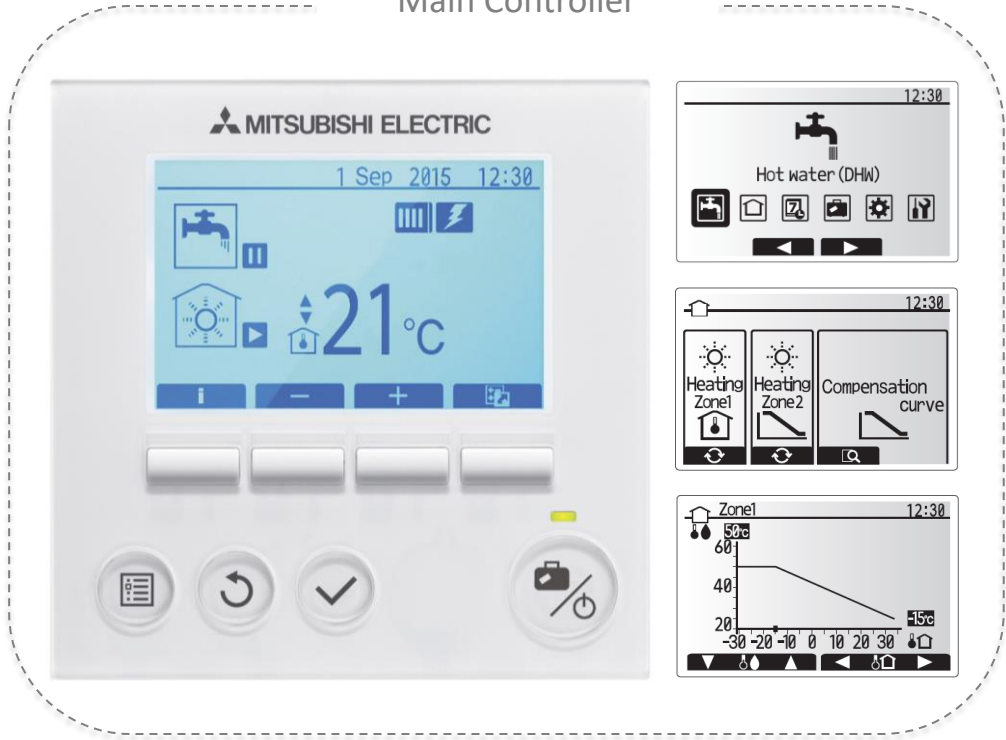


Ecodan – Mitsubishi's Branded Heat Pump Range



In-Home Controls

Main Controller



Wireless Simplified



Maintenance

MEUK Service Offering

MECHANICAL TASKS

- 1 Inspect and clean evaporator fins. Repair damaged fins using a fin comb if required
- 2 Check visually for signs of oil leaks which may indicate a refrigerant leak (check for leaks if necessary)
- 3 Check integrity of refrigerant / water pipe work and lagging, repair lagging if required
- 4 Check system operation
- 5 Check the antifreeze and if necessary top up the concentration as per manufacturer's recommendations
- 6 Check and clean the magnetic particle filter
- 7 Check system pressure
- 8 Release any air from the primary/heating systems

CONTROLLER TASKS

- 9 Check for the correct operation and temperature setting of the thermostats
- 10 Check the operation of the zone valves
- 11 Check the operation and the timing of the immersion heater

Annual Heat Pump Service

What's included:

- Clean evaporator coil, check anti-freeze, clean magnetic filters/strainers, remove trapped air, check primary pressure, check flow rate and adjust where possible/necessary, check controller settings and suitability, record all findings.

Annual System Service

What's included:

As per Annual Heat Pump Service plus the following

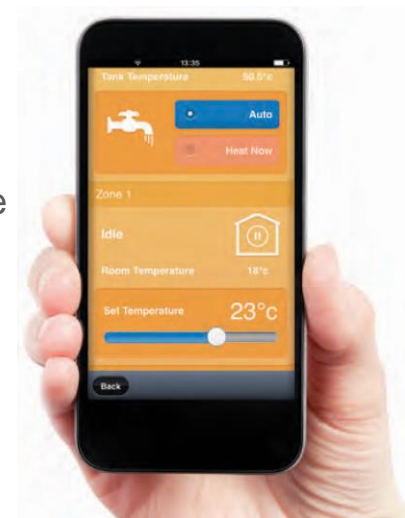
- Immersion heater function check, function of unvented safety equipment, charge expansion vessel, test heat up performance in heating and hot water mode, check and repair outdoor insulation.

MELCloud

Connectivity as standard across ecodan range



- access to remote maintenance and technical support
- view and control your heating and hot water from anywhere in the world
- reports on energy use, temperature history and more
- live weather feed at location of Ecodan
- available for any FTC6 based system, new or retrofit using a Wi-Fi interface



Residential Heating

ecodan®
Renewable Heating Technology



Q&A Session



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