Residential Heating

ecodan
Renewable Heating Technology

MITSUBISHI ELECTRIC

An Introduction to Ecodan Air Source Heat Pump Servicing & Fault Finding

Presented by | Jonathan Prescott

Please note….

This is an introductory course covering the maintenance, servicing and fault finding of Ecodan air source heat pumps and cylinders.

Whilst some of the procedures and checks covered herein can [and in certain cases should] be done by the homeowner or non-competent person, there are aspects of this presentation which will cover mains electrical works and G3 Unvented hot water requirements.

These need to be undertaken by persons who are suitably qualified and trained to do so and if you do not feel confident in undertaking these processes, please contact our site services team or one of our accredited Ecodan installers for further assistance.

We are here to help and are able to provide full service & fault finding courses at any of our 7 UK training centers

This course will cover…

- Brief Ecodan product range overview
- What legislation allows you to do
- Importance of preventative maintenance
- General fault finding & maintenance
- How ME are able to support you

After this course you should have…

- Confidence in working with heat pumps
- The ability to provide appropriate guidance
- Awareness of products, tools & resources
- An appetite for further learning
- Confidence in how ME can support you

Residential heating product range

Core heat pump range

Residential Air Source Heat Pump Monobloc Range (4kW to 84kW*)

4.0kW	5.0kW	8.5kW	11.2kW	14.0kW
				
QUHZ-W40VA R744 (CO2) Compact	PUHZ-W50VHA R410a Compact	PUHZ-W85VAA R410a Ultra Quiet	PUHZ-W112VAA R410a Ultra Quiet	PUHZ-HW140VHA R410a Zubadan

* Achieved by cascading 6 outdoor units

Compatible indoor cylinder range

Residential Packaged (Cased) & Pre-Plumbed Slimline, Standard & Solar Cylinders (150 to 300 litres)

Thermal Store	Packaged	Slimline	Standard	Solar
				
QUHZ only 200L 1 model	PUHZ only 200L 1 model	PUHZ only 150 & 170L 2 models	PUHZ only 150L to 300L 5 models	PUHZ only 210L to 300L 3 models

* Achieved by cascading 6 outdoor units

Heating control and accessory solutions

Intelligent range of controls and accessories to suit all applications

Integrated	Wireless	MELCloud	3rd Party	Fan Assisted Radiators
				
Flow Temp. Controller (standard)	Zone Temp. Controller (option)	Cloud System Controller (standard)	Standalone Controller (option)	iLife2 Slim 0.9kW & 2.1kW (option)

What does legislation allow you to do?

Ecodan & Fluorinated Gases (F-Gas)

- As an industry we have to adhere to F-Gas – it is similar to Gas safe
- Legislation covers refrigerants used in most heat pumps (R410a, R32, R407c)
- Aim is to minimise refrigerant leakage – addressing leak & pressure testing
- Regulations for hermetically sealed systems only apply with a charge >6kg
- Ecodan monobloc systems contain a charge below this and are exempt

Ecodan & G3 Unvented Certification

- Only engineers with G3 qualification can install & service unvented cylinders
- Gov. published building regulations approved document outlines G3 criteria
- G3 qualification is not always covered within a plumbing & heating course
- Ecodan cylinders are all unvented and therefore subject to these regulations

Summary of core activities

Recommended activities – do not undertake specific activities if your are not correctly certified

	Install Mono Systems	Install Split Systems	Service Heat Pumps	Maintain non F-gas Parts	Maintain F-gas Parts	Service Unvented Cylinders	Maintain Unvented Cylinders
Heating Engineer	■		■	■			
F-Gas Engineer	■	■	■	■	■		
G3 Engineer	■		■	■		■	■

The importance of preventative maintenance

Why is preventative maintenance so important?

- To comply with G3 unvented cylinder regulations
- To meet Mitsubishi Electric's warranty terms & conditions
- To maximise the life span of the system
- To ensure the best efficiency from the system
- To minimise life time running and servicing costs

Essential tools

Inhibitor or Glycol	Refractometer or PH Strips	Tools & Test Equipment	Fin Comb	Cleaning Products
				
Ensure the heating system performance is optimised	Determine the correct concentration of anti-freeze	To undertake basic system analysis tasks and investigation	Maximise the evaporator coil performance	Prevent the build-up of muck that can reduce performance

Basic heat pump servicing requirements

Minimal, quick and simple

- Clean dirt & dirt away from the heat exchanger coil & straighten any fins
- Check the outdoor unit fan is running quietly and freely when operating
- Check the electrical connections to ensure no loose or damaged connections
- Check pipework insulation behind the unit is not loose and in good condition
- Clean unit with warm, soapy water to remove dirt & pollen
- Check that the condensate and rain water can drain away freely & quickly

Basic cylinder servicing requirements

Minimal, quick and simple

- Visual check for water leaks & air in the system & clean the filter and strainers
- Visual check of all electrical connections for tightness and potential damage
- Check the concentration of antifreeze (glycol) or inhibitor in the system
- Check all circulation pumps and the 3 port valve to ensure correct operation
- Ensure flow rates in both heating and hot water modes are within tolerance
- Undertake G3 unvented servicing as per the published guidelines

Using the Ecodan controls for servicing

Advanced interrogation possibilities

- **Basic check of unit operation in heating and hot water modes**
- **Check Legionella function is active if required**
- **Use energy monitoring data to check performance of the system**
- **Use the service menu to check the fault history of the system**

Using the Ecodan controls for servicing - continued

Advanced interrogation possibilities

- **Use the running info option in the service menu to check the flow rate – code 540**
- **Simplified wireless controller – check for any sign of damage and check batteries**
- **3rd party controls (e.g. UFH controller) – check to make sure the Ecodan activates when required**

Additional servicing and maintenance guidance

Recommended actions to maximise customer satisfaction

- **Maintenance visit frequency to be every 12 months between inspections**
- **In low water quality regions, the visit frequency may need to be increased**
- **Failure to maintain a system within guidance could invalidate the warranty**
- **Complete the service record documentation in full for future reference**
- **Remember - good air flow and water flow are essential to peak performance**

General fault finding and maintenance checks

Basic overview of fault finding

With 80% of calls to our customer care team resolved over the phone, experience has generated a list of common issues:

- **Ecodan has been prohibited / stopped on the controller**
- **Power has been switched off to the Control board or immersion heater**
- **Batteries have run out on the wireless controller**
- **Low/No flow rate through the Ecodan**
- **All can be diagnosed on the controller and through MELCloud**

Basic overview of fault finding

Site related faults:

- U1 – High refrigerant pressure – flow related
- P1 – Thermistor fault – sensor settings in main controller not correct
- L9 – Electronic flow sensor low flow
- E6 – communication error between indoor and outdoor units.
- L5 – Indoor FTC thermistor fault
- UP – Over current fault

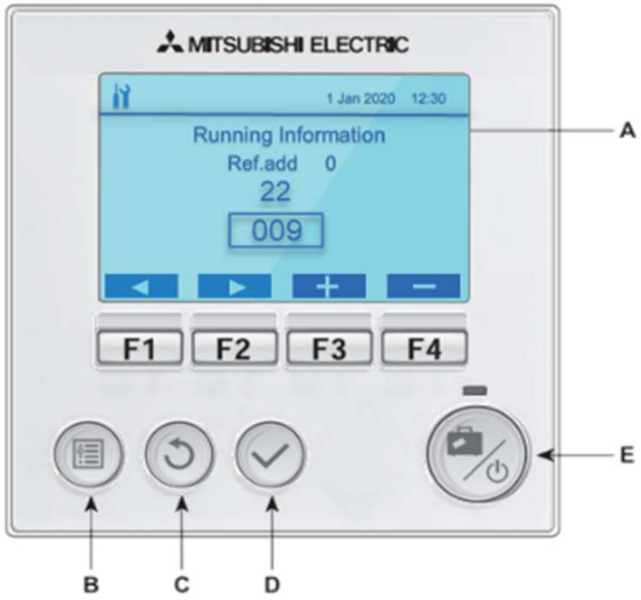
Basic overview of fault finding

Equipment related faults:

- **UF – Compressor Over current**
- **U6 – Inverter board over current**
- **P8 – Abnormal temperatures at the plate heat exchanger**
- **U8 – Outdoor fan motor abnormality**

Using the Ecodan main controller for fault finding

Press the menu button (B) to start



Letter	Name	Function
A	Screen	Screen in which all information is displayed
B	Menu	Access to system settings for initial set up and modifications.
C	Back	Return to previous menu.
D	Confirm	Used to select or save. (Enter key)
E	Power/Holiday	If system is switched off pressing once will turn system on. Pressing again when system is switched on will enable Holiday Mode. Holding the button down for 3 secs will turn the system off. (*1)
F1-4	Function keys	Used to scroll through menu and adjust settings. Function is determined by the menu screen visible on screen A.

*1
When the system is switched off or the power supply is disconnected, the cylinder unit protection functions (e.g. freeze stat. function) will NOT operate. Please beware that without these safety functions enabled the cylinder unit may potentially become exposed to damage.

MELCloud Wi-Fi Adapter (MAC-567IF)

To be provided as standard with all systems as of Autumn-2020, this tiny product is packed full of potential

- **Check the Wi-Fi adapter is connected and communicating with the router**
- **Assist the homeowner in ensuring their Ecodan heating system is registered**
- **Review the energy and temperature performance graphs to check operation**
- **Compatible with Alexa – check the setup**

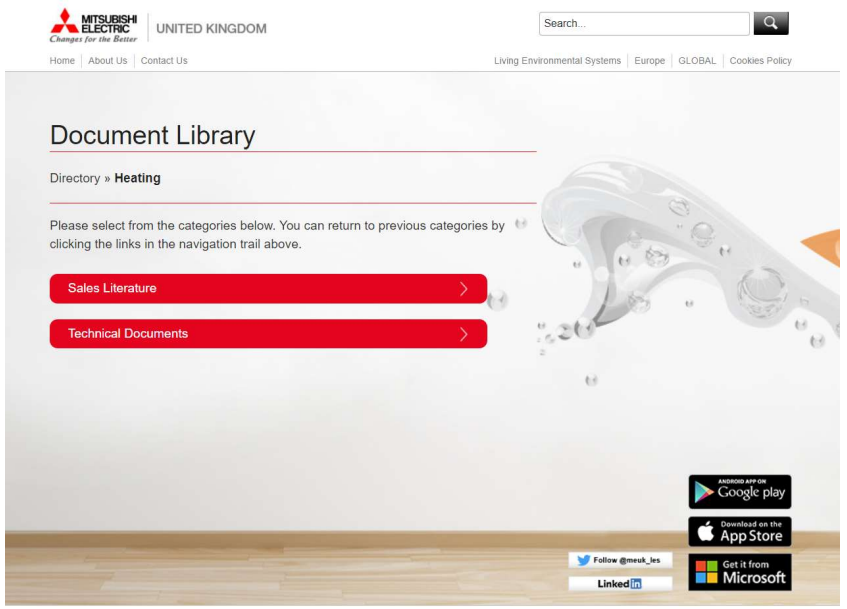
W: https://library.mitsubishielectric.co.uk/pdf/book/MELCloud_Ecodan_PI_Sheet

How Mitsubishi Electric are able to support you

Helpful sources of information

Web based document library & app

- **Full library of technical information**
- **Free accompanying smartphone app**
- **Ability to use app offline**
- **Key documents can be downloaded**
- **Both sales and technical info**



W: https://library.mitsubishielectric.co.uk/pdf/directory/heating

Ecodan commissioning, service & maintenance logbook

Benchmark approved documentation

W: https://library.mitsubishielectric.co.uk/pdf/book/Ecodan_Commissioning_Document

Helpful on-site service tools

Download our free ME Engineer app from all good app stores

- Ecodan Heating only section
- Error code lookup tool
- Service Info: Inverter Test & Thermistor values
- Spare part lookup feature
- Wi-Fi interface guide

MELConsole remote maintenance and technical support

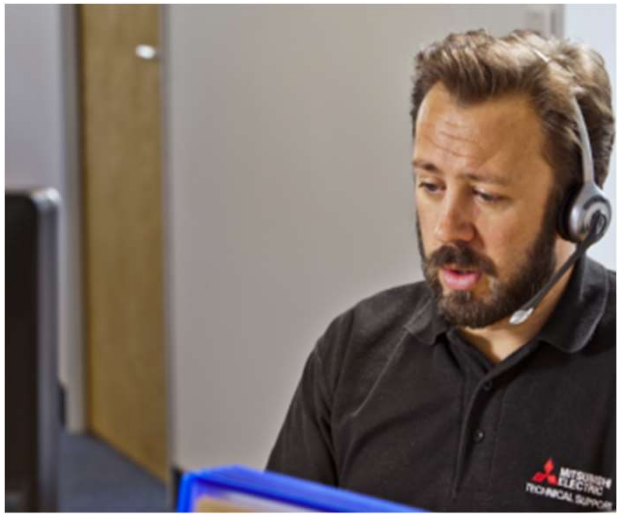
With the homeowners permission, our helpdesk can support you on-site and off-site

- **Instant full system model code clarification**
- **Remote monitoring and fault diagnostics**
- **Operational setting & performance check**
- **Solve your heating and hot water issue faster**
- **Reduce wasted time and travel (& carbon!)**

Mitsubishi customer care team

Staffed 24/7, 365 days a year, Mitsubishi Electric are here to help when it is most needed

- **UK call center (T: 0161 866 6089)**
- **Able to assist with all Ecodan related issues**
- **Full remote access on sites with MELCloud**
- **Warranty & spares service**
- **Site-services engineer reservation facility**



Our full service and fault finding course

Available at all of our 7 national training centers – reservations can be made by calling 0161 866 6089, option 6

- Theoretical training on core refrigeration circuit components and devices
- Hands on practical training session with live Ecodan heating systems
- Ecodan system main service controller interrogation walk-through session
- Inverter, compressor and fan motor testing session
- Further information and more courses available via our website

W: https://les.mitsubishielectric.co.uk/installers/installer-training

Final thoughts

Some key takeaways from our session today

- A good preventative maintenance regime is recommended and necessary
- A full annual service should be undertaken by a qualified engineer
- Always have the correct tools to hand
- We are here to help and recommend the use of our phone, web & app services
- We invite all engineers to attend our Service & Fault Finding Course

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Thank You

T: 01707 278 666
E: livingenvironmentalsystems@meuk.mee.com
W: les.mitsubishielectric.co.uk

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