



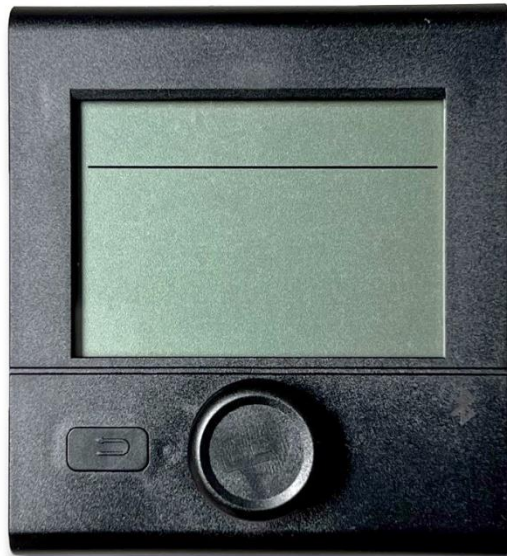
# MV Combi

# Digital Control

OPERATION MANUAL

ED 1.00

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## Preface

Thank you for purchasing the MV Combi Heater, a combined 6kW heater for hot air (4kW) heating and hot water (2kW) systems for motorhomes, using either diesel or electric power. This manual describes the methods, installation instructions, technical parameters, and fault information of the digital control for the MV Combi heater (hereinafter referred to as 'the heater').

Please read this manual carefully before use and keep it in a safe place for future reference.

### Note:

- This instruction booklet is subject to revision without notice but the instruction book is in conformity to the purchased product.
- The manual will attempt to answer any and all questions the user may have. If you have any further questions or find anything incorrect within this manual, please contact us directly.
- Please check that the heater is not damaged when first unpacking it and contact the dealer immediately if any problems are found.
- If any problems or faults arise during installation or operation, please contact us directly or any other customer service station authorised by our company. We shall do our best to offer you our full support.
- Do not perform any repair or modifications on the LCD switch! Any changes to the device or its controls can be dangerous and will void the warranty.
- If a new heater or a replacement is connected to the control switch, the process described in "Power On Start" must be repeated



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## Display and Control

### Key

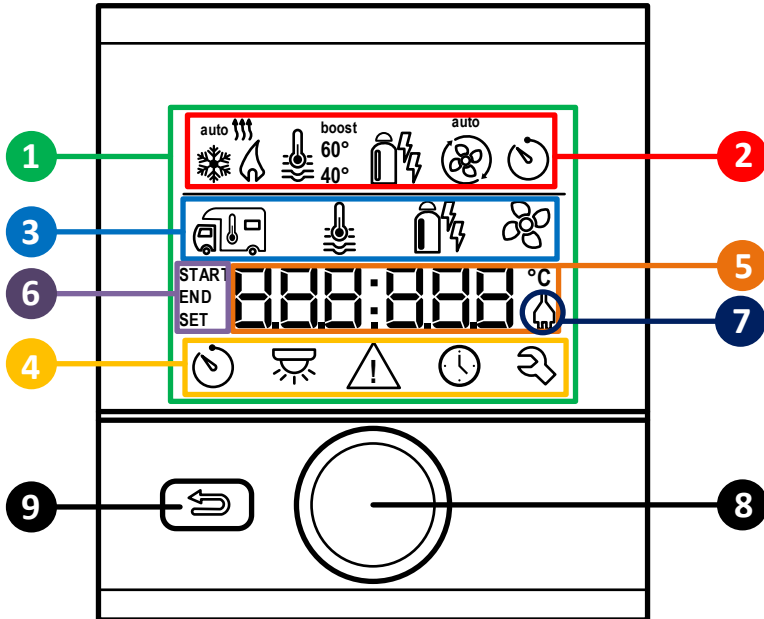


Figure 1

1. LCD Display

3. Upper Menu Bar

5. Parameter Settings Bar

7. 220V Electrical Supply Indicator

9. Return Button

2. Status Display Bar

4. Lower menu bar

6. Timing Display

8. Rotary Dial and Confirm Button



## LCD Display

Information will be displayed on the backlit LCD screen (1:1). The icons on the upper (1:2) and lower (1:4) menu bars can be selected using the rotary dial (1:8). The operating parameters will be displayed on the status display bar (1:2), the parameter settings bar (1:5) and the timing display (1:6). If a 220V power supply is connected, the electrical supply indicator (1:7) will appear.

During operation, the parameter settings bar can be alternated between time, and set room temperature. Press the return button (1:9) to disable selected parameters and return to the previous interface.

## Rotary Dial

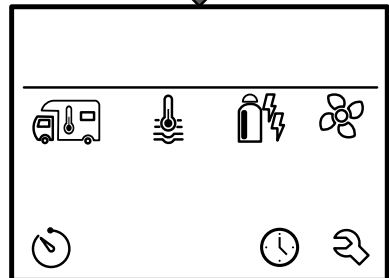
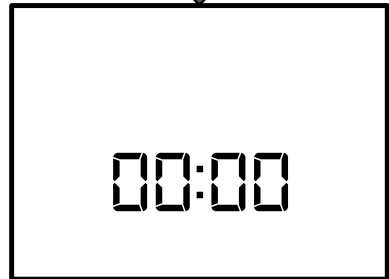
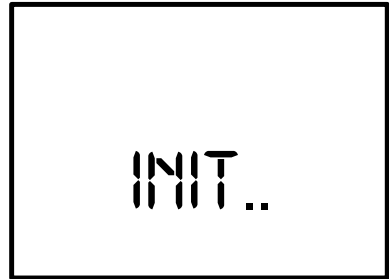
Use the rotary dial to select icons on the display. The icons can be selected by turning the dial either left or right, and they will keep scrolling between the upper and lower menu bars. Short press the dial to confirm parameters, or long press (more than 3 seconds) to switch the heater on and off.

## Return Button

Press the return the button to discard current option and return to the previous option.

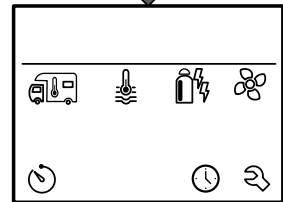
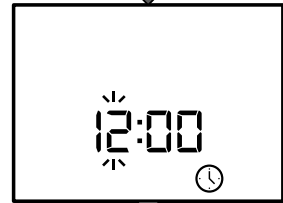
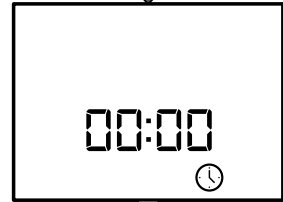
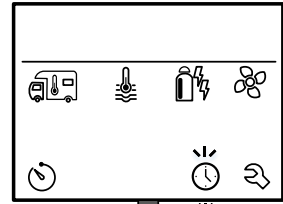
## Initial Power Up

1. When the display is first switched on, it will enter an initializing state.
2. After a few seconds the default time ('00:00') will appear on the screen.
3. Press the rotary dial to display the initial interface options on the LCD display.



## Setting the Time

1. Press the rotary dial to display the initial interface options on the display.
2. Use the rotary knob to navigate to the clock icon in the lower menu bar.
3. Enter the clock settings by pressing the rotary dial.
4. The hours will begin to flash. 'A—' represents 'AM' and 'P—' represents 'PM'. Use the rotary dial to select the hour and press it to confirm.
5. The minutes will begin to flash. Use the rotary dial to select the minutes in the same way. Press the rotary dial to confirm the time and exit the clock settings.

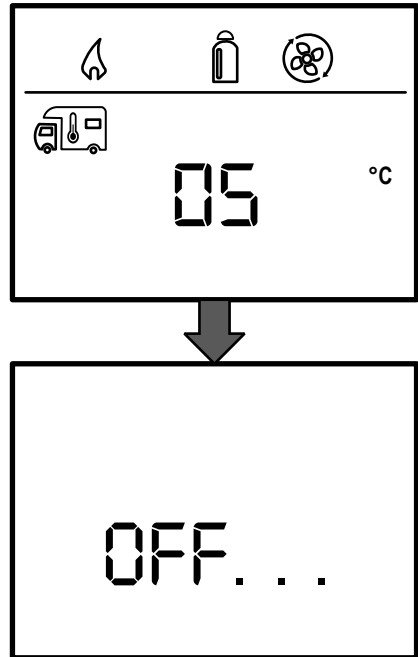




## Manual On/Off

Press and hold the rotary dial for more than three seconds to turn the heater on. The heater will continue to run until it is manually switched off.

Switch the heater off by pressing the rotary dial for more than three seconds. The heater will go into a two-minute cool down cycle, where the air fan will continue to run, so as not to get damaged by the radiating heat of the burner. The control will be unresponsive during this time.



## Air, Water or Mix Heating

### Selecting Energy Type

When beginning either hot air, hot water, or a heating mixture of both, you must first select what energy type the heater will use.

1. Press the rotary button to display the icon menu.
2. Use the rotary dial to select the desired energy mode and click the rotary dial again to confirm.

### Energy Modes

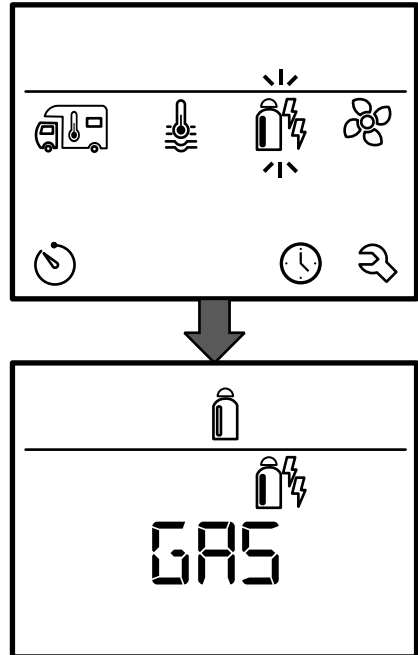
**GAS** – Only diesel from the connected diesel line is used.

**MIX 1** – Electric supply 900W + Diesel.

**MIX 2** – Electric supply 1800W + Diesel.

**EL 1** - Electric supply 900W.

**EL 2** - Electric supply 1800W.



If no energy type is selected and the heater has been switched on, the last set type or default type (diesel) will be used.

## Air Heating

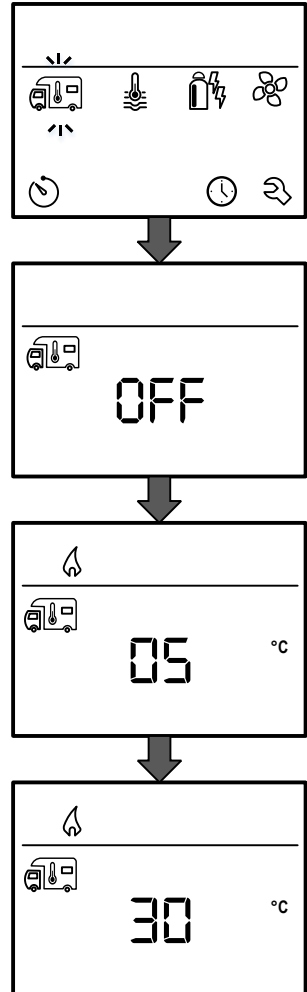
Click the rotary dial to display the icon menu.

Select the motorhome (air heating) icon and confirm by pressing the rotary dial.

Use the rotary dial to select your desired temperature and confirm by pressing the rotary dial. The temperature range is 5 - 30°C.

Once confirmed the flame icon will appear on the status display bar indicating the heater is running. It will continue to flash until the desired temperature has been reached.

**Note:** Accuracy of the reading is dependent on the location of the temperature probe – See installation manual for more details.

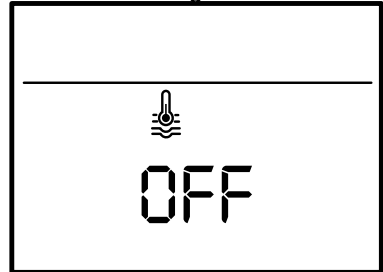
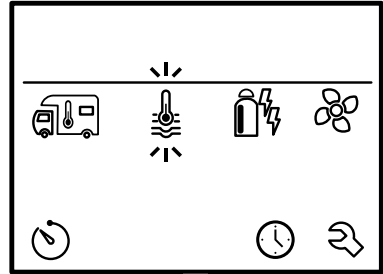


## Water Heating

Click the rotary dial to display the icon menu.

Select the water temperature setting icon and confirm by pressing the rotary dial.

Use the rotary dial to cycle through the heating value and confirm by pressing the rotary knob.



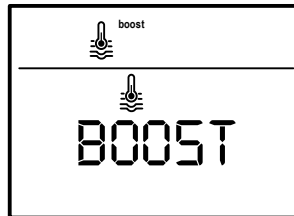
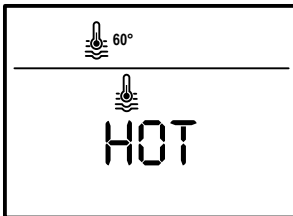
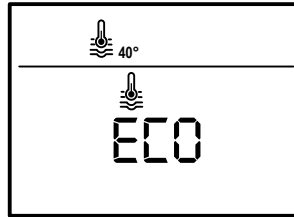
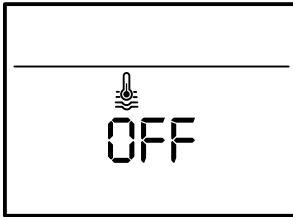
## Water Heating Modes

**OFF** – Water heating is off, no water heating icon.

**ECO** – 40°C water temperature

**HOT** – 60°C water temperature.

**BOOST** – Water heating will run for 40 minutes until it reaches 60°C. Air heating will continue for the duration.

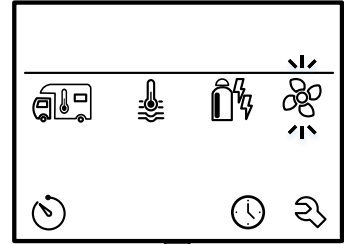


## Fan Speed

Click the rotary dial to display the icon menu.

Navigate to the fan icon and press the rotary dial to confirm.

Use the rotary dial to select the desired fan setting and confirm by pressing the rotary dial.



## Fan Working Modes

**OFF** – Turn the fan off.

**VENT** – No heat, circulation cooling fan only.

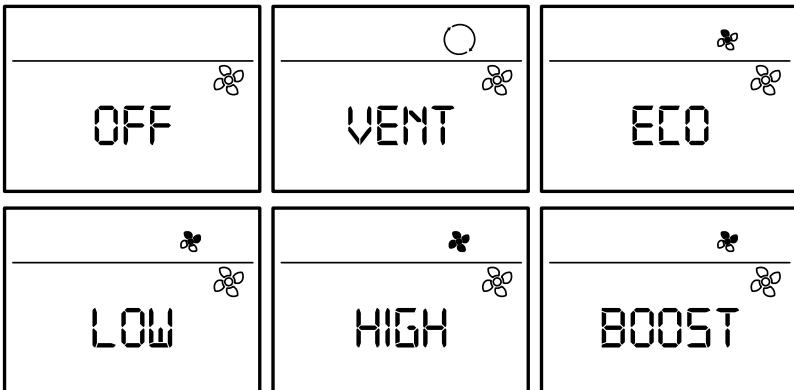
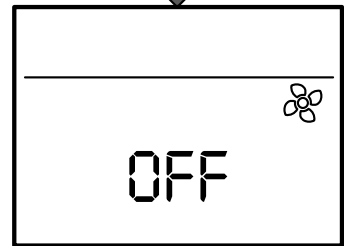
The speed of the fan can still be selected. **Note:** Wear of the motor will increase depending on frequency of use.

**ECO** – Low fan speed

**LOW** – Intermediate fan speed

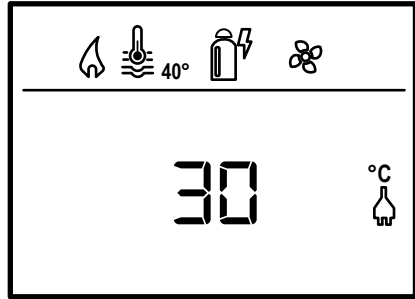
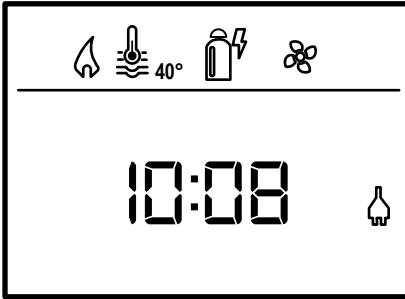
**HIGH** – High fan speed. **Note:** Higher fan speeds result in higher power consumption, higher noise levels and increased motor wear.

**BOOST** – The heater will run on high fan mode for a short time.



## Start Heating

After all heat settings have been selected, press the back key, or wait 10 seconds to enter the timing interface, and the heater starts. The display alternated between the time and set temperature.



## Stop Heating

To stop heating, hold the rotary control for more than 3 seconds.

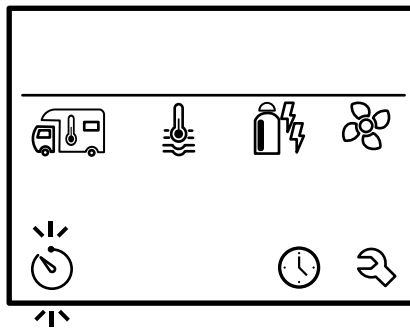
## Timing Heat Settings

### **WARNING: DANGER OF TOXIC GASES**

The timing setting will switch the heater on regardless of operator. Exhaust gases from the heater can be toxic in confined spaces such as garages, and workshops etc. If the vehicle is parked in a confined space:

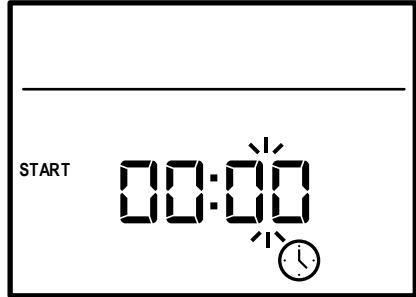
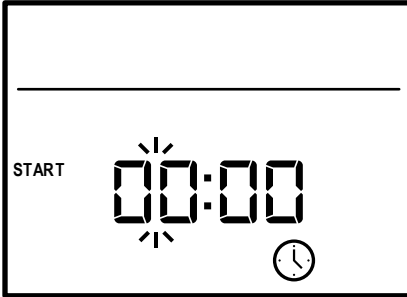
- Turn off the fuel supply to the heater.
- Turn off the timing settings on the LCD display.
- Turn off the heater by pressing holding the rotary switch for 3s.

Press the rotary dial to display the icon menu. Navigate to the timing setting and press the rotary dial to confirm.



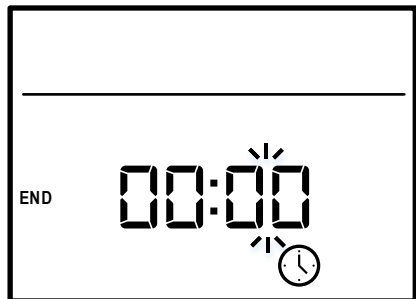
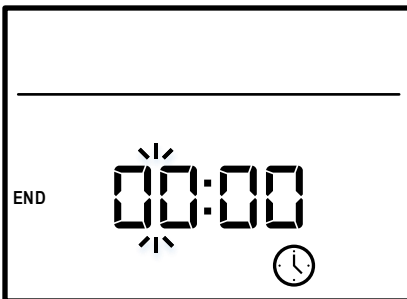
## Setting the Heater Start Time

Once the timing setting icon has been selected, use the rotary dial to select the heater's start time. Select the hours first then the minutes, pressing the rotary dial to proceed, and confirm each setting.



## Setting the Heater End Time

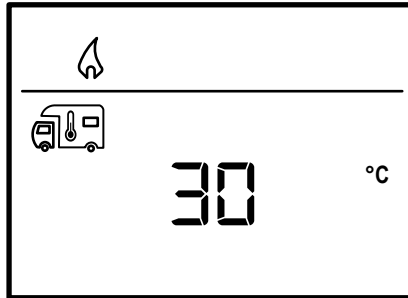
Use the rotary dial in the same way as before to select the heating end time. Select the hours first then the minutes, pressing the rotary dial to proceed, and confirm each setting.





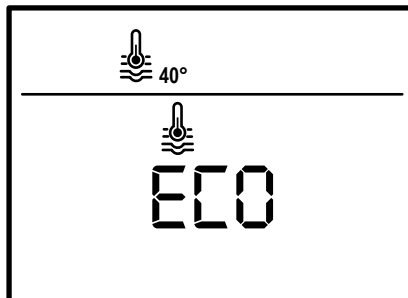
## Setting Room Temperature

Use the rotary dial to select the desired room temperature and press to confirm.



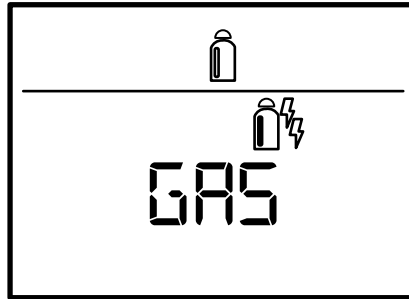
## Setting the Water Temperature

Use the rotary dial to select the desired water temperature and press to confirm.



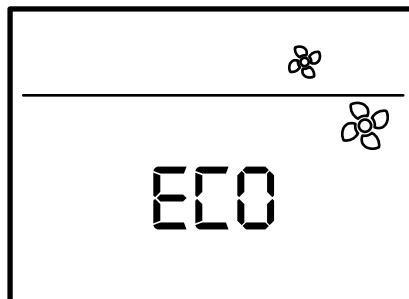
## Setting the Energy Mode

Use the rotary dial to select the desired energy mode and press to confirm.



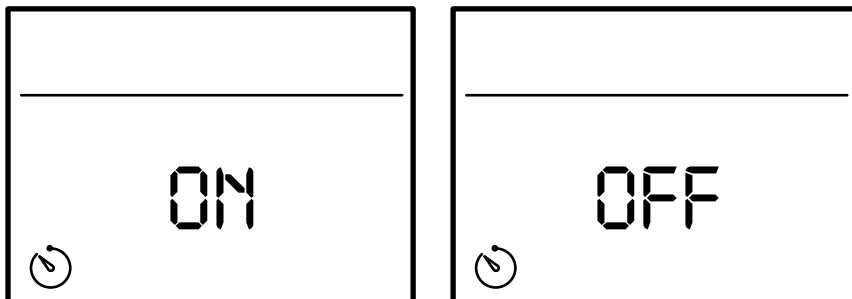
## Setting the Fan Level

Use the rotary dial to select the desired fan level and press to confirm. The fan level is selected only after the room temperature mode has been set.



## Timing Enabled

Use the rotary dial to enable the set timing setting (ON) or disable it (OFF). If 'OFF' has been selected, the timing has been disabled, but the settings have been saved.



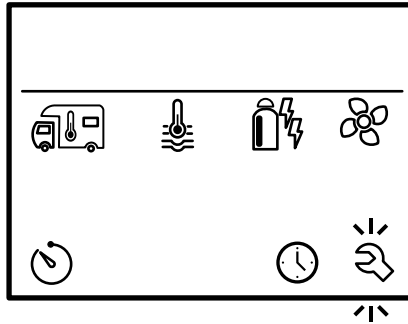
The timing switch remains enabled only once until it is disabled (turned off) or powered down. If the time switch is programmed and enabled, the timing switch icon is displayed in the status line (2). The timing icon flashes if the time switch is enabled and activated.

Once the timing has been set, use the rotary dial to select the timing setting to enable or disable the function.

## Settings

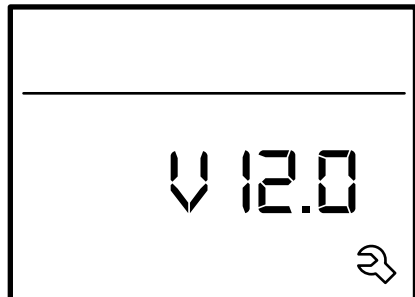
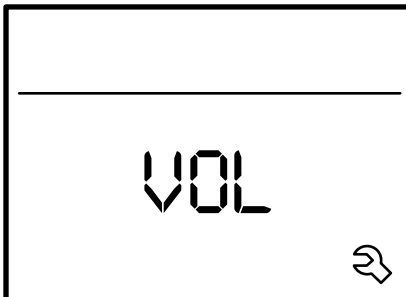
All selected settings will remain even if the power to the display has been switched off.

Use the rotary dial to select the settings icon and press it to confirm.



## Voltage

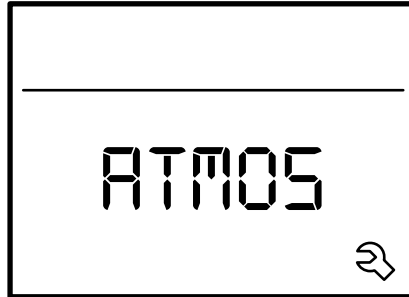
The first setting is voltage (VOL). Press the rotary dial to select it. The display shows the current voltage detected. Press the return button to go back.



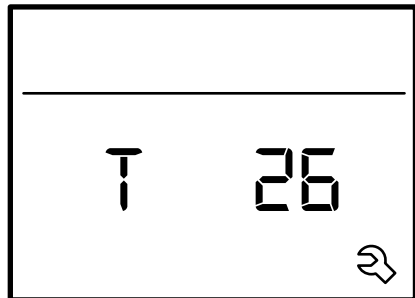
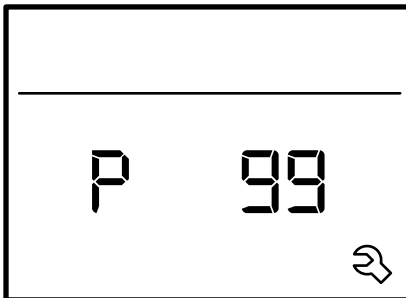
## Ambient Temperature and Air Pressure

Select the settings icon in the lower menu bar.

Use the rotary dial to select the atmosphere (ATMOS) setting.



Once selected, use the rotary dial to switch between atmospheric pressure (example = 99kPa), and ambient temperature (example = 26 degrees Celsius).



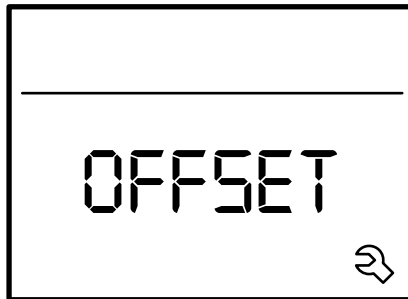
## Offset Setting

The heater's external temperature sensor probe can be adjusted separately depending on the installation of the sensor.

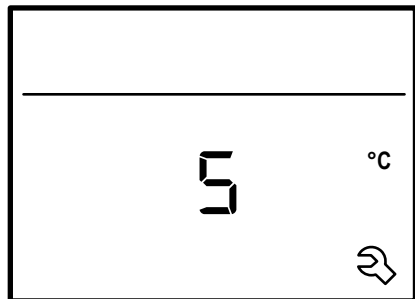
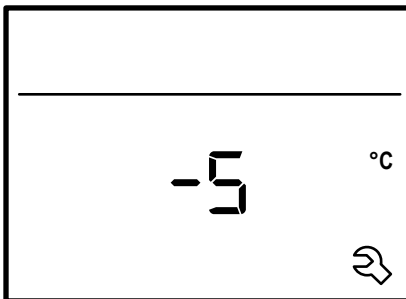
The offset setting can be in a range of  $-5^{\circ}\text{C}$  to  $5^{\circ}\text{C}$ , with an error of  $1^{\circ}\text{C}$ .

Select the settings icon in the lower menu bar.

Use the rotary dial to select the offset setting and press the dial to confirm.



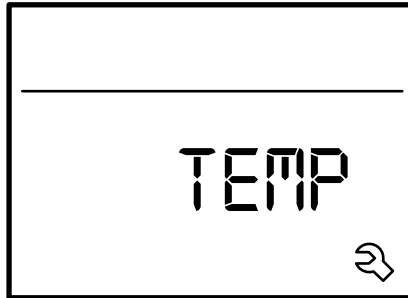
Select your desired offset value and click the rotary dial to confirm it.



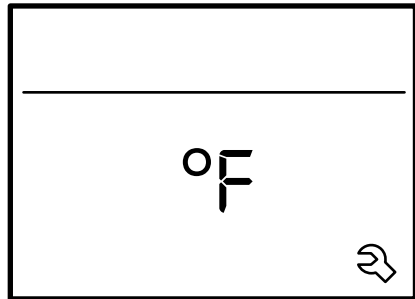
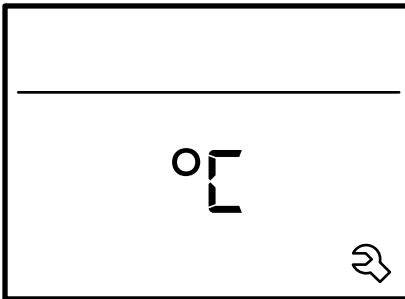
## Converting Temperature Scale

Select the settings icon in the lower menu bar.

Use the rotary dial to select the temperature setting and press it to confirm.



Use the rotary dial again to switch between Celsius and Fahrenheit.



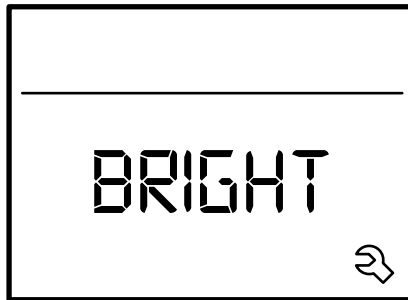
Press the rotary dial to confirm the setting.

## Screen Brightness

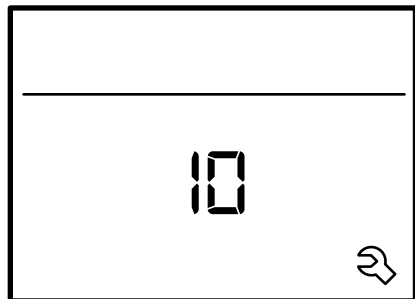
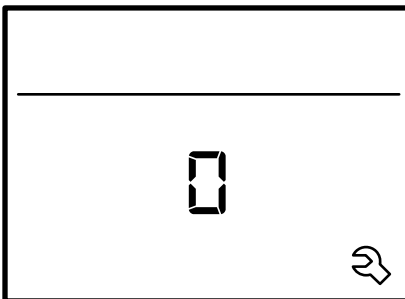
The LCD display has 10 levels of adjustable brightness. The default brightness setting is 6.

Select the settings icon in the lower menu bar.

Use the rotary dial to select the brightness (BRIGHT) setting and confirm by pressing the dial.



Use the rotary dial to select your desired brightness and confirm by pressing the dial. Press the return button to go back at any time and keep the default brightness level (6).

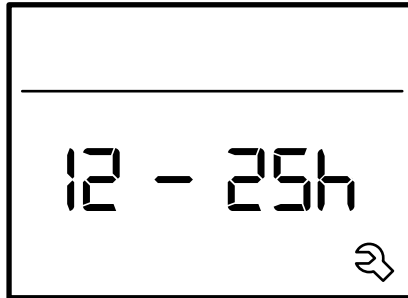




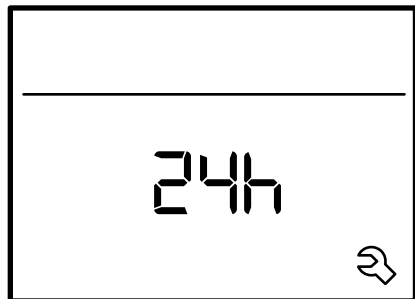
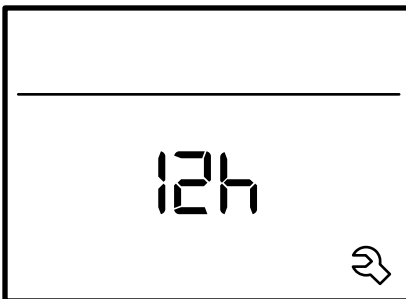
## Time Format

Select the settings icon in the lower menu bar.

Use the rotary dial to select the time format setting (12-24h) and press the dial to confirm.



Use the rotary dial to select between a 12h clock, or a 24h clock and press the rotary dial to confirm. Press the return button at any time to go back and continue with the default setting (24h).



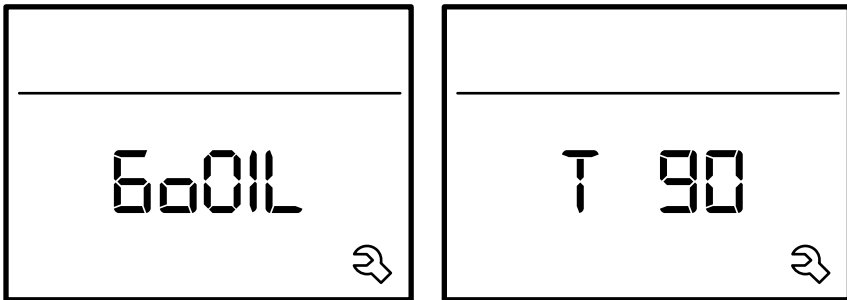
## Fuel Priming Function

### ATTENTION:

- Not to be used in normal heater operation
- Disconnect the fuel line from the heater first, to prevent flooding of the heater and place in a suitable receptacle.

Select the settings icon in the lower menu bar.

Use the rotary button to select the fuel priming setting (GoOIL).



Press the rotary dial to enter the fuel priming mode – the pump will begin to pulse rapidly.

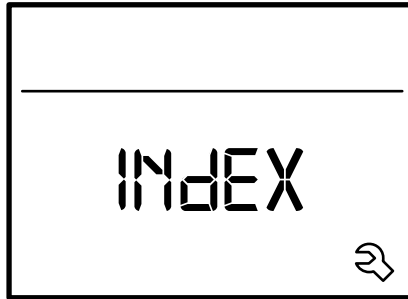
The default runtime is 90 seconds. The time can be adjusted using the rotary dial.

The pumping will automatically stop after the displayed pumping time, or by pressing the return button at any time.

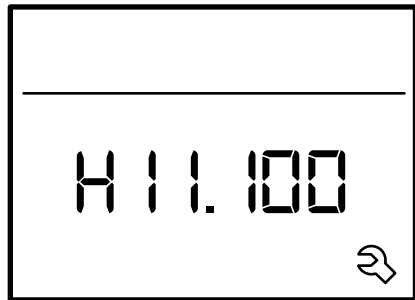
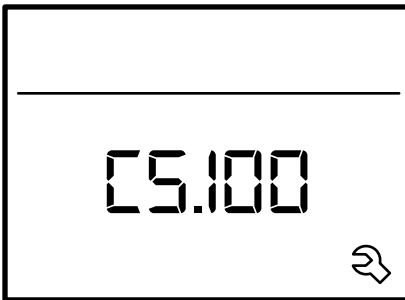
## Software Version

Select the settings icon in the lower menu bar.

Use the rotary dial to select the INdEX setting and press the rotary dial to confirm.



Use the rotary dial to view the version of both the LCD display and the heater's main ECU.



### Example:

C5.100 – LCD Display Version

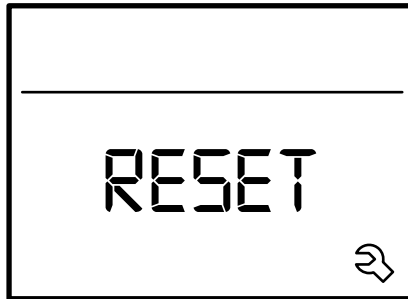
H11.100 – Heater ECU Version

## Reset to Factory Settings

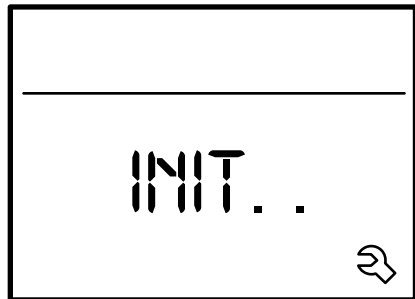
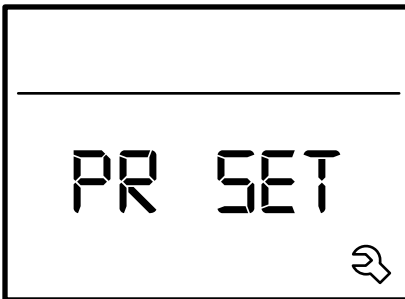
Resetting to factory settings resets all set LCD display settings to the original default settings.

Select the settings icon in the lower menu bar.

Use the rotary dial to select the reset setting and press the dial to confirm.



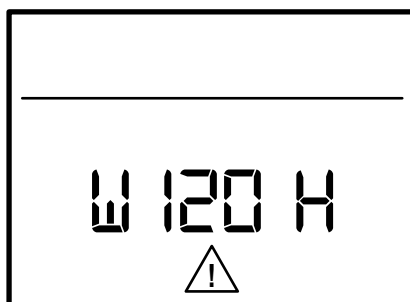
Press the rotary dial on the 'PR SET' display and reset to factory settings, or the return button to go back. Once confirmed the display will begin initializing.



## Fault Display

How to read the alert code: --

Use the rotary button to select the fault icon and click the rotary button to display the current warning code (for troubleshooting, please refer to the fault codes on page 33 - 34).



The faults include those occurring automatically and faults occurring manually after repair.

A fault occurring automatically occurs when an operating parameter has exceeded a defined range of normal operation and reaches an undefined state. In this case, the equipment will continue to run, and the fault warning symbol will be displayed in the lower menu bar without a fault code.

After the fault is repaired, the warning symbol will disappear automatically (it can also be manually restored), and the heater will continue to work according to the original settings.

**For example:** Fault code W120H. A manually recovered fault means that the fault code is displayed in the parameter setting bar when the fault occurs. The cause of the fault can be determined and remedied with the help of the troubleshooting guide.

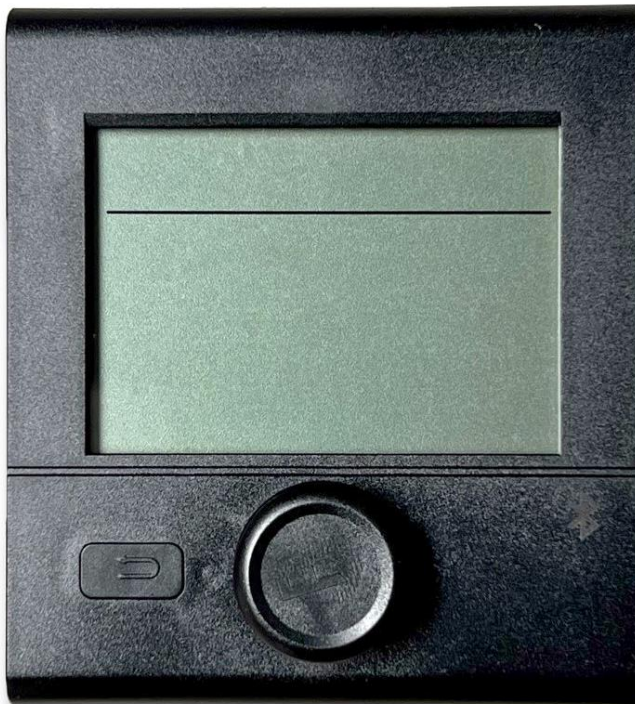
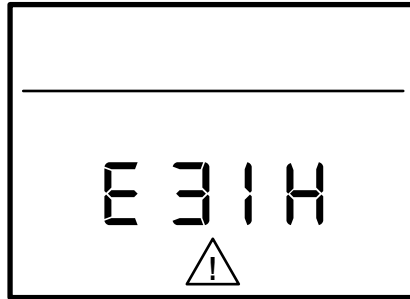


The fault code disappears after a few seconds, and the warning also disappears. The warning symbol is displayed in the lower menu bar.

To begin heating after the fault is identified and resolved, you must first eliminate the fault code. Press the rotary button to display the fault code. Then, press the rotary button again, the displayed fault code disappears, and the interface returns to the initial time interface.

Re-enter the heating parameters to initiate heating. If the fault is eliminated, the heater will operate as normal, otherwise, the fault will occur again. The LCD switch will jump to the “Fault” menu again, and the warning symbol will be displayed again. The affected equipment will still be in the warning state. Since the fault has not been eliminated, if you want to return to the setting level, press the return button.

**For example:** Fault code E31H. Shutdown and power-off can also eliminate faults.





## Technical Parameters

**Display:** LCD, black and white, with backlight.

**Dimensions:** 92×103×40mm

**Working Temperature:** -25°C ~+ 60°C

**Storage Temperature:** -25°C ~+ 70°C

**Power Supply:** DC 10.5 ~ 16v

**Power Consumption:** Max.65mA (100% backlight)

**Standard Current:** 10mA

**Quiescent Current:** 3mA

The above parameters are subject to change without notice.

### Maintenance:

The LCD switch is relatively maintenance free. To clean the front panel, use a damp cloth or neutral soap solution.





## Installation

### Location

Install the LCD switch in a waterproof and moisture proof location. Install the LCD switch at the height of your eyes for easy reading and operation. Lay the connector cable connecting the control in a tension-free circuit. You should be able to pull the LCD switch out of the mounting hole by 20cm so that no tensile stress is applied to the plug connection. Never pull the connector cable connecting to the LCD switch.

### Assembly

1. Prepare a mounting opening as shown in figure 2.
2. Remove the mount surround from the back of the control and fix it around the mounting opening with the 4 x M3×10 screws provided, as shown in figure 3.
3. Remove the rotary knob by gently pulling it off.
4. Hang the front panel of the LCD switch on the holder (4:1).
5. Fasten the LCD switch to the holder, by pressing securely (4:2)
6. Secure the LCD switch with the M3×6 screw provided (4:3)
7. Install the rotary dial back on to the shaft (4:4)

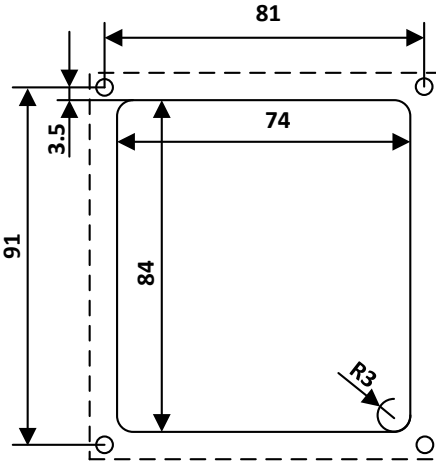


Figure 2

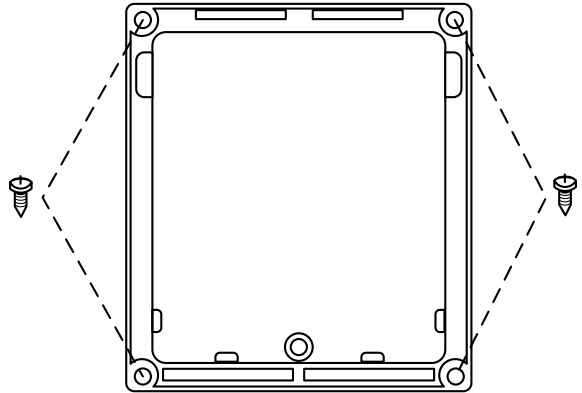


Figure 3

### Parts Included with Control Switch

- 1 x Main Control Switch
- 1 x Auxiliary Power Supply (Not necessary for operation)
- 4 x M3 x 10 self-tapping screws
- 1 x M3 x 6 self-tapping screw
- 1 x 6m Connection Cable

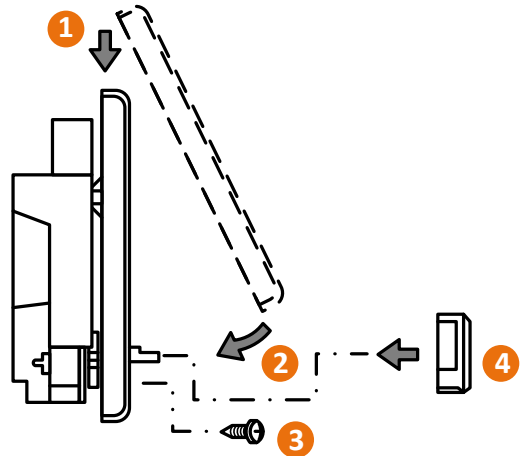


Figure 4



## Fault Codes

Code	Description	Troubleshooting Method
10	High voltage	Check Vehicle Supply
11	Low voltage	A) Check vehicle supply B) Check all connections and look for any damage in the wiring loom
21	Air outlet open circuit	Check whether the sensor is in good condition
22	Air outlet short circuit	Check whether the sensor is in good condition
23	Water temperature sensor open circuit	Check whether the sensor is in good condition
24	Water temperature sensor short circuit	Check whether the sensor is in good condition
25	External temperature sensor short circuit	Check whether the sensor is in good condition
26	External temperature sensor open circuit	Check whether the sensor is in good condition
27	Combustion temperature sensor open circuit	Check whether the sensor is in good condition
28	Combustion temperature sensor short circuit	Check whether the sensor is in good condition
31	Ignition failure	A) Check the fuel supply (air, dirty, or lack thereof) B) Check all inlets for blockages C) Check glow pin and flame sensor
32	Combustion Failure	A) Check the fuel supply (air, dirty, or lack thereof) B) Check all inlets for blockages C) Check the flame sensor
33	Flame Sensor Failure	A) Check the flame sensor leads B) Check the flame sensor
41	Hot air outlet temperature is too high	Check whether the air inlets and outlets are blocked
42	Hot air overheat switch protection	A) Check whether the air outlet is blocked B) Check the heater overheat switch
43	Water temperature is too high	A) Check whether the water tank is short of water B) Check whether the sensor is in good condition C) Check whether the water tank is short of water D) Check whether the sensor is in good condition
44	Water temperature overheat switch protection	A) Check whether the air outlet is blocked B) Check the water temperature overheat switch
45	Continuous overheat fault	A) Check whether the air outlet is blocked B) Check the water temperature sensor C) Check heater sensor
51	Communication failure	Check the connection cable



<b>61</b>	Fuel pump open circuit	A) Check whether the oil pump lead is damaged B) Check whether the oil pump lead connection is reliable C) Replace oil pump D) Replace ECU
<b>62</b>	Fuel pump short circuit	A) Check whether the oil pump lead is damaged B) Check whether the oil pump lead connection is reliable C) Replace oil pump D) Replace ECU
<b>63</b>	Glow pin open circuit	A) Check power supply voltage B) Check the normal temperature resistance of the glow pin (0.2Ω/12V) C) Clean up carbon deposits on glow pin D) Replace ECU
<b>65</b>	Glow pin has no drive	Replace ECU
<b>81</b>	Combustion air fan open circuit	Check combustion air fan
<b>82</b>	Combustion air fan failure to start	A) Check motor lead connection B) Check combustion air fan
<b>83</b>	Combustion air fan speed too low	Check combustion air fan
<b>84</b>	Air motor open circuit	Check air motor
<b>85</b>	Air motor failure to start	A) Check air motor lead B) Check air motor
<b>86</b>	Air motor speed is too low	Check air motor
<b>110</b>	Window opening alarm	Check window switch connection cable
<b>120</b>	Low voltage alarm	Recommend charging
<b>220</b>	220V no connection	Check AC 220V power supply system



## Notes

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