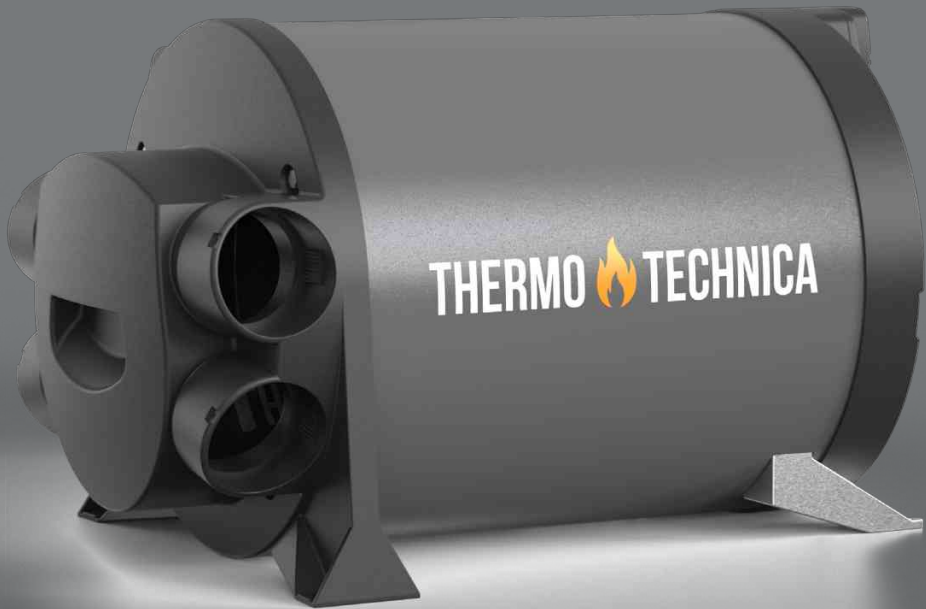


THERMO  TECHNICA



COMBI AIR & WATER HEATER MANUAL

LPG, DIESEL & Electric models

QUIET AND EFFICIENT AIR & WATER HEATER WITH NEW
HIGH-TECH VARIABLE SPEED AND LOW-NOISE FANS

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1 / INTRODUCTION

Thank you for purchasing a Thermo Technica Combi Heater. This service manual describes installation and operation procedures, maintenance recommendations and troubleshooting tips.

Please read carefully before using the product to ensure safe and efficient use.

When installed through authorised dealers, this product is subject to two-year factory limited warranty. For terms and conditions of the warranty please see our website.

2 / PRODUCT INFORMATION

1.1 Ordering Information

SKU #	DESCRIPTION
TTYFY30-4E	4Kw LPG Combi Full Kit
TTYFY30-4E-BB	4Kw LPG Combi Bare Bones Kit
TTYFY30-6E	6Kw LPG Combi Full Kit
TTYFY30-6E-BB	6Kw LPG Combi Bare Bones Kit
TTYFJ-4-6DE	4Kw/6Kw LPG Combi Full Kit
TTYFY30-6DE-BB	4Kw/6Kw LPG Combi Bare Bones Kit

1.2 Areas of Application

The Thermo Technica Combi Heater is designed for use in motorhomes.



1.3 Technical Specifications

	DIESEL	LPG
RATED DC VOLTAGE	DC12V	DC12V
OPERATING VOLTAGE RANGE	DC10.5V ~ 16V	DC10.5V ~ 16V
SHORT-TERM MAXIMUM POWER	8-10A	5.6A
AVERAGE POWER CONSUMPTION	1.8-4A	1.3A
FUEL HEAT POWER [W]	2000-5000	2000-6000
FUEL CONSUMPTION [G/H]	220-550	160-480
PROPANE MAX PRESSURE	-	30mbar
QUIESCENT CURRENT	1mA	1mA
SUPPLY AIR VOLUME M3/H	287max	287max
WATER TANK CAPACITY	10L	10L
MAXIMUM WATER PRESSURE	2.8bar	2.8bar
MAXIMUM SYSTEM PRESSURE	4.5bar	4.5bar
RATED ELECTRIC SUPPLY VOLTAGE	240V	240V
ELECTRIC MODE OUTPUT @240VAC	900W/1800W	900W/1800W
AC CURRENT @240VAC	4A-8A	4A-8A
OPERATING TEMPERATURE	-25 °C ~ +40 °C	-25 °C ~ +40 °C
OPERATING ALTITUDE	≤1500m	≤1500m
WEIGHT (KG)	15.6Kg (without water)	
DIMENSIONS (MM)	510x450x300	
PROTECTION LEVEL	IP21	

1.4 Safety Precautions

- ⚠ Combustion exhaust fumes may be toxic. Do not install exhaust outlet near doors or windows.
- ⚠ Do not operate the heater if exhaust/intake lines are damaged. Do not repair damaged lines, replace with new ones.
- ⚠ Do not place heat-sensitive objects near the heater, as it gets hot during operation.
- ⚠ The compartment and space around the heater must not be used as storage.
- ⚠ Do not operate the heater with an empty water tank for extended periods of time.
- ⚠ Empty the water tank if the heater is not in use and as a part of the winterisation process. Heater will fail if the water inside freezes.
- ⚠ Stop using the device immediately if you smell gas, fuel or see smoke. Do not attempt repairs yourself. Always seek professional help.



3 / INSTALLATION

Typical installation of the heater is shown in Figure 1.

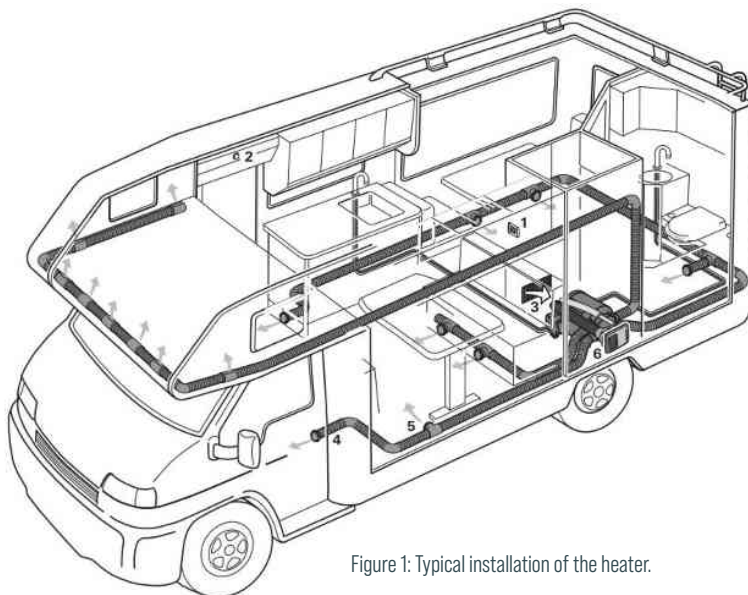


Figure 1: Typical installation of the heater.

2.1 Heater Placement

The heater should be installed in a separate compartment with an air intake opening of at least 640mm, or 127mm x 127mm.

Allow enough room around the heater for easy access and duct routing.

The minimum required compartment size is 560mm W x 500mm D x 355mm H.

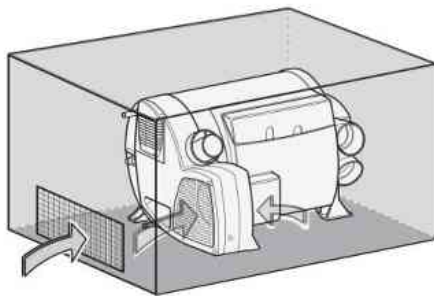


Figure 2: Heater Placement for Easy Access

2.2 Combustion Air Line Routing

The exhaust and combustion air flue pipe should be installed on the side wall of the vehicle.

The total length of the intake/exhaust should not be less than 60cm, and not longer than 100cm.

The flue should not be lower than 20cm below combustion air connection on the heater.

The exhaust pipe is inside the black air intake pipe.

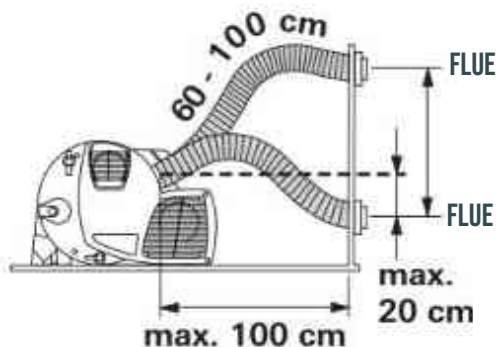


Figure 3: Exhaust and Intake Installation

2.3 Combustion Air Line Installation

Drill a hole with a diameter of 83mm.

Place a seal (Fig.4-8) on the outside of the vehicle, paying attention to the mark “Top” on the front of the fitting.

After the fitting is secured to the wall with screws, install the cover.

Slide the exhaust line (Fig.4-1) onto the exhaust fitting (Fig.4-10) and secure it with the clamp (Fig.4-3).

Slide the intake duct onto the intake fitting (Fig.4-11) and secure it with the clamp (Fig.4-7).

Secure both lines with the strap (Fig.4-6).

Slide the exhaust line (Fig.5-1) onto the exhaust port (Fig.5-2) on the heater, secure it with the clamp (Fig.5-3).

Slide the intake line (Fig.5-4) onto the intake port (Fig.5-5) of the heater and secure it with the clamp (Fig.5-6).

Note: To avoid rattling during operation, make sure your exhaust and intake lines are not too tight or loose.

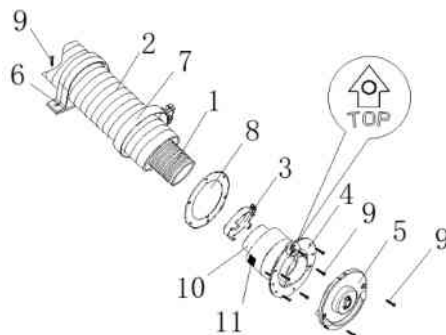


Figure 4: Combustion Air Flue Installation

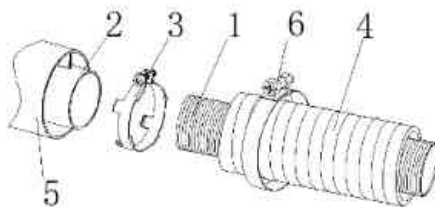


Figure 5: Heater Exhaust Connection

2.4 Warm Air Ducting

Warm air is supplied to the inside of the vehicle through four 60mm ports.

- All four ports should be routed to prevent closed loop circulation of air inside the heater compartment.
- If any ports are not used, seal them.
- Always seal only the lower ports.
- If you need to take a sharp turn out of the heater, use a 90-degree elbow should be used.

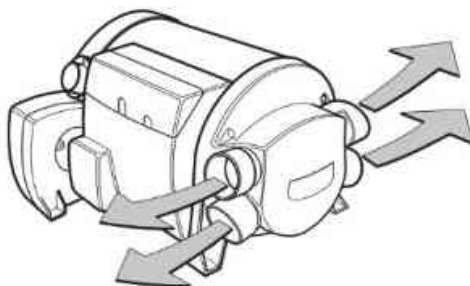
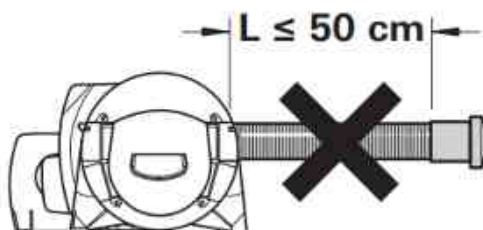
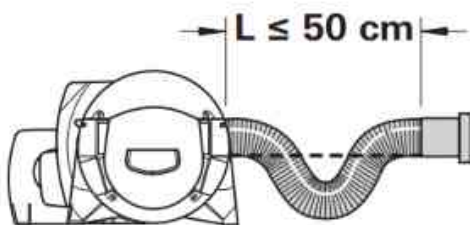


Figure 6: Warm Air Outlets

- Avoid short straight runs of 50cm or less.



- If a short run is necessary – goose neck the duct.



2.5 Fuel Line Installation (Diesel Models)

Diesel-fired heaters should be connected to the fuel tank of the vehicle, or to the auxiliary 10L fuel tank.

When connecting to the main fuel tank, do not tap into the vehicle's pressurised fuel lines.

Only the parts provided with the heater should be used in the installation. Do not extend the fuel lines or use a different fuel pump.

The maximum length of fuel line between the tank and the pump should not exceed 2 metres (6 feet).

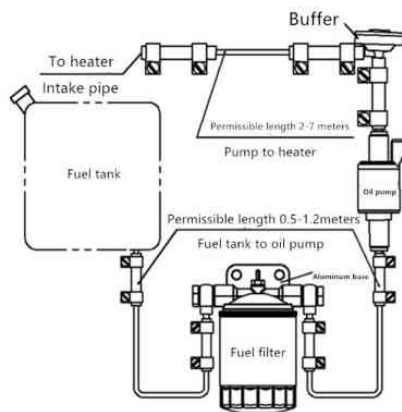


Figure 7: Fuel System Setup

The maximum length of fuel line between the pump and the heater should not exceed 6 metres.

Observe elevation requirements displayed on Fig.8.

The fuel pump should be installed at an angle to the ground. It is not recommended to secure the pump parallel to the ground.

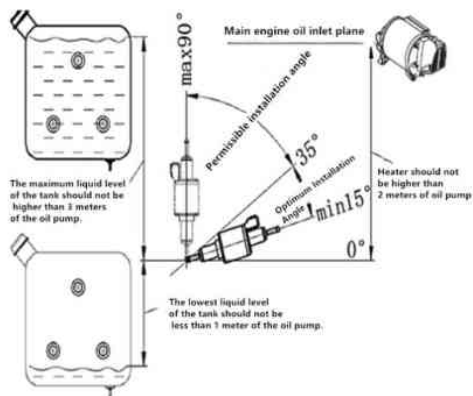


Figure 8: Fuel Pump Placement

2.6 Water System Connection

The water line pressure should not exceed 2.8bar. If the system pressure is higher, use a pressure regulator.

An anti-freeze valve (Fig.9-4) should be used to drain the water and protect the tank from freezing.

A pressure relief valve (Fig.9-8) with drain line (Fig.9-2) should be used to protect the system from excessive pressure.

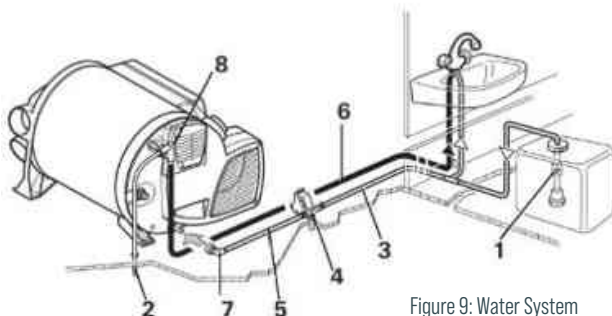


Figure 9: Water System

2.7 Room Temperature Sensor Installation

Install the temperature sensor on a wall, away from sources of heat and direct sunlight, and at a height of at least 1 metre from the floor. This will ensure the best temperature reading.

Do not install the sensor on perimeter walls of the vehicle.

Drill a 10mm hole to install the sensor.

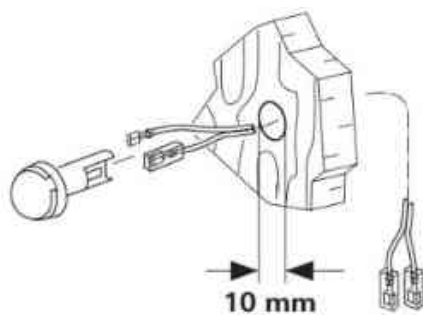


Figure 10: Room Sensor

2.8 LCD Controller Installation

When choosing the location of the LCD controller, make sure the cable provided is long enough to reach the heater.

The cut-out size is 91mm x 81mm.

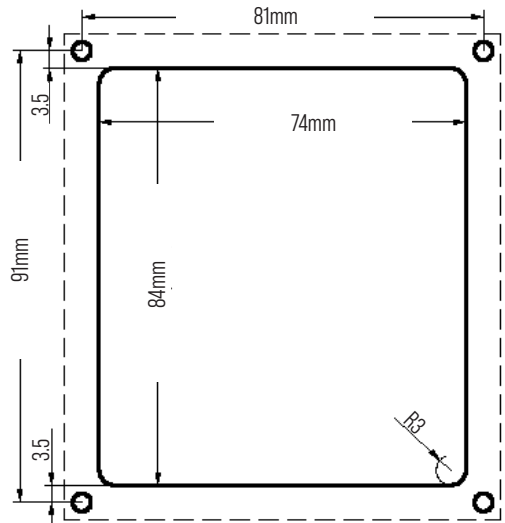


Figure 11: LCD Controller cut-out

2.9 Electrical Connections

All electrical connections, except AC, are terminated in a special compartment of the heater (Fig.12).

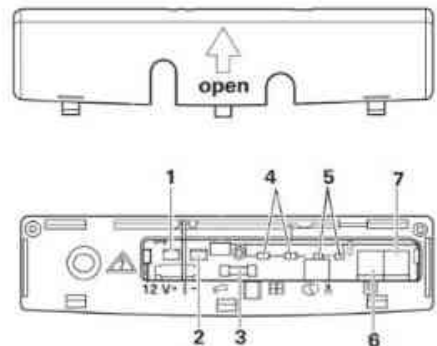


Figure 12: Electrical Connections

1 - +12VDC; 2 - GND; 3 - 12VDC fuse;
4 - window switch; 5 - room sensor; 6/7 - LCD controller

After all connections are made, wires should be bundled and secured with cable ties. Leave a little slack as strain on the wires may break them. Reinstall the cover after you are done.

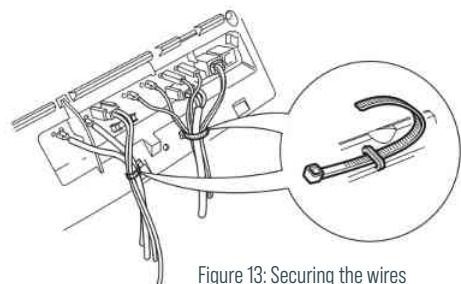
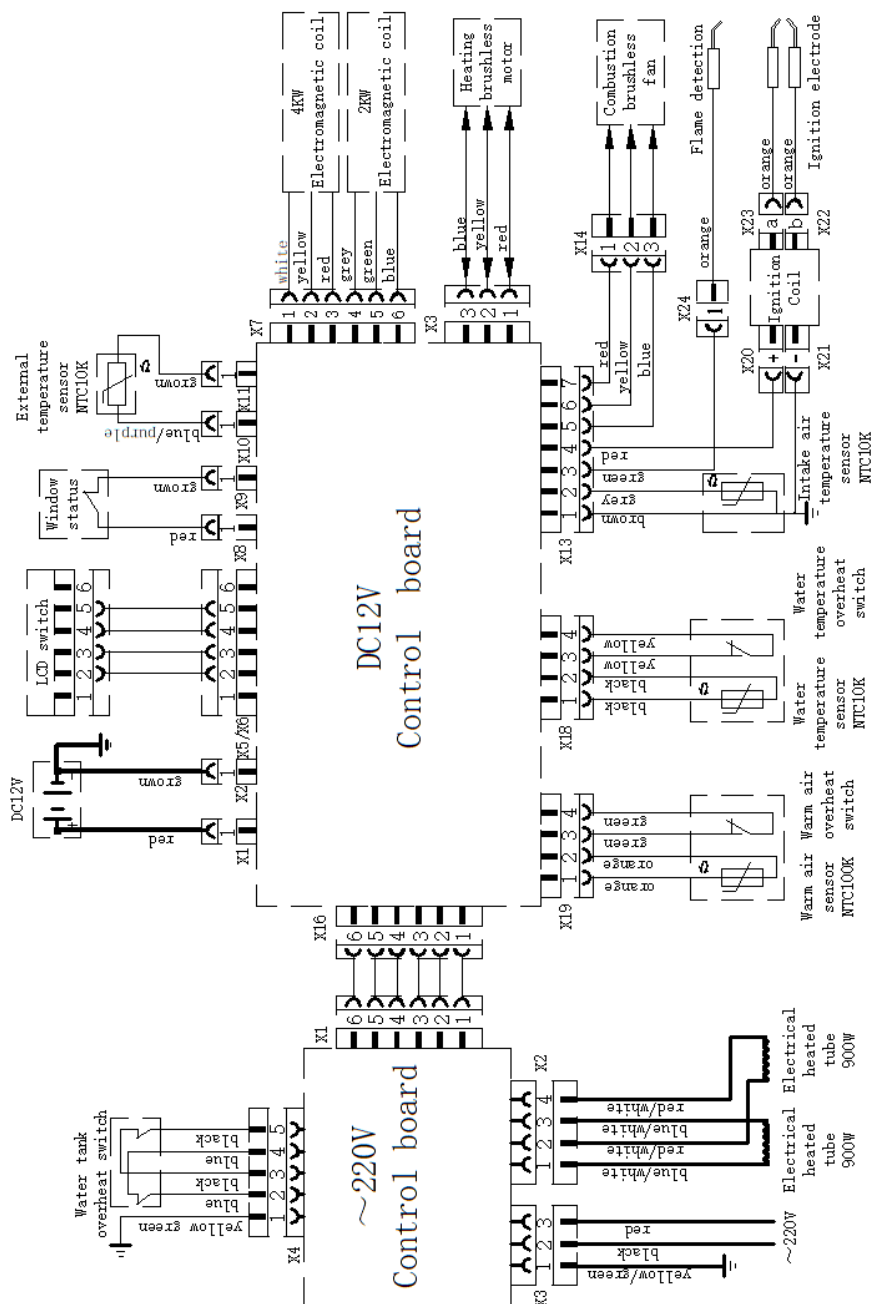


Figure 13: Securing the wires

4 / ELECTRICAL DIAGRAM FOR LPG COMBI



5 / HEATER KIT COMPONENTS FOR DIESEL COMBI

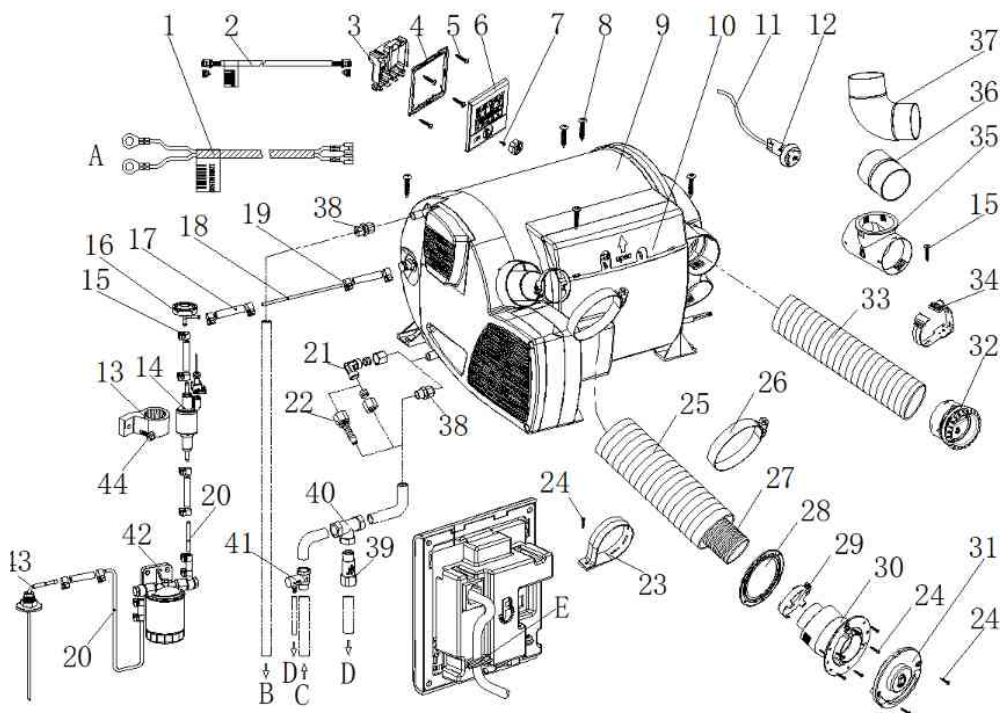


Figure 14: Heater Kit Components

[1] 12V Power cord; [2] LCD controller cable; [3] LCD back cover; [4] LCD mounting bracket; [5] Screw M3*10; [6] LCD controller; [7] Countersink screw M3*6; [8] Screw ST5*25; [9] Heater; [10] Electrical cover; [11] Room temp sensor lead wire; [12] Room temp sensor; [13] Fuel pump mount; [14] Fuel pump; [15] Fuel line clamp (Ø9-11mm); [16] Fuel damper; [17] Fuel line connector; [18] Fuel line [clear, from heater to fuel pump]; [19] Fuel line clamp (Ø8-10mm); [20] Fuel line [blue, from fuel tank to fuel pump]; [21] Ø10mm Steel (water) line elbow fitting; [22] Hose fitting; [23] Combustion intake duct strap; [24] Screw ST3.5*25; [25] Intake duct; [26] Ring clamp; [27] Exhaust duct; [28] Flue seal; [29] Exhaust clamp; [30] Combustion air flue; [31] Flue cover; [32] Air grille; [33] Air ducting; [34] Ducting strap; [35] Ø60mm union tee; [36] Ø60mm straight coupling; [37] Ø60mm elbow; [38] G1/2-Ø10mm fitting [39] Anti-freeze valve; [40] G1/2 union tee; [41] Pressure relief valve; [42] Fuel filter; [43] Fuel pickup; [44] Screw ST5*30.

[A] 12VDC battery connection; [B] Hot water supply line; [C] Water system connection; [D] Water drain; [E] LCD cable strap;

6 / HEATER FAULT CODES

CODE	FAULT DESCRIPTION	REMEDY
10	Overvoltage	Check vehicle power supply
11	Undervoltage	Check vehicle power supply
21	Warm air outlet temperature sensor disconnected	Check the sensor
22	Warm air outlet temperature sensor short circuit	Check the sensor
23	Water temperature sensor disconnected	Check the sensor
24	Water temperature sensor short circuit	Check the sensor
25	External temperature sensor disconnected	Check the sensor
26	External temperature sensor short circuit	Check the sensor
27	Combustion support temperature sensor disconnected	Check the sensor
28	Combustion temperature sensor short circuit	Check the sensor
31	Combustion failure	Check gas/fuel supply Check combustion inlet and outlet Check the ignition coil, ignition electrode, flame sensor
32	Combustion failure	Check gas/fuel supply Check combustion inlet and outlet Check the flame sensor
33	Flame sensor fault	Check flame sensor wire Check the flame sensor
41	Warm air outlet overheat	Check whether air outlet is blocked
42	Warm air overheat switch protection	Check air outlet. Check warm air overheat switch
43	Water overheat	Check if the tank is full Check if the sensor is in good condition Check whether air outlet is blocked
44	Warm air overheat switch protection	Check whether air outlet is blocked Check warm air overheat switch
45	Overheating fault	Check air outlet Check temperature sensor Check warm air sensor

CODE	FAULT DESCRIPTION	REMEDY
21	Communication fault	Check cable between controller and heater
61	Fuel pump fault	Check fuel pump connection and wiring Replace fuel pump Replace motherboard
62	Fuel pump short circuit	Check fuel pump connection and wiring Replace fuel pump Replace motherboard
63	Glow plug open	Check the power supply voltage Check the resistance of the plug at room temperature (0.2/12V) Cleaning up Carbon Accumulation. Replace motherboard
65	Glow plug drive fault	Replace motherboard
71	Gas valve failure	Check gas valve coil and wiring
72	Gas valve power failure	Replace motherboard
81	Combustion fan disconnected	Check combustion fan
82	Combustion fan boot failure	Check fan wires Check air blower
83	Combustion blower speed too low	Check blower motor
84	Supply air blower motor disconnected	Check air blower motor
85	Supply air blower motor boot failure	Check the blower motor wires Check blower motor
86	Supply air blower speed too low	Check air blower and motor
110	Window alarm	Check window switch and interlock cable
120	Low voltage alarm	Recommended charging
169	CPU reset due to loss of power	Check connections, upsize wire gauge
220	120/240V Connection lost	Check circuit breaker

NOTES

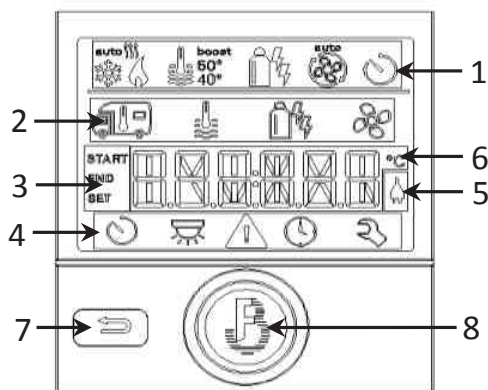


COMBI HEATER CONTROLLER

QUICK START GUIDE

7 / DISPLAY LAYOUT

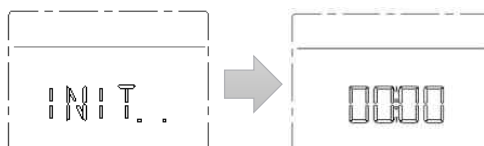
All menu navigation and value adjustments are performed using the rotary push-button (8) and the return button (7) on the controller's front panel. Pressing the rotary push-button is equivalent to the [Enter] command, while rotating it corresponds to [+] / [-], up/down, or left/right.



1 – Status bar; 2 – Settings bar; 3 – Time display; 4 – Menu bar;
5 – AC line icon; 6 – Temp. display; 7 – Return button;
8 – Rotary push-button.

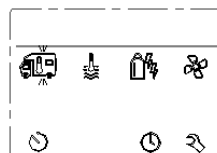
8 / POWER UP

After the device is turned ON, an "INIT.." message should appear on the screen. After a few seconds it switches to a time display.



9 / SETTING TIME

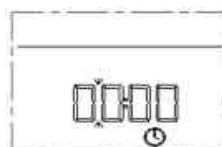
Press the rotary push-button [Enter] to bring up the menu.
The first icon on the menu will begin to flash.



Rotate the button [<] and [>] to select the clock icon and press [Enter].



Rotate the button [<] and [>] to enter the time.
Press [Enter] to navigate between segments.



10 / SETTING INDOOR AIRFLOW & TEMPERATURE

Press the rotary push-button [Enter] to bring up the menu and rotate the knob to navigate to the motorhome icon, then press [Enter].

Rotate the knob to select the temperature (between 5 °C and 30 °C) or OFF, then press [Enter].



A flame icon will appear in the top left corner to indicate that the heating cycle has started.

The heating cycle will continue until the set temperature is reached.

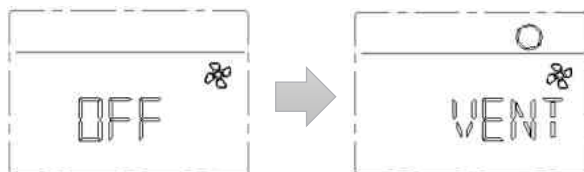
Press [Return] button to return to main menu.

Note: Setting a higher temperature will not increase the amount of heat produced, use the fan speed to do so.

To adjust the fan speed scroll to the fan icon and press [Enter].

Next, select a desired speed:

[VENT], [ECO], [LOW], [HIGH], [BOOST] or [OFF] and press [Enter].



11 / SETTING WATER TEMPERATURE

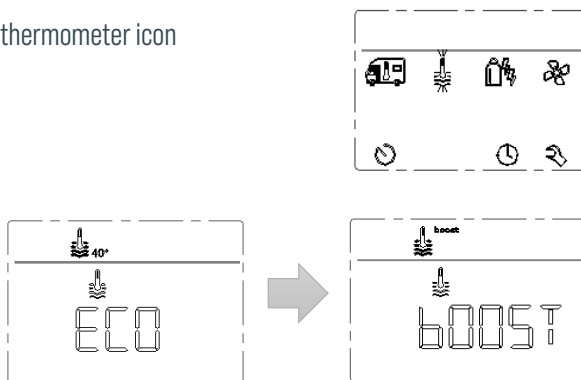
Using the [<] and [>] keys, navigate to the thermometer icon and press [Enter].

[OFF] Water heater is turned off.

[ECO] Temperature target is
40°C/104°F

[HOT] Temperature target is
60°C / 140°F

[BOOST] Only heats the water for
40 minutes or until the water
temperature reaches 60°C / 140°F.



12 / SETTING WATER HEAT MODE

Using the [<] and [>] keys, navigate to the water tank icon and press [Enter].

In the following menu, select one of the following modes:

[GAS LPG] or [Diesel] only

[MIX1] electrical 900 W+GAS

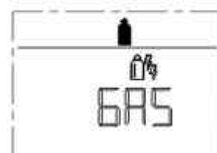
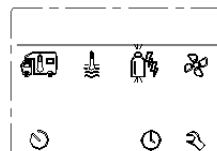
[MIX2] electrical 1800 W+GAS

[EL1] electrical only, 900 W

[EL2] electrical only, 1800 W

Note: For best heating performance, always set MIX2.

MIX1, MIX2, EL1 and EL2 only work when your motorhome is connected to 120V/240V service.



13 / START AND STOP HEATER

To shut-down the heater, press and hold the [Enter] button for more than 3 seconds.

Note: It may take up to two minutes for the heater to cool off and stop completely.

Press and hold the [Enter] button for 3 seconds to start the heater back up again.



14 / SETTING SCHEDULED OPERATION

Using the [<] and [>] keys, navigate to the stopwatch icon and press [Enter].

In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Start Time.

In the following screen, using the [<] and [>] and [Enter] keys, enter the desired End Time.

In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Room Temperature.

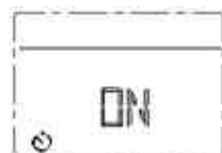
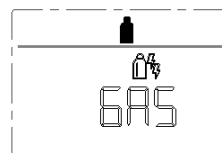
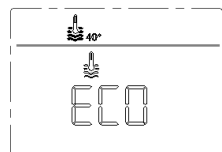
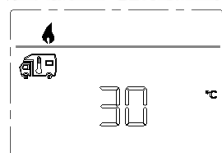
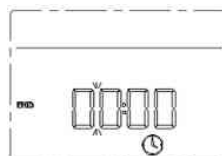
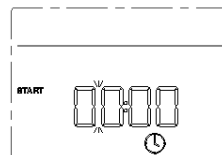
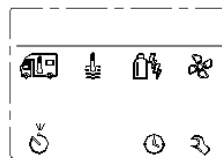
In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Water Temperature.

In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Water Heat Mode.

In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Fan Speed.

In the following screen, using the [<] and [>] and [Enter] keys, enable (or disable) the program.

The program is now set.



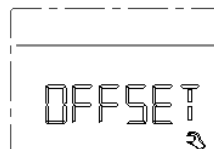
15 / SETTINGS

While in the main menu, using the [<] and [>] keys, navigate to the wrench icon and press [Enter].

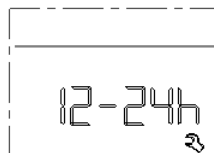


In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Offset.

Offset allows you to calibrate the remote temperature sensor reading to ± 5 degrees of its actual value.



In the following screen, using the [<] and [>] and [Enter] keys, enter the desired Time Format (12H or Military).



In the following screen, using the [<] and [>] and [Enter] keys, enter the desired LCD brightness between 0 and 10.



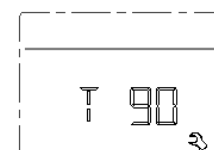
The INDEX screen allows you to check the software version of the timer and heater controller.



The FUEL option of the menu allows you to prime the fuel line after the initial installation or after you have run out of fuel.



You can set the priming duration up to 90 seconds. Press return at any time to stop priming.



Use the RESET option to reset your controller to factory settings.



16 / FAULT DISPLAY

If there is a fault, a code will appear on the screen.

Please do not attempt any repairs yourself. Always refer to your service centre.



List of fault codes and their description:

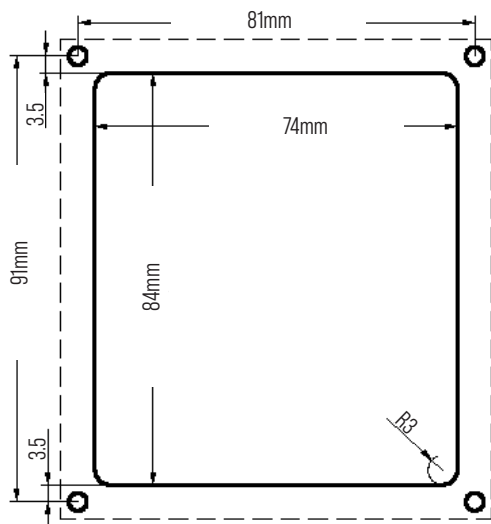
CODE	DESCRIPTION
10	Overtvoltage fault
11	Undervoltage fault
21	Heater supply temperature sensor open circuit
22	Heater supply temperature sensor open circuit
23	Water temperature sensor open circuit
24	Water temperature sensor open circuit
25	Room temperature sensor open circuit
26	Room temperature sensor open circuit
27	Combustion temperature sensor open circuit
28	Combustion temperature sensor open circuit
31	Ignition failure
32	Combustion failure
33	Flame sensor failure
41	Supply air temperature is too high
42	Supply air overheat switch tripped
43	Water temperature is too high
44	Overtvoltage fault
45	Undervoltage fault
51	Heater supply temperature sensor open circuit

CODE	DESCRIPTION
61	Heater supply temperature sensor open circuit
62	Water temperature sensor open circuit
63	Water temperature sensor open circuit
65	Room temperature sensor open circuit
71	Room temperature sensor open circuit
72	Combustion temperature sensor open circuit
81	Combustion temperature sensor open circuit
82	Ignition failure
83	Combustion failure
84	Flame sensor failure
85	Supply air temperature is too high
86	Supply air overheat switch tripped
91	Water temperature is too high
92	High voltage power supply failure
93	High voltage circuit failure
94	Gas valve circuit failure
110	Window alarm
120	Low voltage alarm
220	220V not connected

See page 16 for remedy suggestions

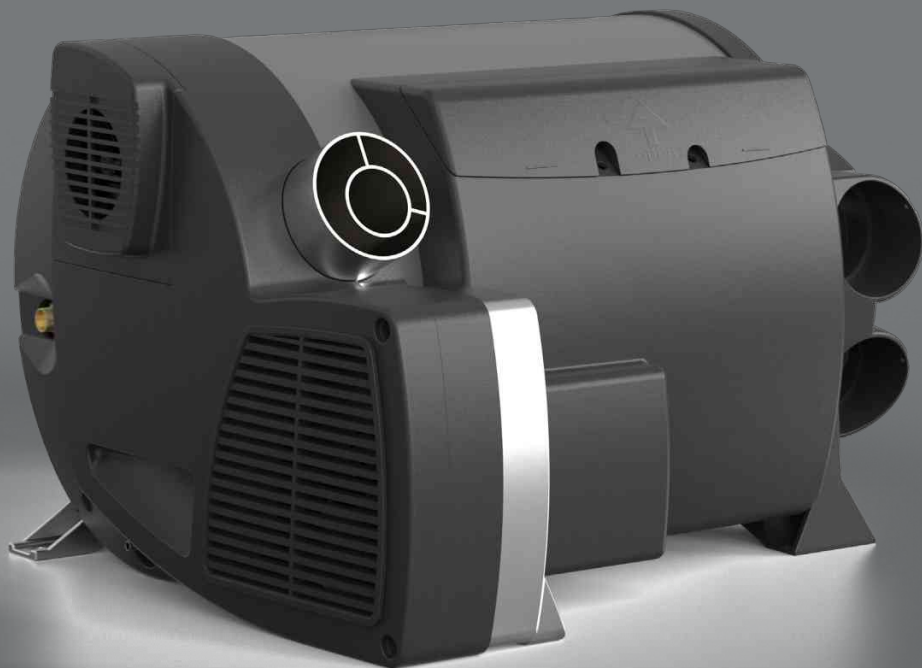
17 / CONTROLLER INSTALLATION

Install the controller in a dry location at a height of 1.5 metres from the floor.
Leave some slack when running the cables and secure them with cable ties.



Wall cut-out

NOTES



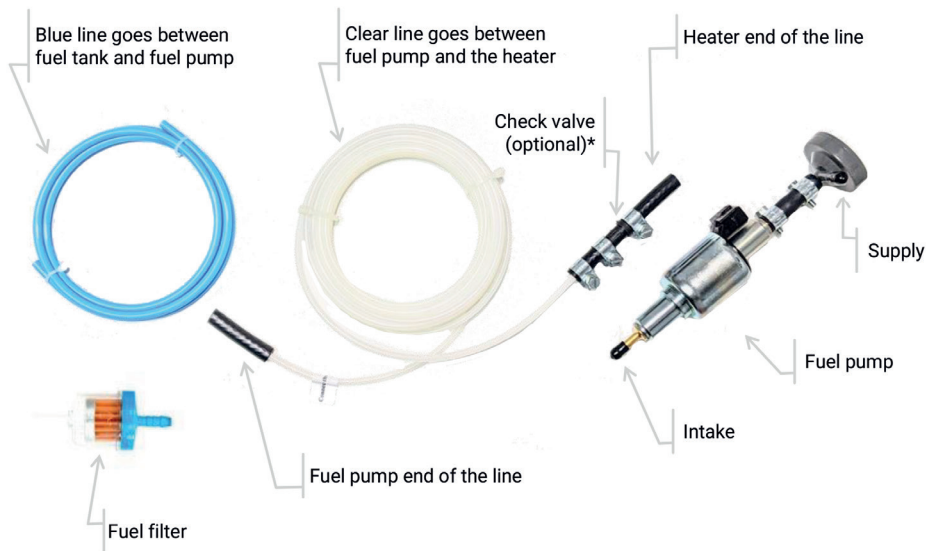
INSTALLATION

QUICK START GUIDE

18 / FUEL SYSTEM

Installation of this product should be carried out only by trained and certified professionals.

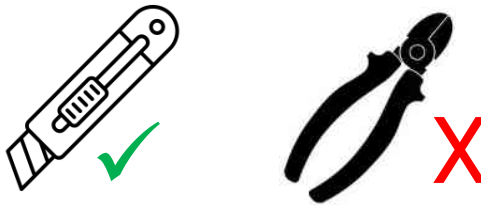
18.1 IDENTIFY YOUR PARTS



* A pressure regulating check valve only comes with diesel models and is an optional component (It ensures even and stable combustion but may cause supply problems if air is introduced to the fuel lines on gas models). Do not install the check valve if you keep your tank low on fuel.

18.2 RUNNING THE FUEL LINE

- The fuel lines provided with the kit are the maximum allowable length. You are limited to that length.
- Lines should be cut back to the length required in your scenario. Do not leave the line coiled up.
- Fuel lines should be protected from direct sunlight, sources of heat, etc.
- When cutting the fuel line, use a utility knife to make straight and clean cuts. Do not use side cutters.



- When joining two lines together, to prevent air traps, make sure the ends meet inside the rubber coupling.

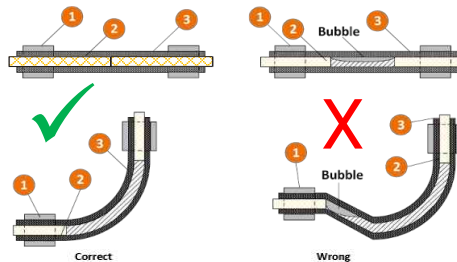


Fig. 1: Fuel line connections

1 Fuel Connector Clamp 2 Fuel Pipe 3 Rubber Fuel Connector

- Make sure your fuel pump is installed on a 30-degree angle to the ground. Failure to do so will cause fuel delivery problems.
- Make sure the elevation between the pump and the heater is less than 2m.
- Make sure the elevation between the tank and the pump is less than 0.5m.

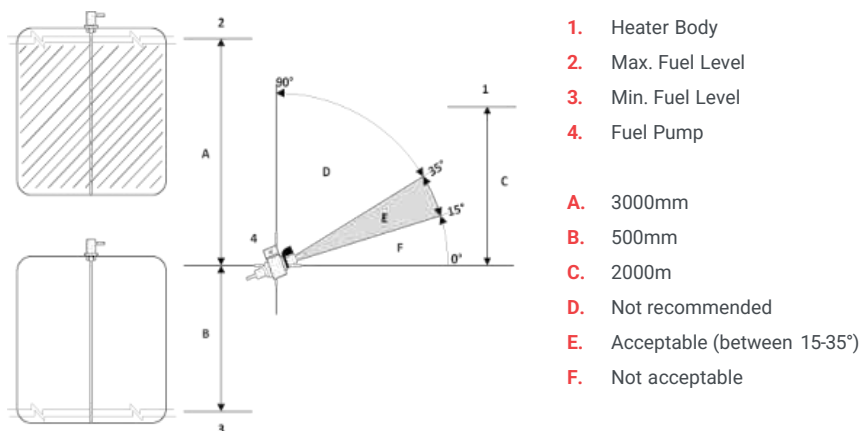


Fig. 2: Fuel pump tilt angle

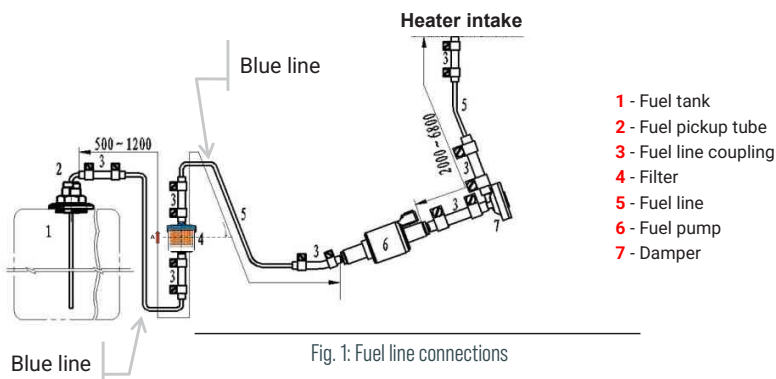


Fig. 1: Fuel line connections

18.3 FUEL TAP

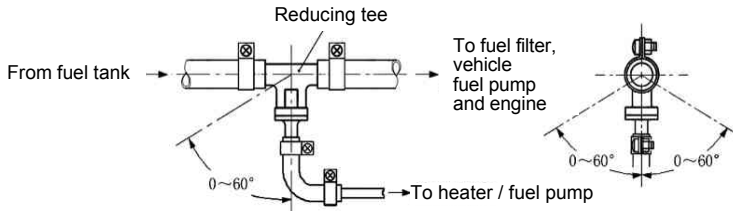


WARNING!

DO NOT TAP INTO PRESSURISED FUEL LINES OR PRESSURISED FUEL VESSELS. USE A SEPARATE FUEL TANK IF NECESSARY.

Fuel to the heater can be supplied from the main fuel tank or from an auxiliary tank by one of the following methods:

- Teeing into existing non-pressurized fuel lines using reducing tee's provided with the kit.



- Installing the separate fuel pick-up provided with the kit, or bulkhead barb provided with an optional separate tank.



19 / ELECTRICAL SYSTEM

PLEASE READ CAREFULLY AND FOLLOW THESE POINTS CLOSELY:

1. Main 12 V Power Connection

- The main 12-volt power connection must be made directly to the starter battery or the auxiliary battery.
- Do not use fuse blocks or tap into other circuits.

2. Peak Cold Start Current

- The peak cold start current of the heater is 40 A.
- Do not replace or modify the fuse included with the kit.

3. Wiring Harness

- The wiring harness provided with the kit is the “bare minimum.”
- Do not extend the power wires.

4. Wires Too Short

- If the wires provided are too short for your application, cut them close to both connectors and replace them with a heavier-gauge wire to minimize power loss.
- Do not simply add onto the existing wires.

5. Wires Too Long

- If the wires are too long, cut them back to size.
- Do not coil excess wire.

6. Starter Battery Caution

- Running the heater on the starter battery for extended periods will drain the battery.

7. Splices and Connections

- All splices and connections must be automotive grade.
- Do not use household connectors, twist caps, solid (non-stranded) wires, or connector blocks.

7. Cable and Wire Specifications

- All cables and wires must be properly rated, stranded automotive types.

NOTES

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Our products come with a **One Year Warranty** as standard.

