

# INSTALLATION AND USERS' MANUAL

## F-11 E L

### SUPER COMPACT ROOM SEALED WATER HEATER



10.010.649 00



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## GENERAL SAFETY INSTRUCTION

Before the installation and use of the water heater, carefully read the supplied instruction. Keep this manual in a safe and easy to find place.

The transformation, installation, adjustment, maintenance or repair the device must only be carried out by Morco Service or qualified professionals.



It is prohibited to tamper with any sealed part of the heater.



Morco assumes no responsibility for any damage that occur due to not following these instructions.



This appliance is not intended for use by children under 8 years of age. Persons with reduced physical, sensory or mental capabilities must be given supervision and instruction concerning the safe use of the appliance by a suitable person responsible for their safety.

Children must be supervised to ensure that they do not play with the appliance.

Children must never carry out cleaning and maintenance of the appliance without adult supervision.



Make sure that the hooks are correctly installed in the wall in order to ensure the correct hanging and fixing of the appliance.



Ensure that heater is always unplugged before any work on the electrical installation of the heater.

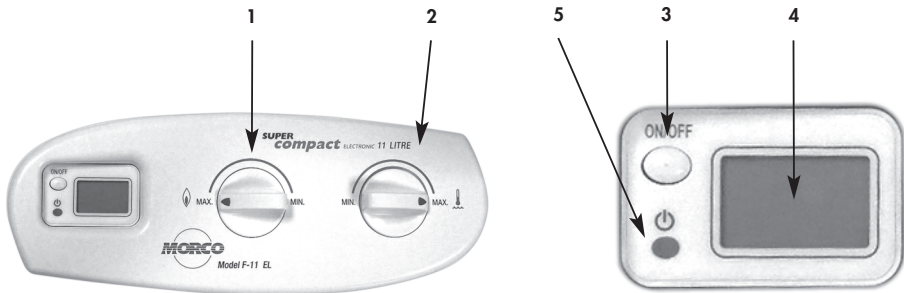
In order to avoid any risk, power cable replacement (type Y attachment) has to be performed by Morco Service or qualified professionals.

New replacement cable must be the same as the original. If in doubt, please consult spare part Morco.

Power cable plug must always be accessible.

# USER

## 1.- CONTROL PANEL



- 1.- Variable power selector
- 2.- Water temperature selector
- 3.- ON-OFF button
- 4.- Display with the following:
  - 4.1.- Indication of hot water temperature
  - 4.2.- Burner ON (flashing)
  - 4.3.- Fault codes (blinking)
- 5.- Power on Indication. Green LED is lit if power is supplied an button (3) is ON.

## 2.- STARTING UP THE APPLIANCE



### IMPORTANT:


The installer must explain to the user how the water heater functions, including its safety devices and the instructions for use. To start up the water heater, it must firstly be connected to the mains using the plug for this purpose.

- Ensure gas and water supplies are connected.
- Ensure the electricity supply is switched on.

## 3.- OPERATION

### Obtaining hot water

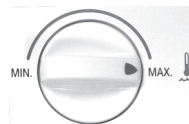
To start up the heater depress the ON-OFF button (3). The heater will then be ready to function automatically when any of the hot water taps are turned on.

While the heater is running the  icon is displayed and shows in the display the water outlet temperature.



### Selecting the required power

Turn the power selector (1) to obtain the desired power. MAX position indicates 100% power. MIN position indicates 50% power.



### Selecting the hot water temperature

Turn the water temperature dial (2) to obtain the desired temperature. MAX position indicates the maximum temperature (minimum flow). MIN position indicates the minimum temperature (maximum flow).

**IMPORTANT:** This heater is not thermostatic.

**Note:** It is advisable to adjust both the power and the water temperature to the minimum value necessary to cover your requirements. This will save energy and prolong the life of the appliance, reducing scale deposits on the heat exchanger.

### Switching off the water heater

When the hot water tap is turned off, the heater will stop automatically. To switch off the heater completely, press the ON-OFF button (3).



**IMPORTANT:** When the heater is switched on for the first time, or if it has not been used for a certain time, or when a new gas bottle is installed, the appliance may fail to ignite due to the presence of air in the gas pipes. If this happens, the heater will 'LOCK OUT' and a fault code will show in the display.



Occasionally, the heater may fail to ignite due to excessively windy conditions or other adverse atmospheric conditions, causing 'LOCKOUT'.



Insufficient gas pressure (faulty regulator) or fluctuations in voltage may also cause 'LOCKOUT' and a fault code will show in the display.



To RESET the heater press the ON-OFF button to switch off then depress the ON-OFF button to restart. The heater should ignite when the hot tap is opened.



If the heater locks out persistently, call your installer or MORCO on 01482 325456 for details of your nearest service agent.

### Combustion product removal control device (Air pressure switch)

**IMPORTANT:** The user must not interfere in any way with this device. Under no circumstances may it be disconnected, modified or replaced by a different part.

If the flue becomes blocked for any reason, or it is contaminated the heater will 'LOCKOUT' and a fault code will show in the display. It will be impossible to re-start the heater without fixing the problem. You should call your installer or phone MORCO on 01482 325456.

# USER

## 4.- MAINTENANCE

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**Note: before carrying out any maintenance or repair operations, the heater MUST be disconnected from the mains electric, and the gas and water supply.**

**MORCO recommends yearly inspection of the heater by a qualified and competent service engineer.**

The following inspections should be carried out:

- Check that the electrical installation is in good condition
- Check for soundness of the gas and water installations.
- Check for blockages and contamination of the flue assembly, especially spiders webs and egg-sacks which can find their way along the flue and into the venturi causing 'LOCKOUT'.
- Check for correct gas pressure.
- Check that the burner and heat exchanger are free of soot and other contamination.

### **Cleaning the burner**

Remove the burner and clean the bars with a soft brush or compressed air. Do not use chemical products.

Remove the ignition and ionisation spark electrodes and clean the ends.

The electrode unit should be replaced every three years.

### **Cleaning the heat exchanger**

Clean the heat exchanger with hot water. If it is particularly dirty, leave it to soak in hot soapy water.

Replace the heat exchanger seals when it is refitted.

### **Cleaning the cover**

Clean the cover with a damp cloth. Do not use aggressive detergents.

### **Scale prevention**

If the appliance is installed in a hard water area and if the following appear over time:

- a reduction in the hot water temperature, or
- a reduction in the hot water flow

this means that scale deposits have formed in the heat exchanger.

To reduce this effect, we recommend obtaining the desired working temperature by using the gas power control and the temperature selector, rather than by mixing cold water at the tap.



## 5.- FROST PROTECTION

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During freezing cold weather, the appliance must be drained down, leaving the appliance undrained during freezing conditions, will result in the appliance being frost damaged.

It must be drained down in the following way:

- Turn off the gas and electrical supply.
- Turn off the mains water inlet stopcock.
- Turn temperature control knob fully anticlockwise to minimum setting.
- Turn on all hot and cold water taps.
- Open all hot and cold drain cocks on the installation. Please refer to your caravan owner's handbook for the location of all drain cocks.
- Disconnect the mains water inlet stopcock from the caravan pipework, this will stop water refilling the pipework, if the stopcock fails due to frost damage.
- Protect drain cocks and any open ended pipe from insects or debris.

To turn the water on again, close all drain cocks, reconnect and open the mains water inlet stopcock and turn off each hot and cold water taps as the water runs clear.

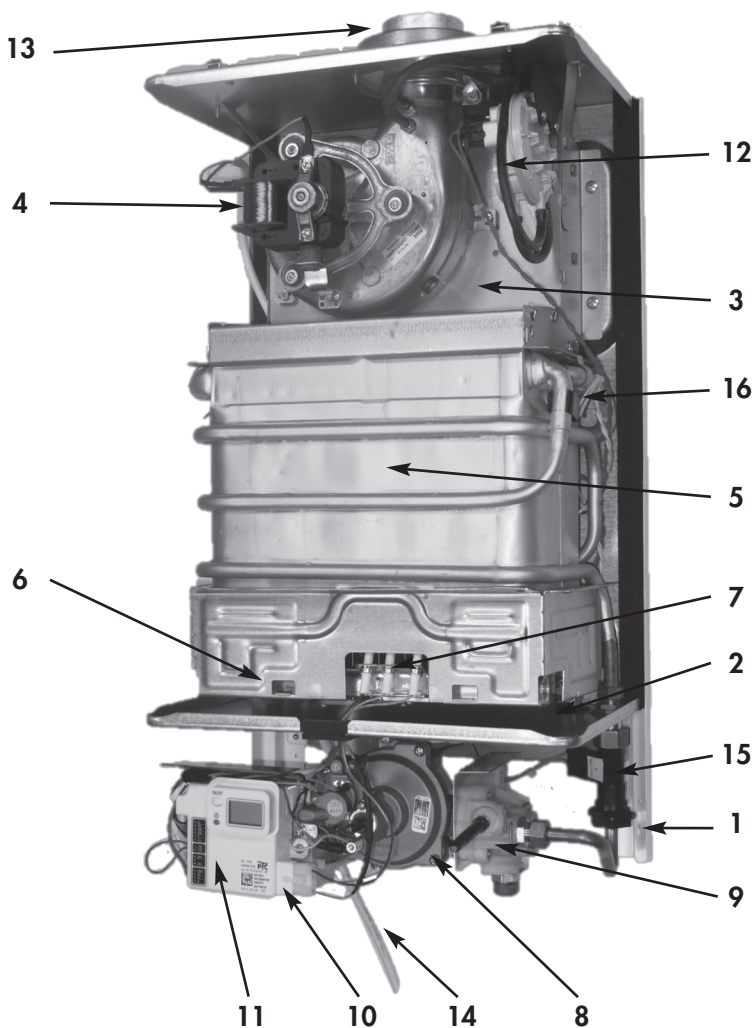
We strongly recommend a qualified & competent service engineer is employed to do the drain down service.

**USER****6.- TROUBLESHOOTING & FAULT CODES**

<b>Code</b>	<b>Description</b>	<b>Cause</b>	<b>Solution</b>
<b>F0</b>	Failed to measure hot water temperature. <b>Not LOCKED OUT</b>	Fault in the NTC sensor or defect in wiring.	Call to technical service. Check the NTC and the wiring
<b>F1</b>	1st ignition failure. The burner is not ignited. <b>LOCK OUT</b>	Gas tap closed.	Open the gas tap.
		Gas bottle empty.	Replace the gas bottle.
		Air in the gas circuit.	Repeat the ignition operation until appliance ignites.
		Wiring in disrepair or improperly connected.	Repeat the ignition operation. Check the wiring, the electronic circuit, the servo valve and electrodes. If the fault persists call to the technical service and replace the defective component.
		Electronic circuit fault.	
		Servo Valve fault.	
		Ionization electrode fault.	
spark fault			
<b>F2</b>	Activation of the combustion product discharge control device (air pressure switch). <b>LOCK OUT</b>	Exhaust fumes outlet blocked.	Check pressure switch and wiring. Review the exhaust fumes outlet. If the fault persists, contact technical service.
		Combustion product discharge control device (air pressure switch) or defective wiring.	
<b>F3</b>	Failure during operation. The burner switches off. Try to reignite the appliance. <b>LOCK OUT</b>	Gas bottle empty.	Repeat the ignition operation. Check the wiring, the electronic circuit, the servo valve and electrodes. If the fault persists call to the technical service and replace the defective component.
		Wiring in disrepair or improperly connected.	
		Electronic circuit fault.	
		Servo Valve fault.	
		Ionization electrode fault.	
<b>F4</b>	TTB jumper connector is missing	Lack of the jumper. Wiring in disrepair or improperly connected.	Connect the jumper. Check the wiring and connections.
	When ON/OFF button is pressed green LED does not light	Check heater is plugged properly to the mains. Blown fuse in the power circuit. Blown fuse in the plug.	Connect the heater. Replace the blown fuse. If the fault persists, contact technical service.
	Green LED is lighting but heater does not work	Check wiring connections between power circuit and electronic circuit. Defective electronic circuit.	Connect the wirings properly. Replace electronic circuit. If the fault persists, contact technical service.

## 7.- DESCRIPTION OF THE APPLIANCE

This is a room-sealed fan flued water heater with electronic direct ignition with ionisation safety. It is mains powered and has a mechanically modulating gas valve responding to water flow rate. Its room sealed combustion chamber, equipped with a fan for the intake of air from the outside and the removal of combustion products to the outside, enables it to function totally independently of the room in which it is installed. For this reason it is ideally suited for use in leisure accommodation vehicles such as caravan holiday homes, motor homes, and specialised vehicles. It is also suitable for boats.



# INSTALLER

## MAIN COMPONENTS:

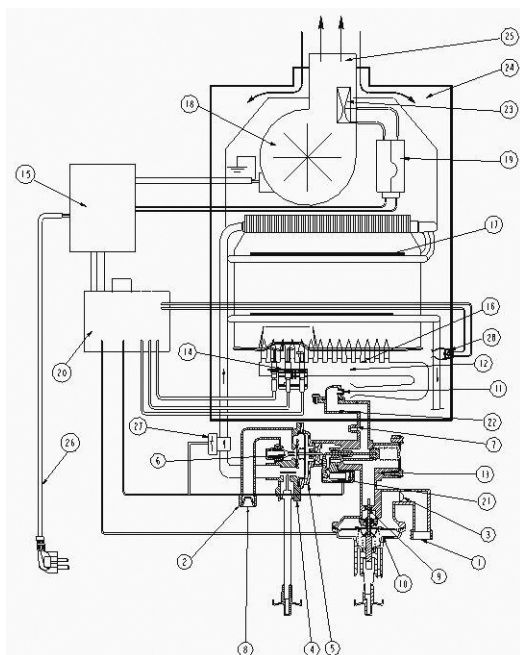
1. **FRAME** including water heater hanging bar.
2. **SEALED CHAMBER BASE**, forming the combustion chamber together with the cover.
3. **FLUE EXTRACTOR UNIT** equipped with an extractor body, fan, air pressure switch and Ø 60-100 coaxial output.
4. **FAN** for removing combustion gases via the Ø 60 pipe and allowing air from outside to enter the chamber.
5. **HEAT EXCHANGER** made of copper.
6. **BURNER** made of stainless steel with distribution manifold equipped with injectors in accordance with gas type.
7. **ELECTRODES** for ignition and ionisation flame sensor.
8. **GAS VALVE** equipped with two safety valves, manual power selection, automatic power modulation depending on water flow and progressive burner ignition.
9. **WATER VALVE** equipped with automatic water flow regulator and manual temperature selector.
10. **POWER SUPPLY AND CONTROL:** Supplies heater with 1.5 V from a 220-230 V<sub>AC</sub> mains voltage. Supplies fan and controls removal of combustion products via the air pressure switch.
11. **ELECTRONIC CIRCUIT** for ignition and ionisation flame control.
12. **AIR PRESSURE SWITCH** which cuts off gas flow to burner in case of fan malfunction
13. Ø 60-100 **COAXIALFLUE SPIGOT**
14. **SUPPLY CABLE**
15. **WATER FLOW SWITCH:** a safety device to prevent the gas water heater operating if there is no water flowing.
16. **THERMISTOR (NTC):** To measure the temperature of hot water outlet.

## 8.- TECHNICAL CHARACTERISTICS

Certification, Category and Type:		MODEL F-11 E L		
EC Type test certificate	99CN922			
Category	I <sub>2E+</sub>	I <sub>2h</sub>	I <sub>3+</sub>	I <sub>3B/P</sub>
Country of destination	BE, FR	ES, GB, IE, IT, PT	BE, ES, FR, GB, IE, IT, PT	NL
Type	C <sub>12</sub>			
Degree of electrical protection	IP-44			
	Symbol	Units	Model F-11E L	
<b>Power an energy consumption</b>				
Nominal output power	P <sub>n</sub>	Kw	19,2	
Minimum output power	P <sub>min</sub>	Kw	8,4	
Power modulation range	P <sub>min</sub> - P <sub>n</sub>	Kw	8,4-19,2	
Nominal energy consumption	Q <sub>n</sub>	Kw	22,1	
Minimum energy consumption	Q <sub>min</sub>	Kw	9,8	
<b>Gas Data</b>				
Connection pressure	2 H	Natural G20	mbar	20
	2 E+	Natural G20/G25	mbar	20-25
	3 +	Butane G30	mbar	28-30
		Propane G31	mbar	37
	3 B/P	Butane G30	mbar	30
Gas consumption	2 H/2 E+	Natural G20 Hi=9,45 Kwh/m <sup>3</sup>	m <sup>3</sup> /h	2,34
		Natural G25 Hi=8,13 h/m <sup>3</sup>	m <sup>3</sup> /h	2,32
	3+/(3B/P)	Butane G30 Hi=12,68 Kwh/kg	Kg/h	1,74
		Propane G31 Hi=12,87 Kwh/kg	Kg/h	1,72
Burner pressure at nominal power	2 H/2 E+	Natural G20	mbar	12,7
		Natural G25	mbar	16
	3+/(3B/P)	Butane G30	mbar	27
		Propane G31	mbar	33,5
Air Flow needed for the combustion	2H/2E+	Natural G20	m <sup>3</sup> /h	23,06
		Natural G25	m <sup>3</sup> /h	23,37
	3+/(3B/P)	Butane G30	kg/h	20,19
		Propane G31	kg/h	20,27
<b>Water data</b>				
Water flow	Δ 50° C		l/min	2,-5,5
	Δ 25° C		l/min	3,7-11
Max operating pressure			MPa (bar)	1,3 (13)
Min operating pressure	Max. tp selector		MPa (bar)	0,015 (0,15)
	Min. tp selector		MPa (bar)	0,025 (0,25)
<b>Combustion products</b>				
Flow			g/s	15,2
Temperature			°C	160
<b>Electrical Data</b>				
Electrical supply			V/Hz	220-230V-50 Hz
Maximum absorbed power			W	35
<b>Connector dimensions and pipe diameters</b>				
Connections /inner Ø (mm)	Gas inlet	Natural	3/4 "	
		Butane - Propane	3/4 "	
	Cold Water Inlet		3/8 "	
	Hot Water Outlet		1/2 "	
Flue outlet (mm)			Ø 60-100	

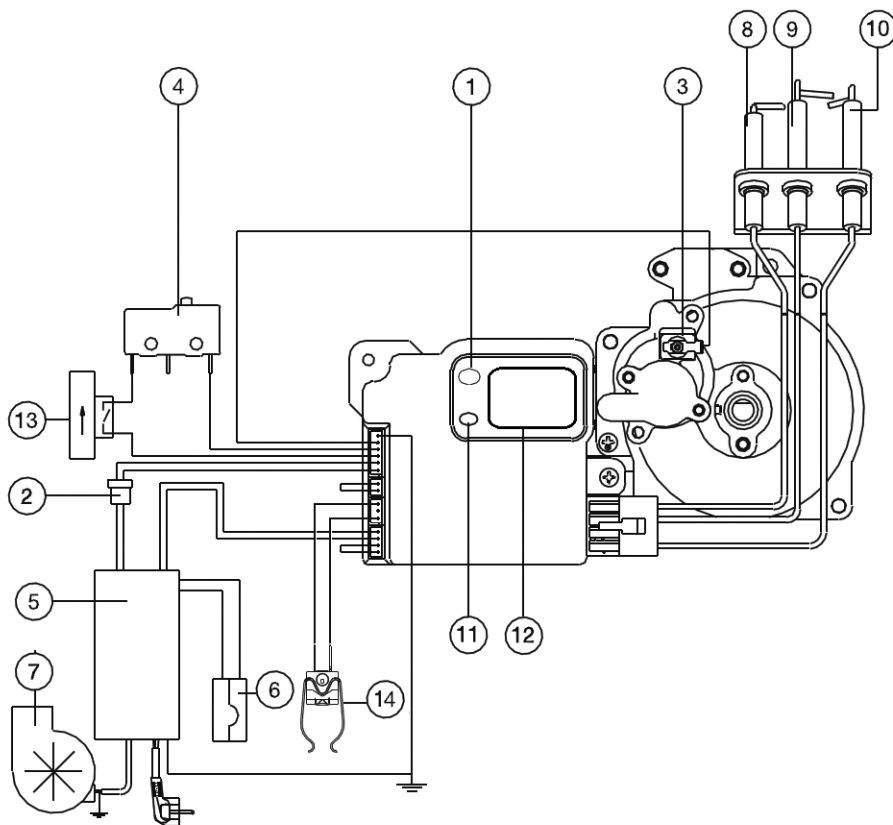
# INSTALLER

## 9.- FUNCTION DIAGRAM



- 1.- Gas inlet
- 2.- Water inlet
- 3.- Gas filter
- 4.- Lower body
- 5.- Upper body
- 6.- Water regulator
- 7.- Pressure test point
- 8.- Water filter
- 9.- Power selector
- 10.- Servo valve
- 11.- Injector
- 12.- Distributor
- 13.- Main body
- 14.- Electrode unit
- 15.- Supply and fan control circuit
- 16.- Burner
- 17.- Heat exchanger
- 18.- Fan unit
- 19.- Air pressure switch
- 20.- Ignition box and ionisation safety device
- 21.- Micro switch
- 22.- Distributor connector
- 23.- Venturi
- 24.- Sealed chamber
- 25.- Ø 60-100 coaxial output
- 26.- Supply cable
- 27.- Water flow switch
- 28.- NTC

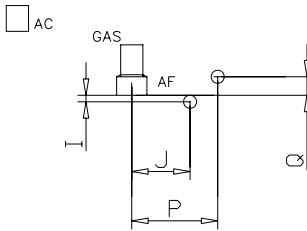
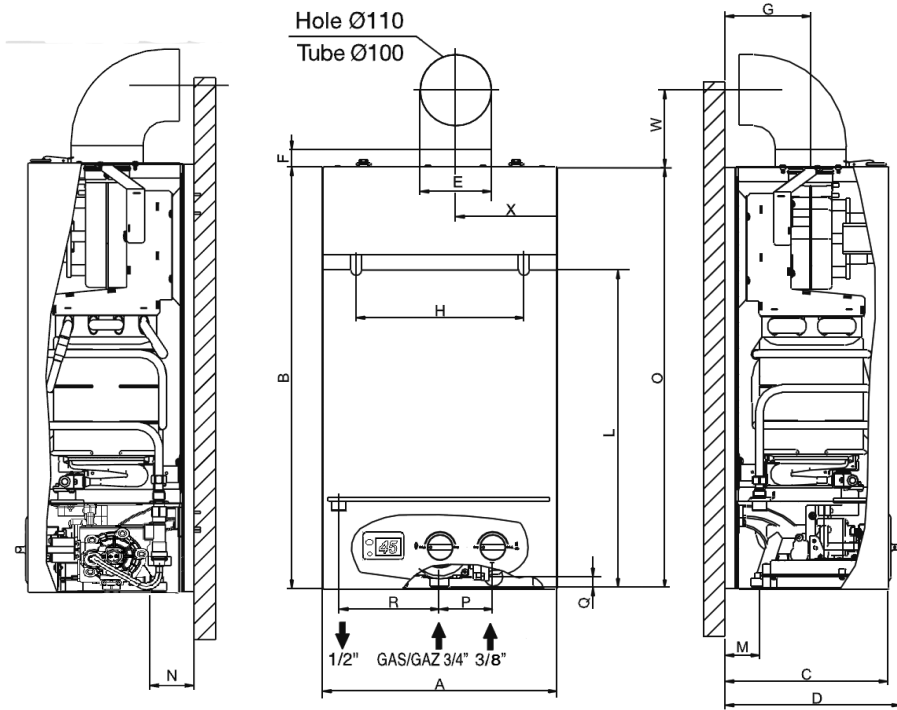
## 10.- ELECTRICAL DIAGRAM



- |  |                            |
|--|----------------------------|
| 1.- ON/OFF button                        | 8.- Ionisation electrode   |
| 2.- Power supply connector               | 9.- Confirmation electrode |
| 3.- Servo valve                          | 10.- Spark electrode       |
| 4.- Micro switch                         | 11.- Power on LED (Green)  |
| 5.- Power supply and fan control circuit | 12.- Display               |
| 6.- Air pressure switch                  | 13.- Water flow switch     |
| 7.- Fan                                  | 14.- NTC                   |

# INSTALLER

## 11.- APPLIANCE DIMENSIONS



MODEL	Weight (kg)	Dimensions (mm)																		
		A	B	C	D	E	F	G	H	I	J	L	M	N	O	P	Q	R	W	X
11 Litre	15,5	330	595	230	247	60-100	25	122	230	8	50	513	50	106	592	75	7	143	125	143



## 12.- GENERAL INSTALLATION REQUIREMENTS

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### 12.1- RECOMMENDATIONS

#### **For the user**

This appliance must be installed, adjusted or adapted for use with another type of gas only by a qualified and competent person.

Its quality and a correct installation will ensure that your heater works properly.

#### **For the installation engineer**

##### **Gas Safety Installation and Use Regulations**

It is the law that all gas appliances must be installed by a registered person in accordance with the above regulations.

Failure to install appliances correctly may lead to prosecution.

It is in your own interest, and that of safety, to ensure that the law is complied with.

In addition to the above regulations, this appliance must be installed in accordance with the current IEE wiring regulations and current ETCI rules for electrical installations.

It should also be in accordance with the relevant recommendations in the current editions of all relevant National Standards. Your particular attention is drawn to the following relevant standards:

BS 5482 Part 2 Installations in Caravans and Non-Permanent Dwellings

PD 5482 Part 3 Installations in Boats

BSEN 1949 Installation of LPG System for Habitational Purposes in Leisure Accommodation Vehicles

BSEN 721 Leisure Accommodation Vehicles-Ventilation Requirements

BS EN ISO 10239 2008 Small Craft, LPG Systems

**IMPORTANT:** Manufacturers instructions must NOT be taken in any way as overriding statutory regulations.

### 12.2- LOCATION

In positioning the heater, the following limitations **MUST** be observed:

The position must allow for a suitable flue termination to be made.

The heater must be installed on a flat vertical wall capable of supporting its weight.

If the heater is in a room containing a bath or shower, the heater controls and power supply must be so situated that they can not be touched by the person using the bath or shower. Attention is drawn to the current IEE Wiring Regulations, and in Scotland the electrical provisions of the Building Regulations applicable in Scotland.

# INSTALLER

## 12.3- FLUE TERMINAL POSITION

The heater must be installed so that the terminal is exposed to the external air. It is important that the position of the terminal allows free passage of air across it at all times.

It is essential to ensure that the products of combustion discharging from the terminal cannot re-enter the building or vehicle, through ventilators, windows, or other sources of natural air infiltration, such as other flues etc, with the exception of doors, but not the opening windows thereof.

The minimum acceptable dimensions from the terminal to obstructions and ventilation openings is as follows:

Directly below an opening fixed vent or window etc .....	300mm
Adjacent to an opening fixed vent or window etc .....	300mm
Below gutters .....	75mm
From a vertical drain pipe .....	75mm
From an internal or external corner .....	300mm

Where the terminal is fitted in a position to which children, the elderly, or disabled people have access (less than 1.5m above steps, decking or ground), a suitable terminal guard should be fitted.

In certain weather conditions the terminal may emit a plume of steam.

## 12.4- MINIMUM CLEARANCES

Minimum clearances of 5mm to the front and sides of the heater must be observed. However full access from the front in the form of an opening door, must be given to allow access to the controls and for servicing.

200mm above the top of the heater case is required for the flue assembly.

150mm is required below the heater to allow easy access to the gas isolation cock.

## 12.5- VENTILATION REQUIREMENTS

The Morco F-11E L is a room sealed appliance and needs no purpose provided combustion air ventilation.

## 12.6- ELECTRICITY SUPPLY

A 3 amp fused three pin plug and unswitched shuttered socket outlet (both complying with BS 1363) or a 3 amp fused double pole isolator with a contact separation of 3mm in all poles supplying only the heater should be used.

**THIS APPLIANCE MUST BE EARTHED**

## 12.7- GAS SUPPLY

Ensure the heater is set for the gas supply intended.

Ensure the regulator is of sufficient capacity to carry the maximum heater input plus the demand for any other appliance in the system.

Ensure that the pipe sizing and connections between the supply/bottle regulator and the caravan/vehicle is designed so that no more than a maximum pressure drop of 2.5mbar occurs.

The complete installation must be tested for gas soundness.

### **12.8- WATER SUPPLY**

A cold water supply with a working pressure of a minimum of 0.25 bar, measured at the cold water inlet to the heater is required.

Wherever possible the cold supply to the heater should be the first connection off the main supply, in order to minimise hot water flow reduction when cold water services are called for.

## **13.- INSTALLATION INSTRUCTIONS**

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### **13.1- PACKAGING**

The water heater is supplied in separate packaging:

- Water heater and hanging bracket
- Flue kit supplied separately
- Gas and water connections supplied separately

### **13.2- SELECTING THE POSITION**

Decide where the heater is to be fixed taking into account the installation requirements in section 12 and the dimensions given in section 11.

### **13.3- REMOVING THE COVER**

Remove the gas knobs and the water temperature dial knob.

Remove the screw holding the cover in place. This is on the front of the cover, behind the gas knob.

Take the cover off by removing the over-centre hinge clips at the top.

### **13.4- WALL MOUNTING**

Screw the bracket to the wall and hang the heater. A further screw fixing should be made through the chassis rail at the bottom to the wall to secure the heater during transport or road use.

### **13.5- WIRING**

Observe all the usual precautions to ensure that the electricity supply is isolated before beginning any installation work. The heater should be wired as described in section 12.6 **Important: this appliance must be earthed.**

## INSTALLER

### 13.6- WATER AND GAS CONNECTIONS

The water and gas pipes must be copper. Do not connect plastic pipes directly to the heater. It is recommended that the copper is extended to below the floor of the caravan/vehicle before connecting to plastic.

Ensure the gas pipe complies with the requirements in section 12.7.

Remove any swarf or other residues in the pipes.

Connect the heater using the corresponding joints and connectors supplied in the bag of accessories.

Mount the cover and fix it to the appliance.

Mount the gas and temperature dial knobs.

### 13.7- FLUE SYSTEM

The standard horizontal flue kit for the F-11E L is part number RSF003. There are various other options available, including a vertical flue kit and other variations on the horizontal kit. Please ask for details. Never use a flue kit not specifically approved for use with this appliance.

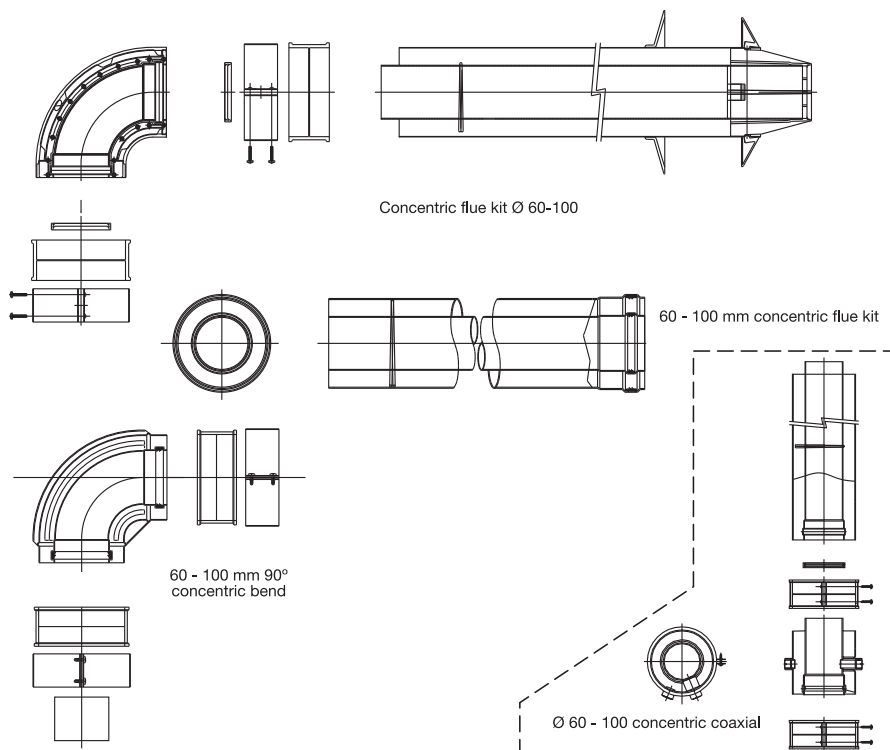
The horizontal pipe may be cut down to size to a minimum of 100 mm, to suit the installation or extended to a maximum of a straight run of 4 meters. Elbows are available but each will reduce the available length by 0.8 m.

Installation in a caravan/vehicle will generally require only the use of part no RSF003.

An external aluminium collar, part no RSF063 can be supplied to make the seal between the flue pipe and the external wall.

#### **IMPORTANT:**

The flue assembly must be installed with a slight downwards incline to prevent the ingress of rain water, which may damage the heater.



If the length of the pipe is 1 metre or less, the diaphragm (inner  $\varnothing$  85 mm) supplied in the accessories bag should be fitted.

# INSTALLER

## 14.- COMMISSIONING INSTRUCTIONS

---

Before commissioning, ensure that the whole gas installation is purged and tested for soundness.

**IMPORTANT: To prevent damage to the gas valve soundness testing of the system must only be done with the isolation cock on the heater in the closed position.** Any over pressure such as is allowable to carry out a pipe soundness test could possibly damage the heater.

### 14.1- SETTINGS

Before leaving the factory the heater is pre-set in accordance with the information on the data plate. No adjustment is necessary and under no circumstances should any of the seals be broken.

### 14.2- GAS CIRCUIT

Turn on the gas supply and check for leaks downstream of the isolation cock using leak detector spray.

### 14.3- WATER CIRCUIT

Turn on the water supply and check for leaks.

### 14.4- INITIAL OPERATION

Operate the heater as per the instructions in section 2 and 3 of this manual.

### 14.5- FINAL CHECKS

Re-light and test for gas soundness

Carry out an operating gas pressure test to ensure maximum potential performance.

### 14.6- USERS INSTRUCTIONS

Upon completion of testing the system the installer should:

- Give the instructions to the user and explain how the heater works.
- Demonstrate the operation of the heater.
- Explain the LOCKOUT and how to re-set.
- Stress the importance of an annual service by a qualified and competent service engineer.
- Explain to the user how to proceed in case of freezing cold weather (drain down the water circuit, turn off the gas and electrical supply).  
Explain the precautions to be taken to avoid frost damage

For more detailed servicing information, workshop manuals, technical advice, spare parts, product training, please ring MORCO on 00 44 1482 325456 or contact us at the address below. Our qualified registered advisors are ready to help you.

*Pour plus d'informations sur les notices, les prescriptions techniques, les pi ces d tach es, la formation sur le produit, etc., veuillez appeler MORCO au 00 44 1482 325456 ou nous contacter   l'adresse suivante. Nos techniciens certifi s sont   votre disposition.*

Voor gedetailleerdere informatie omtrent onderhoud, reparatiehandleidingen, technische adviezen en product-training wordt u verzocht MORCO te bellen. Nr: 00 44 1482 325456 of met ons contact op te nemene op onderstaand adres. Onze gekwalificeerde bij de aangesloten adviseurs staan klaar om u te helpen.

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