Lochinvar®
High Efficiency Water Heaters and Boilers

Knight

Installation, Commissioning, User & Maintenance Instructions

Traditionally Gas Fired Single Flue Water Heater with Automatic Ignition

Models:
LGA 75 G CE and PG CE
LGA 85 G CE and PG CE

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⚠ IMPORTANT INFORMATION ⚠

These instructions must be read and understood before installing, commissioning, operating or maintaining the equipment.

Read these installation instructions f rst before installing the appliance. Carefully read the user instructions before igniting the appliance. Failure to follow these instructions may lead to risk of explosion and/or f re and could cause material damage and/or bodily harm. Installation and commisioning should be carried out by a qualif ed competent installer. The type of gas and the value at which the appliance is set standard in the factory are registered on the rating plate. The appliance may only be installed in a room if this room meets the ventilation requirements.

LOCHINVAR LTD. ACCEPTS NO RESPONSIBILITY FOR WARRANTY, SERVICE AND/ OR PRODUCT LIABILITY IN CASE OF UNAUTHORISED ALTERATIONS, PRODUCT MODIFICATIONS OR REPAIR.

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1. GENERAL

1.1 Description of the appliance

Construction of the water heater is in accordance with the European standard for gas heated water storage heaters for sanitary application (EN89). The appliance thus meets the European Directory for Gas Appliances and is therefore entitled to carry the CE-marking. It is an open f ued appliance without a fan and with a combustion products discharge safety device (category B_{11BS}). The water heater is suitable for a maximum working pressure of 8 bar. The water heater tank is manufactured from low carbon sheet steel and is glasslined on the inside. In addition the tank is f tted with a sacrif cial anode as extra protection against corrosion. A thick, CFC-free, PU insulation layer covered in a steel jacket reduces unnecessary heat loss. When the appliance is f lled with water it continuously is under water pressure. As hot water is drained from the tank, cold water is added immediately. Four f ue baff es have been placed in the f ue tube to improve heat tranfer. The f ue gasses pass their heat on to the water by means of radiation and convection. The exhaust of the f ue gasses is realized by natural thermal draught (see f gure 1).

Dead legs on a hot water installation are undesireable. Where possible they should be avoided. When the inclusion on the system of a dead leg is unavoidable the following restrictions should be applied:

- for pipes not eceeding 19 mm. inside diameter; maximum length of dead leg permitted 12 metres;
- for pipes exceeding19 mm. but not exceeding 25 mm. inside diameter; maximum lenght of dead leg 7,5 metres;
- for pipes with an inside diameter exceeding 25 mm. maximum length of dead leg 3 metres.

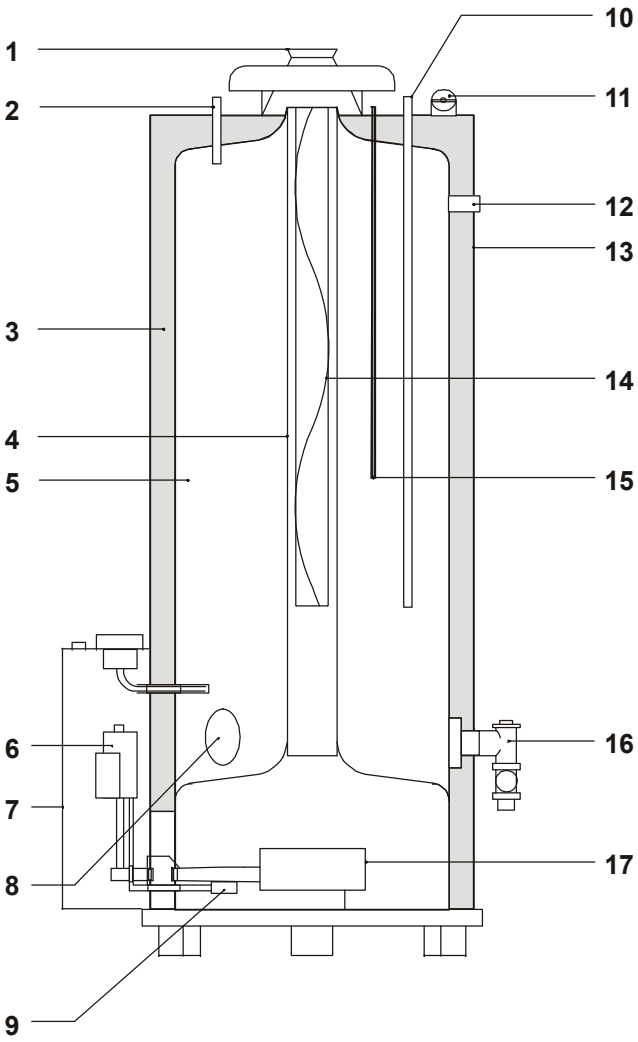


Figure 1 - Cross section of the heater

1) Draught diverter
2) Hot water outlet
3) Insulation
4) Flue tube
5) Glass lined tank
6) Gas control valve
7) Control panel
8) Waterway access cover
9) Intermittent pilot burner and f ame probe
10) Cold-water inlet
11) Combustion products dicharge safety device
12) T&P valve connection
13) Outer casting
14) Flue baff e
15) Sacrif cal anode
16) Drain valve and secondary return connection
17) Main burner

1.2 Technical safety equipment

1.2.1 Gas control valve

The water heater is equipped with a gas control valve wich regulates the f ow of gas to the burner. The gas block is equipped with a safety valve, gas valve and burner control (on a standard natural gas setting). To ensure improved ignition the gas control valve opening mechanism is f tted with a delay (softlite). The gas control block is suitable for gasses from the f rst, second and third gas family. The maximum inlet pressure is 60 mbar.
The automatic incandescent ignition (hot surface) ensures that the burner ignites as soon as there is a demand for heat.

1.2.2 Control panel

Temperature control for the water heater is housed in the control column (See f gure 2). For safety purposes, heaters are always f tted with two thermostats: a control thermostat is adjustable between 40 °C and 80 °C and a safety thermostat 90 °C. The control column is f tted with an ON/OFF switch (I/0). At setting ”I”, the gas control is activated on the basis of heat demand from the control thermostat. At setting ”0” the heater is switched off.

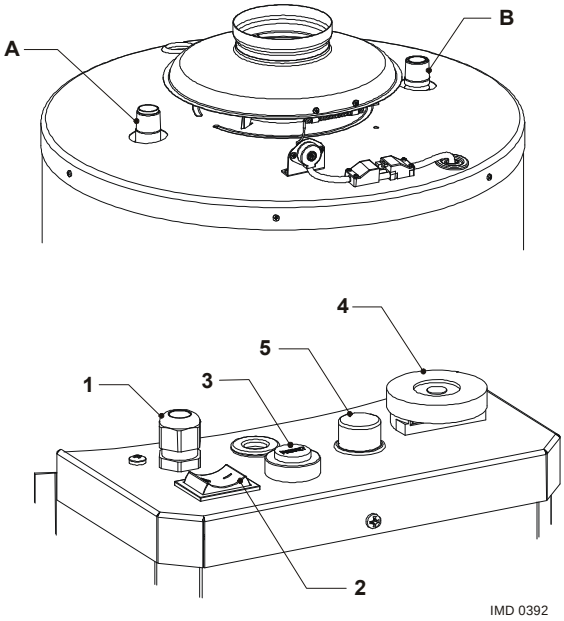


Figure 2 - Top view of the heater

A) Hot water outlet
B) Cold water inlet
1) Electrical connection
2) ON/OFF switch
3) Ignition controller reset button
4) Temperature regulator knob
5) Safety thermostat reset button

1.2.3 Operation of the storage water heater.

Normal operation

When there is a demand for heat a waiting period of about 1 second elapses before the built-in spark generator and pilot gas valve are switched on. The ignition sparks ignite the pilot burner and the resulting f ame is detected by the ionisation electrode.

Almost immediately after the pilot f ame is detected, sparking stops and the main gas valve is openend. The main burner is lit by the pilot f ame. The unit is now in operation. When the temperature of the water in the unit reaches the temperature that is set with the thermostat, the thermostat switches and disconnects the electrical heat demand signal to the burner controller. The gas valves are then closed.

Ignition failure

If the f ame is not established within the safety period the automatic ignition controller locks out. The safety period is about 25 seconds. Lock-out is indicated by the lamp in the RESET-button on the control panel. The unit has to be manually reset by pushing the reset button. If the f ame is lost during normal run, the automatic ignition controller repeats the start sequence.

1.2.4 Combustion products discharge safety device

The water heater has been f tted with a combustion products discharge safety device.

It is the function of the safety device to prevent f ue gases from the water heater entering the room where the water heater has been placed, instead of passing through the f ue to outside atmosphere. The gas supply is disconnected as soon as the device is activated by hot gasses f owing over the sensor.

After the cause of the re-entry of f ue gasses has been traced the device can be put back into operation by pressing its reset button.

If this failure occurs frequently, this indicates that the f ue suffers from down draught conditions. It is recommended that a competent person carry out the necessary remendial action.

Important

The combustion products discharge safety device should never be put out of operation.

Re-entry of flue gasses to the building could be harmful and cause poisoning or death.

1.3 Technical description

1.3.1 Dimensions

These water heaters are only suitable for a f ue tube with minimal the announced diameter (dimension G).

Dimensions	LGA 75	LGA 85
A	1585	1780
B	1450	1640
D	645	675
E	770	775
G	130	130
K	340	340
M	1505	1685
N	1505	1685
R	285	285
S	1280	1460
1	Cold water inlet	
2	Hot water outlet	
3	Gas control valve	
4	Drain valve	
5	T&P valve tapping	
6	Access door opening	

All dimensions are given in mm. (rounded off on 5mm). See drawing 3.

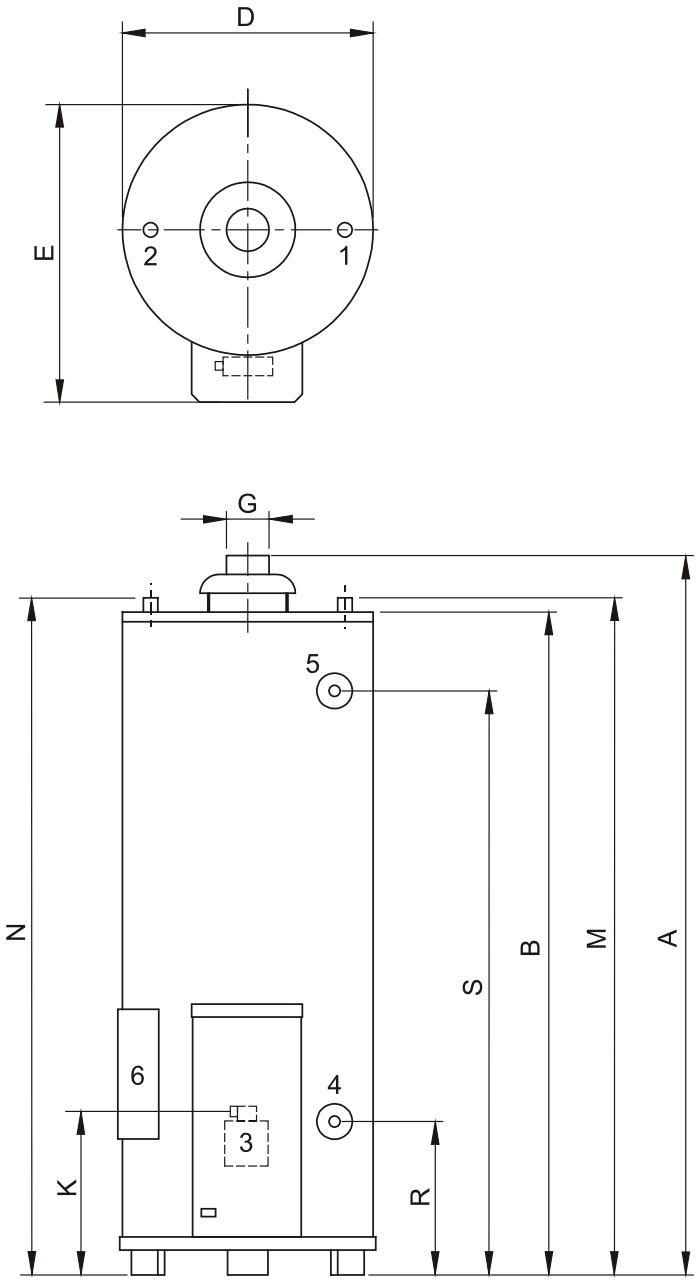


Figure 3 - Dimensions

1.3.2 Technical data

device category: II_{2H3+}

Description	Unit	LGA 75	LGA 85
DATA NATURAL GAS G20 - 20 mbar			
Nominal load (gross)	kW	25.1	26.7
Nominal output	kW	19.2	20.4
Supply pressure	mbar	20	20
Burner pressure	mbar	12.0	7.9
Gas consumption *	m^3/h	2.40	2.50
Diameter main orif ce	mm	3.90	4.50
Diameter pilot orif ce	mm	0.56 / 0.41	0.56 / 0.41
Heating time ΔT= 45 K	min.	43	55
DATA BUTANE G30 - 30 mbar			
Nominal load (gross)	kW	24.5	26.0
Nominal output	kW	19.2	20.4
Supply pressure	mbar	30	30
Gas consumption*	m^3/h	1,8	1.9
Diameter main orif ce	mm	2.30	2.35
Diameter pilot orif ce	mm	0.23	0.23
DATA PROPANE G31 - 37 mbar			
Nominal heat input (upper valvue)	kW	22.9	24.9
Nominal output	kW	17.9	19.5
Inlet pressure	mbar	37	37
Gas consumption*	kg/h	1.6	1.8
Diameter main orif ce	mm	2.30	2.35
Diameter pilot orif ce	mm	0.23	0.23
GENERAL			
Storage capacity	litres	265	355
Water connections**	-	1 - 11.5 NPT	$1^1/_4$ - 11.5 NPT
Gas connection	-	Rp $^1/_2$	Rp $^1/_2$
Drain valve	-	$^3/_4$" - 14 NPT	$^3/_4$" - 14 NPT
T&P-plug	-	$^3/_4$" - 14 NPT	$^3/_4$" - 14 NPT
Maximum operating pressure	bar	8	8
Empty weight	kg	122	149

* Gas consumption at 1013,25 mbar and 15 °C

** For a leak proof sealed connection European coupling pieces can be used on the NPT connection nipples with a pipe thread of ISO 228/1

Electrical connection

Electrical supply	Frequency	Electrically fused to
220/240 V AC	50 Hz	5A

Ionisation current.
The minimal ionisation current is 0.9 micro-Amperes DC. Below this current the burner controller will assume no f ame present. When in normal operation, the ionisation current wil be about 1.2 to 1.3 micro-Amperes DC when only the pilot f ame is burning. (Adjust the main burner pressure to zero to be able to measure under this condition) With pilot- and main burner in operation, the ionisation current will be about 6.0 and 6.3 micro-Amperes DC.

Ionisation current can be measured by connecting a universal-meter in series in the connection to the ionisation electrode. Make sure to measure in Direct Current; Alternating Current in fact gives no information about the system's behaviour.

2. FOR THE INSTALLER

2.1 Installation instructions

This water heater must be f tted in a location which will permit the provision os an approved f ue system and adequate ventilation.

A service clearance of 15 cm at the sides and rear of the unit and 60 cm at the front of the unit should be allowed for ease of servicing. Adequate distance must be allowed between the top of the unit and any obstruction or ceiling to allow the f ue baff e and anode to be inspected, cleaned or in the case of the anode replaced if necessary.
The water heater must stand on a level surface resistant to heat, insulted in accordance with local bylaws and Building Regulations 1985, with suff cient strength to support the weight of the unit when full of water.
This water heater must not be installed in a bathroom, bedroom or in a cupboard opening on to such rooms. This water heater must not be installed in any area where f amable materials are used or stored.
Insuff cient ventilation may give rise to a risk of f re, explosion or suffocation. If in doubt consult the national and local regulations governing the installation of gas appliances or your British gas sevice department.

2.1.1 Installation

The installation of this water heater should be carried out by a suitably qualif ed competent person. It is a criminal offence for unqualif ed persons to install gas equipment.
Installation should be carried out in accordance with all local authority and Building Regualions, Model Water Bylaws, bylaws of the local water supplier, Building Standards (Scotland) (Consolidation) Regulations and any relevant requirements of the Local Authority, local gas regions and the following British Standards (current editions):

For domestic applications:

BS 5440 - part 1 and part 2.
BS 5546 - Installation of gas hot water supplies for domestic purposes.
BS 6700 - Specif cations for design, installation and maintenance of services supplying water for domestic use within buildings and their curtilages.
BS 6798 - Specif cation for installation of gas f red hot water boilers of rated input not exceeding 60 kW.
BS 6891 - Specif cation for installation of low pressure gas pipework of up to 28 mm in domestic premises.

For non-domestic applications:

BS 5400 - part 1 and part 2.
BS 6798 - Specif cation for installation of low pressure gas pipework of up to 28 mm in domestic premises.
CP 342 - Code of practice for centralised hot water supply part 2, buildings other than individual dwellings and the following additional Codes of Practice.
IM/2 - Purging procedures for non-domestic gas installations.
IM/5 - Soundness testing procedures for industrial and commercial gas installations.
IM/11 - Flues for commercial and industrial gas f red boilers and air heaters.
IM/16 - Notes on installation of pipework (excluding 25 mm and below).

Some chemicals produce vapours which can cause rapid failure of main- and pilotburners and storage tanks if they are drawn into the combustion air supply. Therefore if this water heater will be used to supply hot water to:

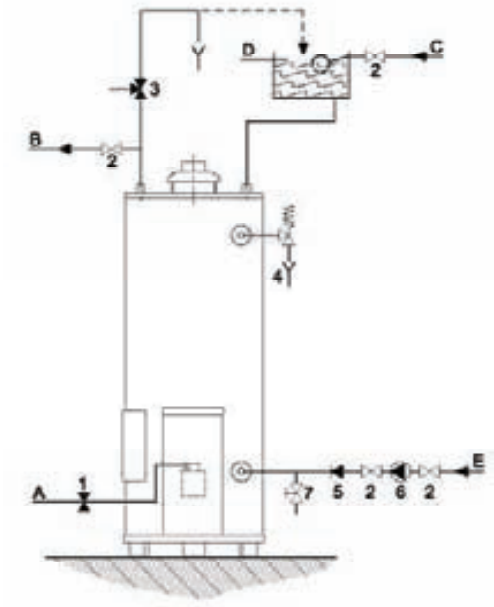
- hairdressers,
- dry cleaners,
- industrial degreasing processes or any other area where compounds containing halogens are used and stored, care should be taken that all primary and secondary air is drawn from outside atmosphere free of such contaminents.

For futher advise contact Lochinvar Ltd..

2.1.2 Water connections

Lochinvar Ltd. is suitable for connection to vented, unvented and pumped pressurised systems. In each case appropriate valves and f ttings should be used to ensure the system complies with the requirements of the water by laws, and appropriate building regulations. When f tting it is essential the rules of 'good practice' are applied at all stages of installation.

Vented systems (See f gure 4)
If the water heater is to be connected to a cold feed tank or cistern the hot water supply pipe must include an open vent which discharges over the cold feed cistern. The cold feed cistern must have an actual capacity of greater volume than the hourly recovery rate of the water heater(s) which it supplies. The minimum actual capacity is 50 gallons or 227 litres.



1) Manual gas valve
2) Stop valve
3) Three way valve
4) Safety valve
5) Non return valve
6) Circulation pump
7) Drain valve
A) Gas supply
B) Hot water outlet
C) Cold water inlet
D) Overf ow
E) Return circulation loop

Figure 4 - Connection diagram vented systems

Unvented system (See f gure 5)
To install a Lochinvar Ltd. on an unvented cold water supply system a kit of valves and f ttings f sted by the water reseach centre and complying with part G3 of the current building regulations should be used. Installation should be carried out generally as shown on the following diagram.

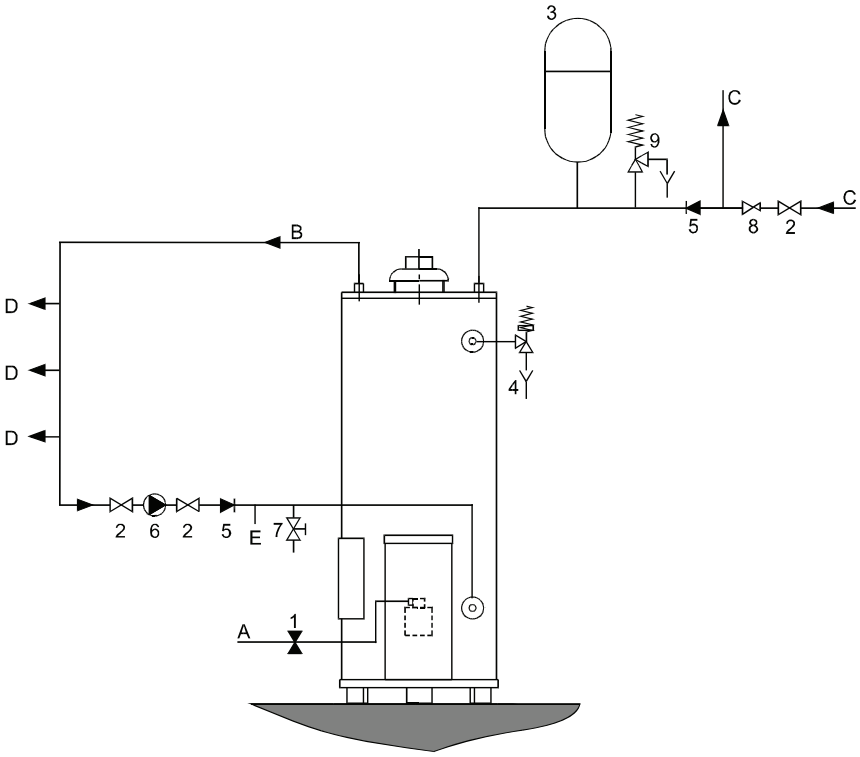


Figure 5 - Connection diagram unvented systems

1) Manual gas valve
2) Stop valve
3) Expansion vessel
4) T&P safety valve
5) Non return valve
6) Circulation pump
7) Drain valve
8) Pressure limiting valve
9) Expansion valve

A) Gas supply
B) Hot water dilevery
C) Cold water inlet
D) Hot water taps
E) Return circulation

2.1.3 Gas connection

The gas supply to this appliance must be installed in accordance with BS 6891 (1988) and British Gas Publications UP1 and UP2. Fit the 1/2" gas supply cock supplied with this unit immediately before the gas control. No heat or soldered joints should be applied in the vicinity of the gas control, as they could cause damage to the control. All connections and joints should be tested for gas soundness with a suitable leak detector (do not use a naked f ame).
N.B. When operating this unit on LPG a suitable gas supply cock should be used.

2.1.4 Flue system

The water heater should be f tted with a f ue system connected to the draught diverter. The f ue pipe should rise for at least 50 cm. vertically before the inclusion of any bends. If a horizontal run of f ue is required this should be kept to the minimum lenght possible and incorporate a rise of 6 cm. per metre of run. A split clip or f ange should be provided in the f ue close to the draught diverter for ease of servicing.
All f ue materials should be corrosion resident i.e. stainless steel or galvanised and must include a tested and apprved terminal to BS 5440 part 1.
If the f ue passes through any combustible marerial measures must be taken to protect against the possibility of f re.
All f ues must terminate in free air space approx. 1,5 metres from any vertical surface of structure i.e. chimney stacks, roof parapets, etc. If an existing chimney or f ue is to be used this should be swept clean and be free of debris before an approved liner is installed and connected to the water heater.

2.1.5 Draught diverter

The draught diverter, supplied separately in the delivery crate, **MUST** be f tted to the top of the heater in an unmodif ed condition before connecting the f ue system.
The sensor of the combustion products discharge safety device is pre-f tted to the draught diverter so care should be taken not to damage the capillary and thermostat. With the sensor facing forward, place the draught diverter over the f ue tube and ensure the three legs engage with the slots in the top casing. To complete the installation of the combustion products discharge safety device, remove the two screws from the top casing, position the bracket with the pre-assembled thermostat over the holes and re-apply screws. Complete the electrical circuit by connecting the two pin plug to its appropriate socket on the top casing. Should the safety device operate, the heater will shut down and only restart when the sensor temperature has dropped suff ciently for the button on the thermostat to be reset.

Important
The combustion products discharge safety device should never be put out of operation.
Re-entry of f ue gases to the building could be harmful and cause poisoning or death.

2.1.6 Electrical connection

All electrical connections must be carried out in accordance with IEE regulations by an accredited electrical installation company. The appliance must be connected to the mains by means of a permanent electrical connection. A main switch must be f tted in the phase between the permanent connection and the water heater. The feeder cable must have cores of at least 3 * 1.0 mm^2 The connecting clamps for the electricity supply are indicated by the symbol for earth Á, N for neutral and L for live. Always check with a voltage tester if the live and the neutral have been connected correctly in the electricity supply. The electricity supply must comply with the requirements below:

Electrical supply	Frequency	Electrically fused to a minimum of
220/240 V AC	50 Hz	5A

The maximum power consumption is 25 W

See electrical diagram for more information, appendix 1.

2.2 Commissioning

Filling the water heater

1. Close the drain tap;
2. Open the cold water tap to the water heater and open all taps where hot water can be drained for de aeration. The water heater is f lled as soon as cold water f ows from all taps;
3. Close all hot water taps.

Putting into operation

1. Check to see if the heater is f lled with water by running a little to waste from a hot water tap connected to the heater;
2. Check wether the ON/OFF switch is in OFF-position;
3. Ensure gas supply is fully purged of air and turn on gas cock;
4. Ensure that power has been correctly supplied to the unit. Use a voltage tester to check that the live is to “L” and neutral to “N”. (Flame detection is phase sensitive);
5. When f rst starting, the controller can be in the lock out condition: depress the reset button to free the control. (After manual reset, an extended prepurge/waiting time will occur);
6. Switch the ON/OFF switch into ON position. If the pilot fails to ignite within 25 seconds the controls will go to lock out and the reset button will need to be reset (wait 15 seconds before attempting reset). It may be necessary to repeat the lighting sequence a number of times on the initial light up if all the air has not been purged from the gas supply;
7. The main burner pressure has been factory set but should be checked once normal operation is established (see ‘Ratings’ for settings);
8. Set the temperature regulator to the required setting (see ‘Descalcif cation’);

Note: If during normal use the reset button is pressed the gas valves will close and the automatic ignition controller will start a new sequence after releasing the reset button.

Shut down

Note:The water heater should only be turned off when hot water will not be required for an extended period (e.g. holidays); otherwise it should be left on. To shut down put the ON/OFF switch into OFF position.

2.3 Removing and replacing the control panel front cover

Taking off the column (see figure 7).

1. Remove the screw at the top center of the column;
2. Shift the column upwards until the hooks at the lower end set free;
3. Pull the lower end of the column slightly forward;
4. Pull the column down until the top end is given free.

Mounting the column (see figure 7).

1. Move the top of the column underneath the rim of the control panel and shift it up as far as possible;
2. Put the hooks inside the burner access opening and over the rim of the bse jacket;
3. Shift down the column;
4. Fix the screw at the top center of the column.

2.4 Setting the gas pressure

The gas pressure has been set to the correct values at the factory.

<u>Important:</u> The following procedure must be followed when checking or setting the gas pressure:

1. Shut down the heater by switching off the mains current (switch off main switch);
2. Connect a manometer to the pressure test nipple to measure the burner pressure on the gas control.
3. Activate the heater and allow the burner to ignite;
4. Check the burner pressure. If necessary, reset it by means of the burner pressure adjusting screw. Turning it anti-clockwise reduces burner pressure. Turning it clockwise increases burner pressure;
5. Shut down the heater, remove the manometer and close the pressure nipple;
6. Restart the heater (test for soundness).

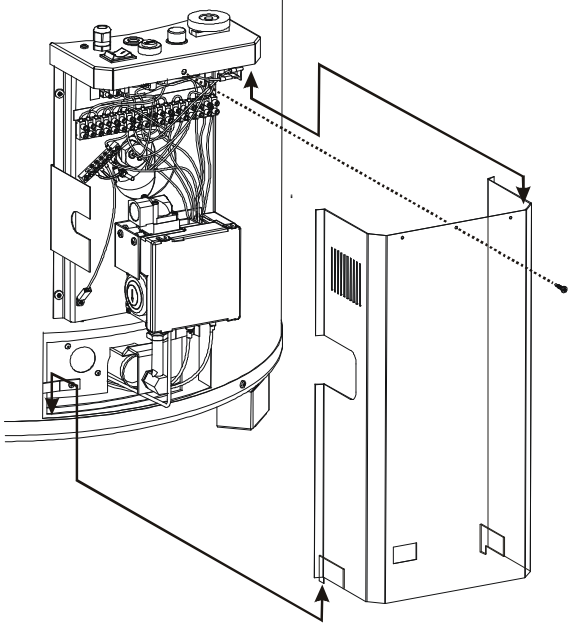


Figure 7 - Taking off and mounting the column

2.5 Temperature regulation

The appliance is under water supply pressure (maximum 8 bar). The amount of cold water that is added is equal to the amount of hot water used. The gas control block automatically regulates the gas supply. The main burner will ignite as soon as a reduction in water temperature is sended by the thermostat. The main burner will shut down as soon as the preset temperature is achieved.

At high water temperatures there is more scale buildup in the appliance. It is for this reason that it is recommended to place the temperature control knob in position of 60 °C as the accumulation of scale will be reduced.

2.6 Converting to another type of gas

For conversion of the appliance from natural gas to another type of gas, or visa versa, it is necessary to exchange the pilot injector and the main injector. The conversion may only be executed by a qualf ed competent person.

Procedure:

1. Shut the heater down. Close the main inlet gas valve and switch off the electricity supply at the main switch;
2. Remove the burner assembly;
3. Replace the injectors with the correct injectors from the conversion set. (see table below).

Remark:

- When conversion of the appliance from natural gas to another type of gas, f x the screw on the gas block of the burner pressure control as far as the stop.

- When conversion of the appliance from another type of gas to natural gas, then the right burner pressure should be adjust.

2.7 Maintenance

To ensure safe and eff cient operation of the water heater it is recommended that it is cleaned and serviced at least once a year by a qualif ed competent person.

2.7.1 Sacrificial anode

The life cycle of the anode is determined by the quality and the quantity of the water f owing through the water heater. It is therefore recommended that the anode be inspected and replaced if necessary at least once a year.

1. Close the stop cock in the cold water supply pipe;
2. Open the nearest hot water tap in order to allow the pressure to drop from the water heater and the pipes;
3. Slacken the anode with a f tting wrench;
4. Check the anode and replace it if it has been reduced in diameter by 60% or more at any point on its lenght;
5. Check for water leaks.

If is necessary to replace the anode it should be replaced by one of the same type. The type of anode required can be detemined on the basis of the type of the appliance and the serial number.

2.7.2 Cleaning

1. Close the gas supply and demount the burner after it has cooled down
2. Disconnect the burner assembly from the gas control
3. Remove the complete burrner assembly
4. Clean the burner with a soft brush
5. Check the pilot burner and clean it if so required
6. Check the combustion chamber, f ue tube and f ue baff e and clean these if required

After cleaning of the pilot- and main burner the operation of these should be checked. If necessary the burner pressure should be reset.

2.7.3 Inspection of the internal waterside surfaces

Formation of lime scale depends on the quality and quantity of the water used. In addition higher water temperatures lead to more deposit in the appliance. A temperature setting of 60° C is recommended in order to keep the calcif cation at a low level. Decalcif cation should be attempted with the proper means. For extensive information a decalcif cation instruction is available.

2.7.4 Spare parts

To be able to order spare parts it is important to note the type of appliance as well as the serial number of the appliance. Based on this information the data concerning the spare parts can be determined.

	Unit	LGA 75			LGA 85		
		G20	G30	G31	G20	G30	G31
Inlet pressure	mbar	20	30	37	20	30	37
Burner pressure	mbar	12.0	30	37	7.9	30	37
Diameter main injector	mm	3.90	2.30	2.30	4.50	2.35	2.35
Diameter pilot injector	mm	0.56/ 0.41	0.23	0.23	0.56/ 0.41	0.23	0.23

2.8 Inlet combination

Not applicable in U.K. and Ireland.

2.9 Gas smell

Immediately shut the main gas tap. Do not light any f re or switch o any lights, do not use any electrical switches or alarm bells. Open windows. Thoroughly inspect all gas connections and, if the gas smell persists, alert the local gas company and/or your installer.

2.10 Condensation

If the appliance is f lled with cold water or if the hot water consumption is very high, condensation of f ue gasses will occur on the cold surfaces of the combustion chamber and the f ue tube. The water drops will fall on the burner and cause a sizzling noise. This is a normal phenomenon that will disappear as soon as the appliance reaches its normal operating temperature.

2.11 Important warning

The applicance should never be taken into operation with a closed cold water supply!
Provision should always be made for expansion.

3. FOR THE USER

3.1 Commisioning

Warning
Installing and commissioning of this water heater should only be carried out by a qualif ed competent heating engineer.

Filling the water heater
1. Close the drain tap;
2. Open the cold water tap to the water heater and open all taps where hot water can be drained for de aeration. The water heater is f lled as soon as cold water f ows from all taps;
3. Close all hot water taps.

Putting into operation
1. Check to see if the heater is f lled with water by running a little to waste from a hot water tap connected to the heater;
2. Check wether the ON/OFF switch is in OFF-position;
3. Ensure gas supply is fully purged of air and turn on gas cock;
4. Ensure that power has been correctly supplied to the unit. Use a voltage tester to check that the live is to “L” and neutral to “N”. (Flame detection is phase sensitive);
5. When f rst starting, the controller can be in the lock out condition: depress the reset button to free the control. (After manual reset, an extended prepurge/waiting time will occur);
6. Switch the ON/OFF switch into ON position. If the pilot fails to ignite within 25 seconds the controls will go to lock out and the reset button will need to be reset (wait 15 seconds before attempting reset). It may be necessary to repeat the lighting sequence a number of times on the initial light up if all the air has not been purged from the gas supply;
7. The main burner pressure has been factory set but should be checked once normal operation is established (see ‘Ratings’ for settings);
8. Set the temperature regulator to the required setting (see ‘De-scalcif cation’).

3.2 Use

The appliance is under water supply pressure (maximum 8 bar). The amount of cold water that is added is equal to the amount of hot water used. The gas control block automatically regulates the gas supply. The main burner will ignite as soon as a reduction in water temperature is sended by the thermostat. The main burner will shut down as soon as the preset temperature is achieved.

At high water temperatures there is more scale buildup in the appliance. It is for this reason that it is recommended to place the temperature control knob in position of 60 °C as the accumulation of scale will be reduced.

3.3 Fault finding

Fault	Possible cause	Corrective action
Gas smell		If you smell gas you should immediately close the main gas tap, you should not f ght any f re or switch on light. electrical switches or bels. Open windows and immediately contact your installer or the local gas company
Heater is off or does not ignite	Burner automat is in lock condition	Reset burner automat with the RESET button on the top of the collumn
	Blocked chimney	Contact your installer to investigate the cause and rectify it
	Overheat thermostat is engaged	Cool down the water in the equipment and adjust the water temperature to a lower setting (60 °C). Reset the safety thermostat using the RESET button.
	Gas supply shut off	Open the inlet gas valve
Insuff cient hot water, or none at all	Temperature set too low	Set water temperature to higher valvue (60 °C recommended)
	Thermal Ref ux Safeguard has shut down the heater	After resetting the TRS activate the heater. If this occurs regularly, call your installer
	Overheat thermostat is engaged	Cool down the water in the equipment and adjust the water temperature to a lower setting (60 °C). Reset the safety thermostat using the RESET button.
	Supply of hot water exhausted	Reduce hot water use. Give the heater time to heat the water
	Unindentif able cause	Switch off the elactricity to the heater, close the inlet gas valve and call your installer
Explosive ignition	Wrong inlet gas pressure and/or burner pressure	Set the correct inlet pressure and/or burner pressure
	Dirty injectors	Clean injectors
Poor f ame image	Wrong inlet pressure and/or burner pressure	Set the correct inlet pressure and/or burner pressure
Water leakage	Condensation of (f ue) gasses	See chapter “Condensation”
	Leakage from other water heater or pipes in the vicinity	If possible trace the cause and/or call your installer

If a fault cannot be rectif ed or if the fault is persistent, please contact your installer.

4. WARRANTY

4.1 General warranty

If within 1 (one) year of the invoice date or commissioning date of a water heater supplied by Lochinvar Ltd, following verif cation, and at the sole discretion of Lochinvar Ltd, an assembly or part (with exclusion of the tank) proves to be defective or fails to function correctly due to manufacturing and/or material defects, then Lochinvar Ltd shall repair or replace this assembly or part.

4.2 Tank warranty

If within 3 (three) years of the invoice date or commissioning date of a water heater supplied by Lochinvar Ltd, following verif cation, and at the sole discretion of Lochinvar Ltd, the enamel-lined steel tank proves to be leaking due to rust or corrosion occurring on the water side, then Lochinvar Ltd shall offer to replace the defective water heater with an entirely new water heater of equivalent size and quality The warranty period given on the replacement water heater shall be equal to the remaining warranty period of the original water heater that was supplied.

4.3 Conditions for installation and use

The warranty set out in articles 1 and 2 will apply solely under the following conditions:

a. The water heater is installed under strict adherence to Lochinvar Ltd installation instructions for the specif c model, and must be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, I.E.E. Regulations and the byelaws of the local water undertaking. The installation should also be in accordance with any relevant requirements of the local gas distributor and local authority.
b. The water heater remains installed at the original site of installation.
c. The water heater is used exclusively with drinking water, which at all times can freely circulate (a separately installed heat exchanger is mandatory for heating saline water or corrosive water).
d. The tank is safeguarded against harmful scaling and lime build-up by means of periodic maintenance.
e. The water temperatures in the heater do not exceed the maximum setting of the thermostats, which form a part of the water heater.
f. The water pressure and/or heat load do not exceed the maximum values stated on the water heater rating plate.
g. The water heater is installed in a non-corrosive atmosphere or environment.
h. The water heater is connected to a protected cold supply arrangement, which is: approved by the relevant authority; with suff cient capacity for this purpose; supplying a pressure no greater than the working pressure stated on the water heater; and where applicable by a likewise approved temperature and pressure relief valve, f tted in accordance with installation instructions of Lochinvar Ltd applying to the specif c model of water heater, and further in compliance with Building Regulations, local authority installation byelaws and the Water Supply (Water Fittings) Regulations 1999 .
i. The water heater is at all times f tted with cathodic protection. If sacrif cial anodes are used for this and these anodes have reduced in size by more than 40% at any point along their length or if they are severely pitted, new anodes should be f tted. Particular attention should be paid to the ends of each anode to ensure excessive localized depletion has not occurred. Where anodes are covered with particles they should be cleaned; for reference, when new, the anode has a diameter of 21 mm. When power anodes are used, it is important to ensure that they continue to work properly.

4.4 Exclusions

The warranty set out in articles 1 and 2 will not apply in the event of:

a. damage to the water heater caused by an external factor;
b. misuse, neglect (including frost damage), modif cation and incorrect and/or unauthorized use of the water heater;
c. contaminants or other substances having been allowed to enter the tank;
d. any attempts at repair to a defective water heater other than by an approved service engineer.

4.5 Scope of the warranty

The obligations of Lochinvar Ltd pursuant to the specif ed warranty are limited to free delivery from the warehouse of the replacement assemblies, parts or water heater, respectively. Labor, installation and any other costs associated with the replacement will not be accepted by Lochinvar Ltd.

4.6 Claims

A claim on grounds of the specif ed warranty must be submitted to the dealer from whom the water heater was purchased, or to another authorized dealer of Lochinvar Ltd. Inspection of the water heater as referred to in articles 1 and 2 shall take place in one of the laboratories of Lochinvar Ltd.

4.7 Obligations of Lochinvar Ltd

Lochinvar Ltd grants no other warranty or guarantee over its water heaters nor the (assemblies or parts of) water heaters supplied for replacement, other than the warranty expressly set out in these conditions.
Under the terms of the supplied warranty, Lochinvar Ltd is not liable for damage to persons or property caused by (assemblies or parts, or the glass-lined steel tank of) a (replacement) water heater that it has supplied.

5. DECLARATION OF CONFORMITY

CE

Lochinvar®
High Efficiency Water Heaters and Boilers

EEC - Declaration of Conformity

Supplier: **Lochinvar Limited**
7 Lombard Way
The MXL Centre
Banbury - United Kingdom

hereby declares that the following products:

Product description: **Commercial Gas Fired Storage Water Heater**

Product models: **LGA 75, LGA 85**

on the assumption that the installation instructions have been followed are compliant to:

Gas Appliance Directive - 90/396/EC
Standards used:
- EN89: 1999
- EN50165: 1997

Low Voltage Directive - 2006/95/EC
Standards used:
- EN60335-1: 1994
- EN50165: 1997

EMC Directive - 2004/108/EC
Standards used:
- EN55014-1: 1993
- EN55014-2: 1997
- EN61000-3-2: 1995
- EN61000-3-3: 1995
- EN50165: 1997

as stated in the EC type-examination report by KIWA-Gastec Certification BV, the Netherlands.

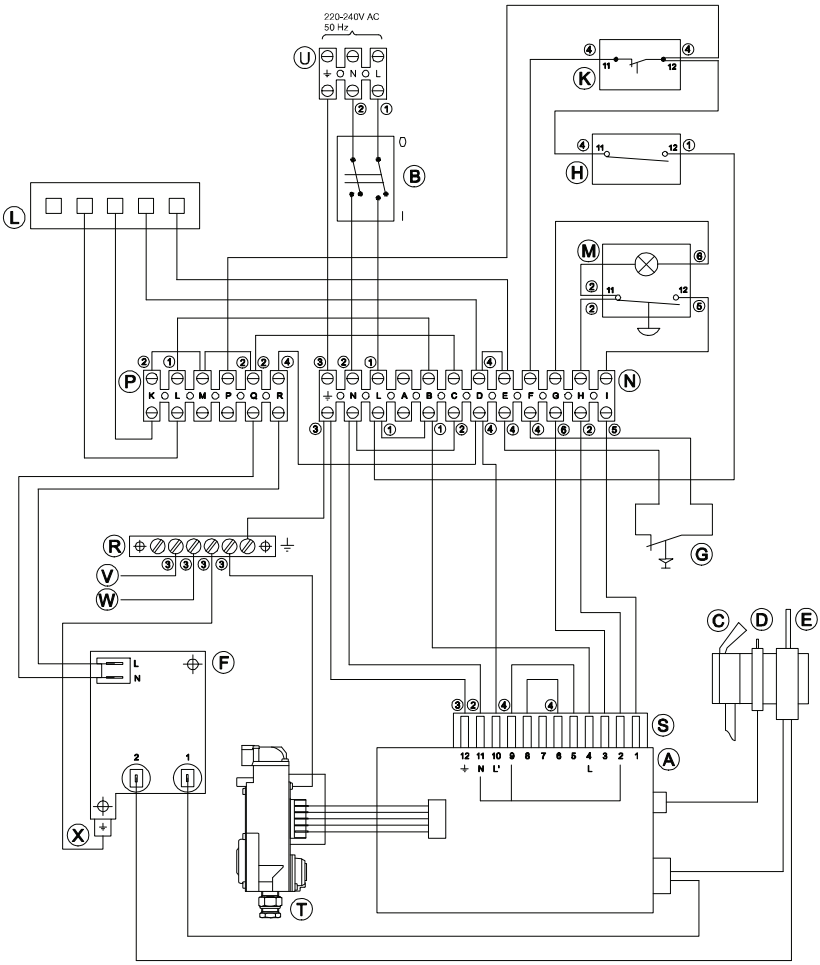
Company:
Lochinvar Limited

Date:
March 1, 2012

Signature:

D. J. Pepper
Managing Director

APPENDIX 1 Connection diagram



① = brown
② = blue
③ = yellow/green
④ = black
⑤ = white
⑥ = red

A = Ignition controller
B = ON/OFF switch
C = Pilot burner
D = Spark electrode
E = Flame probe
F = Transformer f ame detection *
G = Combustion products discharge safety device
H = Control thermostat
K = Safety thermostat
L = Timer *
M = Remote button
N = Terminal block
P = Terminal block
R = Earth terminals
S = Connector to ignition controller
T = Gas control valve
U = Connection strip
V = Tank earth
W = Casing earth
X = Control panel base plate earth

* = Optional

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