Impetus
Instantaneous Gas
Fired Water Heater

Installation, Commissioning,
User & Maintenance Instructions

Models:
IM 550 GB NAT and GB LP
IM 750 GB NAT and GB LP
IM 1250 GB NAT and GB LP
INDEX

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1 - GENERAL SAFETY RECOMMENDATIONS

If you smell gas
1. - Close the manual gas valve.
2. - Ventilate the room.
3. - Do not switch on any electric device, telephone included.
4. - From another room, call a professionally qualified technician immediately or the gas supply company. Call the Fire department if the former is not available.

If you can smell combustion products
1. - Switch the appliance off.
2. - Ventilate the room.
3. - Call a professionally qualified technician.

Explosive or highly flammable products
Do not store or use explosive or highly flammable materials such as paper, solvents, paints, etc... in the same room where the appliance is installed.

Installation, modifications
 frowned
The gas appliance must be installed, calibrated or modified by professionally qualified staff, in compliance with National and local Standards, as well as the instructions in this manual.
 frowned Incorrect installation or poor maintenance can cause injury/damage to persons, animals or objects, for which the manufacturer cannot be deemed liable.
 frowned The appliance must be connected to an approved flue system. Failure to comply with this regulation can lead to serious risks for people and animals.
 frowned A domestic hot water temperature level exceeding 51°C can cause permanent injury/damage to people, animals and objects. Special care should be taken to protect children, the elderly and those with special needs using non-accessible blending valves to limit the flow hot water temperature at outlets.
 frowned The water heater flue system must not be modified by unqualified person.
 frowned The flue system terminals should not be obstructed in any way.
 frowned Do not leave parts of the packaging and any replaced parts within the reach of children.
 frowned Seal the adjustment devices after every calibration.
 frowned In agreement with the provisions for use, the user must keep the installation in good working order and guarantee reliable and safe operation of the appliance.
 frowned We also highlight the importance of an annual scheduled maintenance contract with a professionally qualified technician.
 frowned The end user must have maintenance performed on the appliance only by professionally qualified technicians in accordance with this manual and in full compliance with both local and national standards.
 frowned Before performing any cleaning or maintenance, disconnect the appliance from the mains power supply.
 frowned After any cleaning or maintenance, before reconnecting the power supply, make sure that all internal parts are properly dry.
 frowned This appliance is not intended for use by persons (including children) with reduced physical and sensory conditions or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
 frowned This manual is an integral and essential part of the product and must be kept carefully by the user, for possible future consultation. If the appliance must be transferred or if you should move and leave the unit to another user, always ensure that this manual remains with the new user and/or installer.
 frowned Any accessories or kits which might be added must be original Lochinvar products.
 frowned This appliance must be intended only for the use for which it has been expressly declared: production of domestic hot water for civilian use.
 frowned Any contractual and extra contractual liability of the manufacturer is excluded for damage caused by installation errors or errors in use and however due to failure to comply with the instructions given by the manufacturer or by failure to comply with applicable national and/or local laws.
 frowned For safety reasons and respect for the environment, the packaging elements must be disposed of in the relevant separate waste collection centres.

In case of breakdown
In the case of appliance breakdown and/or malfunctioning, deactivate it and do not attempt any repairs. Contact a professionally qualified technician only. If components must be replaced for repair to be successful, only use original spare parts. Failure to comply with the above can jeopardise the safety of the appliance.

Professionally qualified technician
Professionally qualified technicians with certified training covering gas boilers and/or gas water heaters as envisioned by the law.

Technical drawings
All drawings in this manual relating to electrical wiring, hydraulic and gas layouts are purely indicative. The external services such as electrical cable types and sizes, water services pipes and gas services must always be checked by a professionally qualified technician or engineer to verify compliance with all relevant standards, Laws and codes of good practice.
1 - GENERAL SAFETY RECOMMENDATIONS

1.1 - National laws and regulations

Gas Safety (installations and Use) Regulations 1998 (as amended).

It is law that all gas appliances are installed by competent persons, in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest and that of safety, to ensure that this law is complied with.

The installation of the water heater MUST be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, IEE Regulations and the Water Supply (water fittings) Regulations.

The installation should also be in accordance with any relevant requirements of the HSE, local gas region and local authority and the relevant recommendations of the following documents:

British and European Standards

• BS 6891:
  Installation of low pressure gas pipework of up to 35 mm (R1¼) in domestic premises (2nd family gas) - Specification. Note: for larger installations see IGE/UP/2 below.
• BS 6798:
  Specification for installation and maintenance of gas-fired boilers of rated input not exceeding 70 kW net.
• BS 6644:
  Specification for installation of gas-fired hot water boilers of rated inputs between 70 kW (net) and 1.8 MW (net) (2nd and 3rd family gases).
• BS 6700:
  Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages - Specifications
• BS EN 806-2:
• BS 5546:
  Specification for installation of hot water supplies for domestic purposes, using gas-fired appliances of rated input not exceeding 70 kW.
• BS 5440:
  Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).
  Part 1: Specification for installation of gas appliances to chimneys and for maintenance of chimneys.

Institute of Gas Engineers and Managers (IGEM) Publications

• IGE/UP/1:
  Soundness testing and purging of industrial and commercial gas installations.
• IGE/UP/1A:
  Soundness testing and direct purging of small low pressure industrial and commercial natural gas installations.
• IGE/UP/2:
  Gas installation pipework, boosters and compressors on industrial and commercial premises.
• IGE/UP/10:
  Installation of flued gas appliances in industrial and commercial premises.

CIBSE Publications

2.1 - Model overview

IM XX

- 550 = Water heater with maximum heat input of 25.5 kW
- 750 = Water heater with maximum heat input of 32.0 kW
- 1250 = Water heater with maximum heat input of 57.8 kW

Condensing, indoor, pre-mixed, ecological gas water heater.
2.2 - Manufacturer
Lochinvar Ltd
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Oxon, OX16 4TJ
United Kingdom
Telephone: +44(0) 1295 269 981
Fax: +44(0) 1295 271 640,
Email: info@lochinvar.ltd.uk
Website: www.lochinvar.ltd.uk

2.3 - Symbols key

⚠️ CAUTION !!!
Electric shock hazard. Failure to comply with these recommendations can compromise the good working order of the appliance or cause serious damage to persons, animals or objects.

⚠️ CAUTION !!!
General hazard. Failure to comply with these recommendations can compromise the good working order of the appliance or cause serious damage to persons, animals or objects.

✨ Important indication symbol.

2.4 - Maintenance
Servicing is recommended at intervals no greater than 12 months to aid trouble free operation. Even if a maintenance schedule is determined to be less than annually, it is important that all controls and safety features be checked for correct operation on an annual basis.

Offer your customer a scheduled maintenance contract.
1 - Command and control board
2 - Electric connections board
3 - Electrical box
4 - ----------
5 - ----------
6 - Water flow meter
7 - Cold water temperature sensor (1007)
8 - Fan
9 - ----------
10 - ----------
11 - Heat exchanger output sensors (1001 and 1005)
12 - ----------
13 - ----------
14 - Pump MUST STAY ALWAYS ON THIRD SPEED POSITION
15 - Flame detection electrode
16 - Wall fixing brackets
17 - ----------
18 - ----------
19 - Combustion air and exhaust flue connection
20 - Combustion analysis ports
21 - Exhaust flue temperature sensor (1006)
22 - Spark generator
23 - Ignition cables
24 - Combustion gases non-return valve.
25 - Air inlet manifold
26 - Gas valve
27 - Front cover
28 - Safety valve
29 - Display
30 - Control panel
31 - Gas valve adjustment door

Figure 3-1 - Water heater internal components IM 550 and 750
32 -  
33 - Front cover fixing tabs  
34 -  
35 - Ignition electrodes  
36 - Burner sight glass  
37 - Flue condensate collection collar drain pipe (connected to siphon)  
38 - Burner  
39 - Air/gas mixer  
40 - Condensate drain siphon  
41 - Safety valve drain pipe  
42 -  
43 - Condensate collection funnel  
44 -  
45 - High limit flue gas temperature fuse  
46 - D.H.W. temperature sensor (100°C) 

Figure 3-2 - Water heater internal components IM 550 and 750
1 - Command and control board
2 - Electric connections board
3 - Electrical box
4 - ----------
5 - ----------
6 - Water flow meter
7 - Cold water temperature sensor (1007)
8 - Fan
9 - ----------
10 - ----------
11 - Heat exchanger output sensors (1001 and 1005)
12 - ----------
13 - ----------
14 - Pump MUST STAY ALWAYS ON THIRD SPEED POSITION
15 - Flame detection electrode
16 - Wall fixing brackets
17 - ----------
18 - ----------
19 - Combustion air and exhaust flue connection
20 - ----------
21 - Exhaust flue temperature sensor (1006)
22 - Spark generator
23 - Ignition cables
24 - Combustion gases non-return valve.
25 - Air inlet manifold
26 - Gas valve
27 - Front cover
28 - Safety valve
29 - Display
30 - Control panel
31 - Gas valve adjustment door

Figure 3-3 - Water heater internal components IM 1250
32 - 
33 - Front door fixing tabs
34 - 
35 - Ignition electrodes
36 - Gas burner sight glass
37 - Flue condensate collection collar drain pipe (connected to siphon)
38 - Burner
39 - Air/gas mixer
40 - Condensate drain siphon
41 - Safety valve drain pipe
42 - 
43 - Condensate collection funnel
44 - 
45 - High limit flue gas temperature fuse
46 - D.H.W. temperature sensor (100°C)
47 - Manual air purging valve

Figure 3-4 - Water heater internal components IM 1250
Key to figure 4-1:

1 = Water heater
2 = Combustion air intake
3 = Exhaust flue
4 = Exhaust flue temperature sensor (Par. 1006)
5 = High limit flue gas temperature fuse
6 = Sealed chamber
7 = Water collection tub
8 = Heat exchanger outlet temperature sensor 1 (Par. 1001)
9 = Heat exchanger outlet temperature sensor 2 (Par. 1005)
10 = Burner
11 = Heat exchanger
12 = Fan
13 = Cold water temperature sensor (Par. 1007)
14 = Condensate collection siphon
15 = Air/gas mixer
16 = Gas valve
17 = Safety valve
18 = ---------
19 = Pump
20 = Non-return valve
21 = Water flow meter
22 = ---------
23 = Cap
25 = Manual gas valve (optional)
26 = Gas inlet
27 = Cold water inlet
28 = Safety valve condensate drain funnel
29 = Hot water outlet
30 = Hot water sensor (Par. 1002)

Figure 4-1 - Hydraulic layout
4.1 - Operation and intended use of the appliance

This product is a condensing gas appliance, intended for the production of domestic hot water for civil use. Consider the water pressure drops as illustrated in figure 4-2.

The temperature of the domestic hot water can be adjusted by following the procedure in section 7.4.

This appliance must be connected to a domestic hot water system which has adequately sized pipes to convey the correct water volume and all pipes should be fitted with good quality insulation to optimise the performance of the water heater.

Before installation of the domestic cold and hot water services, the plant should be flushed thoroughly in order to remove any residues or impurities which could compromise the good working order of the appliance.

This appliance is not suitable for installation outdoors. It must not be exposed to temperature below zero or temperature above 50°C.

This appliance must be installed in a location which will not cause damage to objects or property in the event of water leaking from within the appliance or connections at the appliance.

Check figure 5-1 concerning the minimum safety distances for installation and future maintenance.

Key to figure 4-2

A = Model IM 550
B = Model IM 750
C = Model IM 1250

Figure 4-2 - Water pressure drops
4.2 - Examples of installation
In figures 4-3, 4-4 and 4-5 you can see some examples of correct installation.

Legend fig 4-3, 4-4 and 4-5

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<td>IV</td>
<td>ISOLATION VALVE</td>
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<tr>
<td>PRV</td>
<td>PRESSURE REDUCING VALVE</td>
</tr>
<tr>
<td>NRV</td>
<td>NON RETURN VALVE</td>
</tr>
<tr>
<td>EV</td>
<td>EXPANSION VALVE</td>
</tr>
<tr>
<td>TD</td>
<td>TUNDISH</td>
</tr>
<tr>
<td>LSV</td>
<td>LOCKSHIELD VALVE</td>
</tr>
<tr>
<td>EXV</td>
<td>EXPANSION VESSEL</td>
</tr>
<tr>
<td>BRP</td>
<td>BOILER RETURN PUMP</td>
</tr>
<tr>
<td>FS</td>
<td>FLOW SETTER</td>
</tr>
<tr>
<td>S1</td>
<td>COLLECTOR SENSOR</td>
</tr>
<tr>
<td>S2</td>
<td>THERMAL STORE SENSOR</td>
</tr>
<tr>
<td>SPS</td>
<td>SOLAR PUMP STATION</td>
</tr>
<tr>
<td>SEV</td>
<td>SOLAR EXPANSION VESSEL</td>
</tr>
<tr>
<td>CT</td>
<td>COLLECTION TANK</td>
</tr>
<tr>
<td>SC</td>
<td>SOLAR CONTROLLER</td>
</tr>
<tr>
<td>AAV</td>
<td>AUTOMATIC AIR VENT</td>
</tr>
<tr>
<td>HL</td>
<td>HIGH LIMIT STAT</td>
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Figure 4-3 - Example of basic installation
Figure 4-4 - Example of installation with return
Figure 4-5 - Example of installation with solar pre-heat
5.1 - Opening the packaging
The appliance is supplied in a carton box.

5.2 - Dimensions and minimum clearances
It is necessary to leave free spaces around the appliance as illustrated in figure 5-1 both for installation and maintenance.

5.3 - Choosing suitable installation location

⚠️ CAUTION!!! The appliance must be installed exclusively on a solid, vertical wall, which can support the weight.
The appliance must be installed in a suitable room taking into account the following factors:
- connection of the exhaust/air intake pipes;
- connection of the gas supply pipe;
- connection to the cold water pipe;
- connection of the domestic hot water pipe;
- electrical connection;
- connection of the condensate drain;

5.4 - Mounting the appliance
Refer to figure 5-4:
1.- place the paper template, provided with the appliance, against the wall;
2.- check that the template is plumb;
3.- mark the holes for the plugs and hydraulic fittings on the wall;
4.- remove the paper template;
5.- make the holes “A” and introduce the wall plugs “B”;
6.- hang the appliance on the plugs “C”
7.- make hydraulic and gas connections;

5.5 - Domestic hot and cold water

⚠️ CAUTION!!! water quality must be within 6,5<pH<8,5 acidity value.

⚠️ CAUTION!!! If water hardness exceeds 20°f (200 mg/l or 11,2°dH) a water softener must be installed on the incoming cold water supply.

⚠️ CAUTION!!! If water heater works at temperature higher than 60°C and until 75°C, water hardness must be lower than 15°f (150 mg/l or 8,4°dH)

⚠️ CAUTION!!! Water hardness must not be reduced lower than 5°f (50mg/l or 2,8°dH). Softened water than 5°f (50mg/l or 2,8°dH) is aggressive and can corrode the heat exchanger reducing life expectation.

⚠️ CAUTION!!! Install a filter with mesh no wider than 0.5 mm² in the domestic cold water inlet.

⚠️ CAUTION!!! Impetus can supply water at up to 95°C (Hi limit setting) and 10bar (safety valve setting). The installer must ensure that the system can withstand this temperature and pressure or ensure extra safety devices are fitted to protect the system, such as a mixing valve on the outlet and additional Pressure reducing valve.
In figures 5-2 and 5-3 the service and maintenance valves are not shown. Hydraulic and gas connections should be fitted with isolation valves to accommodate service and maintenance works.

### 5.6 - Gas

**CAUTION !!!** It is prohibited to operate the appliance with the incorrect gas type. Check the data label on the appliance for Natural gas or Propane gas to ensure that the correct appliance is being installed.

**CAUTION !!!** Check that the gas and supply pressure are those for which the appliance has been adjusted.

Two situations are possible:

A - the gas and supply pressure correspond to the adjustment of the appliance. In this case, it can be connected;

B - the gas and supply pressure do not correspond to the adjustment of the appliance. In this case, the appliance must be converted to the type of gas and supply pressure corresponding to those of the supply available.

The appliance is provided with the relevant gas conversion kit.

- Before the gas appliance is installed it is essential to ensure that the internal gas pipe is clean and free of metal or plastic filings or any other solid pieces or liquids;

- A manual shut-off valve must be installed on the gas supply pipe adjacent to the appliance;

**CAUTION !!!** Before supplying gas to the appliance, it is essential that the gas pipes have been pressure tested in accordance with the most recent applicable gas standards.

- To prevent damage to the appliance gas valve, the supply pressure should not exceed 50 mbar under any circumstances;

- If the gas pipe-work must be tested in excess of 50 mbar, ensure that the appliance is fully isolated.

Figures 5-2 and 5-3 shows the position and the diameter of the gas connection on the appliance. Ensure that the gas line is adequately sized to provide the maximum volume flow rate at the required minimum pressure.

### 5.7 - Condensate drain

The condensate drain is located on the right hand side of the boiler. It is fitted with a ½” PVC tee and union, this should be connected to an appropriate condensate drain, sloping continuously away from the boiler at an angle of at least 3° (50mm per metre). The Water Resources Act requires that trade effluent is discharged to municipal sewers between pH 6.5 and 10.0. If it is determined that these levels cannot be achieved, an in-line condensate neutralisation kit is available from Lochinvar Limited. This unit is capable of neutralising 4000 litres of condensate to a pH of 7.0 before releasing it to a drain.
5.8 - Unvented system arrangement

CAUTION !!! It is the law that unvented hot water systems be installed by an approved installer. If the Impetus is to be used in an unvented arrangement, the system should follow the guidance given in BS6700 and must comply with the Building Regulations 1992: Part G3, in England and Wales, P5 in Northern Ireland and P3 in Scotland. A kit of components that have been suitably sized for the unvented operation of the appliance is available from Lochinvar Limited.

5.9 - Safety pressure relief valve

The appliance is protected against overpressures by a safety valve rated to 10 bar (see figures 3-1 and 3-4 detail “28”). The safety valve drain is conveyed on the same pipe “9” as per figure 5-5.

5.10 - Hydraulic and gas connections

CAUTION !!! The example in figure 5-5 is a concept drawing only. It is up to the system designer to determine the necessary components, including additional equipment which in the judgement of the designer are appropriate, in order to properly size, configure and design that system and to ensure compliance with local and national code.

Key of figure 5-5:

1 = Water heater
2 = Gas manual valve (EN 331 type-approved) (Field supplied)
3 = Water isolation valve / Flow rate selector (Field supplied)
4 = Water drain valve (Field supplied)
5 = Condensate drain (Field supplied)
6 = Gas inlet
7 = Cold water supply
8 = Domestic hot water
9 = Condensate drain pipe
10 = Water isolation valve (Field supplied)
11 = Filter (Field supplied)

5.11 - Secondary return

To comply with legionella prevention legislation/Guidance hot water should flow from any outlet within 1 minute, if this cannot be achieved then a secondary return system must be fitted.

When using an external recirculation pump make sure that this is a specific hot water circulation pump.

The flow must exceed the minimum water flow.

Prevent for running the circulation pump 24/7 by using a timer and/or thermostat or use an on-demand recirculation system activated by push button or motion sensor.

To ensure the water heater operates correctly with a secondary return pump fitted, the following procedure should be followed:

· Install the appliance as shown in figure 5-5;
· Ensure the secondary pump is turned off;
· Open a tap to remove all the air from the system;
· Turn on the water heater and wait for hot water to flow from the tap and the temperature to stabilise;
· Close the tap;
· After 50 seconds check that the tap Icon has stopped flashing;
· If the icon is still flashing reduce the flow below 2litre/ min using the flow restrictor (supplied and fitted by the installer) shown in figure 4-4 detail “FS”;
· The icon should now stop.
5.12 - Electrical connections
Wiring external to the equipment must be installed in accordance with the I.E.E. Regulations and any local regulations that apply.

WARNING !!! This appliance must be earthed.

WARNING !!! A suitably competent person must check wiring. Normal supply required is 230 volts AC, single phase, 50 hz. An isolator with a contact separation of at least 3mm in all poles should be sited close to the equipment and must only serve that equipment. The double pole switch must be readily accessible under all conditions. Phase and Neutral must not be switched.

Key for figure 5-6
A = Electrical box;
B = Junction box;
C = Connections lid closing flaps;
D = Connection terminals;

Key for electric terminals
PM = Not used
CH = Not used
BUS = Not used
TA = Not used
SE = Not used
SB = Not used
MF = Not used
EP = Not used
DNC = Not used
L1 = Power supply line
N = Power supply neutral
EARTH SYMBOL = Earth contacts

Figure 5-6 - Junction box terminals
5.12.1 - Power supply cable connection
Proceed as follows to connect the power supply cable (refer to figure 5-6):
1. use a three-polar cable with double isolation, with minimum section of 1.5 mm²
2. remove the casing from the appliance following instructions in section 8.2;
3. rotate the panel "A" towards the front of the appliance;
4. operate on the flaps "C" and open the lid "B" as indicated by the arrow;
5. lay the power supply cable through the fairlead in proximity of the contacts "L1", "N" and earth symbol;
6. strip the cable, making sure to keep the earth cable (yellow green) 20 mm longer than the other two;
7. connect the yellow-green cable to the earth terminals (see symbol)
8. connect the brown cable (Phase) to the terminal L1
9. connect the blue cable (Neutral) to the terminal N.
5.13 - Flue systems

⚠️ CAUTION!!! The relevant national and local regulations must be strictly adhered to when installing the exhaust flue and combustion air pipes.

⚠️ CAUTION !!! The exhaust flue gases from the appliance can reach 90°C in certain conditions. Therefore, the plastic flue components must be capable of withstanding high temperatures and they must be approved for these specific appliance.

⚠️ CAUTION!!! This appliance is the “condensing” type. Use AISI 316 stainless steel materials or polypropylene materials for flues, to prevent corrosions due to the acidity of the condensate.

Regarding this, remember that appliances of this type must have exhaust and intake pipes supplied by the manufacturer of the appliance itself. Other types of pipes, if used, must be type-approved for this intended use.

The types of exhaust for which the appliance is approved are given on the technical features table at the end of the manual under the “Type” heading and on the rating plate affixed to the appliance, also under the “Type” heading. The water heaters are approved for installations of type B23, C13, C33, C43, C53, C63 and C83.

This manual discusses installation types C13 and C33 in detail. If the water heater has to function in accordance with B23, C43, C53, C63 or C83, you can obtain more information by contacting Lochinvar.

The symbols used to define type of exhaust is given below:

- **B23**, air for combustion is drawn from the boiler room.

⚠️ CAUTION !!! If the appliance is installed with the B23 type exhaust, it will take air for the combustion from the surrounding environment. Therefore, all precautions must be taken regarding ventilation of the rooms, which are prescribed by the national and/or local Standards.

- **C13**, concentric in vertical wall
- **C33**, concentric at the roof
- **C43**, separate with exhaust in a common chimney, combined with air intake in common channel.

⚠️ CAUTION !!! Appliances installed in type C43 must only be connected to natural draught chimney.

- **C53**, separate with exhaust on roof and air intake on wall or however, in two potentially different pressure points.
- **C63**, the appliance can be fitted to type-approved exhaust and air intake pipes of other brands.

⚠️ CAUTION !!! With the C63 type exhaust, the condensate coming from the chimney cannot be conveyed into the appliance.

- **C83**, separated with wall air intake or another point independent from the intakes of other appliances and flue exhaust in a common chimney.

---

*Figure 5-7 - Exhaust/intake systems*
During operation, especially in winter, a plume will be visible as the water vapour in the exhaust gases come into contact with the outside air. This plume should not cause any concern, however the installer should discuss the matter with the customer prior to commencement of the installation in case the aesthetical impact of this plume might cause a problem.

5.13.1 - Exhaust flue and air intake type B23

In the case of B23 type air intake/flue exhaust systems, it is indispensable that the rooms in which the appliances are installed have at least as much air as that required by combustion and ventilation of the room. It is therefore good practice to remember that the combustion of 1 m³ of gas requires 11 m³ of air. The natural flow of air must take place directly through permanent openings made in the outside walls of the room to be ventilated; however away from sources of pollution, such as: vents of dubious origin, airborne industrial exhaust etc.

The ventilation openings must meet the following requirements:

1. If the water heater is to be installed as an open system, it must meet the locally applicable directives and ventilation regulations for open water heaters;
2. be realised in a way that the opening inlets both inside and outside the wall cannot be blocked;
3. be protected for example with grids, metal meshes, etc. The net section of the passage must not be reduced by these elements;
4. be situated at a height more or less of the floor and such not to disturb the correct operation of the combustion products exhaust. Where this position is not possible, the section of the ventilation openings must be increased by at least 50%.

The flow of air can also be obtained from an adjacent room as long as:

1. it has direct ventilation, in compliance with the previous points;
2. only this gas appliance is installed in the room to be ventilated;
3. the adjacent room is not a bedroom;
4. the adjacent room is not a common part of the building;
5. the adjacent room is not an environment with fire hazard, such as a hangars, garages, combustible materials warehouse, etc.;
6. the adjacent room does not have a negative pressure with respect to the room to be ventilated due to reverse draught (which can be caused by the presence in the room of another appliance operating with any type of fuel, a fireplace and any other intake device for which an adequate air intake has not been envisioned);
7. the flow of air from the adjacent room to that to be ventilated can take place freely through permanent openings with total net section not less than that indicated at the start of this section.

In rooms where gas appliances are installed, it may become necessary, as well as the input of combustion agent air, also to evacuate the stale air, with resulting release of an additional equal amount of clean air.

If the stale air is evacuated with the aid of a mechanical tool (electric fan) the following conditions must be respected:

a) If there is a non used common exhaust pipe in the room, it must be capped;
b) The ventilation opening of the room in which the gas appliance is installed must be increased depending on the maximum air flow rate required at the electric fan.
c) The action of the electric fan must not affect the correct evacuation of the combustion products. To this end, that stated above must be verified by draft testing, running the fan or extractor hood at its maximum power and the gas appliance at the maximum and minimum power.
5.13.2 - “Twin-pipe 80/80PP” System (polypropylene) (Type C13; C33) IM 550 and 750

The appliance is supplied as per standard with fittings for the connection of the flue/air intake. To connect it to a “80/80PP twin-pipe” system, the relevant kit must be installed as in figure 5-8. Fitting “A” can rotate freely by 360°, guaranteeing optimum installation versatility.

- On the exhaust flue side, it is mandatory to install polypropylene plastic pipes or AISI 316L stainless steel pipes which are resistant to damage from condensation.
- Take particular care with the installation of pipes in the part that passes through the wall to the outside. The normal maintenance operations must always be possible, therefore install the pipes in a sheath so that they can slide out.
- The horizontal exhaust flue pipes must always have an inclination of 2% with the fall back towards the appliances as opposed to the wall terminal.
- The appliance is already set-up to collect the condensate, which must be fitted to a drain pipe (see section 5.7).

⚠️ CAUTION !!! This condensate drain is designed to make all liquid produced flow from a single appliance. If several appliances are installed, each one must envision its own condensate drain. The flue/air intake system can be extended up to a maximum distance as indicated in section 9. Every 90° bend has a loss equivalent to value on section 9. Every 45° bend has a loss equivalent to value on section 9.

⚠️ CAUTION !!! The temperature of the exhaust pipe can reach 90°C during operations. If it must pass through a wall that is sensitive to these temperatures, insert a protective heat-isolation sheath.

⚠️ CAUTION !!! Mechanically secure the joints between the various component elements of the exhaust and air intake pipe, through the use of fixing systems or equivalent systems.

⚠️ CAUTION !!! If the air intake and flue terminals are positioned in the same wall, they must remain at a larger distance than 1 metre.

⚠️ CAUTION !!! The exhaust and intake pipes must be appropriately sustained via rigid brackets positioned no more than 1 metre from each other. The brackets must be fixed to rigid walls that can support the weight of the pipe itself.
5.13.3 - “Twin-pipe 80/80PP” System (polypropylene) (Type C13; C33) IM 1250

The appliance is supplied as per standard without fittings for the connection of the flue/air intake. To connect it to a “80/80PP twin-pipe” system, the relevant kit must be requested and must be installed as in figure 5-9. Fitting “A” can rotate freely by 360°, guaranteeing optimum installation versatility.

- On the exhaust flue side, it is mandatory to install polypropylene plastic pipes or AISI 316L stainless steel pipes which are resistant to damage from condensation.

- Take particular care with the installation of pipes in the part that passes through the wall to the outside. The normal maintenance operations must always be possible, therefore install the pipes in a sheath so that they can be slid out.

- The horizontal exhaust flue pipes must always have an inclination of 2% with the fall back towards the appliance as opposed to the wall terminal.

- The appliance is already set-up to collect the condensate, which must be fitted to a drain pipe (see section 5.7).

CAUTION !!! This condensate drain is designed to make all liquid produced flow from a single appliance. If several appliances are installed, each one must envision its own condensate drain. The flue/air intake system can be extended up to a maximum distance as indicated in section 9. Every 90° bend has a loss equivalent to value on section 9. Every 45° bend has a loss equivalent to value on section 9.

CAUTION !!! The temperature of the exhaust pipe can reach 90°C during operations. If it must pass through a wall that is sensitive to these temperatures, insert a protective heat-isolation sheath.

CAUTION !!! Mechanically secure the joints between the various component elements of the exhaust and air intake pipe, through the use of fixing systems or equivalent systems.

CAUTION !!! If the air intake and flue terminals are positioned in the same wall, they must remain at a larger distance than 1 metre.

CAUTION !!! The exhaust and intake pipes must be appropriately sustained via rigid brackets positioned no more than 1 metre from each other. The brackets must be fixed to rigid walls that can support the weight of the pipe itself.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twin-pipe adaptor (at appliance) Ø 60/100mm to 2x Ø 80mm</td>
<td>Art. No. IM 550, IM 750 LV312 273 (1)</td>
</tr>
<tr>
<td>Twin-pipe adaptor (at appliance) Ø 80/125mm to 2x Ø 80mm</td>
<td>Art. No. IM 1250 LV312 209 (1)</td>
</tr>
<tr>
<td>Adaptor (to roof or wall terminal) 2x Ø 80mm to Ø 80/125mm</td>
<td>Art. No. IM 550, IM 750, IM 1250 LV307 177 (1)</td>
</tr>
<tr>
<td>Roof Flue terminal</td>
<td>Art. No. IM 550, IM 750, IM 1250 LV310 753 *</td>
</tr>
<tr>
<td>Wall flue terminal</td>
<td>Art. No. IM 550, IM 750, IM 1250 LV310 757 *</td>
</tr>
<tr>
<td>Pipe material Manufacturer</td>
<td>Muelink &amp; Grol</td>
</tr>
<tr>
<td>Construction</td>
<td>Parallel piping</td>
</tr>
<tr>
<td>Flue gas discharge</td>
<td>PP polypropylene with lipped sealing ring</td>
</tr>
<tr>
<td>Air supply</td>
<td>PP polypropylene with lipped sealing ring</td>
</tr>
<tr>
<td>Pipe diameters Flue gas discharge</td>
<td>IM 550, IM 750, IM 1250 Ø 80 mm</td>
</tr>
<tr>
<td>Air supply</td>
<td>Ø 80 mm</td>
</tr>
</tbody>
</table>

(1) = No other adaptors permitted. Use this item number to order from supplier, manufacturer or wholesaler

* 80/125mm concentric

Figure 5-10 - Parallel flue specifications C13/33 (2x 80mm PP)
5.13.4 - “60/100PP vertical concentric”
System (polypropylene) (Type C13; C33)
IM 550 and 750
The appliance is supplied as per standard with fittings for the connection of the flue/air intake vertical 60/100 system.

⚠️ CAUTION !!! The concentric exhaust and intake pipes must be appropriately sustained via rigid brackets positioned no more than 1 metre from each other. The brackets must be fixed to rigid walls that can support the weight of the pipe itself.

⚠️ CAUTION !!! Once these operations have been performed, check that the exhaust/intake terminal is exposed to the outdoors with the tolerances given in figure 5-19.

⚠️ Take particular care with the installation of pipes in the part that passes through the wall to the outside. The normal maintenance operations must always be possible, therefore install the pipes in a sheath so that they can slide out.

⚠️ The horizontal exhaust flue pipes must always have an inclination of 2% with the fall back towards the appliances as opposed to the wall terminal.

⚠️ The combined exhaust/air intake pipe can be extended up to a maximum distance as indicated in the table in section 9 at the end of the manual. Every 90° bend has a loss equivalent to value on section 9. Every 45° bend has a loss equivalent to value on section 9.

⚠️ CAUTION !!! Mechanically secure the joints between the various component elements of the exhaust and air intake pipe, through the use of fixing systems or equivalent systems. See figure 5-13.
## 5 - INSTALLATION

<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
<th>Art. No.</th>
<th>LV312 247 (1)</th>
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<tbody>
<tr>
<td>Wall flue terminal</td>
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<td>IM 550, IM 750</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Muelink &amp; Grol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Coax line Plus</td>
<td></td>
<td></td>
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<tr>
<td>Pipe material</td>
<td>Construction</td>
<td>Concentric</td>
<td></td>
</tr>
<tr>
<td>Flue gas discharge</td>
<td>PP polypropylene with lipped sealing ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air supply</td>
<td>Thin-walled galvanized sheet steel</td>
<td></td>
<td></td>
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<tr>
<td>Pipe diameters</td>
<td>Flue gas discharge</td>
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<td>Ø 60 mm</td>
</tr>
<tr>
<td></td>
<td>Air supply</td>
<td>Ø 100 mm</td>
<td></td>
</tr>
</tbody>
</table>

(1) = No other wall flue terminal is permitted. Use this item number to order the wall terminal from supplier, manufacturer or wholesaler.

Figure 5-14 - Concentric flue specifications C13 (60/100mm PP)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
<th>Art. No.</th>
<th>LV312 246 (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof flue terminal</td>
<td></td>
<td>IM 550, IM 750</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Muelink &amp; Grol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Coax line Plus</td>
<td></td>
<td></td>
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<tr>
<td>Pipe material</td>
<td>Construction</td>
<td>Concentric</td>
<td></td>
</tr>
<tr>
<td>Flue gas discharge</td>
<td>PP polypropylene with lipped sealing ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air supply</td>
<td>Thin-walled galvanized sheet steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe diameters</td>
<td>Flue gas discharge</td>
<td>IM 550, IM 750</td>
<td>Ø 60 mm</td>
</tr>
<tr>
<td></td>
<td>Air supply</td>
<td>Ø 100 mm</td>
<td></td>
</tr>
</tbody>
</table>

(1) = No other wall flue terminal is permitted. Use this item number to order the wall terminal from supplier, manufacturer or wholesaler.

Figure 5-15 - Concentric flue specifications C33 (60/100mm PP)
5.13.5 - “80/125PP vertical concentric” System (polypropylene) (Type C13; C33)

IM 1250

The appliance is supplied as per standard with fittings for the connection of the flue/air intake vertical 80/125 system.

⚠️ CAUTION !!! The concentric exhaust and intake pipes must be appropriately sustained via rigid brackets positioned no more than 1 metre from each other. The brackets must be fixed to rigid walls that can support the weight of the pipe itself.

- Take particular care with the installation of pipes in the part that passes through the wall to the outside. Normal maintenance operations must always be possible, therefore install the pipes in a sheath so that they can slide out.
- The horizontal exhaust flue pipes must always have an inclination of 2% with the fall back towards the appliances as opposed to the wall terminal.
- The combined exhaust/air intake pipe can be extended up to a maximum distance as indicated in the table in section 9 at the end of the manual. Every 90° bend has a loss equivalent to value on section 9. Every 45° bend has a loss equivalent to value on section 9.

![Figure 5-16 - Installation of vertical concentric system on IM 1250](image)

<table>
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<tr>
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<th>Description</th>
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<tr>
<td>Wall flue terminal</td>
<td>Art. No. IM 1250</td>
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<td>Manufacturer</td>
<td>Muelink &amp; Grol</td>
</tr>
<tr>
<td>Type</td>
<td>Coax line Plus</td>
</tr>
<tr>
<td>Pipe material</td>
<td>Construction Concentric</td>
</tr>
<tr>
<td>Flue gas discharge</td>
<td>PP polypropylene with lipped sealing ring</td>
</tr>
<tr>
<td>Air supply</td>
<td>Thin-walled galvanized sheet steel</td>
</tr>
<tr>
<td>Pipe diameters</td>
<td>Flue gas discharge IM 1250 Ø 80 mm</td>
</tr>
<tr>
<td></td>
<td>Air supply Ø 125 mm</td>
</tr>
</tbody>
</table>

(1) = No other wall flue terminal is permitted. Use this item number to order the wall terminal from supplier, manufacturer or wholesaler.

Figure 5-17 - Concentric flue specifications C13 (80/125mm PP)

<table>
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<tr>
<th>Subject</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Roof flue terminal</td>
<td>Art. No. IM 1250</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Muelink &amp; Grol</td>
</tr>
<tr>
<td>Type</td>
<td>Coax line Plus</td>
</tr>
<tr>
<td>Pipe material</td>
<td>Construction Concentric</td>
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<tr>
<td>Flue gas discharge</td>
<td>PP polypropylene with lipped sealing ring</td>
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<tr>
<td>Air supply</td>
<td>Thin-walled galvanized sheet steel</td>
</tr>
<tr>
<td>Pipe diameters</td>
<td>Flue gas discharge IM 1250 Ø 80 mm</td>
</tr>
<tr>
<td></td>
<td>Air supply Ø 125 mm</td>
</tr>
</tbody>
</table>

(1) = No other wall flue terminal is permitted. Use this item number to order the wall terminal from supplier, manufacturer or wholesaler.

Figure 5-18 - Concentric flue specifications C33 (80/125mm PP)
Figure 5-19 - Examples of concentric pipe installations
6.1 - Operating
Before starting the appliance up, it is necessary to carry out the following.

6.1.1 - User instructions
Instruct the user regarding correct use of the appliance and the plant in general. In particular:
- Give the installation and user manual and all documentation contained in the packaging to the user.
- Instruct the user concerning the special measures for the exhaust of burned gases, informing them that they must not be modified.
- Inform the user regarding the correct adjustment of the temperatures settings.

6.1.2 - Filling the condensate drain siphon
The siphon found inside the appliance (see figures 3-2 and 3-4 detail "40"), must be filled with water to create the water head able to prevent the exhaust gas escaping from pipe "9" in figure 5-5.
Proceed as follows to do this:
(refer to figure 6-1 on IM 550 and 750 or figure 6-2 on IM 1250)
1.- loosen the screw “E”;
2.- remove the lid “D” and the gaskets “C”;
3.- introduce a rubber hose into the opening “B” (do not confuse with “A”) and the other end of the hose into the funnel;
4.- use the funnel to slowly pour about 200 cm³ (a glass) of water;
5.- re-mount everything in reverse order.

![Figure 6-1 - Filling the condensate drain siphon on IM 550 and 750](image)

**CAUTION !!!** If the appliance remains off for more than 3 months, the siphon must be filled again as explained above.

6.2 - General recommendations regarding the supply of gas
For commissioning of the appliance, have a professionally qualified technician perform the following checks:
- That the appliance is powered by the type of fuel for which it is set-up.
- That the gas supply pressure (with appliance operating and at a standstill) is within the maximum and minimum values indicated in the table in section 9 at the end of the manual.
- That the supply plant has all safety and control parts envisioned by the current national and local Standards.
- That the exhaust flue terminal and the air intake terminal are free from any obstruction.
- That the exhaust flue terminal and air intake terminal are positioned outside the building.
- That the condensate drain connection is connected.

**CAUTION !!! What to do if you smell gas:**
A - No naked flames, no smoking!
B - Avoid causing sparks, do not switch on or off electrical equipment or lights;
C - Open windows and doors;
D - Shut off the main gas supply;
E - Warn occupants and leave the building;
F - After leaving the building alert the local gas supply company;
G - Do not re-enter the building until it is safe to do so;

![Figure 6-2 - Filling the condensate drain siphon on IM 1250](image)
6.3 - Type of gas for which the appliance is regulated.

There is a label on the front of the appliance certifying the gas supply type and pressure for which it is adjusted. The appliance may have the following 2 types of wording:

**2H-G20-20mbar NATURAL GAS**

means that the appliance is adjusted to operate with H type gas of the second family (natural gas) at a supply pressure of 20 mbar.

**3P-G31-37mbar LP GAS**

means that the appliance is adjusted to operate with type P gas (Propane, also called LP Gas) of the third family, at a supply pressure of 37 mbar.

6.4 - Conversion of the appliance from one type of gas to another

**CAUTION !!!** Read these instructions carefully before changing the gas:

- The gas appliance must be installed, calibrated or modified by specialised staff in compliance with legal terms;
- Check and be certain that the type of gas which is powering the appliance is compatible with the adjustment kit in your possession;
- Only use the gas the appliance has been set up for, if a different gas is to be used the appliance must be converted before use.

Follow the instructions given below to change the gas:

1. disconnect the electrical power supply upstream from the appliance;
2. open the appliance casing and access the control and command board as reported in section 8.2;
3. move the microswitch “B” from left to right to the “ON” position (see figure 6-6);
4. apply electric power to the appliance;
5. The parameter \(3001\) will appear on the display, followed by its value;
6. using the \(\uparrow\) and \(\downarrow\) keys, access the parameter \(3002\);
7. press the RESET key to make the \(3002\) parameter flash;
8. using the \(\uparrow\) and \(\downarrow\) keys, set the value of the parameter \(3002\) to the new corresponding value according to the table in figure 6-8;
9. press the RESET key to confirm the modification;
10. switch OFF the appliance and disconnect the electric power;
11. Re-position the microswitch “B” from left to right in “OFF” position (see Figure 6-6);
12. close the gas supply manual valve;
13. remove the air manifold making sure to turn it externally and then slide it out of the fan inlet (see figure 6-3, detail “C”);
14. remove the gas inlet pipe by the two fittings (see figure 6-3, details “H” and “L”);
15. remove the clamping spring “M” from the seat “N” releasing the valve “P”(See figure 6-4);
16. - slide the gas valve “P” out upwards;
17. - replace the gas orifice “R” (see figure 6-5) with an appropriate one according to that stated in figure 6-8 under “Gas orifice diameter”;
18. - remount the gas valve (see figure 6-4, detail “P”), making sure to reposition the spring “M”.
19. - remount the gas supply pipe by the two fittings (see figure 6-3, details “H” and “L”);
20. - remount the air manifold (see figure 6-3, detail “C”);
21. - open the gas supply manual valve;
22. - check for any gas leaks on all joints.

⚠️ CAUTION !!! Check for leaks using a leak detection fluid.

23. - check the supply gas pressure, following the procedure in section 6.6;
24. - open the CO2 adjustment screw completely (see figure 6-12 detail “A”);
25. - control and adjust the CO2, following the procedure in section 6.7;
26. - instead of the label that identified the old state of adjustment, apply the sticker onto the front casing of the appliance (see figure 6-7), certifying the appliance’s new state of adjustment, as follows:
- apply label “B” if the appliance has been converted to G31;
- apply label “A” if the appliance has been converted to G20;

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Figure 6-6 - Positioning the microswitch

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Figure 6-7 - Labels certifying the new state of adjustment of the appliance

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Figure 6-8 - Correspondence table for the parameter 3002 and the operating values

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of gas</th>
<th>Setting parameter 3002</th>
<th>Gas supply minimum pressure (mbar)</th>
<th>Gas supply maximum pressure (mbar)</th>
<th>Gas orifice diameter (mm)</th>
<th>CO2 Maximum power (%)</th>
<th>CO2 Minimum power (%)</th>
<th>O2 Maximum power (%)</th>
<th>O2 Minimum power (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>550</td>
<td>G20</td>
<td>50</td>
<td>15</td>
<td>45</td>
<td>4.9</td>
<td>9.0 ± 0.3</td>
<td>8.5 ± 0.2</td>
<td>4.8 ± 0.2</td>
<td>5.5 ± 0.2</td>
</tr>
<tr>
<td></td>
<td>G31</td>
<td>51</td>
<td>15</td>
<td>45</td>
<td>3.7</td>
<td>10.5 ± 0.3</td>
<td>10.0 ± 0.2</td>
<td>4.8 ± 0.2</td>
<td>5.6 ± 0.2</td>
</tr>
<tr>
<td>750</td>
<td>G20</td>
<td>52</td>
<td>15</td>
<td>45</td>
<td>6.5</td>
<td>9.0 ± 0.3</td>
<td>8.5 ± 0.2</td>
<td>4.8 ± 0.2</td>
<td>5.5 ± 0.2</td>
</tr>
<tr>
<td></td>
<td>G31</td>
<td>53</td>
<td>15</td>
<td>45</td>
<td>4.7</td>
<td>10.5 ± 0.3</td>
<td>10.0 ± 0.2</td>
<td>4.8 ± 0.2</td>
<td>5.6 ± 0.2</td>
</tr>
<tr>
<td>1250</td>
<td>G20</td>
<td>54</td>
<td>15</td>
<td>45</td>
<td>10.0</td>
<td>8.7 ± 0.3</td>
<td>8.3 ± 0.2</td>
<td>4.9 ± 0.2</td>
<td>5.8 ± 0.2</td>
</tr>
<tr>
<td></td>
<td>G31</td>
<td>55</td>
<td>15</td>
<td>45</td>
<td>6.5</td>
<td>10.1 ± 0.3</td>
<td>10.8 ± 0.2</td>
<td>4.8 ± 0.2</td>
<td>5.6 ± 0.2</td>
</tr>
</tbody>
</table>
6.5 - Ignition
1.- Open the gas manual valve;
2.- Turn the electrical power;
3.- Adjust the temperature desired for the domestic hot water service using the \(\text{\textup{\textdegree}}\) and \(\text{\textup{\textdegree}}\) keys. The icon \(\text{\textup{\textdegree}}\), present on the display will inform regarding the operating state of the domestic hot water service:
   a) fixed \(\text{\textup{\textdegree}}\) icon: domestic hot water inactive (no-one is tapping domestic hot water).
   b) flashing \(\text{\textup{\textdegree}}\) icon: domestic hot water is being tapped.
4.- Open an hot water outlet at its maximum to help the water heater purging the air. If outlet has a limited water flow, open two or three outlets to completely purge the air. On model 60, help yourself opening the manual air purging valve (item "47" figure 3-4);

\[\text{CAUTION !!! If the air is not purged correctly a boiling noise can be experienced causing water heater going into Loc 15 or Loc 16.}\]

6.6 - Check the gas supply pressure
The gas supply pressure must correspond to that stated in the table in section 9 at the end of the manual. For its verification, proceed as follows:
1.- close the gas supply manual valve;
2.- access the components inside the appliance, following the procedure in section 8.2;
3.- loosen the pressure port "A" (see figure 6-9);
4.- connect to a pressure gauge with resolution of at least 0.1 mbar (1 mmH2O);
5.- open the gas manual valve;
6.- check that the pressure does not exceed the value given in the table in section 9 under "gas supply maximum pressure";
7.- open the domestic hot water tap to maximum;
8.- wait for the temperature of the appliance to stabilise;
9.- check that the pressure does not drop to a lower value than the "gas supply minimum pressure" given in section 9. If the supply pressure does not respect the values described, operate upstream from the appliance in order to take it back within the minimum and maximum range;
10.- close the domestic hot water tap;
11.- close the pressure point "A" in figure 6-9;
12.- check for any gas leaks on port "A" in figure 6-9.

\[\text{CAUTION !!! Check for leaks using a leak detection fluid.}\]
6.7 - Measurement and adjustment of CO2 levels

The appliance in normal operating condition and for altitudes within 1000 m, must have a CO2 (carbon dioxide) level in the exhaust flue gases within the parameters as detailed in section 9. A value which is different to those detailed can cause malfunctions and is strictly prohibited. Combustion analysis must be performed to check and eventually adjust this value. Proceed as follows:

1. Insert a combustion analyser on the appropriate point on the flue fitting "B" in figure 6-10 or 6-11;
2. Open the domestic hot water tap fully;
3. Wait for the CO2 measurement to stabilise;
4. Compare the value measured with that given in the table in figure 6-8, “CO2 maximum power”. If the value measured is different from the value read, it must be taken back within the value given in the table in figure 6-8. Proceeding as follows:
   a) Turn screw “A” (figure 6-12) clockwise to decrease the level of CO2;
   b) Turn screw “A” (figure 6-12) counter-clockwise to increase the level of CO2;
5. Once the check has been completed, seal the screw “A” in figure 6-12 with red paint or similar system;
6. Follow section 7.8 to enter parameter 2010 and set it to Lou;
7. Open a DHW outlet to draw some water;
8. Now appliance will fire at minimum capacity;
9. Wait for the CO2 measurement to stabilise;
10. Compare the value measured with that given in the table in figure 6-8, “CO2 minimum power”;
11. If the value is not in the range, use screw “B” as per figure to adjust the CO2 value. Rotate the screw counter-clockwise to reduce the CO2 value or clockwise to increase the CO2 value;
12. Once the check has been completed, seal the screw “B” in figure 6-12 with red paint or similar system;
13. Press the RESET key again to enter the parameter 2010 and use the and keys, to modify the value to OFF;
14. Press the RESET key to confirm the modification.
15. Hold the RESET key down for 5 seconds to exit the “installer” menu.
16. Close the previously-opened domestic hot water tap.
6.8 - Self-learning and calibration of the minimum and maximum capacity output

Impetus water heaters have a self-learning programme to ensure water is supplied at a consistent temperature. The water heater automatically calibrates itself based on maximum and minimum tapping patterns. When first installed this is not known so to help the heater work effectively when first installed and aid the calibration process follow this procedure:

1.- open a hot water outlet to its maximum flow, preferably a tap;
2.- using button \[\downarrow\uparrow\] increase the value to the maximum water temperature;

⚠️ CAUTION!!! A domestic hot water temperature exceeding 51°C can cause permanent damages to persons, animals and objects. Children, the elderly and disabled must be protected against the potential risks of scalding, by introducing devices that limit the temperature of use of domestic hot water to utilities.

3.- water heater should fire for at least five minutes, to its maximum capacity or to the maximum capacity of the system where it is installed
4.- now the maximum capacity is calibrated;
5 - enter installer menu (see procedure on section 7.8) and set parameter 2010 to LOu
6.- now burner will fire at minimum capacity. Wait at least five minutes;
7.- now the minimum capacity is calibrated;
8.- Turn OFF and ON the water heater (see section 7.10);
9.- close your hot water outlet;
10.- now water heater learned the first minimum and maximum limit of this installation and it will correctly tune the hot water temperature.

6.9 - Adjust the domestic hot water flow rate

If the appliance is installed in a geographical area where the temperature of the cold water is very low, the flow rate of domestic hot water that passes inside the appliance may have to be reduced. It is therefore good practice to perform this adjustment:

1.- switch the appliance on;
2.- using the \[\downarrow\uparrow\] and \[\downarrow\uparrow\] keys, adjust the temperature of the domestic hot water to 48 - 50°C;
3.- open the domestic hot water tap fully. In the case of a single lever mixer, the position must be completely on “HOT”;
4.- wait 3 minutes for the temperature to stabilise;
5 - if the water temperature is too cold, the flow rate must be reduced via the selector “3” in figure 5-5 (or something similar), until the desired temperature is reached.

6.10 - Check the capacity input

The heater has a factory-set air/gas ratio. The pressure of the gas at the burner is indirectly controlled by the blower. The only way to check the heater capacity input is operating directly on the gas meter. To do so proceed as follow:

1. turn the power switch (item “A” in Figure 7-1) to on;
2. gain access to the installer menu (see section 7.8) and set parameter 2010 to HIGH. Now heater will run at high fire for 20 minutes;
3. open a DHW outlet to the maximum flow;
4. measure the capacity input to the gas meter. This should match with the value given in technical data section 9 header “Maximum heat input” with a tollerance of +/- 10%;
5. if the capacity input is too low, check:
   a) that there are no obstructions in the combustion air and/or vent system;
   b) check that the flue and air intake length is below the maximum specified in the technical data, section 9;
   c) check that heat exchanger and burner are clean (see section 8.4).
7.1 - Display

During operation the display shows the appliance operating state as well as other information as indicated in section 7.9 (Diagnostics). Other parameters can be consulted through the "User menu" (see section 7.7), which are useful for understanding operation of the appliance and to control the latest errors or lockout occurring.

After 5 minutes of normal operation, the display switches off completely to save energy. Just press any key to switch it back on.

In the case of any anomaly, the display switches back on automatically. This function can be modified by following section 7.6 (Energy saving).

7.2 - Ignition procedure

1. open the gas manual valve;
2. power the appliance electrically;
3. adjust the temperature of the domestic hot water as per section 7.4.
4. open a DHW outlet.

The command and control equipment will switch the burner on. If ignition does not take place within 20 seconds, (the appliance automatically re-attempts ignition 3 times), the appliance blocks and the visual display will show Loc 1.

Press the RESET key to restore the normal operating conditions.

The appliance will automatically attempt a new ignition.

⚠️ CAUTION !!! If shutdown due to blocking is repeated frequently, contact a qualified technician to reset the normal operating conditions.
7.3 - “User menu”
Entry into the “User menu” is highlighted by the visual display “F”, in figure 7-1, which indicates parameters that can assume values from 1001 to 1999. To enter the “User menu”:
1. - hold the RESET key down for 2 seconds until the visual display “F” shows 1001;
2. - press the and keys to scroll the parameters situated inside the user menu;
3. - hold down the RESET key for more than 2 seconds to exit the “User menu”;

If no key is pressed for more than 60 seconds, the menu is exited automatically.
The parameters in section 7.7 can be queried in this menu.

7.4 - Adjustment of the domestic hot water temperature
The temperature of the domestic hot water is adjusted by operating on the and keys. On pressing one of the two keys, the visual display “H” in figure 7-1 will start to flash and show the temperature that is being set. The range of adjustment for the temperature of the domestic hot water goes from 40°C to 60°C. For higher output temperatures, contact your technician to change the maximum output temperature factory setting, see section 11.

7.5 - Pump control features and timers
To safeguard the lifespan of the appliance, improve the comfort generated and increase energy saving, timers have been introduced during operation. These timers are:
- Pump post-circulation: every time the domestic hot water service ends, the pump continues to operate for 40 seconds;
- Pumps anti-block: every 24 hours the recirculation pump is forced on for 15 seconds;

7.6 - Display Energy Saving mode
To reduce the consumption of display energy, it will switch off automatically after 5 minutes from the last operation performed. This function can be deactivated or the time modified via parameter present in the “Installer menu” (see section 7.8). If the parameter is set at OFF, the display will remain on constantly.
# 7.7 - “User menu” Parameters

To access the “User menu” follow that reported in section 7.3.

The following parameters can be queried in this menu:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Description</th>
<th>M.U.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>Heat exchanger outlet temperature 1</td>
<td>°C</td>
</tr>
<tr>
<td>1002</td>
<td>Hot water outlet temperature or storage tank temperature (if any)</td>
<td>°C</td>
</tr>
<tr>
<td>1003</td>
<td>No function</td>
<td>/</td>
</tr>
<tr>
<td>1004</td>
<td>External temperature (visible when an external temperature sensor is installed) (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1005</td>
<td>Heat exchanger outlet temperature 2 (safety sensor)</td>
<td>°C</td>
</tr>
<tr>
<td>1006</td>
<td>Exhaust flue temperature</td>
<td>°C</td>
</tr>
<tr>
<td>1007</td>
<td>Cold water inlet temperature</td>
<td>°C</td>
</tr>
<tr>
<td>1008</td>
<td>Ionisation current</td>
<td>uA</td>
</tr>
<tr>
<td>1009</td>
<td>Status of the pump inside the appliance</td>
<td>ON/OFF</td>
</tr>
<tr>
<td>1010</td>
<td>Status of the central heating side diverter valve (OFF = in central heating mode; ON = in domestic hot water mode) (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1011</td>
<td>Status of the central heating side diverter valve (ON = in D.H.W. mode; OFF = in central heating mode) (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1012</td>
<td>Central heating supply temperature calculated via the external sensor (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1013</td>
<td>Status of the timer contact (N/A)</td>
<td>open or closed</td>
</tr>
<tr>
<td>1014</td>
<td>Exhaust flue temperature 2 (safety sensor) (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1040</td>
<td>Current rotation speed of the fan</td>
<td>rpm</td>
</tr>
<tr>
<td>1041</td>
<td>Fan rotation speed on ignition</td>
<td>rpm</td>
</tr>
<tr>
<td>1042</td>
<td>Fan rotation speed in minimum power mode</td>
<td>rpm</td>
</tr>
<tr>
<td>1043</td>
<td>Fan rotation speed in maximum power mode</td>
<td>rpm</td>
</tr>
<tr>
<td>1051</td>
<td>Latest block condition recorded (Loc) (see section 7.9.1) (255 means no block)</td>
<td>/</td>
</tr>
<tr>
<td>1052</td>
<td>Latest error condition recorded (Err) (see section 7.9.2) (255 means no error)</td>
<td>/</td>
</tr>
<tr>
<td>1053</td>
<td>Number of times the burner has lost the flame</td>
<td>n°</td>
</tr>
<tr>
<td>1055</td>
<td>Number of failed burner ignitions</td>
<td>n°</td>
</tr>
<tr>
<td>1056</td>
<td>Number of hours worked in central heating mode (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1057</td>
<td>Number of hours worked in domestic hot water mode</td>
<td>h x 10</td>
</tr>
<tr>
<td>1058</td>
<td>Number of burner working days</td>
<td>days</td>
</tr>
<tr>
<td>1059</td>
<td>Interval of time between the last two blocking errors (Err)</td>
<td>1: value in minutes; 2: value in hours;</td>
</tr>
<tr>
<td>1060</td>
<td>Interval of time between the last two blocks (Loc)</td>
<td>3: value in days; 4: value in weeks;</td>
</tr>
<tr>
<td>1061</td>
<td>Current rotation speed of the domestic hot water turbine (N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>1062</td>
<td>Current domestic hot water flow rate (Meter have a tolerance of +/- 15%)</td>
<td>l/min</td>
</tr>
</tbody>
</table>

N/A = Not applicable
7.8 - “Installer menu” & parameters

CAUTION !!! The modification of these parameters could cause the appliance, and therefore the plant, to malfunction. For this reason only a technician that has the awareness and in-depth knowledge of the appliance can modify them.

The appliance command and control board makes this parameter menu available to the technician for the analysis of operation and adaptation of the appliance to the plant. Proceed as follows to enter the “Installer menu”:

1.- hold the RESET and keys down simultaneously for 5 seconds until the parameter is displayed.

The symbol appears on the display to indicate the entry into the “Installer menu”.

2.- the and keys can be used inside the menu to scroll the parameters;

3.- once the parameter of interest has been displayed, it can be modified as follows:
   a.- press the RESET key to access the parameter (the visual display “H” in figure 7-1 will start to flash);
   b.- modify the value of the parameter using the and keys;
   c.- press the RESET key to confirm the data modified and go back to the list of parameters;

4.- To exit the “Installer menu”, hold down the RESET key for 5 seconds until the symbol disappears from the display.

If no key is pressed for more than 5 minutes, the menu is exited automatically. Any data variation that is not confirmed with the RESET key will be lost.

CAUTION !!! Any variation to the parameters must be noted in the “Customised values” column present in the following table in order to facilitate the eventual replacement of the command and control board.

The following parameters can be changed or queried in this menu:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Description</th>
<th>M.U.</th>
<th>Setting range</th>
<th>Factory value</th>
<th>Customised values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Central heating minimum power level (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>1</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2002</td>
<td>Central heating maximum power level (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>100</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2003</td>
<td>Central heating operating mode (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>0</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2004</td>
<td>Stand-by time after maximum differential (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>10</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2005</td>
<td>Post-circulation in central heating mode (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>120</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2010</td>
<td>Forcing of fan and burner (Water heater will work only in presence of demand of DHW)</td>
<td>/</td>
<td>OFF = No forcing FAN = Forcing of fan only to max speed LOu = Forcing of burner to minimum power Ign = Forcing of burner to ignition power Hlgh = Forcing of burner to maximum power rEg = Forcing of burner to maximum power</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>Forcing the pump (N/A)</td>
<td>(N/A)</td>
<td>On = Pump on OFF = Pump off</td>
<td>OFF</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2012</td>
<td>Forcing of the domestic central heating side diverter valve (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>OFF</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2013</td>
<td>Forcing of the domestic hot water side diverter valve (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>OFF</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2014</td>
<td>Icons test on the display. By pressing the REST key, all of the icons on the display light up. By pressing the RESET key again to display goes back to normal operation</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>2020</td>
<td>Climatic adjustment: external temperature for central heating switch-off (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>22</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2021</td>
<td>Climatic adjustment: design external temperature (winter) (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>-5</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2022</td>
<td>Climatic adjustment: supply temperature corresponding to the design external temperature (winter) (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>80</td>
<td>(N/A)</td>
</tr>
<tr>
<td>2023</td>
<td>Climatic adjustment: external spring-like temperature (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>20</td>
<td>(N/A)</td>
</tr>
</tbody>
</table>
### 7 - USE

<table>
<thead>
<tr>
<th>Parameter Description</th>
<th>Display on visual display “H” in figure 7-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climatic adjustment: supply temperature corresponding to the external spring-like</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Temperature reduction by room thermostat opening</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Climatic adjustment: central heating boost temperature</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Climatic adjustment: central heating boost time</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Protection against frequent switch-on in central heating mode: time</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Protection against frequent switch-on in central heating mode: temperature</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Domestic hot water minimum power level</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Domestic hot water maximum power level</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Post-circulation in domestic hot water mode</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Maximum time for loading storage tank</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Number of flow meter revs. for every litre of water</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Delay in the detection of the instantaneous domestic hot water</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Storage tank loading procedure</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Periodic maintenance meter</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Periodic maintenance meter: maintenance request time</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Energy saving display</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Anti-freeze function active</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Appliance in lockout. To reset, press RESET. If the lockout occurs frequently, contact a professionally qualified technician</strong></td>
<td>Lockout code (see section 7.9.1 for decode)</td>
</tr>
<tr>
<td><strong>Appliance in error mode. Functioning can only be restored by solving the cause of the anomaly. Contact a professionally qualified technician</strong></td>
<td>Error code (see section 7.9.2 for decode)</td>
</tr>
<tr>
<td><strong>Anti-legionella function running. (N/A)</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Maintenance request for the appliance</strong></td>
<td>Appliance temperature (°C)</td>
</tr>
</tbody>
</table>

N/A = Not applicable

### 7.9 - Diagnostics

During normal operation of the appliance, the visual display in figure 7-1 continuously shows the state of work of the appliance, via the following indications:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Description</th>
<th>Display on visual display “H” in figure 7-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AFro</strong></td>
<td>Anti-freeze function active</td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Loc</strong></td>
<td>Appliance in lockout. To reset, press <strong>RESET</strong>. If the lockout occurs frequently, contact a professionally qualified technician</td>
<td>Lockout code (see section 7.9.1 for decode)</td>
</tr>
<tr>
<td><strong>Err</strong></td>
<td>Appliance in error mode. Functioning can only be restored by solving the cause of the anomaly. Contact a professionally qualified technician</td>
<td>Error code (see section 7.9.2 for decode)</td>
</tr>
<tr>
<td><strong>ALEg</strong></td>
<td>Anti-legionella function running. (N/A)</td>
<td>Appliance temperature (°C)</td>
</tr>
<tr>
<td><strong>Ser</strong></td>
<td>Maintenance request for the appliance</td>
<td>Appliance temperature (°C)</td>
</tr>
</tbody>
</table>

N/A = Not applicable
# 7.9.1 - Diagnostics “Loc” block fault codes and potential solution

<table>
<thead>
<tr>
<th>Block</th>
<th>Block Description</th>
<th>Checks</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loc 0</td>
<td>Internal memory error</td>
<td>E2prom at command board</td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 1</td>
<td>1 No flame detection after three successive ignition attempts.</td>
<td>Control: Supply gas pressure (see section 6.6), sparks on the ignition electrodes (see section 8.6); 230Vac electric power supply to the gas valve; electric resistance of the two gas valve coils of 0.88 Kohm and 6.59 Kohm</td>
<td>the supply pressure is not correct, operate upstream from the appliance to restore it; If the current at the gas valve is not 230Vac, the command and control board must be replaced. If the electric resistance of the gas valve is not 0.88 Kohm and 6.59 Kohm, the valve must be replaced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the burner switches on and switches off at the end of the ignition attempt, check: that the ionisation current is at a value over 4 (follow the procedure in section 8.13)</td>
<td>If the ionisation current is not over 4, the CO₂ must be checked (follow section 6.7) and restore its correct value, check the ionisation electrode and replace it if necessary. Check the integrity of the ionisation current electric circuit cables.</td>
</tr>
<tr>
<td>Loc 2</td>
<td>Gas valve command relay broken</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 3</td>
<td>Internal safety relay failure at command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 4</td>
<td>Appliance in error mode for more than 20 hours</td>
<td>Control the last error displayed in the board.</td>
<td>Operate according to the last error displayed.</td>
</tr>
<tr>
<td>Loc 5</td>
<td>Fan out of speed for more than 60 seconds</td>
<td>Check that it is powered at 300 Vdc.</td>
<td>If the fan is powered, it must be replaced, alternatively replace the command and control board.</td>
</tr>
<tr>
<td>Loc 6</td>
<td>Fan error too slow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loc 7</td>
<td>Fan error too fast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loc 8</td>
<td>Parameters inside the E2prom memory, incorrect</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 9</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 10</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 11</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 12</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Loc 13</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Loc 14</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Loc 15</td>
<td>Appliance has reached the maximum temperature of operation</td>
<td>Check that the pump works; Check that the electrical resistance of the two sensors 1001 and 1005 combine with the chart referred to in section 8.14; Check that the high limit flue gas temperature fuse has not been involved; Check air is purged from water heater (see section 6.5);</td>
<td>Restore the flow of water or replace the control board; If either or both of the sensors are not within correct values, replace sensor; If the high limit flue gas temperature fuse has been involved (the contact is open) before replacing the high limit verify the temperature of the flue gas referred to in the technical data from section 9, CAUTION!!! If the temperature is not within the correct value <strong>DO NOT ATTEMPT ANY REPAIR</strong> but contact the manufacturer.</td>
</tr>
<tr>
<td>Loc 16</td>
<td>Exhaust flue maximum temperature. <strong>ATTENTION !!!</strong> If the block is repeated more than once a day, turn off the appliance and contact a qualified service center.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check that the pump is operating correctly; Measure that appliance performance; it must correspond to that declared in the technical features. Check air is purged from water heater (see section 6.5)</td>
<td>If the pump does not operate, it must be replaced. If the appliance is under-performing, the primary heat exchanger might be dirty either on the exhaust flue side or the domestic water side or both. Follow instructions in section 8.4 and check again.</td>
<td></td>
</tr>
<tr>
<td>Loc 17</td>
<td>Software error inside the command board</td>
<td>Replace the command and control board.</td>
<td></td>
</tr>
<tr>
<td>Loc 18</td>
<td>Software error inside the command board</td>
<td>Replace the command and control board.</td>
<td></td>
</tr>
<tr>
<td>Loc 19</td>
<td>Software error inside the command board</td>
<td>Replace the command and control board.</td>
<td></td>
</tr>
<tr>
<td>Loc 20</td>
<td>Flame still present 10 sec. after closing gas valve</td>
<td>Replace the gas valve or the command and control board.</td>
<td></td>
</tr>
<tr>
<td>Loc 21</td>
<td>Flame present before ignition</td>
<td>Replace the gas valve or the command and control board.</td>
<td></td>
</tr>
<tr>
<td>Loc 22</td>
<td>Flame lost three times</td>
<td>Control: that the ionisation current is at a value over 4 (follow the procedure in section 8.13) Check: that the exhaust flue system is not being affected by high gusts of wind or nearby mechanically operated fans</td>
<td>If the ionisation current is not over 4, the CO2 must be checked (follow section 6.7) and restore the correct value. Check the ionisation electrode and replace it if necessary. Check the integrity of the ionisation current electric circuit cables. If a horizontal exhaust flue terminal is exposed to unusually high wind conditions or nearby mechanically operated fans then a suitable deflection shield or protection should be considered or an alternative location should be considered. The same approach should be taken for a vertical exhaust flue and in addition, check that downdraughts are not being encountered due to the proximity of higher roof profiles.</td>
</tr>
<tr>
<td>Loc 23</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td></td>
</tr>
<tr>
<td>Loc 24</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td></td>
</tr>
<tr>
<td>Loc 25</td>
<td>1001 and 1005 sensors measure the different temperatures for more than 60 seconds.</td>
<td>Check that the electrical resistance of the two sensors match the graphics in section 8.14; If one of the two or both sensors do not have correct values, they must be replaced;</td>
<td></td>
</tr>
<tr>
<td>Loc 26</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td></td>
</tr>
<tr>
<td>Loc 27</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td></td>
</tr>
<tr>
<td>Loc 28</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td></td>
</tr>
<tr>
<td>Loc 29</td>
<td>Software error inside the command board</td>
<td>Replace the command and control board.</td>
<td></td>
</tr>
<tr>
<td>Loc 30</td>
<td>Software error inside the command board</td>
<td>Replace the command and control board.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hot water temperature is not stable</td>
<td>Repeat calibration procedure (see section 6.8) Check if pump is in speed 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water flow is present but the water heater doesn't work</td>
<td>Check if the water flow (parameter 1062) is higher than the minimum water flow as stated on section 7.7.</td>
<td></td>
</tr>
</tbody>
</table>

N/A = Not applicable
## 7.9.2 - Diagnostics “E” error fault codes and potential solutions

<table>
<thead>
<tr>
<th>Error</th>
<th>Error Description</th>
<th>Checks</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Err 100</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 101</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 102</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 103</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 104</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 105</td>
<td>The supply temperature exceeds 110°C with the gas valve closed</td>
<td>Check that the electrical resistance of the two supply sensors match the graphics in section 8.14. Check that the gas valve closes the gas correctly when the burner switches off.</td>
<td>If one of the two sensors does not match, the double supply sensor must be replaced. The gas valve must be replaced if it does not close correctly.</td>
</tr>
<tr>
<td>Err 106</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 107</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 108</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 109</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 110</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 111</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 112</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 113</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 114</td>
<td>Flame detected in a moment when it should not be present</td>
<td></td>
<td>Replace the gas valve.</td>
</tr>
<tr>
<td>Err 115</td>
<td>Central heating water low pressure (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Err 116</td>
<td>Central heating water pressure sensor error (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Err 117</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Err 118</td>
<td>Software error inside the command board</td>
<td></td>
<td>Replace the command and control board.</td>
</tr>
<tr>
<td>Err 119</td>
<td>Cold water inlet sensor (1007) circuit open</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>Err 120</td>
<td>Heat exchanger outlet sensor (1001) circuit open</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>Err 121</td>
<td>Heat exchanger outlet sensor (1005) circuit open</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
</tbody>
</table>
## 7 - USE

<table>
<thead>
<tr>
<th>Err</th>
<th>Description</th>
<th>Action</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>Domestic hot water outlet sensor (1002) circuit open</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>123</td>
<td>Flue gas sensor (1006) circuit open</td>
<td>Check that the electrical resistance of the sensor matches the graphics in section 8.14. Check that the wires between the board and the sensor are connected correctly.</td>
<td>If the sensor does not match, the double exhaust sensor must be replaced. If the wires are not connected correctly, the connections must be restored.</td>
</tr>
<tr>
<td>124</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>125</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>126</td>
<td>Cold water inlet sensor (1007) circuit, in short circuit condition</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>127</td>
<td>Heat exchanger outlet sensor (1001) circuit, in short circuit condition</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>128</td>
<td>Heat exchanger outlet sensor (1005) circuit, in short circuit condition</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>129</td>
<td>Domestic hot water outlet sensor (1002) circuit, in short circuit condition</td>
<td>Check that the electric resistance of the sensor matches the graphics in section 8.14. Check the electric cables for connection between the sensor and the command board.</td>
<td>If the electric resistance does not match, replace it. The electric circuit must be repaired if it is damaged. Without either of the two previous cases, replace the command and control board.</td>
</tr>
<tr>
<td>130</td>
<td>Flue gas sensor (1006) circuit, in short circuit condition</td>
<td>Check that the electrical resistance of the sensor matches the graphics in section 8.14. Check that the wires between the board and the sensor are connected correctly.</td>
<td>If the sensor does not match, the double exhaust sensor must be replaced. If the wires are not connected correctly, the connections must be restored.</td>
</tr>
<tr>
<td>131</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>132</td>
<td>External temperature sensor circuit (1004) in short circuit condition (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>133</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>134</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>135</td>
<td>Phase neutral reversed error</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>200</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>201</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>202</td>
<td>Not applicable</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
<tr>
<td>203</td>
<td>Too high difference between supply and return sensor</td>
<td>(N/A)</td>
<td>(N/A)</td>
</tr>
</tbody>
</table>

N/A = Not applicable

### 7.10 - Switch ON and OFF the appliance

To switch Off the appliance press in the same time the keys and OFF will appear then press key and OFF will appear; Press RESET key to confirm the OFF state. To switch on the appliance press in the same time the and keys and ON will appear. Then press key and ON will appear; press RESET key to confirm the ON state.
8 - MAINTENANCE

8.1 - Care and maintenance
This section must be brought to the attention of the user by the installer so that the user can make the necessary arrangements with a qualified service agency for the periodic care and maintenance of the heater.

The installer must also inform the user that the lack of proper care and maintenance of this heater and any fuel burning equipment may result in an hazardous condition.

Installer should discuss contents of section 7 (User’s section) with the user.

A trained and qualified service technician should perform the inspection listed in these instructions before each heating season and at regular intervals.

CAUTION !!! Appliance maintenance must only be performed by a professionally qualified technician.

CAUTION !!! Before every maintenance operation, disconnect the appliance from the electric power supply, using the relevant switch in the vicinity.

CAUTION !!! Close the manual gas valve before any maintenance operation.

Service and maintenance schedules

<table>
<thead>
<tr>
<th>Service Technician</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Startup:</strong></td>
</tr>
<tr>
<td>- Address reported problems (Follow section 8.1.2);</td>
</tr>
<tr>
<td>- Check all piping for gas leaks (Follow section 8.1.3);</td>
</tr>
<tr>
<td>- Verify flue and air lines in good condition and sealed tight (Follow section 8.1.4);</td>
</tr>
<tr>
<td>- Check water pressure/system piping (Follow section 8.1.5);</td>
</tr>
<tr>
<td>- Check control settings (Follow section 8.1.6);</td>
</tr>
<tr>
<td>- Check wiring and connections (Follow section 8.1.7);</td>
</tr>
<tr>
<td>- Check flame signal (Follow section 8.6);</td>
</tr>
<tr>
<td>- Inspect combustion chamber. Clean and vacuum if ther’s presence of debris and/or products of the combustion (Follow section 8.4).</td>
</tr>
<tr>
<td>- Inspect thermal insulations inside the combustion chamber and replace them if they are cracked or damaged (Follow section 8.3.1).</td>
</tr>
<tr>
<td>- Clean condensate siphon and fill with fresh water (Follow section 8.5).</td>
</tr>
<tr>
<td>- Check the capacity input (Follow section 6.10).</td>
</tr>
</tbody>
</table>

Figure 17-1 - Service and Maintenance Schedules

8.1.1 - Service recall
In order to maintain maintenance frequency, the parameter $2080$ is present in the installer menu (see section 7.8), which is used to activate the maintenance call (Service) along with parameter $2081$ which is used to set the operating days which must pass between one intervention and the next. The control system identifies the operating days, verifying the burner activity time.

Proceed as follows to activate the call service:
1. Access the Installer menu (see section 7.8) and set parameter $2080$ on $0^\text{th}$;
2. Access parameter $2081$ and set the appliance operating days which must pass between one call and the next.

The call will be completed with $SE_r$ on the display. To remove the indication $SE_r$ and renew the call period, operate as follows:
1. Access the “Installer menu”;
2. Access the parameter $2080$, set it on $r SE$ and press the RESET key.
3. Exit the Installer menu by pressing the RESET key for 5 seconds.

The call time is now renewed and $SE_r$ appears on the display.

8.1.2 - Address reported problems
Inspect any problems reported by the owner and correct before proceeding.

8.1.3 - Check all piping for gas leaks
1. Inspect all gas piping and verify to be leak free.
2. Check for gas leaks: using soap solution, check for gas leaks from meter to appliance including all pipes and fittings and heater connection. Use liquid soap solution for all gas testing.

CAUTION !!! Do not check for gas leaks with an open flame. Use the bubble test. Ignoring the bubble test or check for gas leaks with an open flame can cause explosion, severe personal injury, death, or substantial property damage.

8.1.4 - Verify flue and air lines in good condition and sealed tight;
1. Check for obstruction, condensation, corrosion and physical damage, water stains, any signs of rust, other corrosions or separation of the vent and air intake piping.
2. Check outside terminations. Screens and louvers should be free of any debris and must be cleaned as required.

8.1.5 - Check system water pressure/system piping/expansion tank;
1. Check water piping and accessories for leaks. Slightest leaks should be corrected.
2. Check the system to be full of water and pressure to remain stable at correct setting on gauge.

CAUTION !!! Eliminate all system or heater leaks. Continual fresh makeup water will reduce heater life. Minerals can build up in sections, reducing heat transfer, overheating heat exchanger, and causing heat exchanger failure. Leaking water may also cause severe property damage.

8.1.6 - Check control settings
1. Set heaters setpoint low enough to end call for heat (see section 7.4). Gas valve should close and burner should stop firing. Fan will go into a post purge, then shuts off.
2. Control Safety Shutdown test: with the burner firing, close the manual gas shut off valve (detail “2” Figure 5-5). Gas valve should close and burner should stop firing. The boiler will try for ignition three times, then should lock out with a “Loc 1” error shown on the display. Open the manual gas shut-off valve, and verify your gas meter. Gas flow must be zero.
CAUTION: If gas flow occurs, close the manual gas shutoff valve and troubleshoot the system to determine why there is gas flow when the gas valve should be deenergized. Do not operate the boiler until the problem is resolved or a fire or explosion causing property damage, personal injury or loss of life may occur.

8.1.7 - Check wiring and connections
Inspect all heater wiring, making sure wires are in good condition and securely attached.

8.2 - Casing removal
Proceed as follows to remove the casing (refer to figure 8-1):

1. Loosen the screws "H";
2. Pull the lower part of the front-piece “B” towards the front and then slide it out upwards until it is released from the guides “C”;

To access the command and control board:

1. Turn the command board “D” towards the front;
2. Open the commands board “D” by operating on closure “G”;

To access the electric connections board:

1. Turn the command board “D” towards the front;
2. Slide lid “E” out by operating on the “F” closing flaps;

Figure 8-1 - removing the casing and opening of command board
8.3 - Burner and fan removal
Proceed as follows to remove the burner fan unit (refer to figure 8-2 when not differently specified):
1.- access the internal components following section 8.2;
2.- remove the air manifold (detail “C” in figure 6-3) rotating it towards the outside of the appliance and then pulling it towards the right (see figure 6-3);
3.- unscrew nut “C” from the valve “D”;
4.- disconnect the cables “B” and the detection cable from the ignition and detection electrodes (details “15” and “35” of figures 3-1, 3-2, 3-3 and 3-4);
5.- unscrew the four nuts “E”;
6.- extract the group “F” as per figure;

8.3.1 - Thermal insulations
Thermal insulations must be checked every year and replaced if they are cracked or damaged. See Figures 8-2 where the thermal insulations (items “G” and “H”) are showed assembled in the burner and in the heat exchanger.
Once verified the condition of thermal insulation (see Figure 8-2), if necessary, replace with spare parts kit, following the instructions supplied with it. With the thermal insulation must be replaced the burner gasket “L” and the two gaskets of the electrodes.

8.4 - Gas burner and heat exchanger outer surface cleaning procedure
To correctly clean the burner and the heat exchanger (exhaust flue side), proceed as follows (refer to figure 8-2 when not differently specified):
1.- access the internal components following section 8.2;
2.- remove the burner unit following section 8.3;
3.- use a suction device to remove the unburned residues present inside the combustion chamber;
4.- pass a cylindrical brush with plastic bristles inside the combustion chamber;
5.- use the same suction device on the surfaces of the burner and around the electrodes;
6.- re-mount the components in reverse order;
7.- open the gas isolation valve;
8.- restore the electric power supply.
9.- check that there are no gas leaks on all joints;

⚠️ CAUTION!!! Perform the leak test using a soap solution. The use of flames is prohibited.

⚠️ CAUTION!!! Every time you clean the burner and the heat exchanger verify the good condition of thermal insulation “G” and “H” (following section 8.3.1).
Figure 8-2 - Removing the burner fan unit

CAUTION!!! Gasket is intended for sealing combustion. If damaged DO NOT reuse it, the heat exchanger door must be replaced. Consult factory to replace heat exchanger door.
8.5 - Condensate siphon cleaning procedure

For correct cleaning of the collection siphon and the conveying of the condensate produced by combustion, operate as follows (refer to the figures 8-3, 8-4 and 8-5):
1. With the appliance on, open a domestic hot water tap or taps fully to force the burner to its maximum power and the level of the liquid present inside the siphon tank “D” lowers (see figure 8-4);
2. Switch off the appliance and disconnect the electrical supply;
3. Access the internal components following section 8.2;
4. Remove the burner fan unit following section 8.3;
5. Cover the electric box with a cloth to protect it from any residues of water inside the siphon to be removed.
6. Slide the support “B” outwards from the holding support;
7. Slide the tank “C” downwards, paying attention to the fact that it is full of condensate water and this could escape;
8. Extract the siphon outwards (see figure 8-4) paying attention to disconnect the collection pipes of the water coming from the upper part of the appliance and from the air vent valve.
9. Clean the decanting tank “D”;
10. Re-mount everything in reverse order, paying attention to the gasket “E”, which is put back in the relevant seat and that terminal “G” is inserted correctly into seat “H”;
11. Restore the level of liquid inside the siphon following the procedure in section 6.1.2.
8.6 - Ignition and ionisation
flame electrodes position
For good working order of the appliance, it is indispensable
that the electrodes are positioned correctly (refer to figure
8-6):
- the distance between the ignition electrodes “A” and “B”,
must be between 2.0 and 2.5 mm;
- the distance between the ignition electrodes from the burner
  surface must be between 5 and 5,5 mm;
- the distance of the ionisation electrode “C” from the surface
  of the burner must be between 5,5 and 6,5 mm.

Figure 8-6 - positioning the electrodes on the
burner

8.7 - Circulation pump
replacement procedure
Operate as follows if the pump must be replaced (refer to
figure 8-7):
1.- empty the domestic hot water circuit, following the
   procedure in section 8.10;
2.- disconnect the electric power supply upstream from the
   appliance;
3.- access the components inside the appliance, following
   section 8.2;
4.- disconnect the electric cables from the pump body.
5.- loosen the nuts “C”;
6.- extract the pump “B” outwards and replace it.

Figure 8-7 - Replacing the pump motor
8.8 - Domestic water flow meter replacement procedure
Proceed as follows, making reference to figure 8-8:
1.- empty the domestic hot water circuit, following the procedure in section 8.10;
2.- disconnect the electric power supply upstream from the appliance;
3.- access the components inside the appliance, following section 8.2;
4.- disconnect the cables from the flow meter (detail “B” in figure 8-8);
5.- unscrew nuts “A”, paying attention that the residual water from the pipes does not reach the control board;
6.- slide the flow meter “B” upwards and replace it.

Figure 8-8 - Removing the flow meter

8.9 - Safety pressure relief valve replacement procedure
The safety valve (detail “A” in figure 8-9) protects the appliance from over pressures. If it has to be replaced, proceed as follows (refer to figure 8-9):
1.- empty the domestic hot water circuit, following the procedure in section 8.10;
2.- access the components inside the appliance, following section 8.2;
3.- disconnect the drain pipe from the valve to be replaced “A”;
4.- unscrew the fixing dowel “B”;
5.- unscrew the lower fixing disk of valve “A”;
6.- extract the safety valve “A” and replace it.

Figure 8-9 - Removing the safety valve
8 - MAINTENANCE

8.10 - Procedure for draining the water heater
To empty the appliance proceed as follows (see figure 5-5):
1.- close the isolation valves “10” and “3”;
2.- connect a drain pipe to drain valves “4”;
3.- open the drain valves “4”;
4.- if there is a risk of freezing it is recommended to empty all the water in the exchanger by blowing air into a tap with a compressor (pressure less than 3 bar).

8.11 - Fan test mode procedure
Switch-on of the fan only can be generated, accessing the parameter 20 10 situated inside the “Installer menu” (see section 7.8) and set it on F An. To go back to normal operating conditions, set parameter 20 10 again to OFF.

8.12 - Gas burner minimum and maximum power test mode procedure
Appliance operation can be forced to its own minimum, maximum power. Proceed as follows:
1.- access parameter 20 10 found in the “installer menu” (see section 7.8);
2.- set the parameter 20 10 at the following value:
   a) LOw to force the appliance to minimum power;
   b) IGN to force the appliance to ignition power;
   a) HIgh to force the appliance to maximum power;
   a) REG to force the appliance to maximum power.
4.- to end forcing, take the parameter 20 10 to the OFF value and press the RESET key.

8.13 - Checking the ionisation current
In any operating status, also during verifications of minimum and maximum power stated in section 8.12, the ionisation current value can be consulted on parameter 1008 present in the “User menu” (section 7.7). This value must be between 1.5 and 3 uA (microampere) at minimum power and between 5 and 8 uA at maximum power.

8.14 - Water temperature sensor testing procedure
The temperature sensors are positioned on the appliances exchanger body. The electric resistance existing between the two contacts of the sensor, must correspond with that stated in figure 8-10.

The temperature sensors are: 1001, 1002, 1005, 1006 and 1007, the positioning of which can be verified in figures 3-1, 3-3 and 3-4.
8.15 - Electrical connections

CAUTION !!! To consult the wiring diagram correctly, references K are given followed by a number (see example above) to identify the correct follow-on of the cables in the next page.

Figure 8-11 - Operational wiring diagram

1001 - Heat exchanger output sensor
1002 - D.H.W. outlet temperature sensor
1005 - Heat exchanger output sensor 2
1006 - Exhaust flue sensor 1
1007 - Cold water inlet sensor
CM - Appliance control unit and flame control
DSP - Display
EA - Ignition electrode
ER - Flame detection electrode
F (PWM) - PWM fan
F1 (SDC) - 1.6A fuse
F2 (CM) - 5A fuse
PR - Inner Pump
GS - Spark generator
IG - Main electrical switch
J1 - 8 pin Molex connector
J12- 6 pin Molex connector
J2 - 6 pin Molex connector
J26- 4 pin Molex connector
J3 - 10 pin Molex connector
J4 - 6 pin Stelvio connector
J5 - 4 pin Molex connector
J6 - 14 pin Molex connector
J7- 10 pin Molex connector
J9- 4 pin Molex connector
SDC- Connection board

TF - High limit flue gas temperature fuse
TU - Domestic hot water flow meter
VG1- Gas Valve
8 - MAINTENANCE

8.16 - Internal multi-core wiring diagram

Figure 8-12 - Multi-core colours wiring diagram

Key - see key figure 8-11

Figure 8-12 - Multi-core colours wiring diagram

COLOR OF DIAGRAM CABLE
ARANCIO = ORANGE
BIANCO = WHITE
BLU = BLUE
GIALLO = YELLOW
GIALLO/VERDE = YELLOW/GREEN
GRIGIO = GREY
MARRONE = BROWN
NERO = BLACK
ROSSO = RED
VERDE = GREEN
<table>
<thead>
<tr>
<th>TECHNICAL DATA</th>
<th>UM</th>
<th>IM 550</th>
<th>IM 750</th>
<th>IM 1250</th>
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</thead>
<tbody>
<tr>
<td>Type (Type of exhaust flue/combustion air intake)</td>
<td>B23; C13; C33; C43; C53; C63; C83:93</td>
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<td></td>
<td></td>
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<tr>
<td>Category</td>
<td>II2H3P</td>
<td>II2H3P</td>
<td>II2H3P</td>
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<tr>
<td>CE type certificate (PIN)</td>
<td>0476CQ1097</td>
<td>0476CQ1097</td>
<td>0476CQ1097</td>
<td></td>
</tr>
<tr>
<td>Max. heat input NET (GROSS) kW</td>
<td>25.5 (28.3)</td>
<td>32.0 (35.5)</td>
<td>57.8 (64.2)</td>
<td></td>
</tr>
<tr>
<td>Min. heat input NET (GROSS) kW</td>
<td>3.2 (3.6)</td>
<td>6.0 (6.7)</td>
<td>12.0 (13.3)</td>
<td></td>
</tr>
<tr>
<td>Max. useful heat output kW</td>
<td>27.0</td>
<td>33.5</td>
<td>60.9</td>
<td></td>
</tr>
<tr>
<td>NET Efficiency at max. useful heat output (GROSS) %</td>
<td>106 (96)</td>
<td>105 (95)</td>
<td>107 (96)</td>
<td></td>
</tr>
<tr>
<td>Min. useful heat output kW</td>
<td>3.30</td>
<td>6.14</td>
<td>12.85</td>
<td></td>
</tr>
<tr>
<td>NET Efficiency at min. useful heat output (GROSS) %</td>
<td>103 (93)</td>
<td>102 (92)</td>
<td>107 (96)</td>
<td></td>
</tr>
<tr>
<td>Gas flow rate G20 m³/h</td>
<td>2.70</td>
<td>3.38</td>
<td>6.11</td>
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</tr>
<tr>
<td>Gas flow rate G31 Kg/h</td>
<td>1.98</td>
<td>2.48</td>
<td>4.49</td>
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</tr>
<tr>
<td>Gas supply pressure G20 mbar</td>
<td>20</td>
<td>20</td>
<td>20</td>
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</tr>
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<td>Gas supply pressure G31 mbar</td>
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<tr>
<td>Gas supply minimum pressure G31 mbar</td>
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<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Gas supply maximum pressure G20 mbar</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Gas supply maximum pressure G31 mbar</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
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<td>Instantaneous D.H.W. adjustment range °C</td>
<td>40-75</td>
<td>40-75</td>
<td>40-75</td>
<td></td>
</tr>
<tr>
<td>D.H.W. flow rate (Δt 30°C) l/min</td>
<td>13.0</td>
<td>16.1</td>
<td>29.5</td>
<td></td>
</tr>
<tr>
<td>Domestic circuit maximum pressure</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Domestic circuit minimum pressure</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Minimum water flow l/min</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td></td>
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<td>Rated power supply voltage V</td>
<td>230</td>
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<td>230</td>
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<tr>
<td>Rated power supply frequency Hz</td>
<td>50</td>
<td>50</td>
<td>50</td>
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<tr>
<td>Absorbed electric power W</td>
<td>169</td>
<td>162</td>
<td>235</td>
<td></td>
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<td>Electric protection degree</td>
<td>IPX4D</td>
<td>IPX4D</td>
<td>IPX4D</td>
<td></td>
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<tr>
<td>Exhaust flue and air intake pipe diameter (twin-pipe) mm</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Exhaust flue pipe max. length (twin-pipe) (80) m</td>
<td>20</td>
<td>12.5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Air intake pipe max. length (twin-pipe) (80) m</td>
<td>20</td>
<td>12.5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Exhaust flue pipe diameter (concentric) mm</td>
<td>60/100</td>
<td>60/100</td>
<td>80/125</td>
<td></td>
</tr>
<tr>
<td>Exhaust flue pipe max. length (concentric) m</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Equivalent length of a bend m</td>
<td>45° bend = 0.5m, 90° bend =1m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighted CO (% O2 with natural gas) (EN26:2015) GROSS ppm</td>
<td>11</td>
<td>19</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Weighted NOx (% O2) (EN26:2015) GROSS G20 mg/kWh</td>
<td>20</td>
<td>29</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Weighted NOx (% O2) (EN26:2015) GROSS G31 mg/kWh</td>
<td>24</td>
<td>34</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>CO2 (%) at minimum/maximum power</td>
<td>8.5/9.0</td>
<td>8.5/9.0</td>
<td>8.3/8.7</td>
<td></td>
</tr>
<tr>
<td>Exhaust flue gas maximum temperature at appliance outlet °C</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Mass flow rate of exhaust flue gases kg/h</td>
<td>41.9</td>
<td>52.5</td>
<td>97.8</td>
<td></td>
</tr>
<tr>
<td>Head available at exhaust flue outlet Pa</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Exhaust flue gas maximum temperature for overheating °C</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Max. negative pressure in exhaust flue system Pa</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Condensate maximum flow rate l/h</td>
<td>3.2</td>
<td>4.0</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>Condensate average acidity PH</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Operating environment temperature °C</td>
<td>0 ; +50</td>
<td>0 ; +50</td>
<td>0 ; +50</td>
<td></td>
</tr>
<tr>
<td>Weight of the appliance kg</td>
<td>36</td>
<td>36</td>
<td>48</td>
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</table>
## Key for figure 10-1

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="reset_0" alt="RESET" /></td>
<td>Press and release the RESET key</td>
</tr>
<tr>
<td><img src="reset_2" alt="RESET" /></td>
<td>Hold the reset key down for a time in seconds, indicated by the number (2)</td>
</tr>
<tr>
<td><img src="reset_5" alt="RESET" /></td>
<td>Hold the reset key down for a time in seconds, indicated by the number (5)</td>
</tr>
<tr>
<td><img src="reset_5" alt="RESET" /> <img src="key_6" alt="key" /></td>
<td>Hold down the RESET and key simultaneously for a time in seconds, indicated by the number</td>
</tr>
<tr>
<td><img src="key_6" alt="key" /></td>
<td>Press and release the key</td>
</tr>
<tr>
<td><img src="key_6" alt="key" /></td>
<td>Press and release the key</td>
</tr>
</tbody>
</table>

### Parameters that can be displayed in normal operating conditions (see section 7.9)

- **AFro**
- **ALTE**
- **Loc**
- **Err**
- **ALEG**
- **SEr**

Use menu access (see section 7.7)

- 2001
- 2002
- 2003
- 2004
- 2999

Use menu parameters (see section 7.7)

- 1999

Installer menu access (see section 7.8)

- 0
- 1
- 2
- 30

Return to normal operation
CAUTION !!!
The modification of these parameters could cause the appliance, and therefore the plant, to malfunction.
For this reason only a technician that has the awareness and in-depth knowledge of the appliance can modify them.
To access this menu, move the switch in the board as stated in figure 6-6 detail “B”.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Description</th>
<th>M.U.</th>
<th>Setting range</th>
<th>Factory value</th>
<th>Customised value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3001</td>
<td>Cascade adress (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>0</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3002</td>
<td>Selection type</td>
<td></td>
<td>From 50 to 55</td>
<td></td>
<td>See figure 6-8</td>
</tr>
<tr>
<td>3012</td>
<td>Domestic hot water operating mode</td>
<td>/</td>
<td>0 = DO NOT USE: 1 = Storage tank with temperature sensor; 2 = Storage tank with thermostat; 3 = DO NOT USE; 4 = DO NOT USE; 5 = DO NOT USE; 6 = DO NOT USE; 7 = DO NOT USE; 8 = Instantaneous water heater;</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>3013</td>
<td>Plant fill automatic valve (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>0</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3014</td>
<td>Instantaneous domestic hot water pre-heat</td>
<td>/</td>
<td>OFF = No pre-heat ON = With pre-heat</td>
<td>OFF</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3015</td>
<td>Maximum central heating temperature (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>80</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3016</td>
<td>Minimum central heating temperature (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>30</td>
<td>(N/A)</td>
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<tr>
<td>3017</td>
<td>Pre-heat mode (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>0</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3018</td>
<td>Minimum DHW temperature °C</td>
<td>From 30 to 75</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3019</td>
<td>Maximum DHW temperature °C</td>
<td>From 30 to 75</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3020</td>
<td>Domestic hot water flow rate sensor</td>
<td>/</td>
<td>0 = B; 1 = DN 8; (IM 550) 2 = DN 10; 3 = DN 15; (IM 750 and 1250) 4 = DN 20; 5 = DN 25;</td>
<td>1 (IM 550) 3 (IM 750) 3 (IM 1250)</td>
<td></td>
</tr>
<tr>
<td>3021</td>
<td>2nd Exhaust flue sensor (1014)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>0</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3022</td>
<td>Central heating minimum pressure (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>0,8</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3023</td>
<td>Water pressure sensor</td>
<td>/</td>
<td>0 = Disabled; 1 = Enabled;</td>
<td>0 (IM 550) 0 (IM 750) 0 (IM 1250)</td>
<td></td>
</tr>
<tr>
<td>3033</td>
<td>Modulating pump (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
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<td>(N/A)</td>
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<td>3034</td>
<td>Modulating pump delta T target (N/A)</td>
<td>(N/A)</td>
<td>(N/A)</td>
<td>15</td>
<td>(N/A)</td>
</tr>
<tr>
<td>3040</td>
<td>Antilegionella for water heater</td>
<td>/</td>
<td>ON = Antilegionella enable OFF = Antilegionella disabled</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>3041</td>
<td>Tank supply temperature increase °C</td>
<td>From 0 to 30</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3042</td>
<td>Minimal water flow l/min</td>
<td>From 0 to 25,5</td>
<td>2,5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N/A = Not applicable
Declaration of Conformity

Distributor: Lochinvar Ltd
7 Lombard Way, The MXL Centre, Banbury, Oxon,
OX16 4TJ
United Kingdom

hereby declares that the following water heating products:

Product description: Gas-fired condensing instantaneous water heater
Product family name: Impetus
Product models: IM 550, IM 750, IM 1250

are, provided that the appliances are installed according to the installation manual, compliant to these European Directives:

• Gas Appliance Directive (GAD) - 2009/142/EC
  - EN 26:2015

• Low Voltage Directive (LVD) - 2014/35/EC
  - EN 60335-1:2012
  - EN 60335-2-102:2006

• Electro Magnetic Compatibility Directive (EMC) - 2014/30/EC
  - EN 55014-1:2007
  - EN 55014-2:2015
  - EN 61000-3-2:2014
  - EN 61000-3-3:2013

• Eco-Design Directive (ErP) - 2009/125/EC
  - Commission Regulation No. 814/2013

• Energy Labelling Directive - 2010/30/EC
  - Commission Regulation No. 812/2013

and are conform the tested type as reported in the EC Type-Examination report by KIWA CERMET ITALIA SpA with report number 141201097

Company: Lochinvar Ltd
Place and date: Banbury, April 2016

D. Pepper
Managing Director
To register your warranty, you should complete and return the enclosed warranty card.

**General warranty**

If, after verification and at the sole discretion of Lochinvar, a component or part (with exclusion of the stainless steel heat exchanger) of a water heater supplied by Lochinvar proves within two years of the original installation date to be defective or fails to function correctly due to manufacturing and/or material defects, then Lochinvar shall repair or replace this component or part.

**Heat exchanger warranty**

If, after inspection and at the sole discretion of Lochinvar, the stainless steel heat exchanger of a water heater supplied by Lochinvar proves within 3 years of the original installation date to be leaking due to corrosion occurring on the water side, then Lochinvar 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. Notwithstanding that in the event that unfiltered water is used, the warranty shall be reduced to one year from the original installation date.

**Conditions for Installation and Use**

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

- The water heater is installed under strict adherence to Lochinvar installation instructions for the specific model, and the relevant government and local authority installation and building codes, rules and regulations in force at the time of installation.
- The water heater remains installed at the original site of installation.
- The water heater is used exclusively with drinking water.
- The heat exchanger is safeguarded against harmful scaling and lime build-up by means of periodic maintenance according to the Installation-, User-, Maintenance and Service manual.
- The water temperatures in the heater do not exceed the maximum setting of the thermostats, which form a part of the water heater.
- The water pressure and/or heat load do not exceed the maximum values stated on the water heater rating plate.
- The water heater is installed in a non-corrosive atmosphere or environment.
- The water heater is connected to a protected cold water supply arrangement, which is approved by the relevant authority; with sufficient capacity for this purpose; supplying a water pressure no greater than the working pressure stated on the water heater; in compliance with the government and local authority installation and building codes, rules and regulations.

**Exclusions**

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

- damage to the water heater caused by an external factor;
- misuse, neglect (including frost damage), modification, incorrect and/or unauthorised use of the water heater and any attempt to repair leaks;
- contaminants or other substances having been allowed to enter the water heater and/or heat exchanger k;
- the hardness (alkaline earth ions) of the water exceeding 11.2 °dH (equals 20 °fH, 14 eH, 2.0 mmol/litre CaCO3 or 200 ppm CaCO3).
- unfiltered, recirculated water flowing through in the water heater;
- any attempts at repair to a defective water heater other than by an approved service engineer.
- damage to the water heater due to excessive lime deposits in the heat exchanger caused by improper or negligent maintenance.

**Scope of the warranty**

The obligations of Lochinvar by virtue of the warranty provided do not extend beyond delivery free of charge from the warehouse of the parts or components or water heater to be replaced; transport, labour, installation and other costs associated with the replacement shall not be borne by Lochinvar.

**Claims**

A claim on grounds of the specified warranty must be submitted to the dealer from whom the water heater was purchased, or to another authorised dealer for Lochinvar Water Products Company products. Inspection of the water heater as referred to in articles 1 and 2 shall take place in one of the laboratories of Lochinvar Water Products Company.

**Obligations of Lochinvar**

Lochinvar 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 articles.

Under the terms of the supplied warranty, Lochinvar is not liable for damage to persons or property caused by (assemblies or parts of) a (replacement) water heater that it has supplied.
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<tr>
<th>INFORMATION</th>
<th>SYMBOL</th>
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<th>VALUE</th>
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\(^1\) According commission delegated regulation (EU) No 812/2013

\(^2\) According commission delegated regulation (EU) No 814/2013
IMPORTANT INFORMATION

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