

**INSTALLATION,
USE AND MAINTENANCE
MANUAL**

**FLOOR STANDING CONDENSING
WATER HEATER WITH STORAGE TANK**

AGUAPLUS



WARNING!!!

FAILURE TO COMPLY WITH THESE PROVISIONS AND REQUIREMENTS MAY COMPROMISE THE SAFETY OF THE UNIT AND CAN RESULT IN A FIRE OR EXPLOSION CAUSING PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

Installer: Read all instructions, including this manual, before installing. Perform steps in the order given.

User: This manual is for use only by a Competent Person. Refer to the User's Information section for your reference.

Maintenance: at least once a year the user must call a Competent Person for routine maintenance.

If you smell gas

- A - Turn off the gas supply at the gas meter;
- B - Extinguish all naked flames – do not smoke or strike matches;
- C - Do not operate electrical appliances or switches such as a light switch.
- D - Open all doors and windows to ventilate the property.
- E - Call the gas emergency service and follow their directions.

Carbon Monoxide.

Every year deaths and serious injuries occur due to carbon monoxide poisoning. These tragedies are avoidable if certain preventative measures such as the following are undertaken:

- ☞ Ensure that all boilers, water heaters, room heaters, stoves and hobs which burn oil, natural gas, LP gas, coal, peat, wood and wood pellets are serviced regularly. Servicing is needed at least once per year to ensure safety. The service person should be qualified and trained to service the specific types of appliance
- ☞ If an appliance is fitted in a dwelling, then a carbon monoxide detector should always be fitted. There are two types available: a simple detector works like a fire alarm to emit a loud noise and flashing light if carbon monoxide is detected or a more sophisticated version which will also switch off the appliance to provide more safety.

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.

If you can smell combustion products

1. - Switch the appliance off.
2. - Ventilate the room.
3. - Call a professionally qualified technician.

Competent Person: Competent Person is an individual with specific, technical training in space heating systems, domestic hot water systems, fuel gas systems and electrical systems. This individual must have the legally required qualifications.

Installation and Modifications: Only a Competent Person must carry out the installation and calibration of the heater. Never modify the heater or its flue gas carrying components in any way. This heater must be properly vented.

Flue gas/air intake:

- You are only permitted to operate this appliance with the combustion air/flue gas system that has been specifically designed and approved.
- Do not obstruct the air intake or vent pipe terminals.
- If heater installation is provided as replacement heater, DO NOT connect new heater to an existing flue system, unless the flue system designer has been consulted.
- Do not restrict or seal any air intake or outlet openings (terminals).

Hazards and Your Safety - Hot Water Can Scald! Water temperature over 52°C can cause severe burns instantly, or death from scalds. Children, the disabled, and the elderly are at highest risk of being scalded; see instruction manual before setting temperature at heater! Feel water before bathing or showering.

Defects: If you find any defects, you must inform the owner of the system of the defect and the associated hazard in writing.

When servicing heater, to avoid electric shock, disconnect electrical supply before performing maintenance.

When servicing heater, to avoid severe burns, allow heater to cool before performing maintenance.

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

Correct Use:

This heater must only be used for the purpose for which it has been expressly designed: Heating of water for closed circuit systems for central heating.

Do not use this appliance if any part has been under water. Immediately call a competent person to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

Ensure the heater and its controls are protected from dripping or spraying water during normal operation or service.

Only use the heater in the combinations and with the accessories and spares listed in this manual.

For safety and environmental reasons, the packing materials must be properly disposed of. Any replaced part or packaging should never be left within the reach of children.

CAUTION!!!

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Installation location: The heater must be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the heater or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the heater. The pan must not restrict combustion air flow.

Installation location: The heater must be installed on a non-combustible surface.

In the event of a breakdown and/or malfunction of the heater, turn off the unit and do not make any attempt to repair it. The heater must be serviced by a Competent Person using original spare parts.

Installation, modifications

- Seal the adjustment devices after every calibration.
- 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.
- We also highlight the importance of an annual scheduled maintenance contract with a Competent Person.
- The end user must have maintenance performed on the appliance only by Competent Person in accordance with this manual and in full compliance with both local and national standards.
- Before performing any cleaning or maintenance, disconnect the appliance from the mains power supply.
- After any cleaning or maintenance, before reconnecting the power supply, make sure that all internal parts are properly dry.

- 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.
- 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.

Do not use “homemade cures” or “heater patent medicines”. Serious damage to the heater, personnel, and/ or property may result.

Do not use petroleum-based cleaning or sealing compounds in the heater system. Gaskets and seals in the system may be damaged. This can result in substantial property damage.

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 pipes and gas pipes must always be checked by a professionally qualified technician or engineer to verify compliance with all relevant standards, Laws and codes of good practice.

NOTICE!

Local approval of the flue system and the condensate connection to the public sewer system may be required.

The local building regulations stipulating the installation rules at the time of installation.

When calling or writing about the heater – Please have the heater model and serial number from the heater rating plate.

Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

The manufacturer declines all liability, contractual or otherwise (warranty included), for any damage to people, animals property or this same appliance, caused by:

- a) - incorrect installation;
- b) - failure to comply with this or any other instruction provided by the manufacturer;
- c) - failure to comply with the applicable local and/or national regulations in force;
- d) - incorrect use of this appliance
- e) - inadequate or incorrect service
- f) - inadequate or incorrect maintenance.

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1.1 - National laws and regulations

All the gas appliances must be installed by a competent and qualified person, in accordance with the relevant clauses of applicable standards and recommendations. These include but may not be limited to the following:

- I.S. 813 Domestic gas installations.
- I.S. 820 Non-Domestic gas installations.
- BS 7671:2008+A3:2015 - Requirements for Electrical installations. IEE Wiring Regulations.
- BS 6644:2011 - Specification for the installation and maintenance of gas-fired hot water boilers of rated inputs between 70 kW (net) and 1.8 MW (net) (2nd and 3rd family gases).
- BS 6891:2015 - Specification for the installation and maintenance of low pressure gas installation pipework of up to 35 mm (R1 1/4) on premises.
- BS 5482-1:2005 - Code of practice for domestic butane and propane gas burning installations. Installations at permanent dwellings, residential park homes and commercial premises, with installation pipework sizes not exceeding DN 25 for steel and DN 28 for corrugated stainless steel or copper.
- BS 8558:2011 - Guide to design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Complementary guidance to BS EN 806;
- IGEN UP 10 4th Edition;
- Building regulations issued by the Department of the Environment and Building Standards Regulations.
- Gas safety (Installation and Use) Regulations current issue.
- Health and Safety at Work Act 1974.
- All relevant Building Regulations.
- Local Water Byelaws.
- Water Regulations.
- Health & Safety legislation.

Failure to install this appliance correctly could lead to prosecution. It is in your own interest and in the interest of safety to ensure that the law is complied with. Manufacturer's instructions must not be interpreted as over-riding statutory obligations under any circumstances.

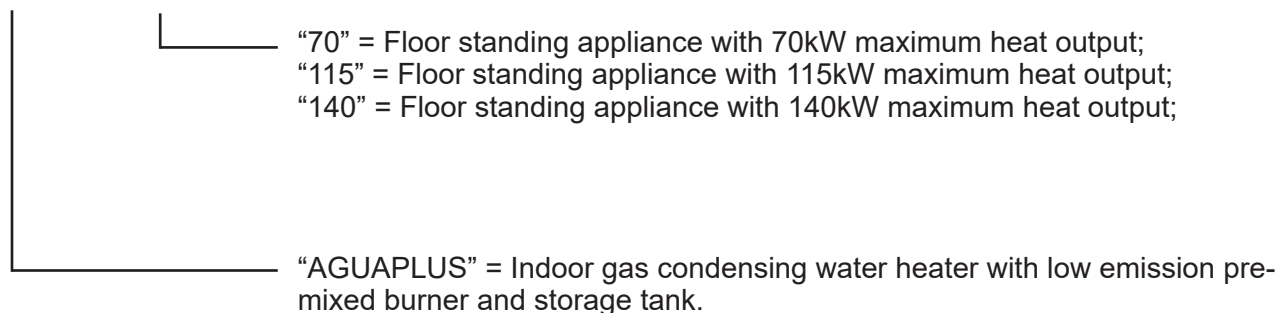
2 - GENERAL INFORMATION

2.1 - Presentation

Congratulations! This appliance is truly one of the best products on the market. Each individual part was designed, created, tested and assembled with pride at the COSMOGAS factory, therefore guaranteeing the best quality control.

2.2 - Overview of the models

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2.3 - Accessories

☞ Accessories, in some models, could be not supplied with the appliance.

Amount No.	Description	Code	Figure
No. 1	115 NATURAL GAS-LPG CONVERSION KIT.	62630197	
	70 and 140 NATURAL GAS-LPG CONVERSION KIT.	62630198	
No. 4	ADJUSTABLE FEET	60805006	
No. 1	10KG BAG OF CONDENSATE NEUTRALIZER	62801022	

2.4 - Manufacturer

COSMOGAS srl
Via L. da Vinci 16
47014 - Meldola (FC) Italy
Tel. 0543 498383
Fax. 0543 498393
www.cosmogas.com
info@cosmogas.com

2.6 - Maintenance

A regular annual maintenance (see section 15) on the appliance is advised for the following reasons:

- to maintain high performance and reduce fuel consumption;
- to achieve an high standard of safety;
- to maintain an high level of environmental compatibility of the combustion.

Offer your customer a periodic maintenance contract.

2.5 - Meaning of symbols used



WARNING !!!

Failure to follow this indication can cause an electrical shock which can result in personal injury or death!



WARNING !!!

Failure to follow this indication can cause an explosion, fire, extensive property damage, severe personal injury ore death.

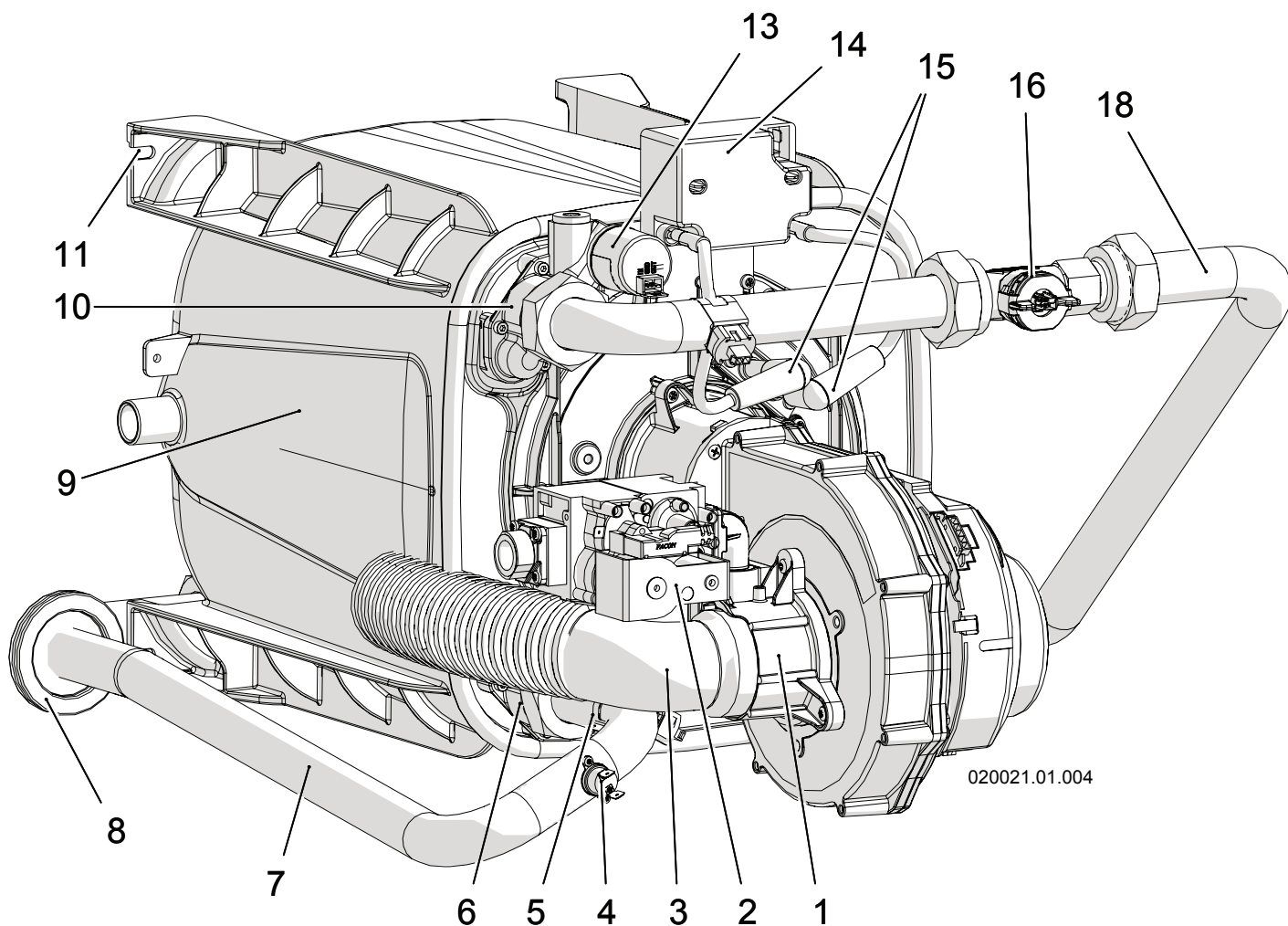
☞ Symbol indicating important instruction.

2.7 - Disposal



The crossed wheelie bin symbol means that the product must not be thrown away in the ordinary rubbish bin (i.e. in with “mixed urban rubbish”); it must be dealt with separately, in order to undergo suitable operations for it to be reused or treated, so that any substances that are dangerous for the environment can be removed and disposed of safely. The user is responsible for getting rid of the boiler at the end of its life, delivering it to a recycling centre run by the local authority or city hygiene companies, or, when he/she buys a new boiler, giving the product that has been replaced to the dealer, who is obliged to take it under the terms of EU Directive 2012/19/EU. For further information regarding correct decommissioning of these units, users can contact the public service in charge or retailers.

3 - MAIN COMPONENTS



- 1 - Air/gas mixing group
- 2 - Gas valve
- 3 - Air inlet manifold
- 4 - High limit temperature switch
- 5 - Hot water temperature sensor
- 6 - Supply connection
- 7 - Hot water outlet pipe
- 8 - Gasket
- 9 - Heat exchanger
- 10 - Return connection

- 11 - Support fittings
- 12 - -----
- 13 - Water pressure sensor (present in burner 1 MASTER)
- 14 - Spark generator
- 15 - Ignition cables
- 16 - Water flow rate
- 17 - -----
- 18 - Water inlet pipe

Figure 3-1 - Internal components

3 - MAIN COMPONENTS

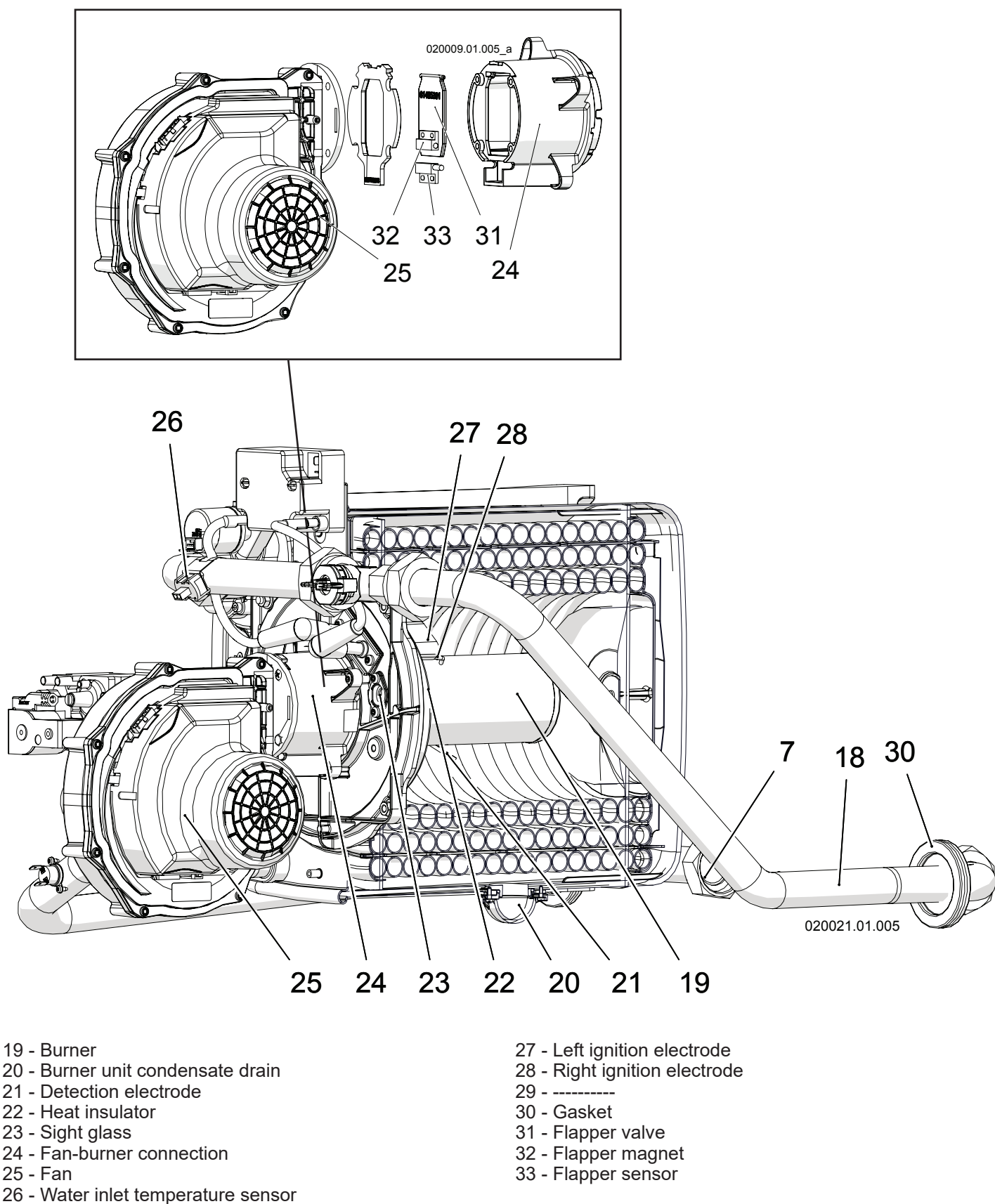
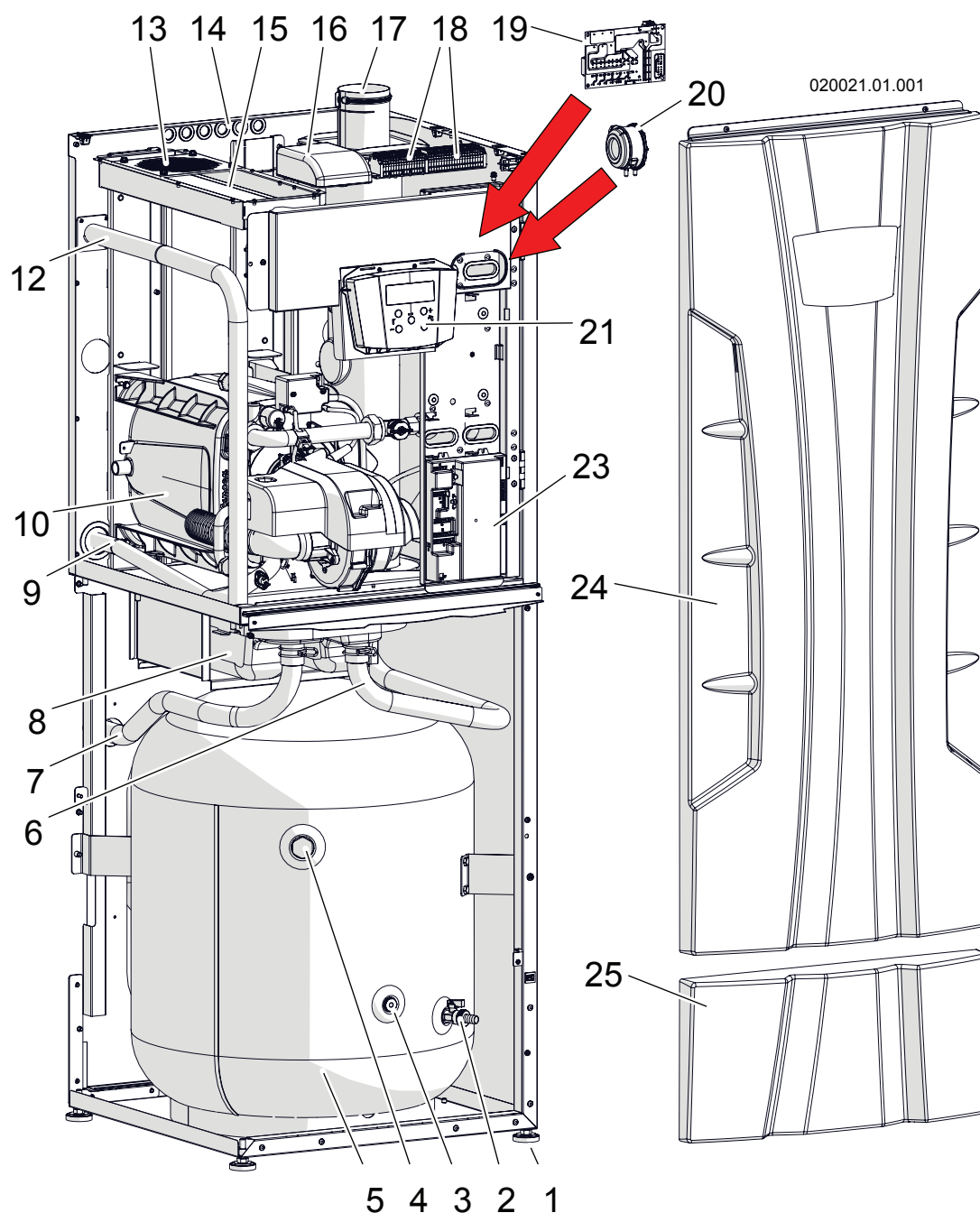


Figure 3-2 - Internal components

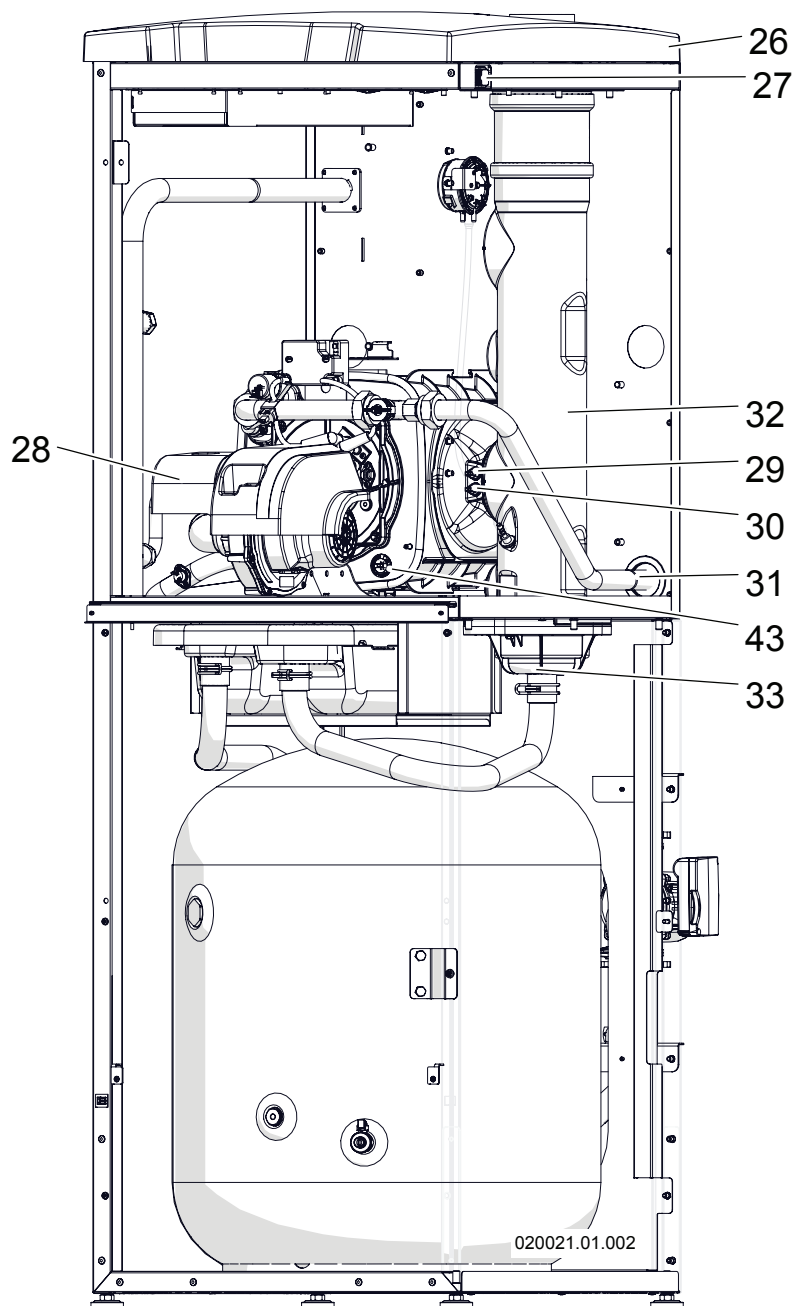
3 - MAIN COMPONENTS



- | | |
|-------------------------------------------------------------|-------------------------------------------------|
| 1 - Leveling feet | 13 - Air inlet connection |
| 2 - Drain valve | 14 - Electrical cable passage |
| 3 - Hot water tank temperature sensor | 15 - Air filter |
| 4 - Anode | 16 - 885 IF board (present only in some models) |
| 5 - 120 litre storage tank, 50.8 mm thick and "R"=0.0383 W/ | 17 - Flue exhaust connections |
| mK thermal insulation | 18 - Electrical connections |
| 6 - Flue exhaust condensate drain pipe | 19 - Electrical board |
| 7 - Condensate drain pipe | 20 - Blocked flue pressure switch |
| 8 - Condensate neutralizer box | 21 - Control panel |
| 9 - Hot water outlet pipe | 23 - "Burner 1" control board |
| 10 - Burner "1" (MASTER) | 24 - Front cover |
| 12 - Gas inlet pipe | 25 - Bottom front cover |

Figure 3-3 - Internal compents of 70 model

3 - MAIN COMPONENTS

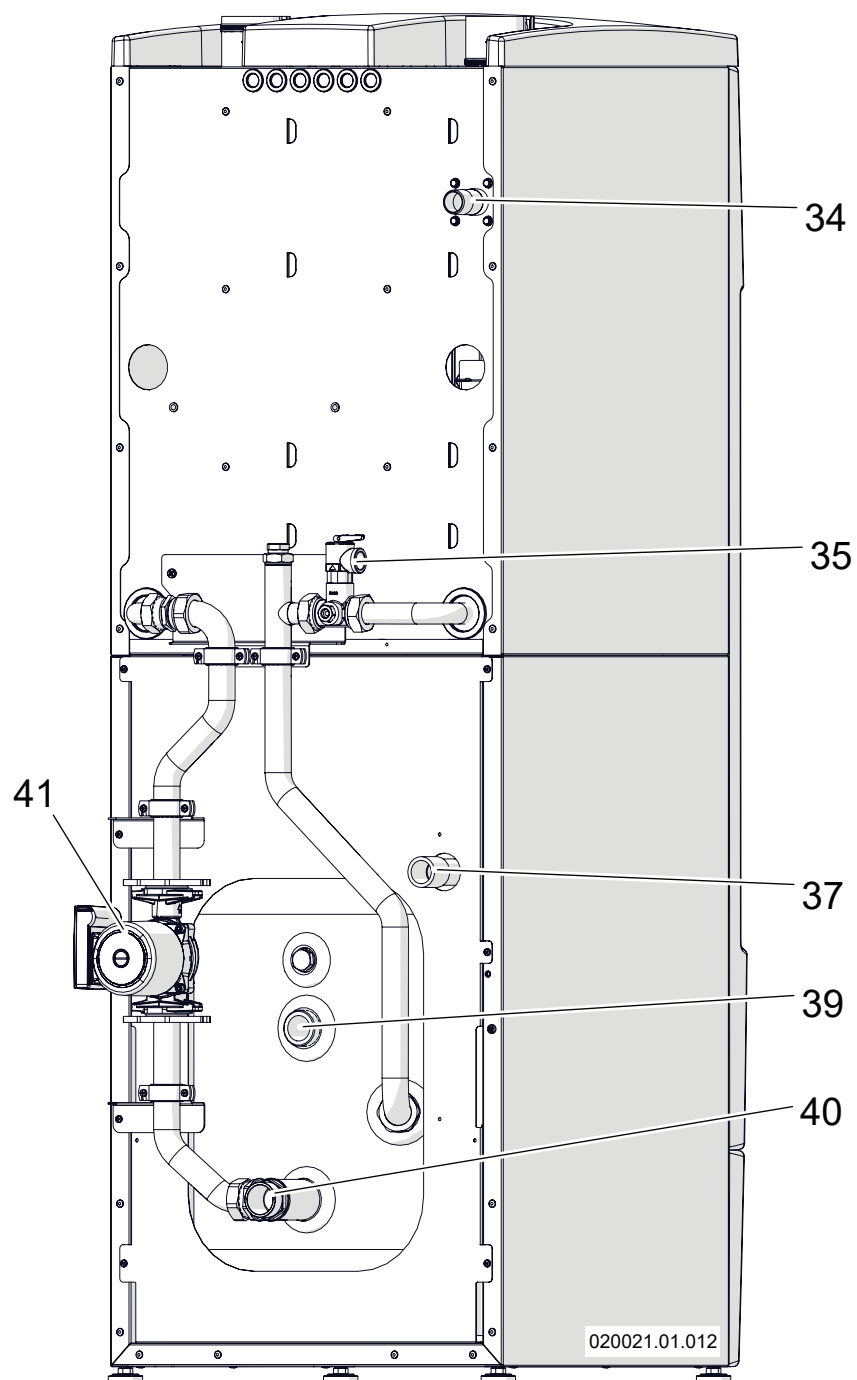


- 26 - Top cover
- 27 - Main electrical switch
- 28 - Fan covering
- 29 - Flue gas temperature sensor

- 30 - High limit flue gas temperature fuse
- 31 - Water inlet pipe
- 32 - Flue gas exhaust manifold
- 33 - Condensate blocked drain switch
- 43 - Heat exchanger temperature fuse

Figure 3-4 - Internal components of 70 model

3 - MAIN COMPONENTS

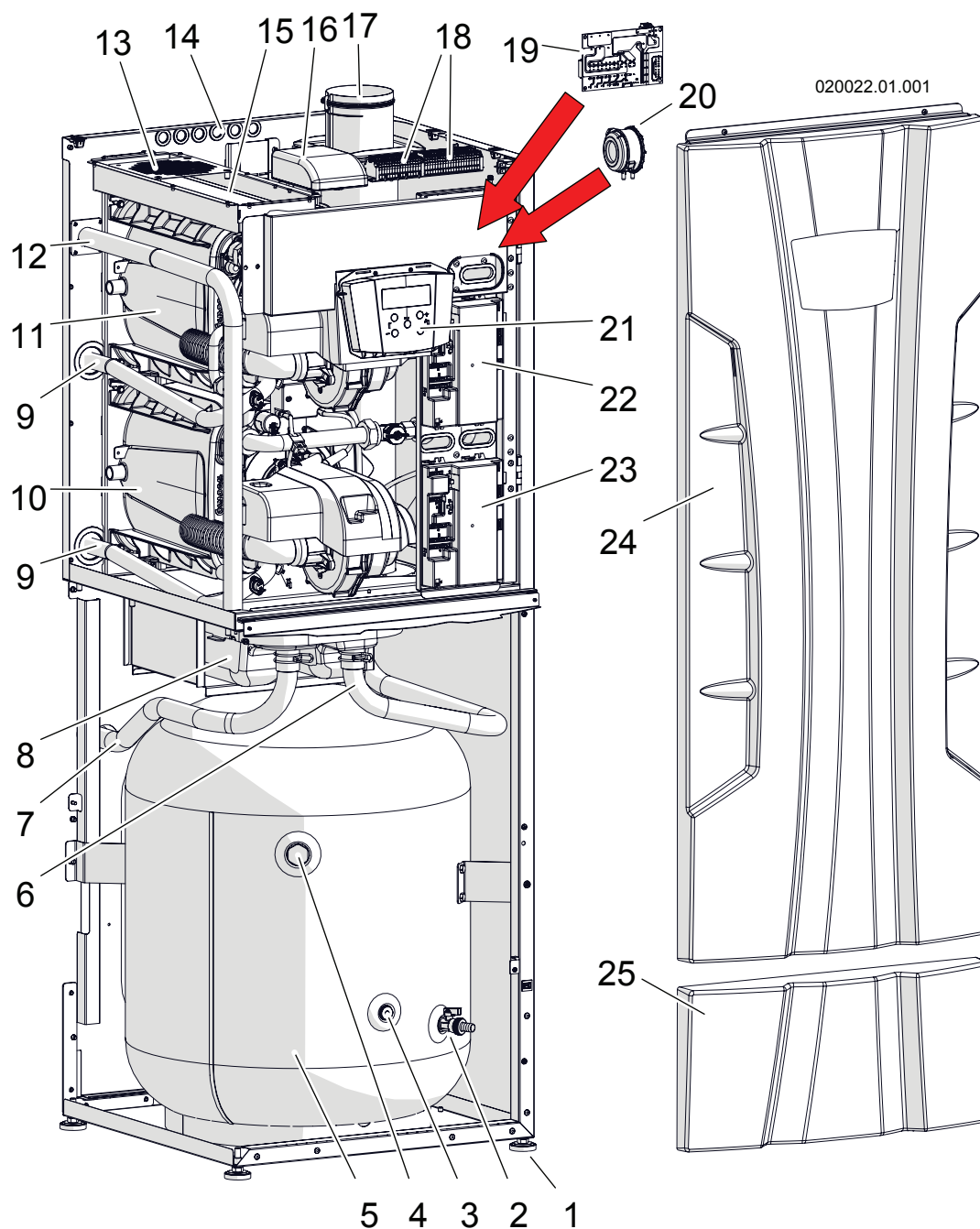


34 - Gas connection
35 - P/T Safety relief valve
36 - -----
37 - Condensate drain

38 - -----
39 - Hot water outlet
40 - Cold water inlet
41 - Pump

Figure 3-5 - Internal components of 70 model

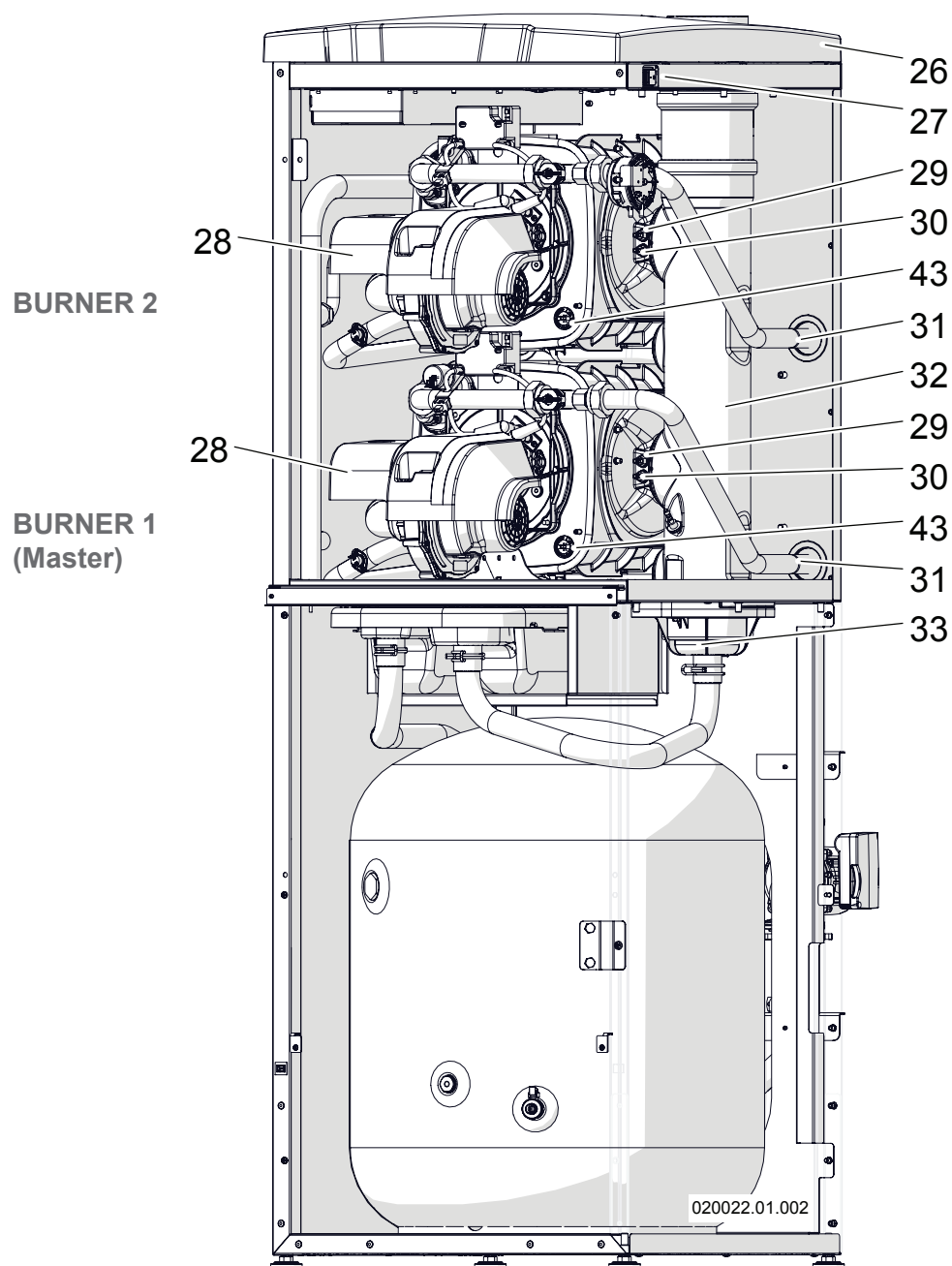
3 - MAIN COMPONENTS



- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------|
| 1 - Leveling feet | 13 - Air inlet connection |
| 2 - Drain valve | 14 - Electrical cable passages |
| 3 - Hot water tank temperature sensor | 15 - Air filter |
| 4 - Anode | 16 - 885 IF board (present only in some models) |
| 5 - 120 litre storage tank, 50.8 mm thick and "R"=0.0383 W/
mK thermal insulation | 17 - Flue exhaust connections |
| 6 - Flue exhaust condensate drain pipe | 18 - Electrical connections |
| 7 - Condensate drain pipe | 19 - Electrical board |
| 8 - Condensate neutralizer box | 20 - Blocked flue pressure switch |
| 9 - Hot water outlet pipe | 21 - Control panel |
| 10 - Burner "1" (Master) | 22 - Burner "2" control board |
| 11 - Burner "2" | 23 - Burner "1" control board (Master) |
| 12 - Gas inlet pipe | 24 - Front cover |
| | 25 - Bottom front cover |

Figure 3-6 - Internal components of 115 and 140 models

3 - MAIN COMPONENTS

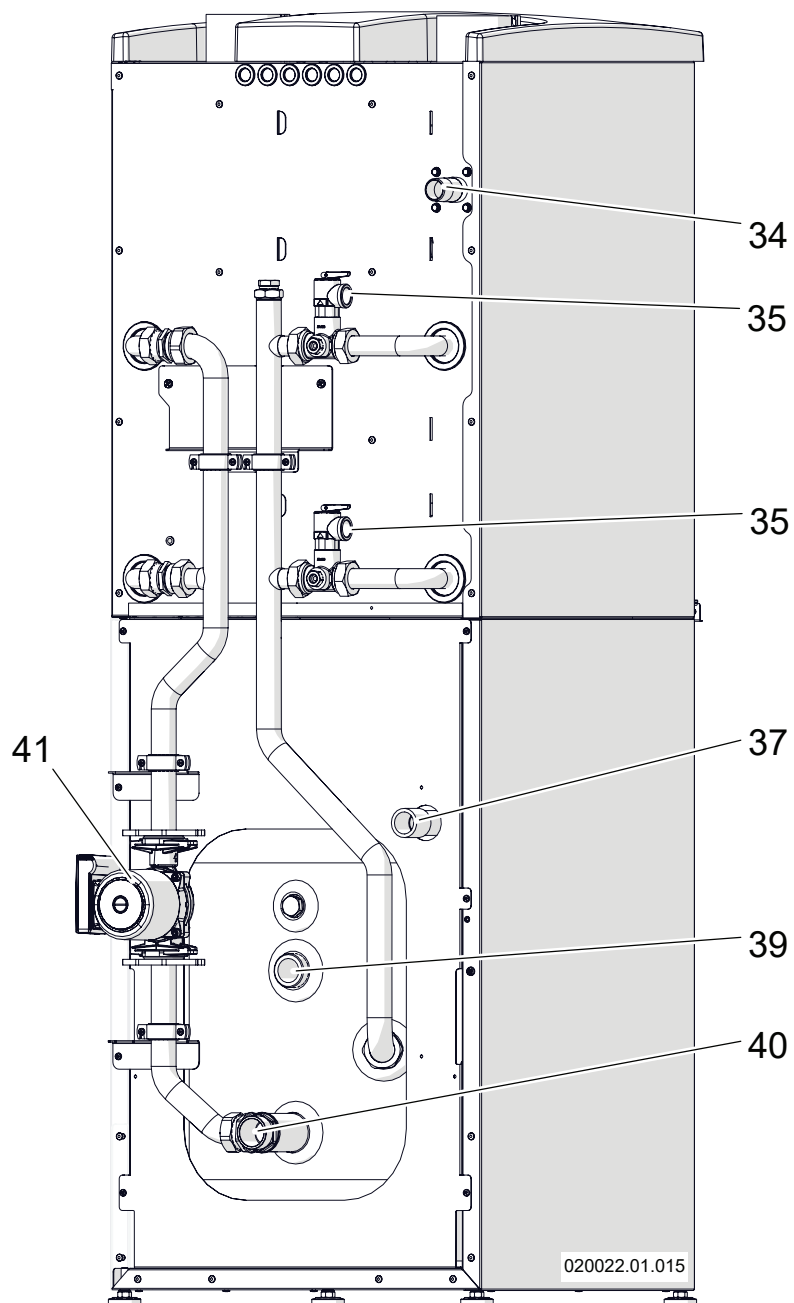


- 26 - Top cover
- 27 - Main electrical switch
- 28 - Fan covering
- 29 - Flue gas temperature sensor

- 30 - High limit flue gas temperature fuse
- 31 - Water inlet pipe
- 32 - Flue gas exhaust manifold
- 33 - Condensate blocked drain switch
- 43 - Heat exchanger temperature fuse

Figure 3-7 - Internal components of 115 and 140 models

3 - MAIN COMPONENTS



34 - Gas connection
35 - P/T Safety relief valve
36 - -----
37 - Condensate drain

38 - -----
39 - Hot water outlet
40 - Cold water inlet
41 - Pump

Figure 3-8 - Internal components of 115 and 140 models

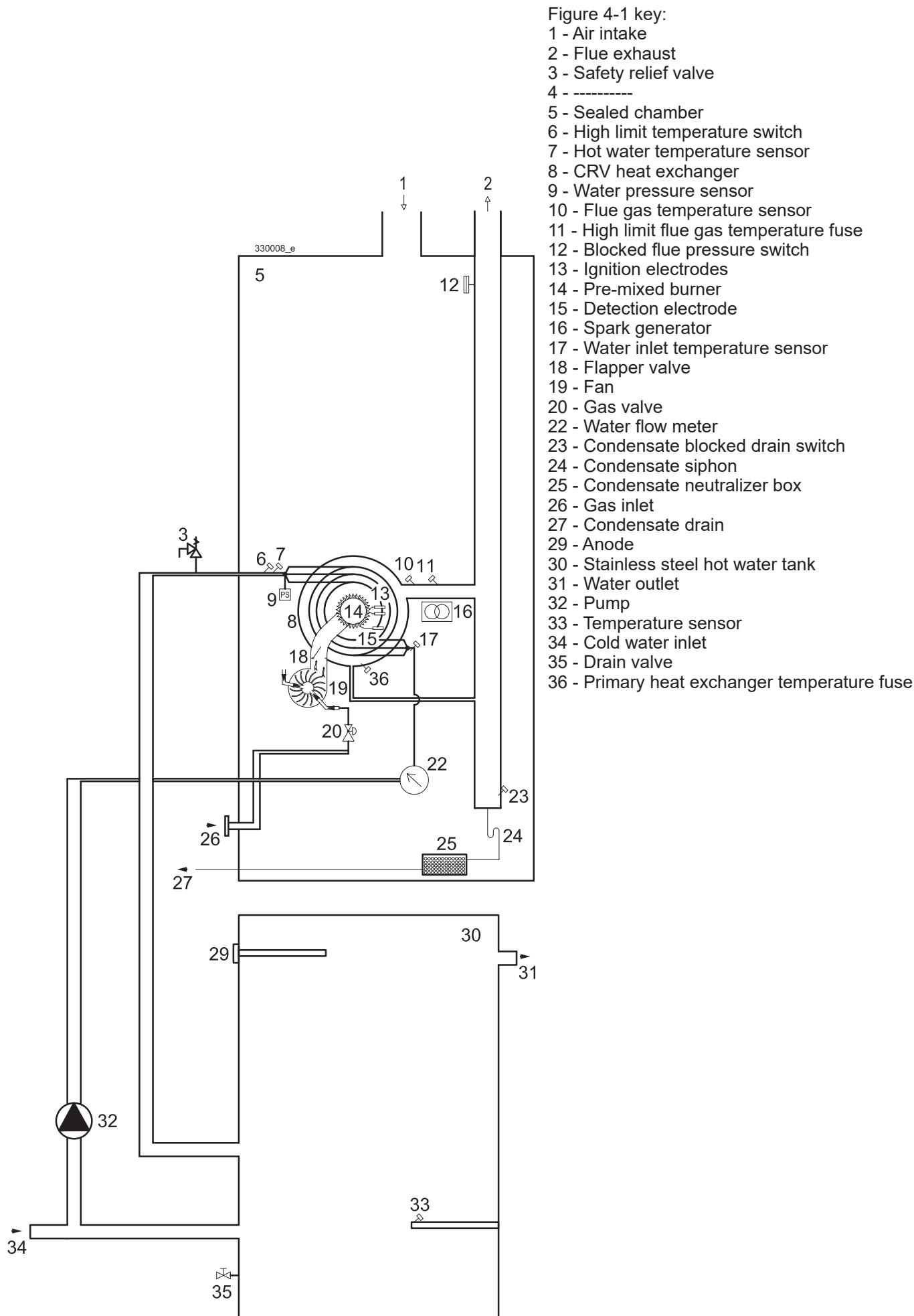


Figure 4-1 - Functional schematic for models 70

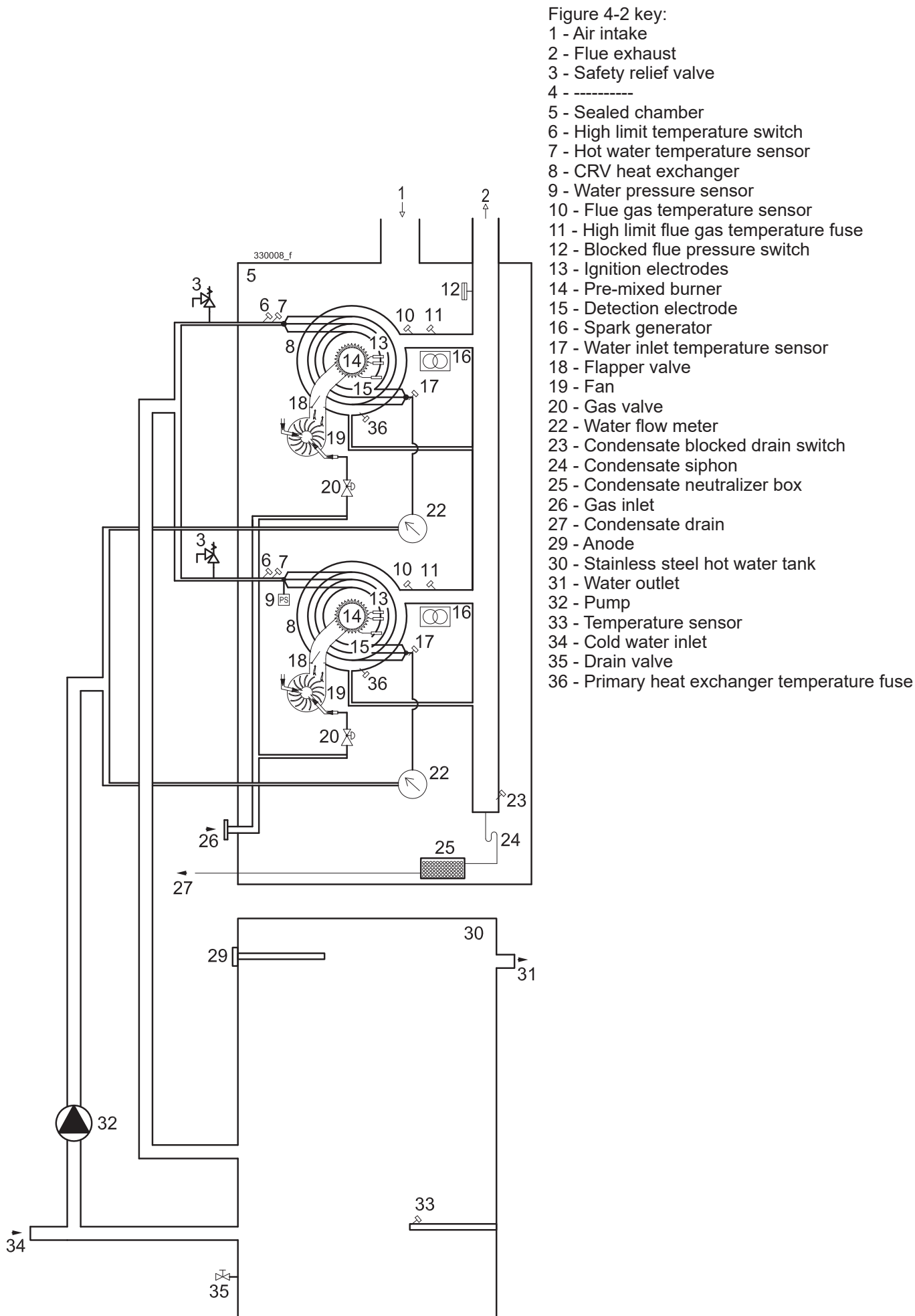


Figure 4-2 - Functional schematic for models 115 and 140

4 - OPERATION

4.1 - Operation and intended use

4.1.1 - Operation and intended use

The product is a gas fired condensing appliance designed to heat domestic hot water for civil uses (see Figure 8-2). Any other use is forbidden.

4.1.2 - Pump

The appliance is provided with a pump that transfers the heat generated by the burner to the hot water tank.

4.1.3 - Types of system

The following types of system can be created with this appliance:

- System solely for the production of domestic hot water (see Figure 8-2).

4.2 - Precautions for installation

For the appliance to work well, respect the follow indications:


- ☞ It must be connected to a domestic hot water distribution system, compatibly with the features, performance and output of the appliance itself.
- ☞ Check Figure 7-1 regarding minimum distances to be observed for installation and future maintenance.


4.3 - Anti-legionella

The appliance does not have protection against legionella. It is the installer's responsibility to keep the storage tank temperature higher than 60°C to disinfect it or adopt equivalent systems.

5 - INSTALLATION - Place of installation

5.1 - Choosing the installation location

 **WARNING !!!** Do not store any flammable material in the immediate vicinity of the appliance.

 **WARNING !!!** Do not install the appliance on a combustible surface.

 **WARNING !!!** The appliance must be installed in a room in which it can be supplied with air for ventilation and combustion, regardless whether it is taken from the outside (sealed combustion) or from inside (combustion ventilated room).

 **WARNING !!!** Inadequate ventilation of appliance can cause elevated air temperatures.

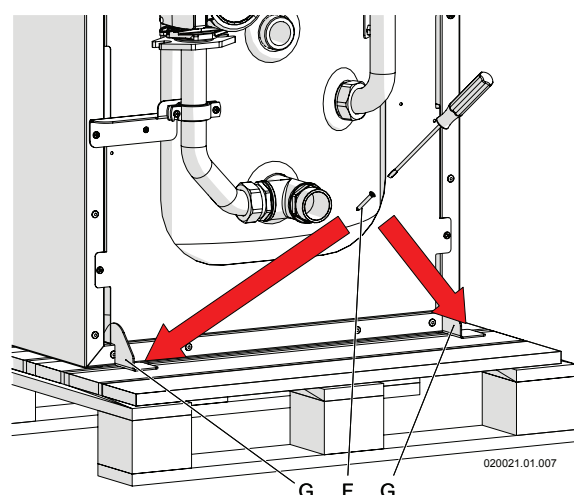
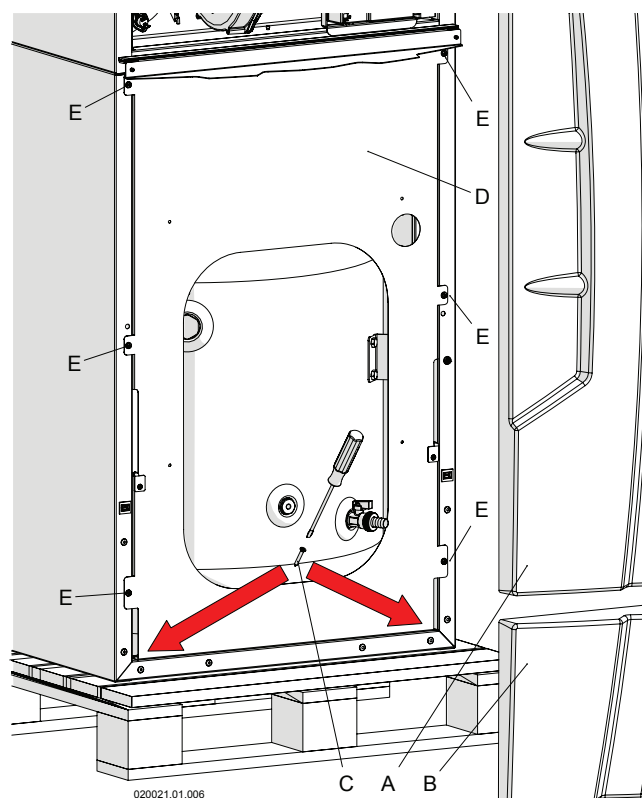







Figure 5-1 Undoing transport pallet screws


 **WARNING !!!** Make sure that the inlet and extract openings are appropriately sized and that there are no obstructions such as flyscreens or guazes. If the problem cannot be resolved, do not start the appliance. Please keep in mind these restrictions and the risks they may cause to the operator.


 **WARNING !!!** Liquefied Petroleum Gas (LPG) - The installation requires special attention: LPG boilers shall not be installed below ground level, e.g. in cellars or basements. This does not preclude the installation of such appliances into rooms which are low level with respect to one side of the building but open to ground level on the opposite side. In all cases, adequate low-level ventilation to the outside is essential. Failure to respect this precaution could cause explosions and serious harm to people, death or severe property damage.

 **WARNING!** This appliance will generate noise during operation. The installation location should be selected to ensure that any noise is not a nuisance to building occupants or appropriate noise damping measures should be used.

 **WARNING!** Do not allow too much dust to accumulate on the appliance.

 **WARNING !!!** The appliance must only be installed on a solid flooring that supports the weight and is level.

 **WARNING!** This appliance must be installed in a place where water leakages from the appliance itself, from the joints between the pipes or from any drainage from the safety valve, cannot cause damage to materials or items below it.

 **WARNING!** The room where this appliance is installed must have a water collection and discharge point for any leakage.

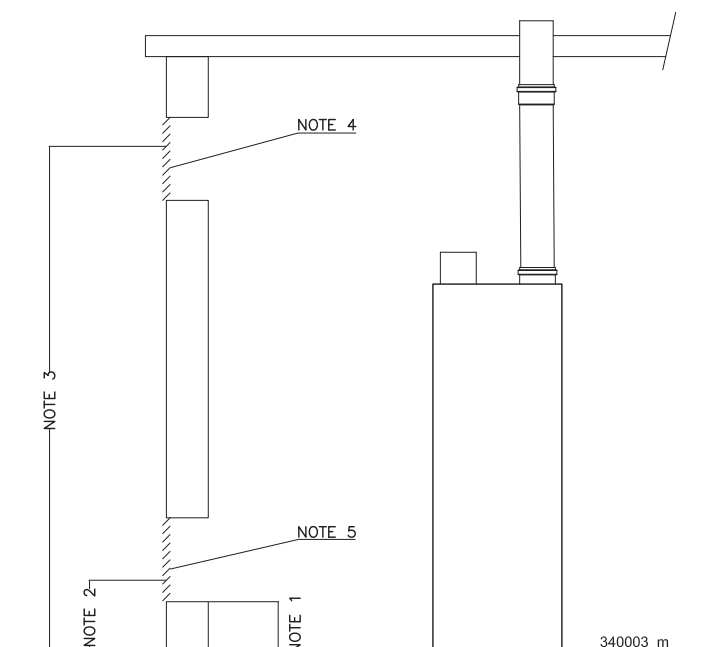
☞ Before installation, carefully wash out the system to remove any possible residues or impurities that might compromise operation of the appliance itself.

☞ This appliance is not designed for direct outdoor installation. It must not be exposed to temperatures below zero or above 50°C. Choose a location inside the home or, in any case, sheltered from elements like rain, wind, sun and, especially, frost.

Determine the room and the right position for installation, taking the following factors into account:

- connection to flue exhaust/air intake ducts;
- connection to gas pipe;
- water supply connection;
- domestic hot water system connection;
- electrical connection;
- connection to condensate drain;
- safety valve discharge connection;
- room ventilation.

5 - INSTALLATION - Place of installation



NOTE 1: For LPG installations, ventilation must be within 250 mm from floor level.

NOTE 2: At least 20% of low-level ventilation allowance to be below 1000 mm from floor level.

NOTE 3: At least 20% of high-level ventilation allowance to be above 85% of maximum room height.

NOTE 4: Operation <50% of time = $2\text{ cm}^2/\text{kW}$ (total net input);
Operation 50 - 75% of time = $3\text{ cm}^2/\text{kW}$ (total net input);
Operation >75% of time = $4\text{ cm}^2/\text{kW}$ (total net input).

NOTE 5: Operation <50% of time = $4\text{ cm}^2/\text{kW}$ (total net input);
Operation 50 - 75% of time = $5\text{ cm}^2/\text{kW}$ (total net input);
Operation >75% of time = $6\text{ cm}^2/\text{kW}$ (total net input).

Figure 5-2 Example of ventilation

5.1.1 - Requirements for correct ventilation

The plant room **MUST** have a properly sized ventilation openings. To ensure proper ventilation for combustion, high and low level ventilation shall be installed. Where the appliance is installed in an open-flue (B23) configuration, ventilation shall be directly to outside and the free area of openings shall be as detailed in figure 5-2.

Room sealed appliances (type C) should be provided with ventilation with free area as detailed in figure 5-2.

Low level ventilation shall be provided as low as practicable and be within 1 m of the plant room floor for natural gas installations and within 250 mm of the floor for LPG installations.

Further guidance on ventilation provision including the use of mechanical ventilation systems can be found within IGEN/UP/10 Edition 4.



WARNING! There must never be negative pressure in the heating unit. For this reason you must take into account the presence of any outlet fans, ceiling fans, dryers, compressors, air heating units, etc. that might take air away from the boiler.



WARNING! Extractors or similar devices for the removal of air from the heating unit might reduce the ventilation required for combustion and/or cause low pressure in the ventilation system. Escapes of exhaust gases from the ventilation system in an occupied habitable room can cause a very dangerous situation which must be corrected immediately.

5.1.2 - Prevent combustion air contamination

Do not terminate vent/air in locations that can allow contamination of combustion air.



WARNING !!! Contaminated combustion air will damage the appliance.

Ensure the combustion air will not contain any of the following contaminants.

Product that may contaminate the air combustion:

- Chlorinated waxes/cleaners;
- Chlorine-based swimming pool chemical;
- Calcium chloride used for thawing;
- Sodium chloride used for water softening;
- Refrigerant leaks;
- Paint or varnish removers;
- Hydrochloric acid/muratic acid;
- Cements and glues;
- Antistatic fabric softeners used in clothes dryers;
- Chlorine-type bleaches, detergents and cleaning solvents found in household laundry rooms;
- Adhesives used to fasten building products and other similar products;

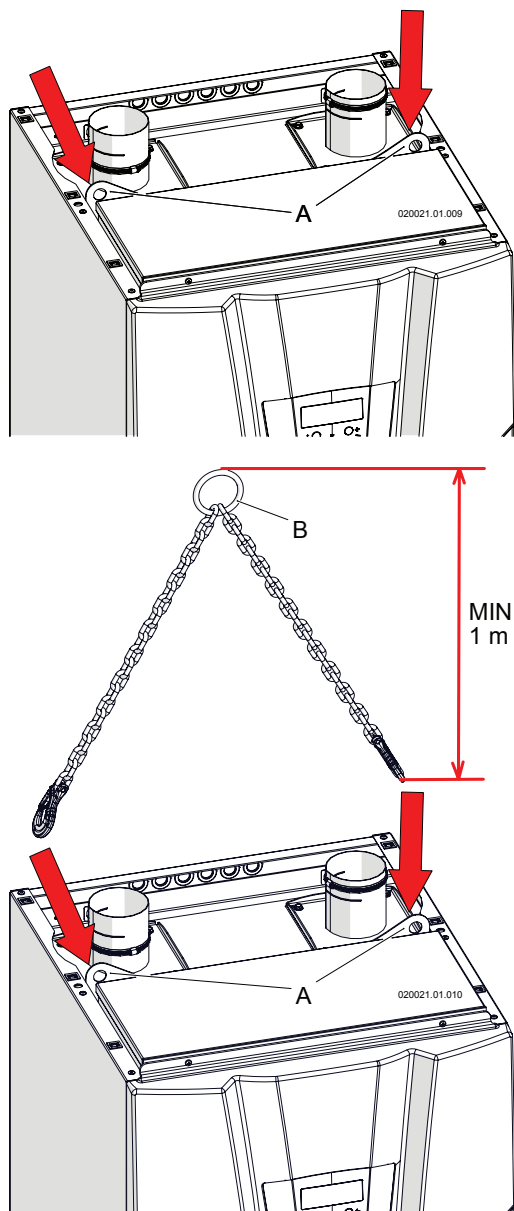


Figure 6-1 - Lifting system

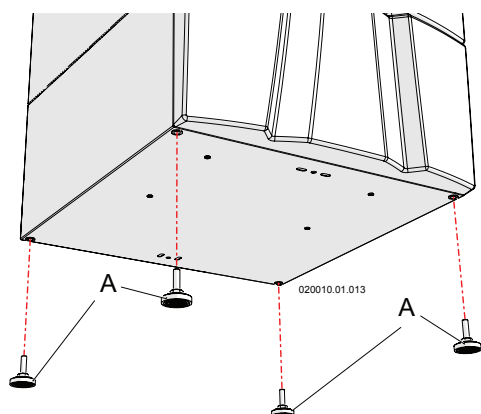


Figure 6-2 - Install leveling feet

6.1 - Setup

To install the appliance correctly and easily, the following steps must be scrupulously followed.

6.1.1 - Moving the appliance



WARNING !!! Always lift and carry the appliance with a lift truck or special equipment. Failure to comply with this provisions could result in sever personal injury, death or substantial property damage.

Position the appliance in the area selected for installation, moving it using the pallet it is fixed to, taking care to keep it vertical without making any sharp movements that might cause it to overturn.

Proceed as follows to remove the appliance from the pallet (see Figure 5-1):

- 1.- Remove front cover "A" and bottom front cover "B" (see section 15.2);
- 2.- Remove panel "D" by loosening screws "E" to access screws "C";
- 3.- Unscrew the front clamping screws (part "C") and rear clamping screws (detail "F");
- 4.- Remove the rear fixing brackets (G);
- 5.- Reassemble front cover "A" and "B".

6.1.2 - Opening the package

The appliance is supplied in cardboard package, fixed to the pallet for transportation. Be careful when opening it, take the cardboard box off by lifting it upwards, after detached it from the pallet.

6.1.3 - Lifting the appliance

There is a bracket (detail "A" in Figure 6-1) to facilitate installation that allows the appliance to be lifted.

☞ Remove the top cover as per section 15.2.

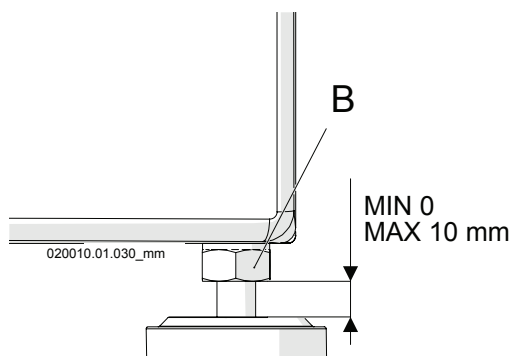
☞ Hook lifting cables "B" to the bracket "A" in Figure 6-1, and lift the appliance.



WARNING !!! The cables and lifting system must be suitable for the purpose envisaged. In particular, they must be able to bear the weight of the appliance (section 19).

☞ Install the leveling feet "A" to level the appliance as shown in Figure 6-2.

Once the appliance has been positioned properly, the lifting cables (detail "B" in Figure 6-1) must be removed before applying the top cover.



B = Locking nut

7 - INSTALLATION - Dimensions and minimum distances to respect

7.1 - Dimensions and minimum distances to respect

For both installation and maintenance, it is recommended to leave free spaces around the appliance, as shown in Figure 7-1. The dimensions and connection centre space distances for the appliances are shown in Figure 7-2.

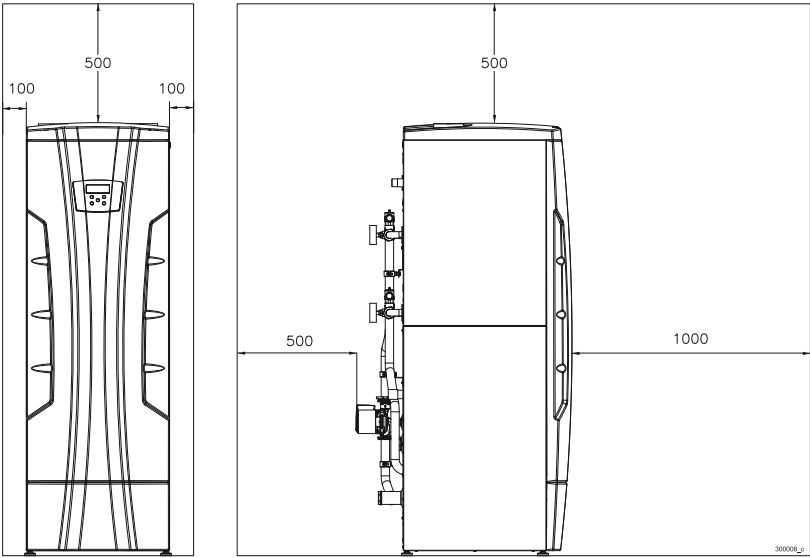
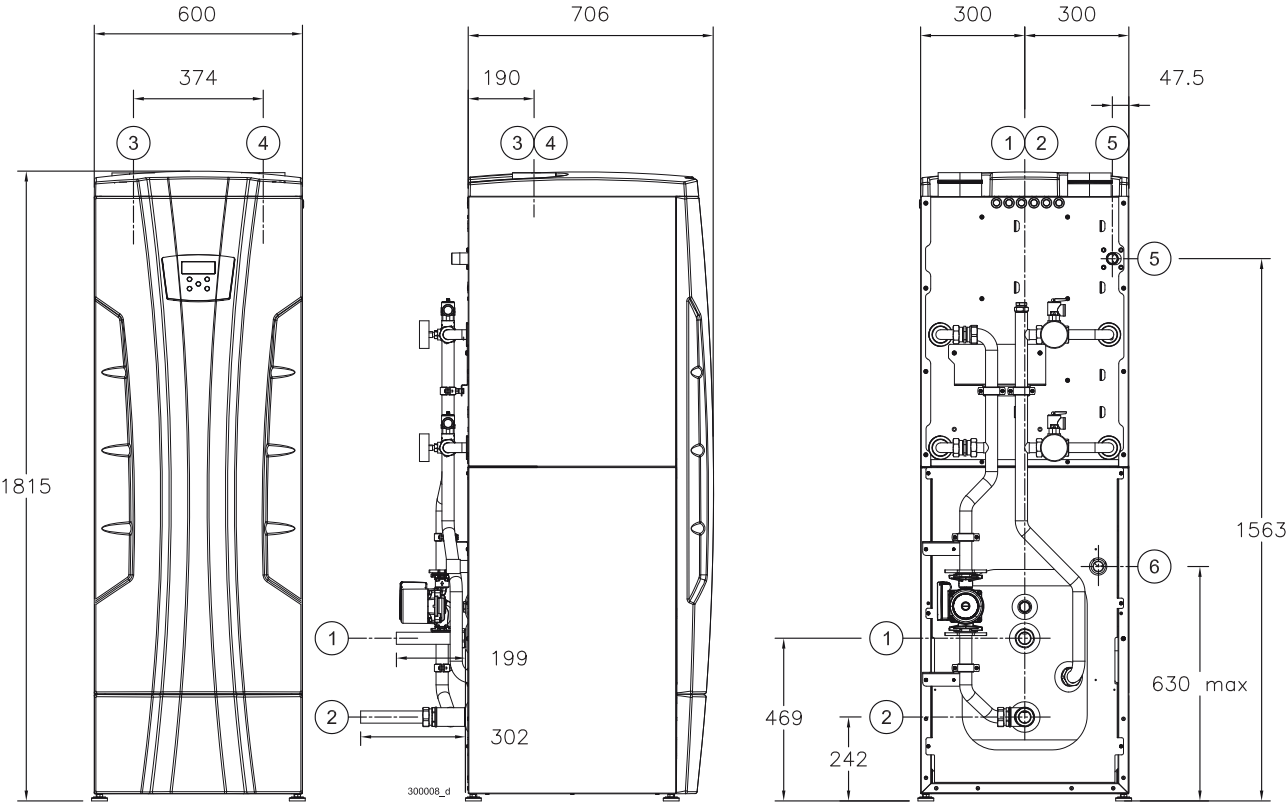


Figure 7-1 - Recommended minimum clearance distances for proper installation and servicing



MODEL	① SUPPLY	② RETURN	③ AIR INTAKE	④ FLUE EXHAUST	⑤ GAS	⑥ CONDENSATE DRAIN
70	1"1/2	1"1/2	136 mm *	110 mm	1"	28mm
115	1"1/2	1"1/2	136 mm *	110 mm	1"	28mm
140	1"1/2	1"1/2	136 mm *	110 mm	1"	28mm

* Air intake in the environment, do not obstruct or add any fittings;

Figure 7-2 - Dimensions and diameters connections

Alternative size and max duct length

	UM	60T-70T	100T-115-140T
Alternative size flue exhaust duct diameter (split)	mm	110	160
Alternative size max. flue exhaust duct length (split)	m	19.1	21.5
Alternative size equivalent length of one curve	m	2.8	2.8

8 - INSTALLATION - Plumbing

8.1 - Water connections



WARNING !!! If the water hardness is higher than 20°f (200 ppm), a softener shall have to be installed on the cold water inlet.



WARNING !!! If the appliance works at a temperature higher than 60°C, the water hardness must be lower than 15°f (150 ppm).



WARNING !!! The water must not be softened at values lower than 5°f (50 ppm). At these values it becomes acid and can corrode parts of the appliance, thus reducing its life.



WARNING !!! The water acidity must have a pH value between 6.5 and 8.5. A value outside this range is corrosive, and it can damage the heat exchanger and/or the piping.



WARNING !!! Install a filter with mesh no larger than 0.5 mm² in the domestic cold water inlet.



WARNING !!! The domestic hot water circuits must be made with materials that are resistant to a temperature of at least 95°C and a pressure of 10 bar. Otherwise (i.e. plastic piping), the system must be equipped with appropriate protection and safety devices.

You can check the position of the domestic hot water and cold water connections in Figure 7-2.
Provide a shut-off valve upstream of the cold water inlet, which is useful for maintenance work.

8.2 - Gas



WARNING !!! Never use a gas different than that stated on the appliance rating plate.



WARNING !!! Check that the type and the pressure of the gas supplied correspond with those required for the appliance as stated on the rating plate. There can be two situations:

- ☞ If the gas and the supply pressure correspond with the appliance setting,;
- B - the gas and the supply pressure do not correspond with the appliance setting. In this case you need to convert the appliance for the type of gas and supply pressure corresponding to the supply ones available.

The appliance is equipped with the specific gas conversion kit.

- ☞ Before installation, it is advisable to thoroughly clean the inside of the gas adduction pipe.

- ☞ It is mandatory to always install a gas shut-off valve near the appliance on the gas adduction pipe.



WARNING !!! Before supplying gas to the appliance, do a leak test on the gas system, as required by the technical regulations in force.

- ☞ To prevent damaging the appliance gas control unit, run a seal test at a pressure no greater than 50 mbar.
- ☞ If the gas system test must be run at pressures exceeding 50 mbar, use the valve located immediately upstream of the appliance to cut it off from the rest of the system.

In Figure 7-2 you can check the appliance gas fitting positioning. The sections of piping that make up the gas adduction system must always ensure sufficient gas supply to cover the maximum required.

8.3 - Temperature and pressure Relief valve

This appliance is supplied with a Safety Temperature and Pressure Relief valve which discharge connection must be piped to prevent scalding in the event of a discharge. Discharge pipework from the safety valve should be installed in accordance with building regulations and should contain a tundish within 600 mm of the outlet of the safety valve.



WARNING !!! Failure to properly pipe the relief valve discharge can result in scalding of individuals and animals.

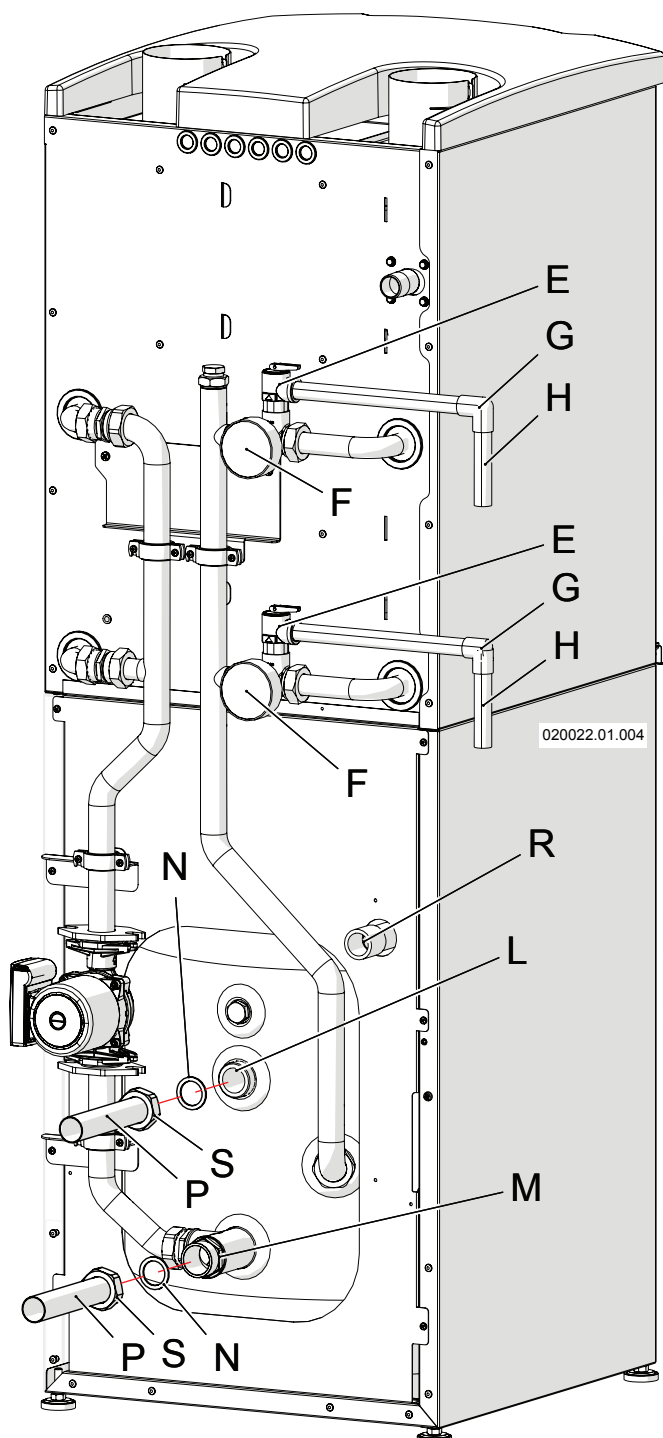


WARNING !!! Never block the outlet of the safety relief valve or an explosion causing extensive property damage, severe personal injury or death!



WARNING !!! Never install any type of valve between the appliance and the relief valve or an explosion causing extensive property damage, severe personal injury or death may occur!

☞ If the relief valve discharges periodically, this may be due to thermal expansion. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the relief valve.



Key of Figure 8-1

- E = Safety Temperature and Pressure relief valve
- F = Not present in this product
- G = Elbow (Field supplied)
- H = Relief valve discharge piping (Field supplied)
- L = Hot water outlet
- M = Water inlet
- N = Gasket (Factory supplied)
- P = Pipe (Factory supplied)
- R = Condensate drain
- S = Nut (Factory supplied)

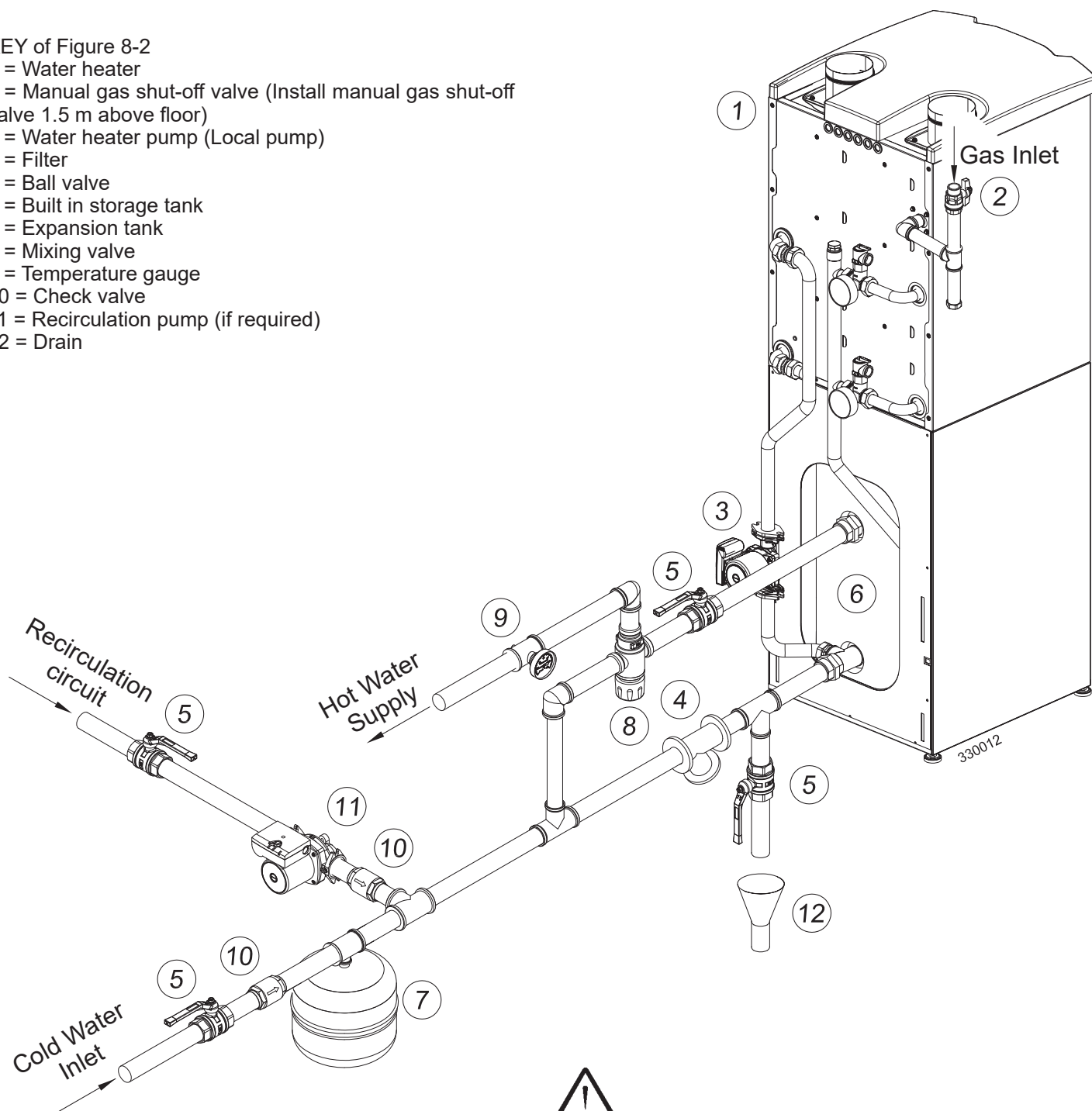
Figure 8-1 Piping of the P-T relief valve discharge and water connections

8 - INSTALLATION - Plumbing

8.4 - Installation example

KEY of Figure 8-2

- 1 = Water heater
- 2 = Manual gas shut-off valve (Install manual gas shut-off valve 1.5 m above floor)
- 3 = Water heater pump (Local pump)
- 4 = Filter
- 5 = Ball valve
- 6 = Built in storage tank
- 7 = Expansion tank
- 8 = Mixing valve
- 9 = Temperature gauge
- 10 = Check valve
- 11 = Recirculation pump (if required)
- 12 = Drain



WARNING !!! This example is only for illustration purposes. It is up to the designer to determine the components needed, including any additional equipment and all safety devices which, if decided, will be suitably sized; as provided by national and local installation regulations.

Figure 8-2 - Example of piping diagram

8.5 - Expansion tank

Provide a heat expansion control system like an expansion tank. Make sure that the expansion tank is properly sized considering the volume of water contained in the appliance and in the system (see section 16, "Water contained in the main exchanger"), also considering the working temperature and pressure.



WARNING !!! The appliance does not have an expansion tank. Provide the system with an appropriately sized expansion tank for domestic circuits as required by the national and local installation standards. An undersized expansion tank can cause the safety valve to trip.

The expansion tank must be installed as shown in Figure 8-2 or according to recognised design methods. Refer to the instructions of the expansion tank manufacturer for further installation details.

8.6 - System sizing

Size the piping and every device necessary to the system following a recognised design method.

To size the water flow needed consider the appliance pressure drops as reported in Figure 8-3.

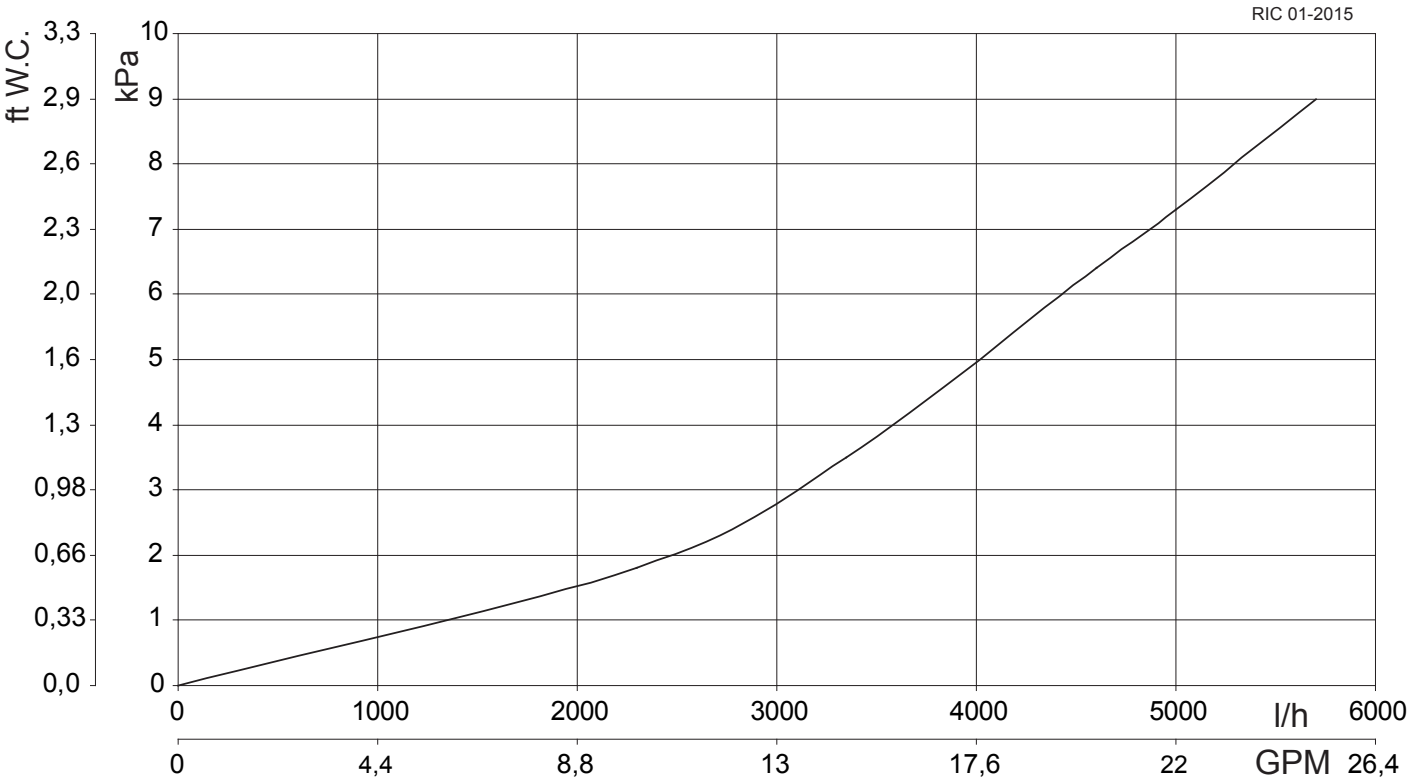


Figure 8 - 3 - Water side head loss

9 - INSTALLATION - Condensate disposal

9.1 - Condensate drain

Inside the appliance there is a siphon and condensate neutralizer to evacuate condensates (see Figures 3-3 and 3-6, details “6” and “8”) and to prevent the combustion products from escaping, the outlet of which meet duct “7”, in Figures 3-3 and 3-6. This outlet must be funnelled into another anti-odour siphon (responsibility of the installer) in order to prevent bad smells from coming back into the room.

In particular, the condensate disposal system must:

- ☞ Be done through a pipe with an internal diameter greater than or equal to 13 mm;
- ☞ Be installed in such a way as to avoid the liquid freezing, so pay attention to any external sections; draining into gutters or drainpipes is prohibited.
- ☞ Be at a constant slope towards the discharge point; avoid high points which could put the duct under pressure.

Figure 9-2 shows how a condensate disposal system must be made downstream of the appliance.

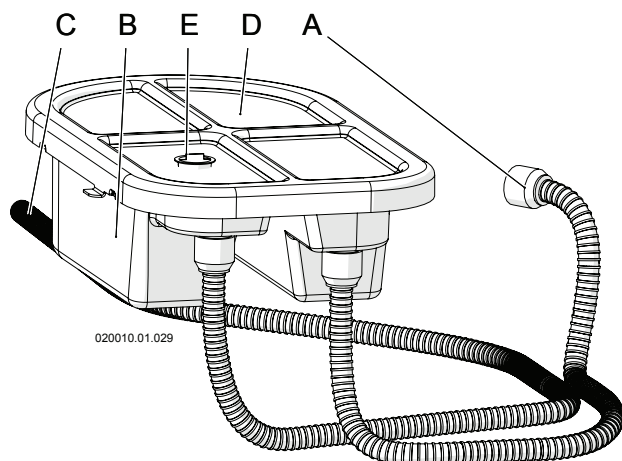


Figure 9-1 - Condensate neutralizer box

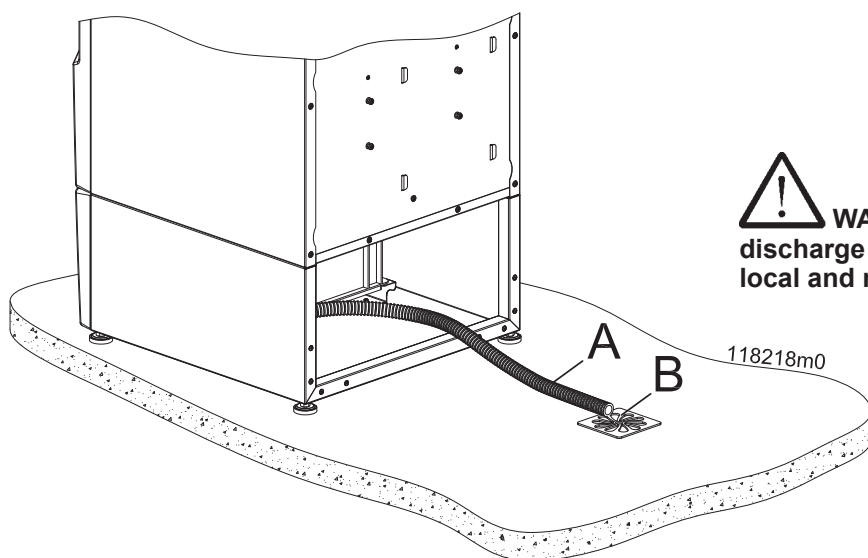


Figure 9-2 - Condensate drain

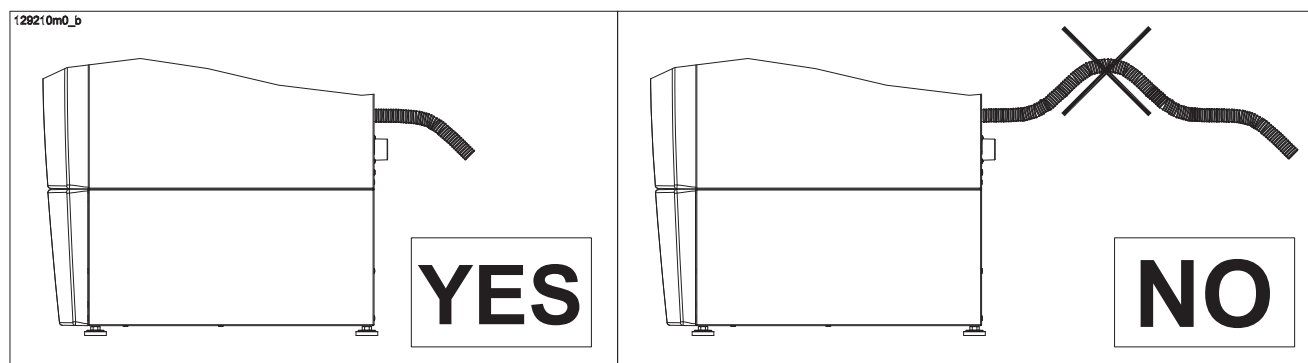


Figure 9-3 - Correct installation of condensate outlet pipe

10 - INSTALLATION - Electrical connections

10.1 - Electrical connections



WARNING !!! Disconnect power before carrying out any operations inside the appliance.



WARNING !!! During maintenance, label all the wires involved in the operation before disconnecting.



WARNING !!! The appliance is only electrically safe when it is properly connected to a suitable earthing system installed in accordance with the relevant standards and regulations in force.

This fundamental safety requirement must be checked. In the event of any doubt, ask for a full check of the electrical system to be done by a qualified installer.

- ☞ Have a professionally qualified electrician make sure that the electrical system is appropriate to the electrical power required by the appliance, shown on the plate.
- ☞ The appliance must be connected to the electrical mains through a fixed connection or through an unswitched plug connection. The use of adapters, power strips, extension cords, etc. is not allowed.
- ☞ The appliance must be connected to the electrical mains with a double insulated three-core cable or equivalent with appropriate cross-section.

☞ For the connection to the mains power supply 2-pole switch must be provided in the vicinity of the appliance. This switch must have a contact opening distance of at least 3 mm, as expected by applicable standards in force.

☞ Ensure that the polarity between live and neutral wires is maintained when connecting the appliance.

☞ Make sure that the water, central heating and gas system pipes are not used as ground for the electrical or telephone system. These pipes are not at all suitable for this purpose; furthermore in a short time serious damage in terms of corrosion could be noticed in the appliance and pipework.

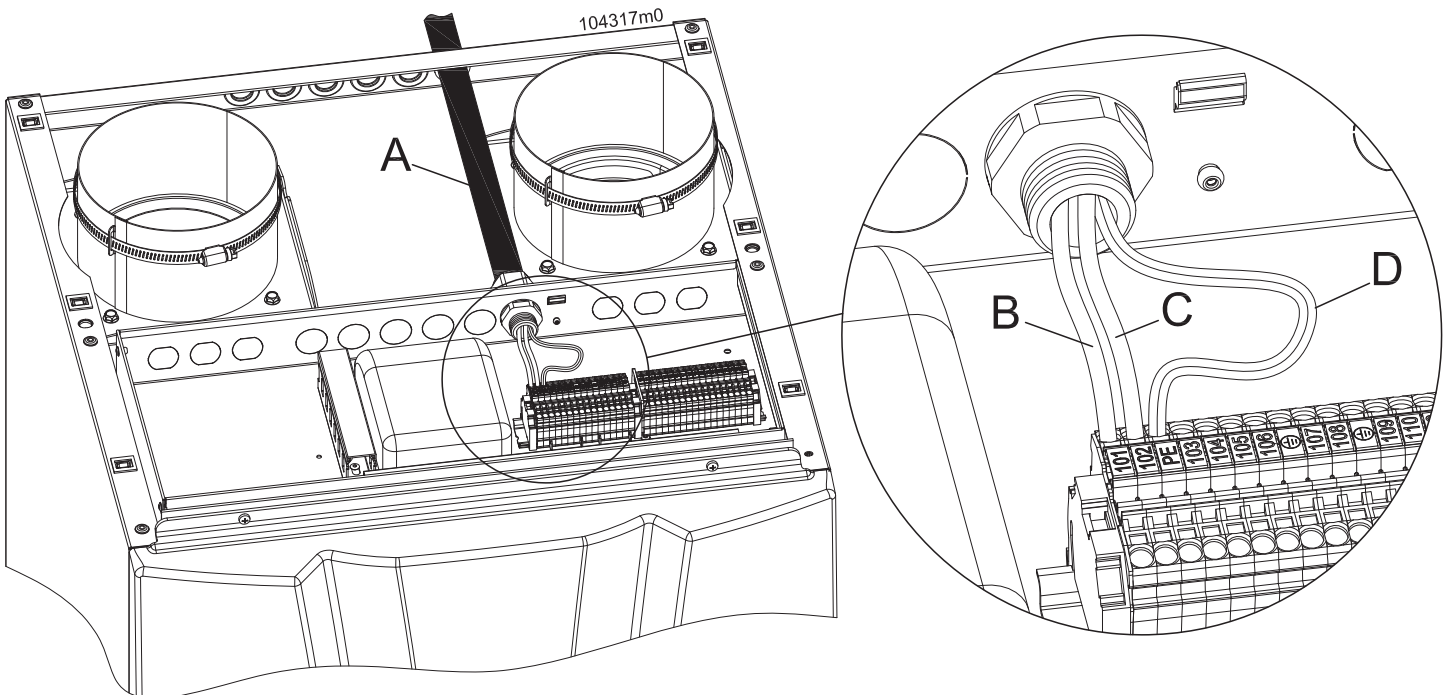


WARNING !!! The appliance has no protections against the effects of lightning strikes.

10.1.1 - Connecting power supply cable

To connect the electrical power supply cable, proceed as follows (refer to Figure 10-1):

- 1.- Use a triple-pole dual insulation cable;
- 2.- Access the electrical connections terminals following the specific instructions in section 15.2;
- 3.- Lay the power supply cable through the cable gland next to contacts "101", "102" and "PE";
- 6.- Remove the sheathing from the cable, taking care to keep the earth wire (yellow/green) 20 mm longer than the other two;
- 7.- Connect the green-yellow cable to the ground terminal ("PE");
- 8.- Connect the brown cable (Phase) to terminal "101";
- 9.- Connect the blue cable (Neutral) to terminal "102";



A = Cable conduit
B = Line (hot) cable
C = Neutral cable
D = Ground cable

Figure 10-1 - Electrical connections box

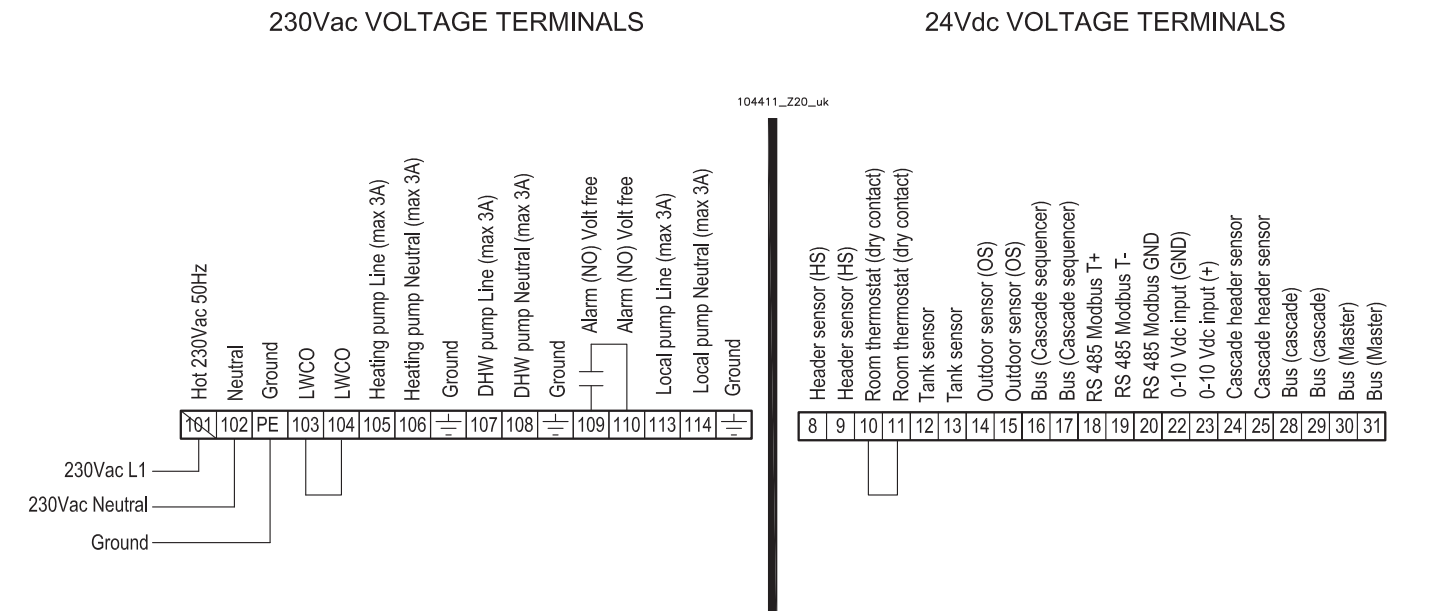


Figure 10-2 - Electrical connections

WARNING !!! For this appliance the following connections, in Figure 10-2, “ARE UNUSABLE”:

- Terminal “12” - Hot water tank P
- Terminal “13” - Hot water tank P
- Terminal “14” - External P
- Terminal “15” - External P (EP)
- Terminal “24” - Cascade temperature P
- Terminal “25” - Cascade temperature P
- Terminal “28” - Bus (cascade)

- Terminal “29” - Bus (cascade)
- Terminal “30” - Bus (Master)
- Terminal “31” - Bus (Master)
- Terminal “105” - Heat circ pump line
- Terminal “106” - Heat circ pump neutral
- “Earth” Terminal (between “106” and “107”)
- Terminal “107” - Dom circ pump line
- Terminal “108” - Dom circ pump neutral
- “Earth” Terminal (between “108” and “109”)

10.2 - Connecting the appliance in cascade

Appliances can be installed in cascade with a configuration like in Figure 10-3.

The appliances work independently without requiring additional electrical connections.

Many other configurations can be done: ask to the appliance manufacturer for conceptual drawings.

For water, gas, flue exhaust and air intake connections, ask for conceptual drawings to the manufacturer.

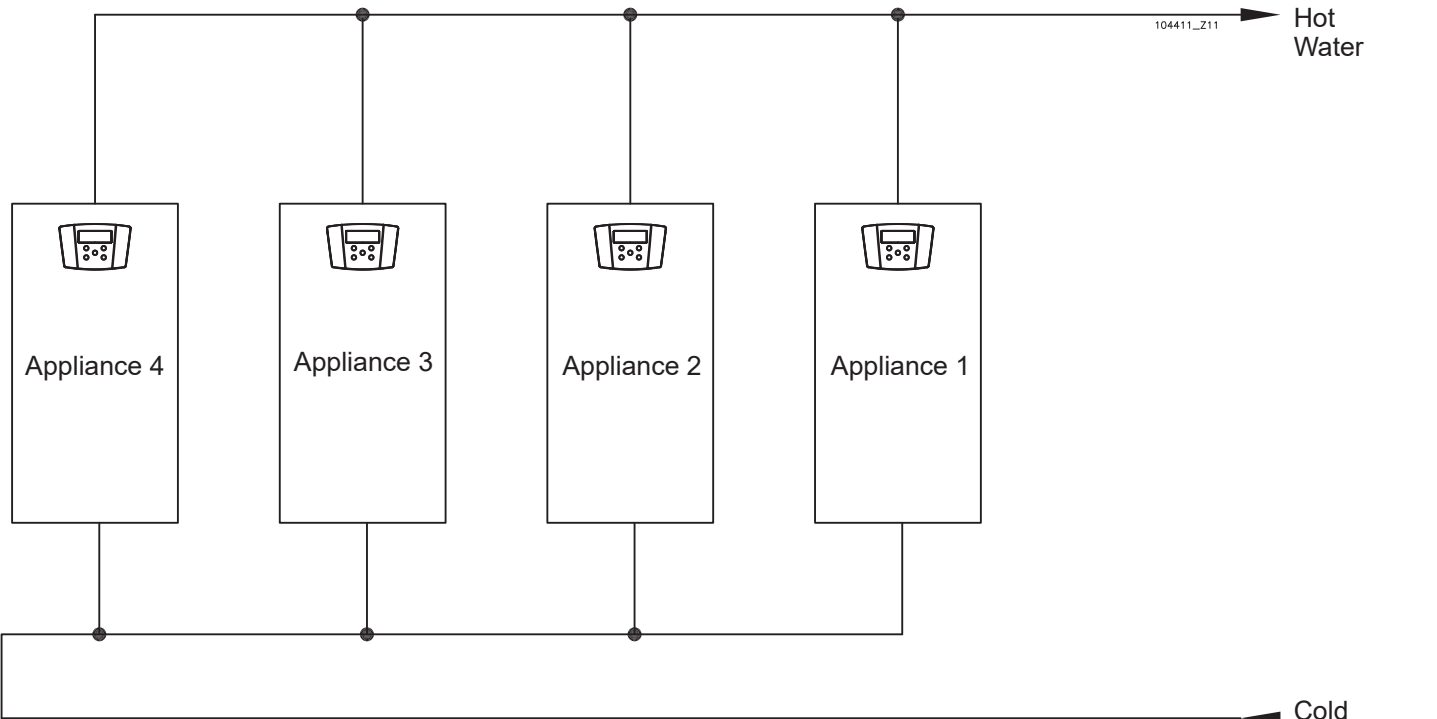


Figure 10-3 Cascade connection conceptual diagram

11 - INSTALLATION - Air intake and flue exhaust ducts

11.1 - Flue exhaust and combustion air intake duct



WARNING !!! This appliance must be connected to a flue system that evacuates the products of combustion to the open air outside of the building.



WARNING !!! The flue system must be terminated in accordance with the national and local regulations and standards in force.



WARNING !!! This appliance has flue gas temperatures that can reach 90°C under certain conditions. Therefore, use flue exhaust ducts in plastic that can resist said temperature.



WARNING !!! This appliance is “condensing”. To realise a flue exhaust, use materials in AISI 316L stainless steel or polypropylene plastic materials to prevent corrosion due to condensate acidity.

It is recommended that exhaust and intake ducts supplied by the manufacturer of the appliance itself. Other types of ducts, if used, must be approved for such intended use. The types of exhaust for which the appliance is approved are shown on the technical features table at the end of the manual, under the “type” heading and on the plate affixed to the boiler, again under the “type” heading.

The symbols used to define the type of exhaust are shown below:

- B23 and B23P, room intake and wall or ceiling mounted flue exhaust.



WARNING !!! If you install an appliance with a B23 ou B23P type exhaust, it will extract air for combustion from the room in which it is located. Therefore, all the precautions regarding room ventilation required by national and/or local standards must be taken.

During operation, especially in the winter, it is possible for white smoke to come out of the appliance flue exhaust due to high output. This is solely a natural phenomenon and no cause for worry as it is the water vapour in the flue gases that condense in contact with the external air.

11.1.1 - B23 and B23P air intake/flue discharge type

In the event of B23 type combustion air intake/flue exhaust, it is essential that sufficient allowances for combustion air are made. The combustion air shall be taken from outside either through natural or mechanical means.

The location of the air intake should be away from sources of pollution such as industrial air extraction systems, swimming pool ventilation systems and cleaning chemicals such as laundry discharges. Further details on ventilation requirements and allowances can be found in sections 5.1.1 and 5.1.2.

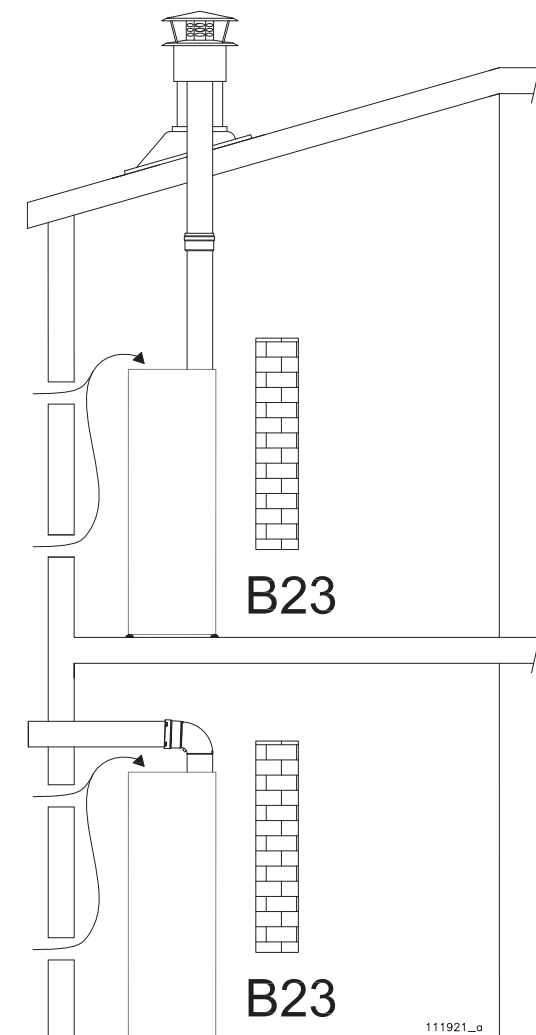


Figure 11-1 - Exhaust/intake systems

11 - INSTALLATION - Air intake and flue exhaust ducts

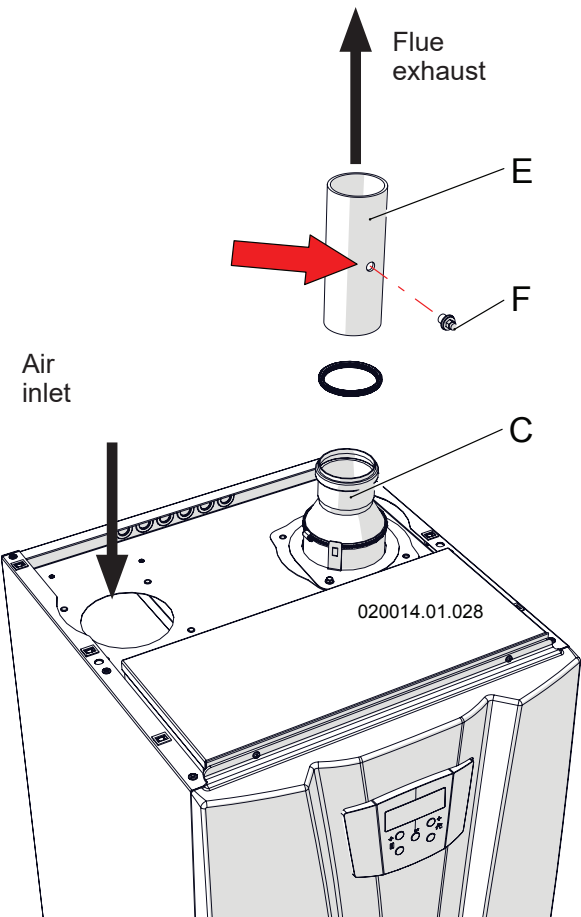


Figure 11-2 - Split system installation

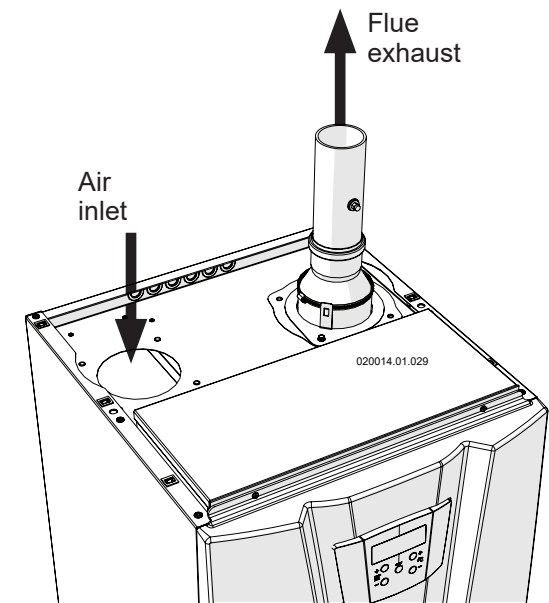


Figure 11-3 - Assembled system

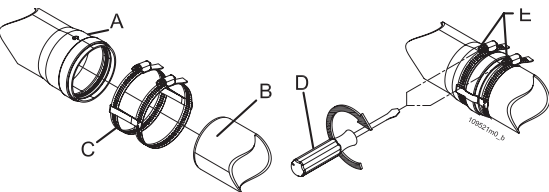


Figure 11-4 - Securing exhaust ducts

11.1.2 - Flue exhaust

- The appliance is standard supplied with fittings to connect to the flue exhaust. To install, proceed as shown in figure 11-2.
- 1.- put duct "E" into reducer "C", being sure that the gasket in reducer "C" is positioned correctly;
- It is mandatory to install polypropylene ducts that are more resistant to condensate formation on the "B" flue exhaust side.
 - Take particular care in installing the ducts in the parts that cross the wall towards the outside; it must always be possible to do normal maintenance operations. Therefore, install the pipes in a sheath in order to be able to slide them out.
 - The horizontal sections must always have a slope of at least 2% towards the condensate drain devices.
 - The appliance is already equipped with a condensate collector, which must be joined to an exhaust pipe (see section 9).

WARNING !!! This condensate drain is designed to make all the liquid produced by an individual appliance flow out. Should several appliances be installed, provide each with its own condensate drain.

The flue exhaust system can be extended up to a maximum distance as instructed in section 16. Each 90° curve has a loss equivalent to what is described in section 16.

WARNING !!! The flue exhaust outlet must be appropriately protected against the effects of the wind.

WARNING !!! Mechanically secure the joints between the various exhaust duct components using fixing or equivalent systems. See figure 11-4.

WARNING !!! The temperature of the exhaust pipe during operation can reach 90°C. If they cross through walls that are sensitive to these temperatures, put in a protective heat insulating sheath.

WARNING !!! The exhaust ducts must be appropriately supported via rigid brackets positioned no more than 1 m from each other. The brackets must be secured to rigid walls that can support the weight of the duct itself.

WARNING! The table below shows the equivalent lengths of the exhaust components:

TABLE OF EQUIVALENT LENGTH COMPONENTS		
CODE	DESCRIPTION	UM = equivalent linear meters
		models 70T-115T-140T
62617344	PIPE 1m Ø110	1,0
62617345	ELBOW 45° Ø110	2,2
62617346	ELBOW 90° Ø110	4,0
62617289	PIPE 1m Ø160	/
62617297	ELBOW 45° Ø160	/
62617298	ELBOW 90° Ø160	/

12 - INSTALLATION - External cover

12.1 - Installation of external cover



ATTENTION:

The small parts in this kit will have the following references:

- Screw 6x20 will be indicated with "A";
- Screw 4x10 will be indicated with "B";
- Screw 4x25 will be indicated with "C";
- Screw 4x20 will be indicated with "D".



ATTENTION:

Overtightening of screws "C" may lead to deformation of the panel on which they are applied.

For installation of the external cover, proceed as follows:

- 1.- Use a spanner to loosen the adjustable feet "T" on the appliance (figure 12-1), insert bracket "H" and re-tighten the adjustable feet "T" (figures 12-2 and 12-3). Repeat this procedure on the opposite side.
- 2.- Remove the lower and upper front coverings "F" and the upper covering "U" from the appliance, as shown in figure 12-4.
- 3.- Insert the lower frame "J" (figure 12-5) and secure it to bracket "H" with the screws "A" through the holes (figure 12-6).
- 4.- Insert the lower and upper front coverings "F" on the appliance (figure 12-7). Then adjust the adjustable feet "I" on the lower frame "J" to stabilise it on the installation surface (figure 12-8).
- 5.- Insert the four tubes "K" over the pins on the lower frame "J" using a rubber hammer (figures 12-9 and 12-10).
- 6.- Insert the upper frame "G" of the outdoor covering using a rubber hammer (figure 12-11).
- 7.- Insert the upper fixing brackets "Q" (figures 12-12 and 12-13). Then insert screw "A" with nut "E" to fasten the brackets to the appliance (figure 12-14) and screw "B" to fasten the brackets to the frame of the outdoor covering (figure 12-15).
- 8.- Remove the pre-cut discs (AG) and (AH), as shown in figures 12-16 and 12-17, and according to the type of electrical and condensate disposal system present at the appliance's installation site, the pre-cut discs "X" and "Y" can be removed from the covering (AG) in figure 12-18.
- 9.- Insert coverings (AG) and (AH) in the way shown in figures 12-18 and 12-19 and secure them to the structure with screws "C" (figure 12-20). Then fit the rain protection grille "R" with screws "B", as shown in figure 12-21.
- 10.- Fit the metal plate "S" on the covering (AH) with screws "B" (figure 12-22) and fit the metal plates (AA) on the covering (AG) with screws "B" and "C" to fasten them; inserting them as shown in figure 12-22.
- 11.- Position the side coverings (AM) (before) and (AL) (after), and secure them to the structure with screws "C" (figure 12-23).
- 12.- Fit the upper covering (AE) to the upper frame "G", with screws "B" (figures 12-24 and 12-25).
- 13.- Use screws "D" to fasten the guard for electrical connections "L", for intake "M" and for exhaust "N" (or "P") to the upper covering (figures 12-26 and 12-27); remember to insert gaskets "O" and "W" as shown in figure 12-26.



ATTENTION:

- If you have a 110 mm diameter flue exhaust, use the covering for exhaust "N" in figure 12-26.
- If you have an 80 mm diameter flue exhaust, use the covering for exhaust "P" in figure 12-26.

14.- Place the front coverings (AP) (before) and (AN) (after), in the way shown in figures 12-28 and 12-29. Fasten them to the structure by adjusting locks "Z" with a flat head screwdriver (figure 12-30).

15.- Finally, fasten the metal plates (AR) and (AS), with screws "B", to the lower covering "J"; as shown in figures 12-31 and 12-32.

12 - INSTALLATION - External cover

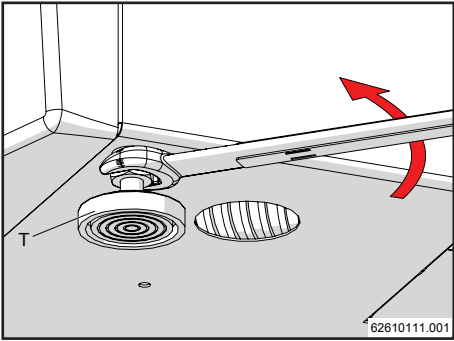


Figure 12-1

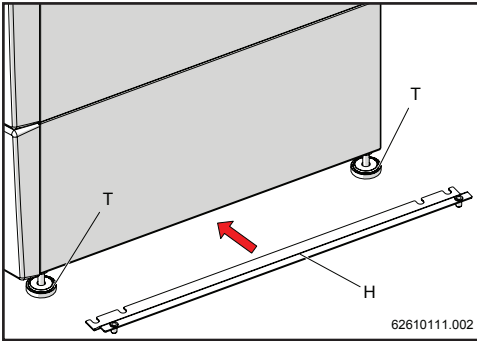


Figure 12-2

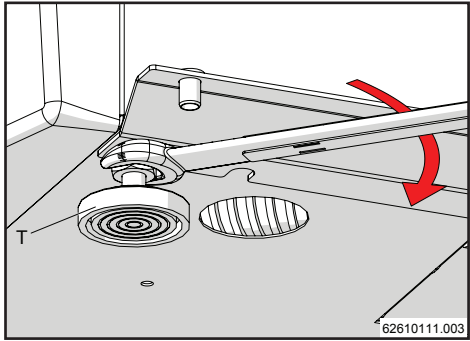


Figure 12-3

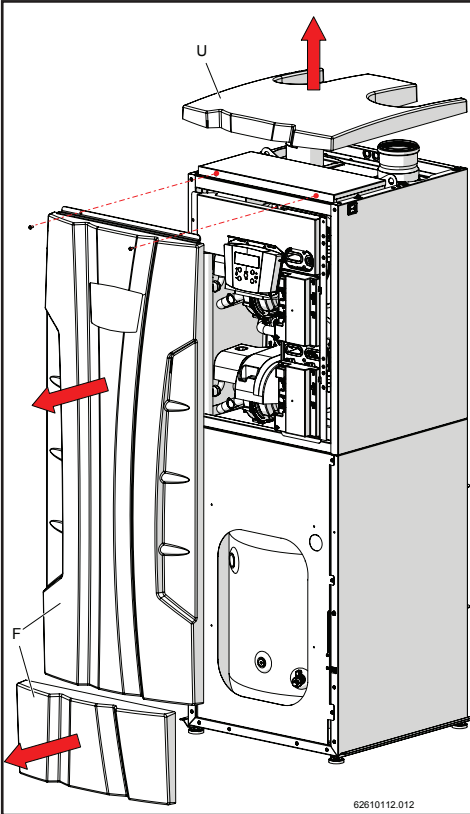


Figure 12-4

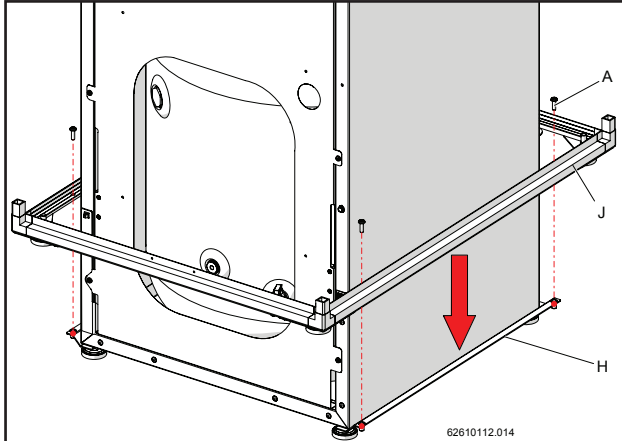


Figure 12-5

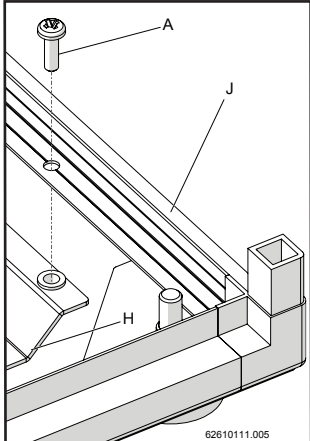


Figure 12-6

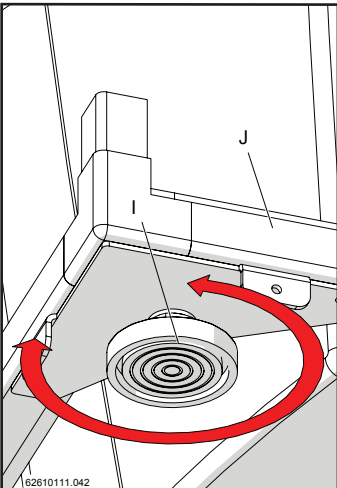


Figure 12-8

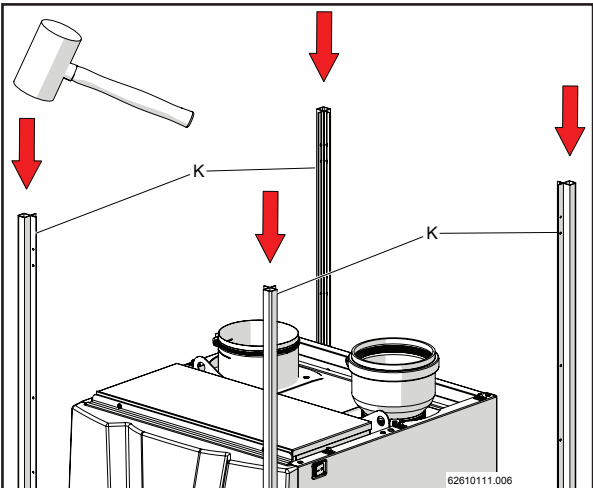


Figure 12-9

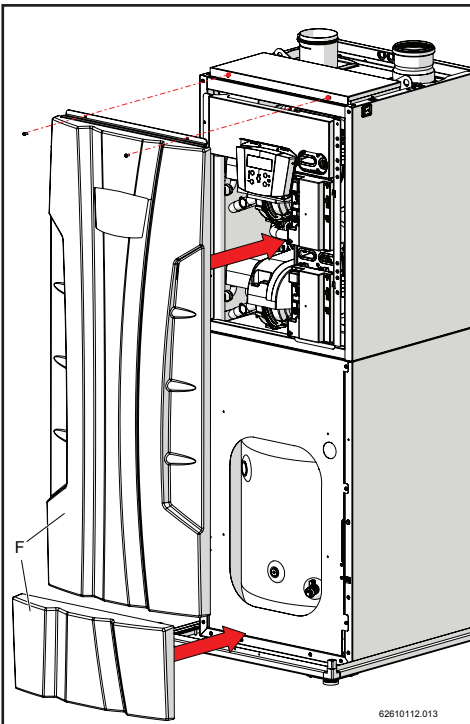


Figure 12-7

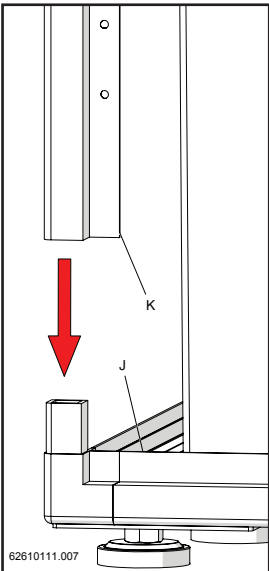


Figure 12-10

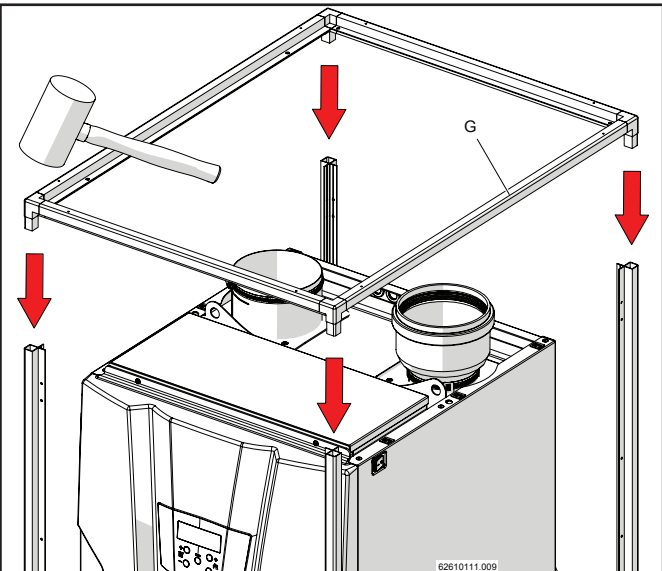


Figure 12-11

12 - INSTALLATION - External cover

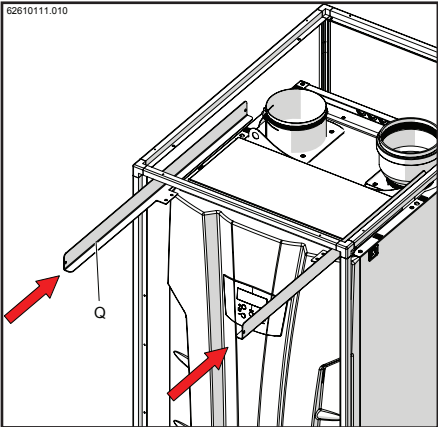


Figure 12-12

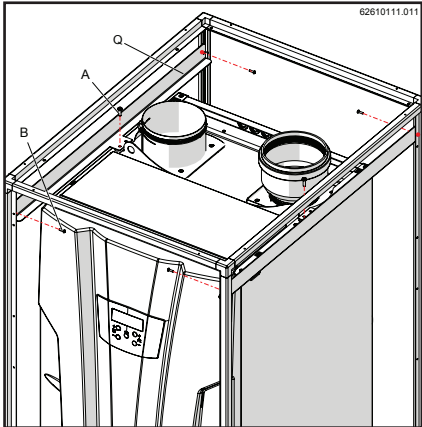


Figure 12-13

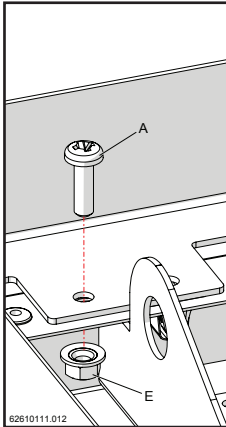


Figure 12-14

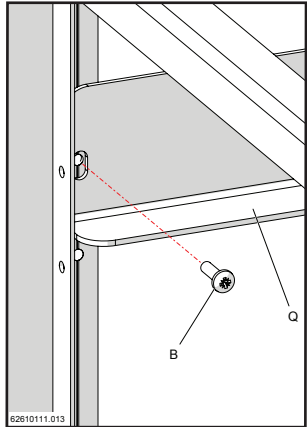


Figure 12-15

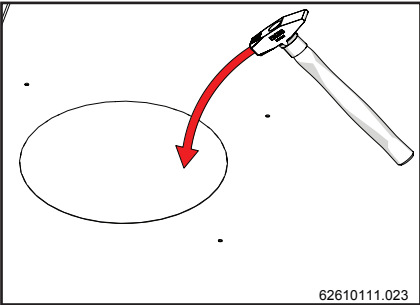


Figure 12-16

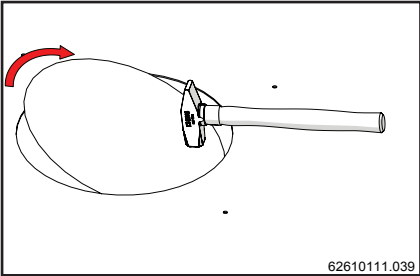


Figure 12-17

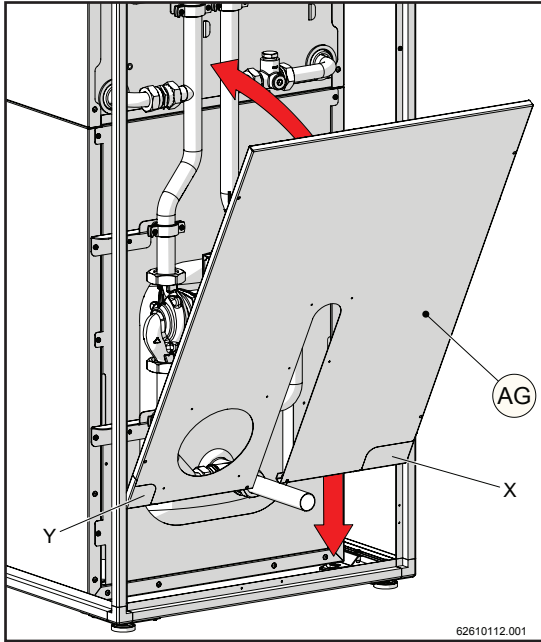


Figure 12-18

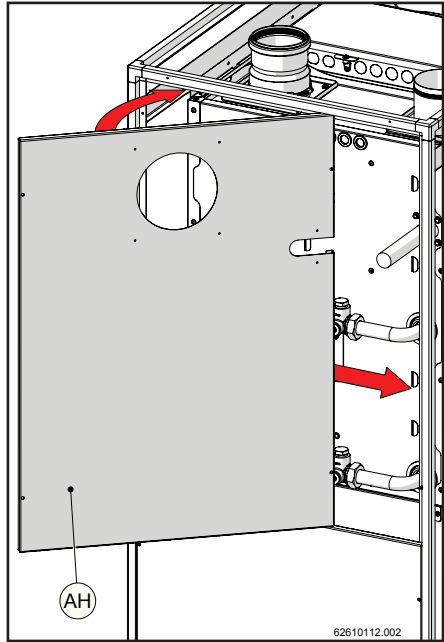


Figure 12-19

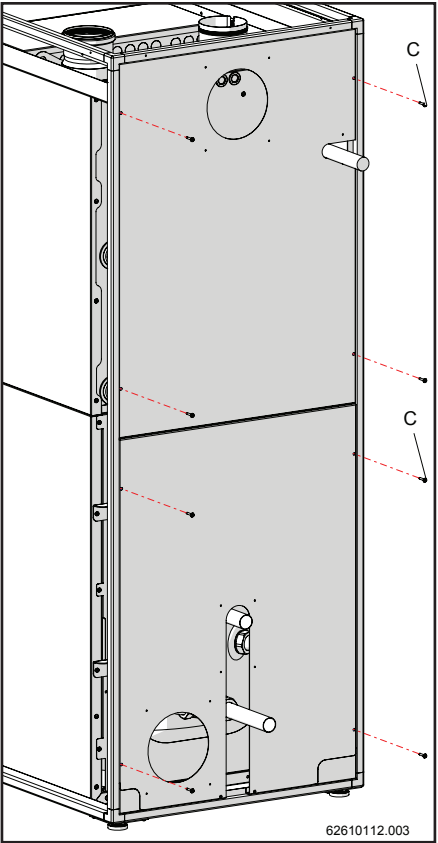


Figure 12-20
AGUAPLUS

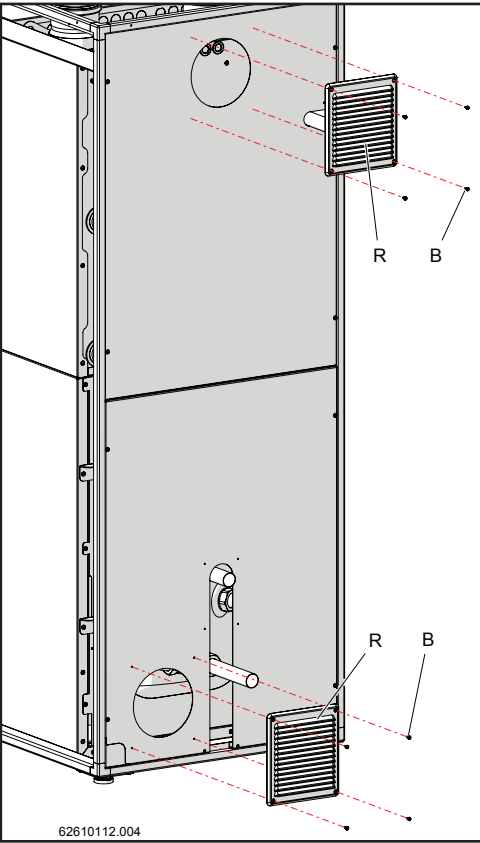


Figure 12-21

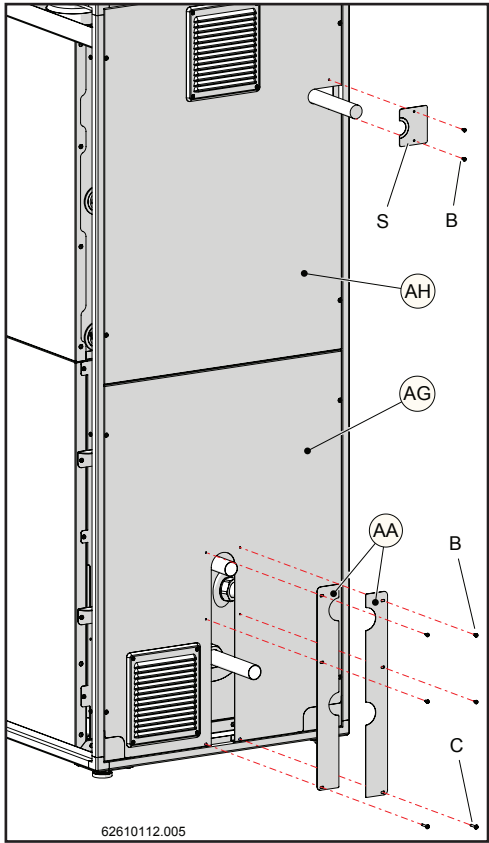


Figure 12-22

12 - INSTALLATION - External cover

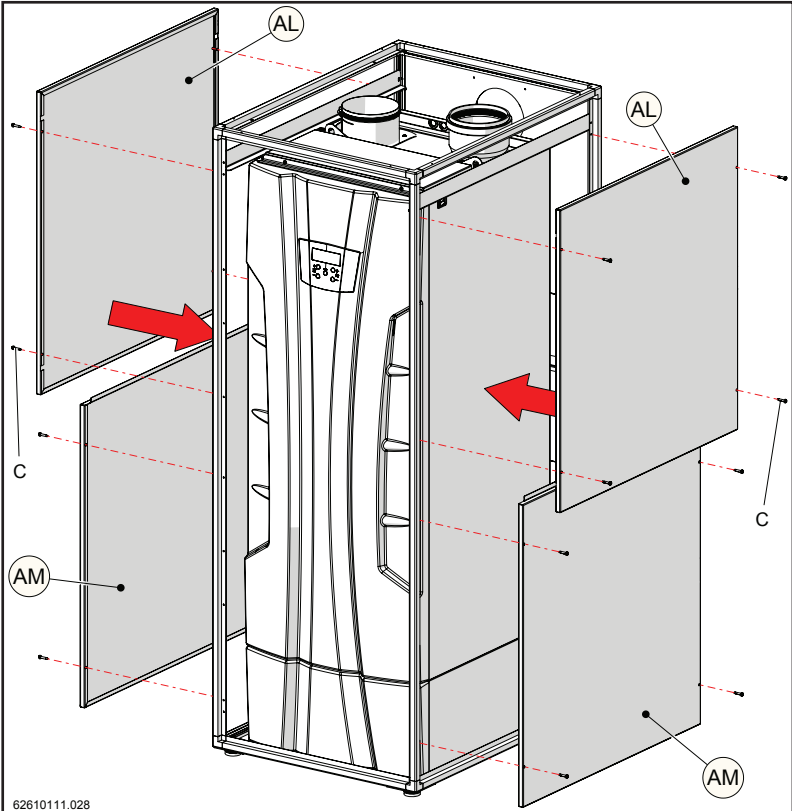


Figure 12-23

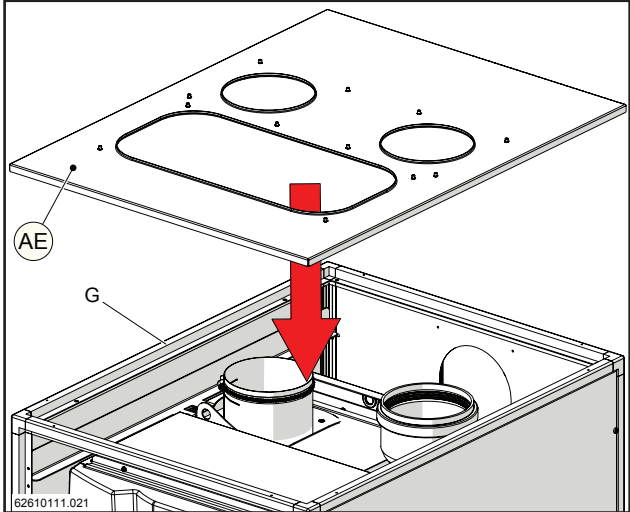


Figure 12-24

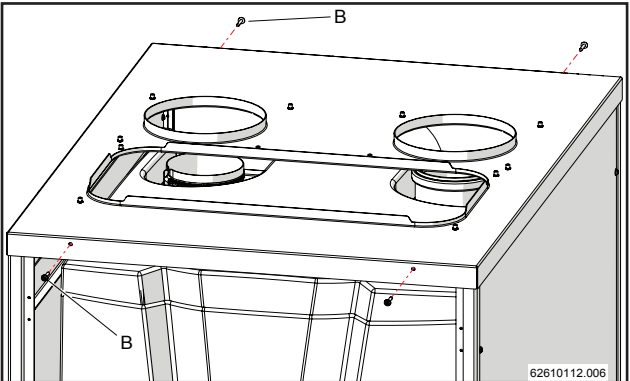


Figure 12-25

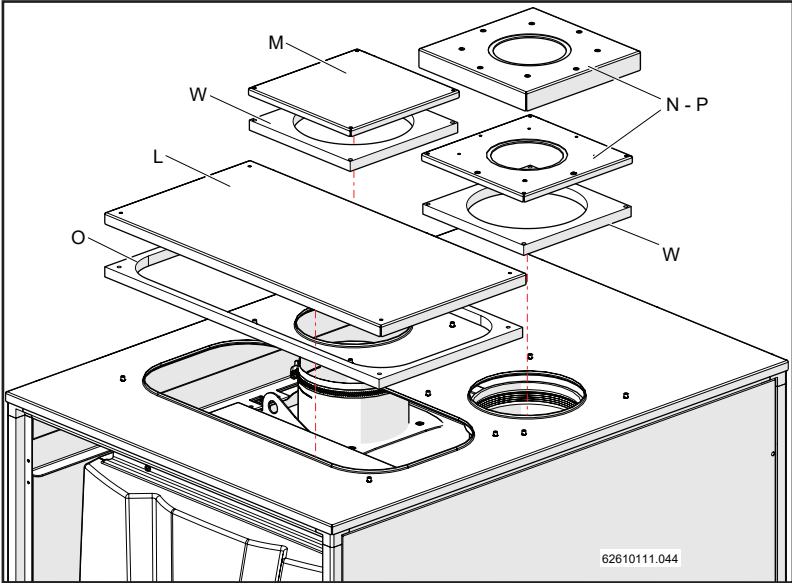


Figure 12-26

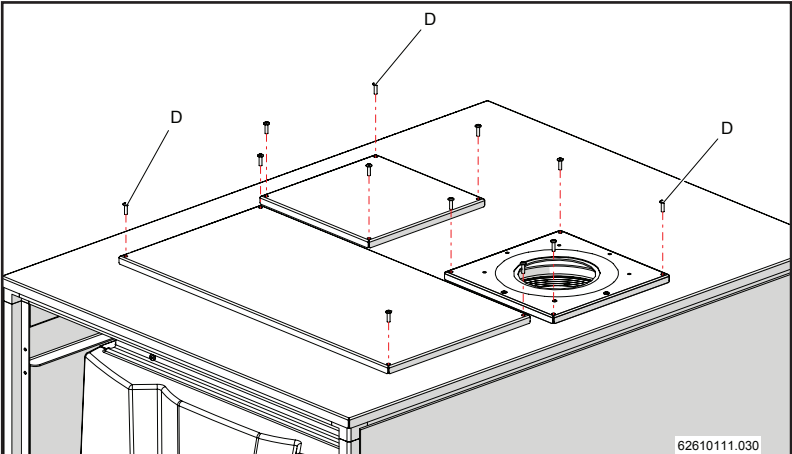


Figure 12-27

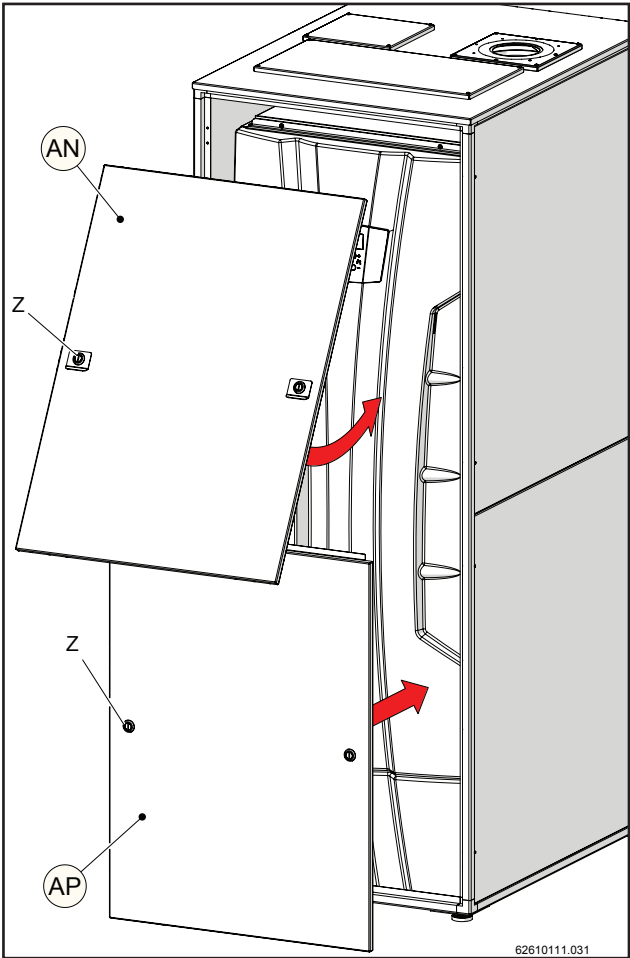


Figure 12-28

12 - INSTALLATION - External cover

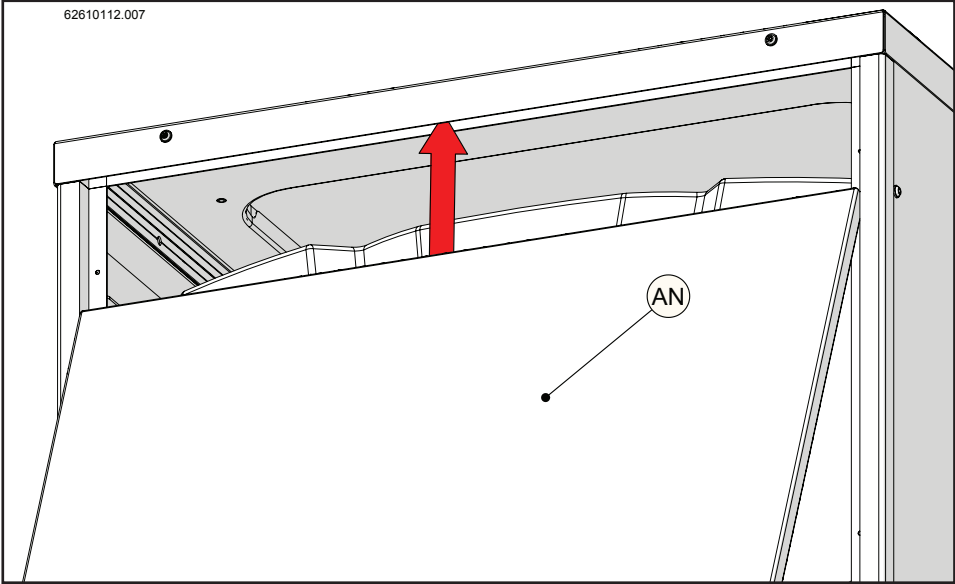


Figure 12-29

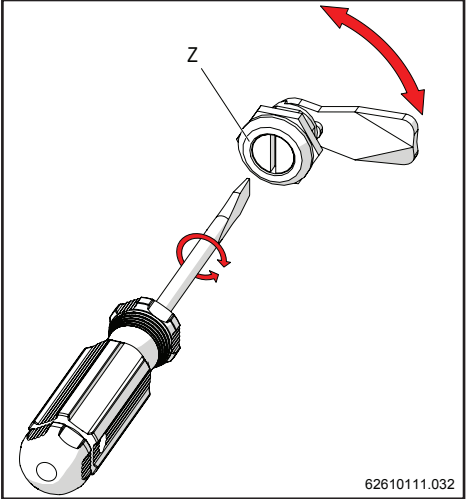


Figure 12-30

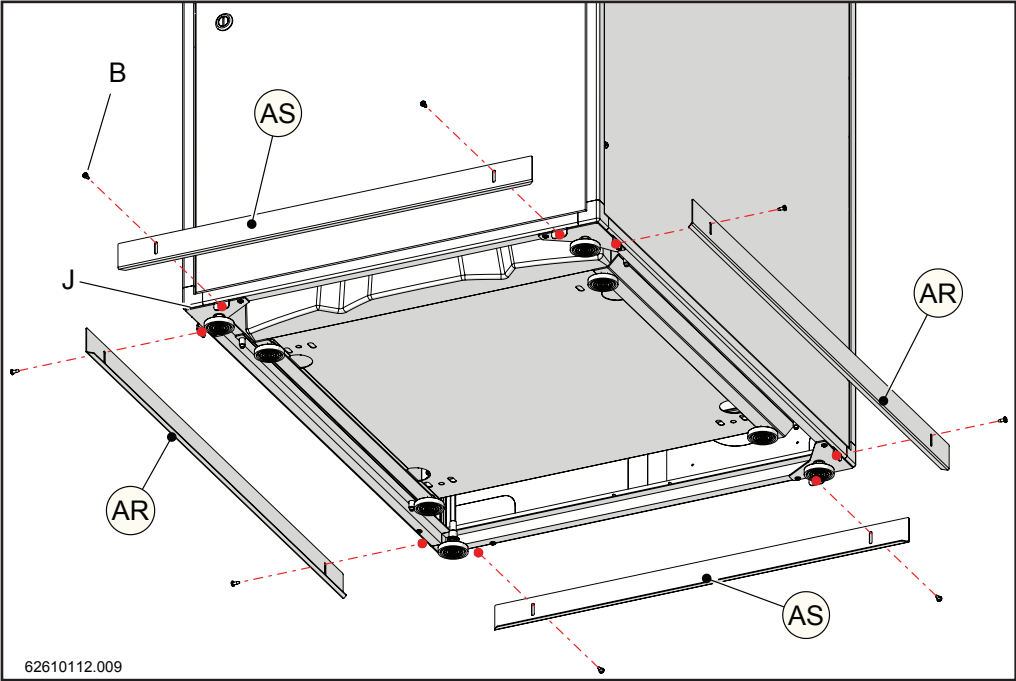


Figure 12-31

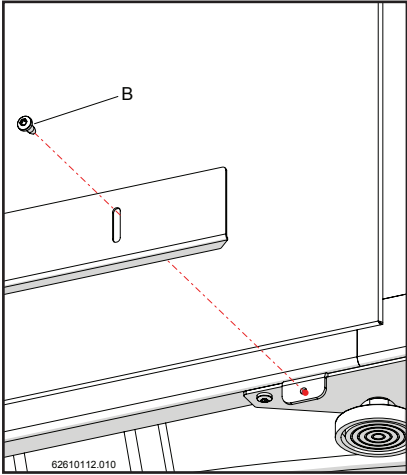


Figure 12-32

13.1 - Start-up

Before starting up the appliance the following operations must be carried out.

13.1.1 - Instructions to the user

Instruct the user on how to properly use the appliance and the entire system in general. In particular:

- ☞ Give the user the use and installation manual and all the documents contained in the packaging.
- ☞ Teach the user about the special measures for the flue exhaust, informing them that they must not be modified.
- ☞ Inform the user of the necessary water pressure control in the system and of the necessary measures to fill and bleed air.
- ☞ Inform the user about properly adjusting temperatures, control units for energy saving.

13.1.2 - Filling the condensate outlet siphon

The siphon located inside the appliance must be filled with water to create the shutter that can prevent the leakage of flue gases from the condensate drain pipe "7" in Figures 3-3 and 3-6.

For this purpose, proceed as follows:
(refer to Figure 13-1)

- 1.- Undo o and remove stopper "A" shown in the figure;
- 2.- Insert a rubber tube into hole "S" and at the other end of the tube position a funnel;
- 3.- Slowly pour about 5 litres of water through the funnel;
- 4.- Reassemble everything in reverse order.



WARNING!!! If the appliance stays off for more than 3 months, repeat the above operation to again fill the condensate trap.



WARNING!!! Once the appliance has been started up again, make sure no flue gases are escaping from plug "A".

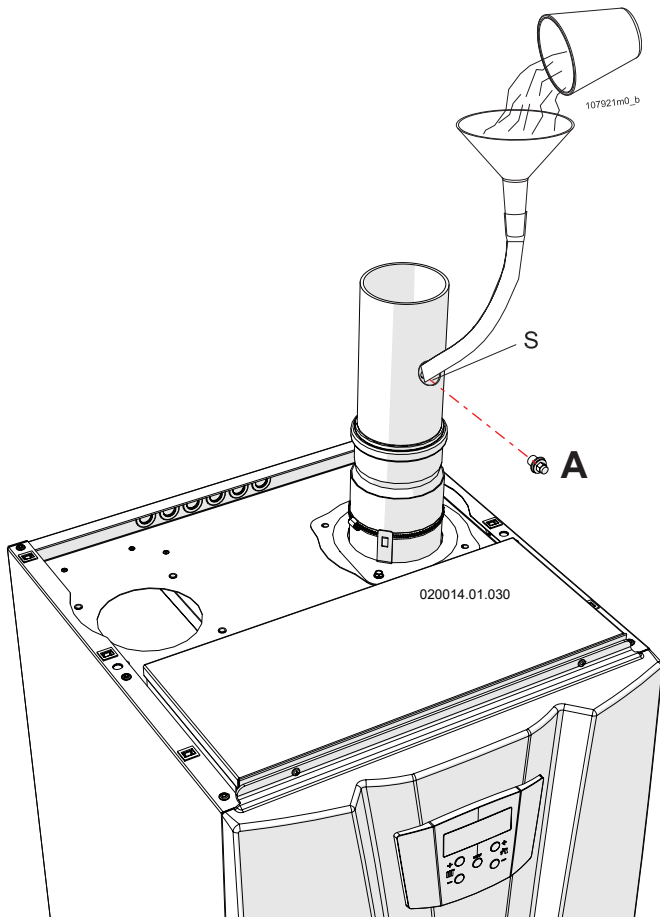


Figure 13-1 - Filling the condensate outlet siphon

13 - START-UP

13.2 - General recommendations regarding the gas supply

For first start-up of the appliance carry out the following checks:

- ☞ That it is powered by the type of fuel for which it is set up (see section 13.3).
- ☞ That the gas supply pressure (with the appliance on and off) falls between the maximum and minimum values shown in the table in section 16.
- ☞ That the gas supply system is provided with all the safety devices and controls required under current national and local codes.
- ☞ That the flue gas outlet terminal and the combustion air intake terminal are properly connected and free from any obstruction.
- ☞ That the flue gas outlet terminal and the combustion air intake terminal are located outside the building.
- ☞ That the condensate drain is properly connected.



WARNING !!! It is forbidden to supply the appliance with a type of gas other than those anticipated.



WARNING !!! Ensure that the supply pressure and gas are the ones for which the appliance is set.

The appliance is provided with the relevant gas conversion kit.

- ☞ Before installation it is recommended that the inside of the gas adduction pipe be cleaned thoroughly.
- ☞ A shut-off manual valve must always be installed on the gas adduction pipe.
- ☞ To avoid damage to the appliance gas control assembly, carry out the seal test at a pressure of not more than 50 mbar.
- ☞ If the test of the gas system has to be carried out at pressures greater than 50 mbar, turn off the manual gas shut-off valve located immediately up-stream the appliance, to isolate it from the system.

In Figure 7-1 you can check the position of gas connection. The sections of piping that make up the gas adduction system must always ensure sufficient gas supply to cover the maximum required.



WARNING!!! If you smell gas:

- A - Turn off the gas supply at the gas meter;**
- B - Extinguish all naked flames - do not smoke or strike matches;**
- C - Do not operate electrical appliances or switches such as a light switch;**
- D - Open all doors and windows to ventilate the property;**
- E - Call the gas emergency service and follow their directions.**

13.3 - Type of gas for which the appliance is set

The type of gas and the gas supply pressure that the appliance is set up for is listed on the rating plate.

The appliance can operate using one of the following two gases:

2H-G20-20mbar NATURAL GAS

means the appliance is regulated to work with type H second family gas (NATURAL GAS) at a supply pressure of 20 mbar.

3P-G31-37mbar LP Gas

means the appliance is regulated to work with type P third family gas (propane, also known as LP gas) at a supply pressure of 37 mbar.

13.4 - Conversion of appliance model 70 from one type of gas to another



WARNING !!! Read these instructions carefully before changing the gas:

- The gas equipment must be installed, calibrated or modified by specialised personnel according to the terms of the law;
- Check and be sure that the type of gas that is supplying the appliance is compatible with the regulation kit you have;
- Do not supply the appliance with a different type of gas than those provided for.

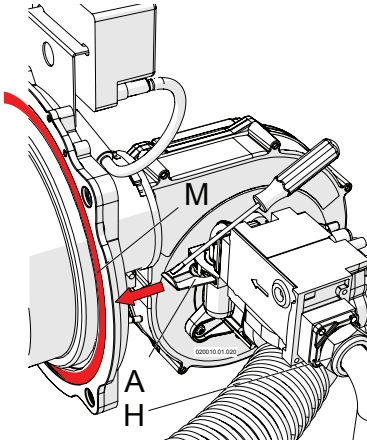


Figure 13-2 - Dismantling gas valve

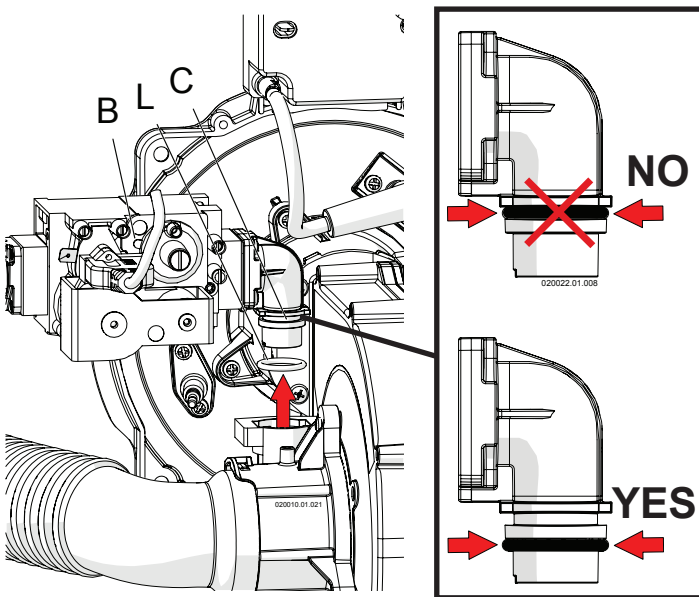


Figure 13-3 - Raising gas valve

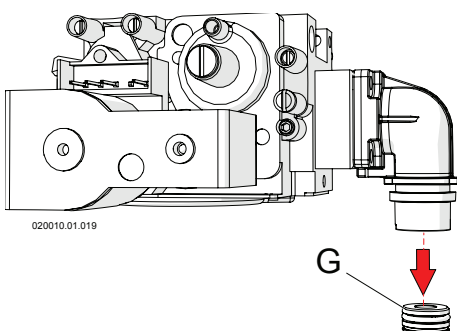


Figure 13-4 - Replacing gas orifice

Contents:

The Kit (supplied with the appliance) is composed of label certifying the new type of gas, a gas nozzle for each burner and an instruction sheet.

Carry out to change the gas, proceed as follows:

- 1.- Turn off the appliance by moving the main switch to OFF (detail "T" in Figure 14-1);
- 2.- Turn off the gas supply valve;
- 3.- Open the appliance casing as described in section 15.2;
- 4.- Undo junction "H" in Figure 13-2;
- 5.- With the aid of a screwdriver, remove fork "A" in Figure 13-2;
- 6.- Remove the gas valve with junction "C" as in Figure 13-3 (paying attention to the OR "L" in Figure 13-3);
- 7.- Replace nozzle "G" in Figure 13-4 with the one in the kit, checking it corresponds in diameter to that shown in Figure 13-8;
- 8.- Replace the gas valve paying attention to the correct position of the OR "L" in Figure 13-3 and to the joint gasket "H" in Figure 13-2;
- 9.- Replace fork "A" in the locking housing;
- 10.- Tighten joint "H" in Figure 13-2;
- 11.- Open the gas supply valve;
- 12.- Check that there are no leaks from joint "H" in Figure 13-2;



WARNING !!! Carry out the gas seal test only with a soap water solution. The use of open flames is absolutely forbidden.

- 13.- Turn on the appliance by moving the main switch to ON (detail "T" in Figure 14-1);
- 14.- Completely undo screw "E" in Figure 13-6 in an anticlockwise direction;
- 15.- Check the gas pressure by following section 13.7; the minimum pressure must not be less than 10 mbar, while the maximum must not exceed 45 mbar;
- 16.- Check and regulate the CO₂ following the procedure referred to in section 13.8 and checking the value in Figure 13-8;



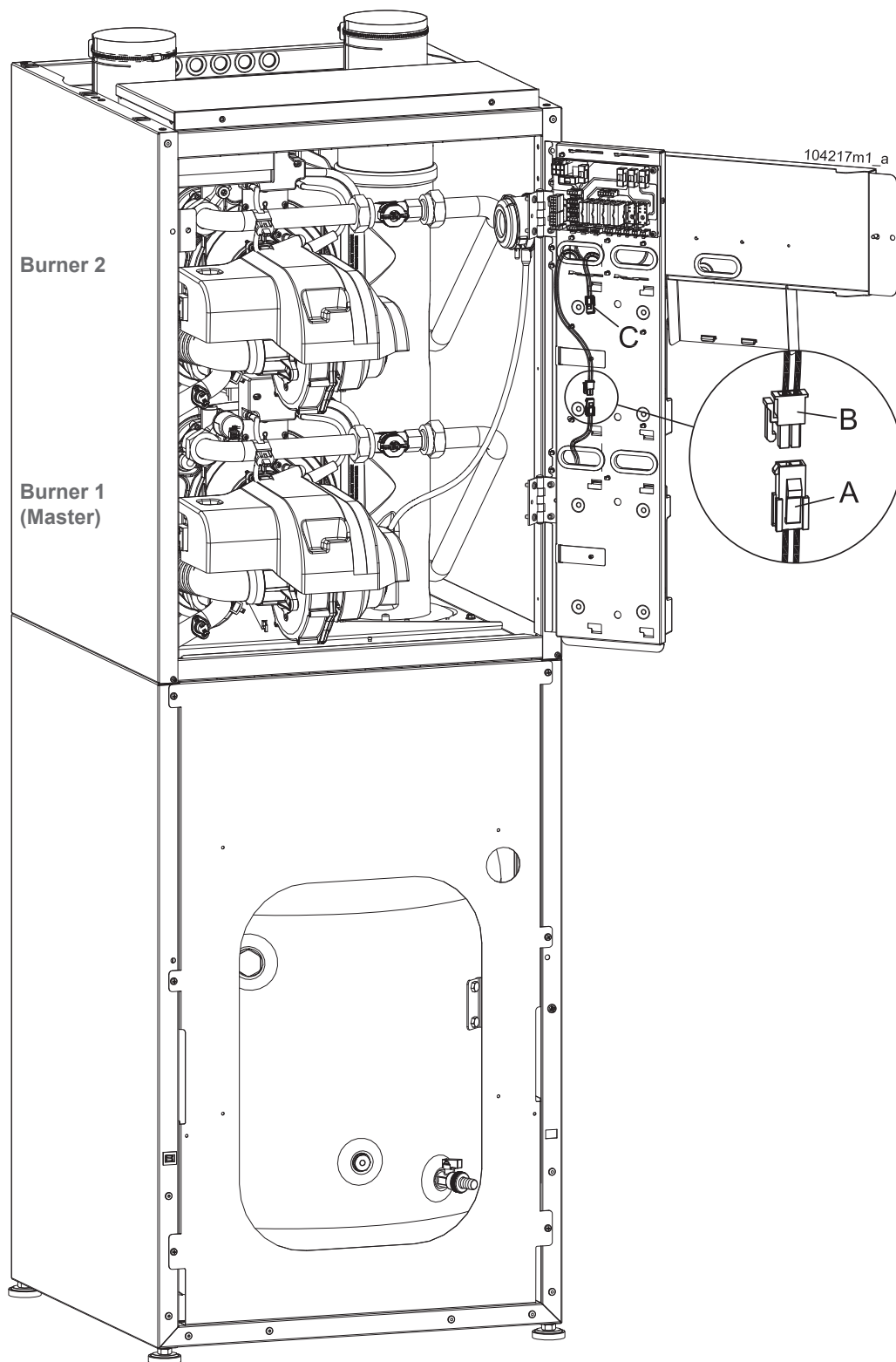
WARNING !!! The measurements must be taken with calibrated, guaranteed instruments that ensure an accurate reading.

- 17.- Check the appliance power by following section 13.9;
- 18.- The gas conversion kit contains self-adhesive labels for the indication of the new gas supply type. The correct label must be selected and applied to the appliance in a prominent location, next to the rating plate where possible. If the appliance has been converted to LPG, "Section B" of the label should be applied; if the appliance has been converted to Natural Gas, "Section A" should be applied.



WARNING !!! If there is a smell of gas:

- A - Turn off the gas supply at the gas meter;
- B - Extinguish all naked flames - do not smoke or strike matches;
- C - Do not operate electrical appliances or switches such as a light switch;
- D - Open all doors and windows to ventilate the property;
- E - Call the gas emergency service and follow their directions.



- A - Connector from Burner 1 (MASTER)
- B - Connector from display
- C - Connector from Burner 2

Figure 13-5 - Burner Position

13 - START-UP

13.5 - Conversion of appliance models 115 and 140 from one type of gas to another

Appliances models 115 and 140 are multi-burners, which means that the type of gas must be converted on every burner.



WARNING !!! Read these instructions carefully before changing the gas:

- The gas equipment must be installed, calibrated or modified by specialised personnel according to the terms of the law;
- Check and be sure that the type of gas that is supplying the appliance is compatible with the regulation kit you have;
- Do not supply the appliance with a different type of gas than those provided for.

Contents:

The Kit (supplied with the appliance) is composed of label certifying the new type of gas, a gas nozzle for each burner and an instruction sheet.

Carry out to change the gas, proceed as follows:

- 1.- Carry out the conversion in "Burner 1" (MASTER). See Figure 13-5 to identify "Burner 1" (MASTER);
- 2.- Carry out the conversion in "Burner 1" (MASTER) following points 1 to 16 of section 13.4;

After converting "Burner 1", continue with "Burner 2" as shown below:

- 3.- Carry out the conversion in "Burner 2" following points 1 to 16 of section 13.4;

After converting "Burner 2", proceed as described below:

- 4 - Check the gas inlet pressure as described in section 13.7;
- 5 - Check the appliance power as described in section 13.9;



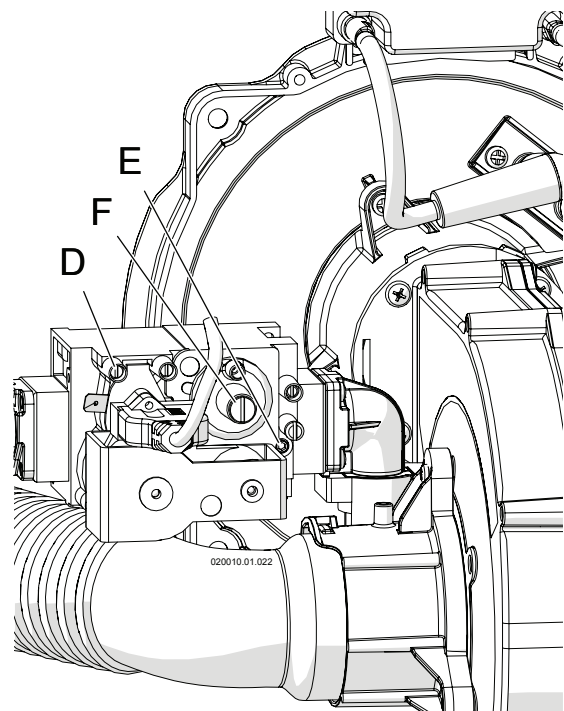
WARNING !!! The measurements taken must be done with calibrated instruments that guarantee an accurate reading.

- 6.- The gas conversion kit contains self-adhesive labels for the indication of the new gas supply type. The correct label must be selected and applied to the appliance in a prominent location, next to the rating plate where possible. If the appliance has been converted to LPG, "Section B" of the label should be applied; if the appliance has been converted to Natural Gas, "Section A" should be applied.



WARNING !!! If there is a smell of gas:

- A - Turn off the gas supply at the gas meter;
- B - Extinguish all naked flames - do not smoke or strike matches;
- C - Do not operate electrical appliances or switches such as a light switch;
- D - Open all doors and windows to ventilate the property;
- E - Call the gas emergency service and follow their directions.



- D - Gas inlet pressure port
- E - CO2 regulation screw
- F - Factory regulation screw (do not touch)

Figure 13-6 - Gas valve

A AT-BG-CH-CY-CZ DK-EE-ES-FI-GB GR-HR-HU-IE-IT LT-LU-LV-NO-PT RO-SE-SI-SK-TR 2H-G20-20mbar 2H-G20-25mbar	B AT-BE-BG-CH-CY-CZ DE-DK-EE-ES-FI-FR GB-GR-HR-HU-IE IT-LT-NL-NO-PL PT-RO-SE-SI-SK 3B/P-G30/G31-30/37/50mbar 3B-G30-30/50mbar 3P-G31-37/50mbar
C FR-DE-BE-NL-PL-RO 2Es-G20-20mbar 2E-G20-20mbar 2E(S)-G20-20mbar	D FR-DE-BE-NL-RO 2E(S)-G25-25mbar 2K-G25.3-25mbar 2Ei-G25-25mbar 2LL-G25-20mbar 2L-G25-20mbar



62408090m13

Figure 13-7 - Label bearing the new adjustment status of the appliance

	U.M	70	115	140
Gas supply nominal pressure G20/G31	mbar	20/37		
Gas supply minimum pressure G20/G31	mbar	17/25		
Gas supply maximum pressure G20/G31	mbar	25/45		
Nozzle diameter for (G20)	mm	9,5	8,9	9,5
Nozzle diameter for (G31)	mm	6,4	6,2	6,4
Methane gas CO ₂ (G20) at maximum output	%	8,4 to 9,0		
Methane gas CO ₂ (G20) at minimum output	%	8,4 to 8,6		
Methane gas O ₂ (G20) at maximum output	%	5,2 to 5,6		
Methane gas O ₂ (G20) at minimum output	%	5,7 to 5,9		
LP gas CO ₂ (G31) at maximum output	%	9,9 to 10,5		
LP gas CO ₂ (G31) at minimum output	%	9,7 to 9,9		
LP gas O ₂ (G31) at maximum output	%	5,2 to 5,6		
LP gas O ₂ (G31) at minimum output	%	5,9 to 6,1		


Figure 13-8 - Settings for the various operating gases

13.6 - Ignition

- 1.- Turn on the manual gas shut-off valve;
- 2.- Connect the appliance to the electricity and set the general switch to ON (detail "T" in Figure 14-1);
- 3.- The appliance only switches on when the set temperature is higher than the current supply temperature. Adjust the desired temperature for the supply using the  and  keys;
- 4.- If the display shows a low water flow rate error (see section 14.10.2), bleed the air again.

13.7 - Check gas supply pressure and make any necessary adjustment

The gas supply pressure must match that shown in the table in section 16. To check it do the following:


- 1.- Turn off the appliance and the manual gas shut off valve;
- 2.- Access the appliance internal parts by following the procedure described in section 15.2;
- 3.- Loosen pressure port "D" (see Figure 13-6);
- 4.- Connect to a manometer with a resolution of at least 0.1 mbar (1 mmH₂O). For models from 100 to 140 you can use any one of the valves;
- 5.- Turn on the manual gas shut off valve;
- 6.- Make sure the pressure does not exceed 45 mbar;
- 7.- position the main switch to ON (part "T" in Figure 14-1) and generate a heating demand by pressing the  key until the maximum value. Make sure the room thermostat is being called and the system is in the conditions to dissipate the heat generated;
- 8.- Set parameter **2200** to **H 10H** (in the 60 and 70 models, use parameter **20 10**). The burners will now work at maximum output heat for 20 minutes;
- 9.- With the appliance at maximum flow rate, make sure that the gas supply pressure does not drop below the value shown in Figure 13-8. If the pressure is lower, do not attempt to adjust the appliance; you must work upstream to reset proper pressure and gas flow rate.



WARNING !!! Do not touch screws "E" and "F" in figure 13-10. They are factory set for proper gas flow rate and supply pressure.

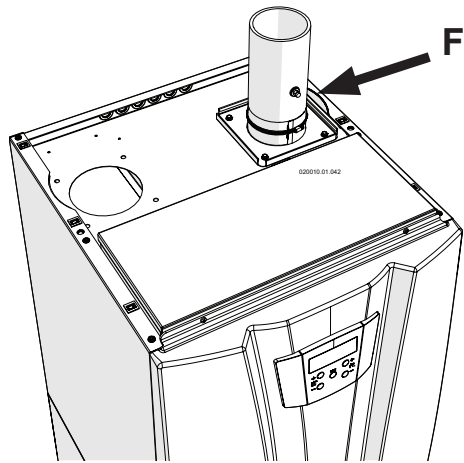
After having made sure the gas pressure is correct:

- 1.- Bring parameter **2200** back to **OFF** (in the 60 and 70 models, use parameter **20 10**).
- 2.- Turn off the manual gas shut-off valve;
- 3.- Disconnect the manometer and close pressure plug "D" again;
- 4.- Check for and gas leaks from pressure plug "D" (Figure 13-6);

 Do not force the screws to close the pressure port in order to avoid damaging to the gas valve.

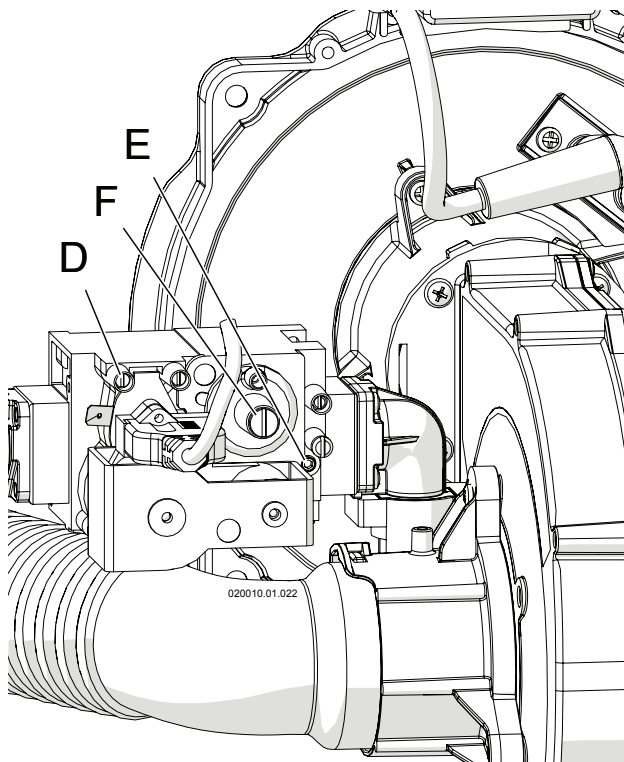


WARNING!!! Carry out the gas leak test only with a leak detection fluid. The use of open flame is absolutely forbidden.



F - Combustion analysis port

Figure 13-9 - Taking combustion analysis



D - Gas inlet pressure port

E - CO2 regulation screw

F - Factory regulation screw (do not touch).

Figure 13-10 - Gas valve

13.8 - Checking CO2 level

Figure 13-8 lists the correct CO2 ranges for an appliance running at normal operating conditions at an altitude below 1000 metres. CO2 values outside of the ranges given in Figure 13-8 may lead to malfunctioning of the appliance and cause it to prematurely fail. To check the CO2 value, carry out a combustion analysis follow Section 13.8.1 or 13.8.2.

13.8.1 - Checking CO2 level and any adjustments on appliance model 70



WARNING!!! During this procedure compare also CO (carbon monoxide) reading, with the value given in Figure 15-9. If this is higher, STOP the appliance and call the retailer.

- 1.- The flue system must contain a purpose provided test point for the analysis of combustion products. The test point should be located as close to the appliance as is possible (see Figure 13-9, part "F").
- 2.- Switch on the appliance and open the bridge between terminals "10" and "11";
- 3.- Make sure that the required temperature is higher than the appliance temperature;
- 4.- Access the installer menu (see section 14.9) and set parameter **20 10** to **HIGH**. The appliance will now work for 20 minutes at maximum power;
- 5.- Wait two or three minutes for the CO2 to stabilise;
- 6.- Put the CO2 value reading probe into socket "F" shown in Figure 13-9;
- 7.- Compare the CO2 reading with range given in Figure 13-8, making sure to use the range for the gas type in use. If the CO2 reading is outside the specified range, it must be adjusted operating on the "E" screw of Figure 13-10. Use a 2.5mm Allen Wrench to turn the screw (clockwise to reduce the CO2 level, counter-clockwise to increase the CO2 level) in small increments and wait for the CO2 to stabilize to prevent overshooting the desired value;
- 8.- Once the correct CO2 value as per table 13-8 has been reached, seal the screw with red paint or a similar system to discourage tampering.
- 9.- Set parameter **20 10** to **LOW**. The appliance will now work for 20 minutes at minimum output heat.
- 10.- Wait two or three minutes for the CO2 to stabilise;
- 11.- Compare the CO2 value read with the one in table 13-8. Be sure to read the value for the type of gas being used. The CO2 value must be within the values shown; if not, stop the appliance and call the manufacturer.
- 12.- Set parameter **20 10** to **OFF** to bring the appliance back to normal operation.
- 13.- Close the combustion analysis hole in figure 13-9 with appropriate plug "F" as per the instructions from the drain pipe manufacturer.



WARNING!!! Once plug "F" is positioned with the appliance at maximum output heat, make sure there are no flue gas leaks.

13.8.2 - Checking CO2 level and any adjustments on appliance models 115 and 140



WARNING!!! If, during this procedure, a CO value greater than 1000 ppm is detected, stop the appliance and contact the manufacturer.

- 1.- The flue system must contain a purpose provided test point for the analysis of combustion products. The test point should be located as close to the appliance as is possible (see Figure 13-9, part "F").
- 2.- Put the appliance in stand-by, shutting down all heating demands (remove the room thermostat bridge, if any).
- 3.- Make sure that the required temperature is higher than the boiler/water heater temperature;
- 4.- Access the installer menu (see section 14.9) and set parameter **2201** to **HIGH**. The MASTER burner will now work for 20 minutes at maximum output heat;
- 5.- Wait two or three minutes for the CO2 to stabilise;
- 6.- Put the CO2 value reading probe into socket "F" shown in figure 13-9;
- 7.- Compare the CO2 value detected with the one shown in table 13-8. Be sure to read the value for the type of gas being used. If the CO2 value does not match the one in table 13-8, it must be adjusted via screw "E" in figure 13-10. Use a 2.5 mm hex spanner (turn the screw clockwise to reduce the CO2 value and anticlockwise to increase it). Make small turns, always waiting for the value to stabilise before continuing, until you reach the desired value;
- 8.- Once the correct CO2 value as per table 13-8 has been reached, seal the screw with red paint or a similar system to discourage tampering;
- 9.- Set parameter **2201** to **LOW**. The MASTER burner will now work for 20 minutes at minimum output heat;
- 10.- Wait two or three minutes for the CO2 to stabilise;
- 11.- Compare the CO2 value read with the one in table 13-8. Be sure to read the value for the type of gas being used. The CO2 value must be within the values shown; if not, stop the appliance and call the manufacturer;



WARNING!!! The reading of CO2 at minimum power could be affected by the chimney draft. This can be seen from the quite low CO2 value against the high power value. In this case the CO2 has to be read by removing the flue gas sensor from the corresponding burner and inserting the analyser probe into the opening.


- 12.- Set parameter **2201** to **OFF**;
- 13.- Repeat the operations from point "3" to point "11" on the remaining burners, considering that parameter **2202** corresponds to burner 2, **2203** to burner 3 and **2204** to burner 4;
- 14.- Close the combustion analysis hole in figure 11-2 with appropriate plug "F" as per the instructions from the drain pipe manufacturer.



WARNING!!! Once plug "H" is positioned with the appliance at maximum output heat, make sure there are no flue exhaust leaks, which could cause damage.

13.9 - Checking appliance output heat

The appliance has a factory set air/gas mixture ratio. The gas pressure to the burner is indirectly controlled by the fan. The only way to check the appliance output heat is to directly use the gas counter. Proceed as follows:

1. Switch the appliance on by turning the main switch to ON (part "T" in figure 14-1) and send a heating demand, bring the requested temperature to the maximum value via the  key, making sure that the system is able to dissipate all the heat generated;
2. For the 60 and 70 models, set parameter **2010** to **HIGH**.
For the other models, set parameter **2200** to **HIGH**.
The appliance will now work for 20 minutes at maximum output heat;
3. Measure the gas flow rate to the counter. The value obtained must be compared with the value given in section 16 under "Gas flow rate" with a tolerance of + or - 10%;
4. If the flow rate is lower, make sure:
 - a) That there are no obstructions in the air intake and flue exhaust ducts;
 - b) That the lengths of the air intake and flue exhaust ducts correspond to what is described in section 16;
 - c) That the air intake filter (part "15" in figures 3-3 and 3-6) is clean;
5. If the gas flow rate is within the tolerance, set parameter **2200** to **OFF**. In 60 and 70 model appliances, set parameter **2010** to **OFF** to bring the appliance back to normal operation;
6. If the gas flow rate is greater, repeat the procedure in section 13.9.

13.10 - Minimum water flow rate

This appliance does not have minimum water flow rate requirements.

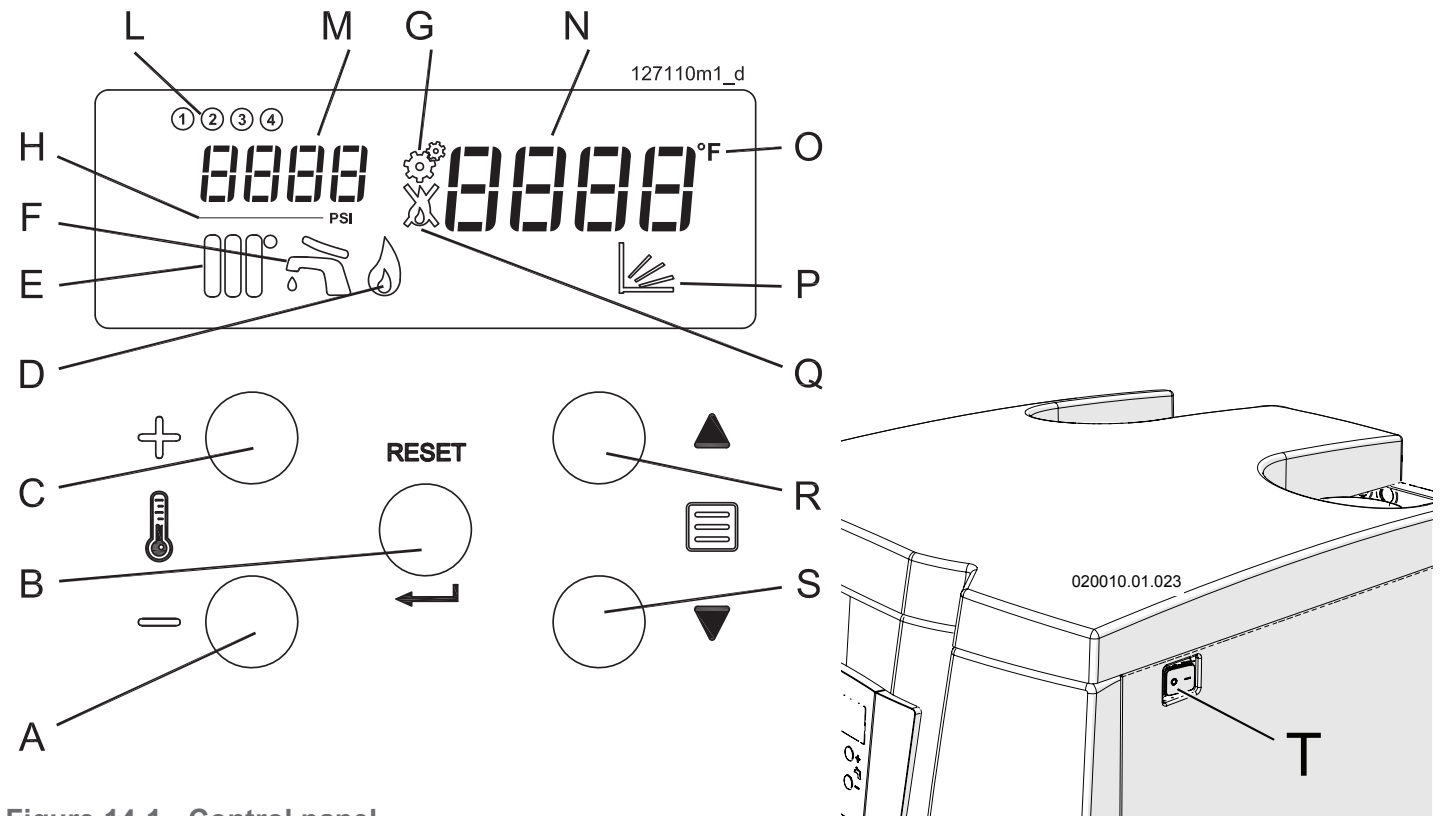


Figure 14-1 - Control panel

FIGURE 14-1 KEY

- A - Key to reduce water temperature;
- B - Multifunction key: Key to Reset and access the "user menu" and the "installer menu";
- C - Key to increase water temperature;
- D - Burner state:
Icon off = burner off;
Icon on = burner on;
- E - State of domestic service:
Icon off = Service off;
Icon on = Service active but not working;
Flashing icon = Service active and working;
- F - Not used;
- G - "Installer menu" access icon;
- H - Unit of measurement of the displayed pressure;
- L - Burner unit indicator:
① = Burner 1 (master);
② = Burner 2;
- M - Water pressure or indicator of the different parameters in the various menus
- N - Domestic hot water temperature or indicator of the values assumed by the various parameters
- O - Unit of measurement of the displayed temperature
- P - Icon not used;
- R - Key for scrolling and changing the parameter values;
- S - Key for scrolling and changing the parameter values;
- T - On/off switch

14.1 - Checking water pressure

If the pressure in the water circuit drops to below the minimum pressure value, the appliance automatically

switches off and display "N" in figure 14-1 displays **Err 59** (see section 14.10.2) to show that correct pressure needs be restored. As the water heater is installed in an open circuit, you must check the mains supply pressure or the adjustment of any pressure reducers installed upstream.

When the value is reestablished, **Err 59** disappears from the display.

14.2- General information

The appliance leaves the factory set with standards parameters. However, you can consult or make a series of changes to the parameters through the "user menu" (section 14.8) and the "installer menu" (section 14.9). During operation, the display shows the appliance operating status in addition to other information as described in section 14.10 (Diagnostics).

14.3 - Display

During normal operation, you can consult further parameters through the "User menu" (see section 14.8) that are helpful in understanding appliance operation and check the latest blocks or errors that have occurred.


After 5 minutes of normal operation, the display switches off completely to save energy. Simply press any key to switch it back on. In the event of any anomaly, the display switches back on automatically. This function can be modified by following section 14.7 (Energy saving).

14.4 - Ignition and shutdown procedure

To switch on the appliance, proceed as follows:

- 1.- open the gas valve;
- 2.- power the appliance;
- 3.- If the display shows **Err 65**, it means that phase and neutral polarity were not respected (call customer service to solve the problem without attempting to fix it yourself).
- 4.- adjust the domestic hot water temperature as per section 14.5.

The command and control equipment will ignite the burner. If ignition is unsuccessful within 3 minutes, the appliance automatically attempts ignition five times, after which, if it continues not to switch on, it locks up and the display will

show **L0C** along with the icon  and the corresponding

① ② flashing burner icon. Press the RESET key to restore normal operating conditions. The appliance will automatically attempt another ignition.



WARNING!!! If the appliance frequently stops because it locks up, contact a qualified technician to reset normal operating conditions.

Once started properly, the appliance will continue to work for the service requested.

To switch off the appliance, proceed as follows:

- 1.- Use switch "T" in figure 14-1 to cut power;
- 2.- close the gas valve;

14.5 - Temperature adjustment

To adjust the temperature, use the  or  keys (see

figure 14-1). When the keys are pressed, the display, part "N" in figure 14-1, shows the requested temperature. The water temperature adjustment range goes from 20°C to 80°C.



WARNING!!! The water heater should be adjusted to ensure that water is stored at a temperature greater than 60°C and a temperature of 50°C is achieved at all outlets within 1 minute. Excessive temperatures significantly increase the possibility of scalding with children and those with a sensory or mobility loss being at the greatest risk. Where the possibility of scalding has been identified, appropriate measures such as thermostatic mixing valves should be considered.

14.6 - Antifreeze protection



WARNING !!! In order for the antifreeze protection to be effective, the appliance must be left with the power and gas supply on and the domestic water service in the **OFF position.**



WARNING !!! The antifreeze protection provided by the appliance cannot ensure antifreeze protection for the domestic water system, nor for the building being served or parts of it.

Once the temperature of 10°C is reached, the pump automatically switches on. If the temperature drops further below 5°C, the burner also switches on in order to protect the appliance from the effects of frost.

If you do not use the appliance for a long period of time (over a year), we recommend draining it, following the procedure in section 15.10.

14.7 - Energy Saving

To reduce display energy consumption (Figure 14-1), it switches off automatically 5 minutes after the last operation done. You can disable this function or edit the time via parameter **2 100** in the "installer menu" (section 14.9). If you set the parameter to **0**, the display will remain on constantly.

14 - USE

14.8 - “User menu”

Pressing the RESET key for 2 seconds accesses the “user menu”. Display “M” in figure 14-1 begins to show parameter

1001 to tell the user that the mode has changed.

Using the ▼ and ▲ keys, you can scroll through the parameters in the menu.

To exit the menu, simply press the RESET key again for 2 seconds.

If no keys are pressed for more than 60 seconds, it automatically exits the menu.

For models from 100 to 140, all the parameters indicated as “Burner 1” refer to the appliance Master Burner. To display the same parameters for the other burners, you must connect the display to the burner in question as described in section 15.8. The following parameters can be accessed in this menu:

Parameter	Parameter description	U.M.
1001	Burner 1 - Water supply temperature	°C
1002	Hot water storage tank temperature (N/A)	°C
1004	External temperature (N/A)	°C
1006	Burner 1 - Flue gas temperature	°C
1007	Burner 1 - Return temperature	°C
1008	Burner 1 - Ionisation current	uA
1009	Burner 1 - Main circuit pump and motorised valve status	ON/OFF
1010	Heating circuit pump status (N/A)	ON/OFF
1011	Domestic hot water circuit pump status (N/A)	ON/OFF
1012	Calculated heating setpoint (N/A)	°C
1040	Burner 1 - Current fan rotation speed	rpm
1041	Burner 1 - Fan rotation speed at ignition	rpm
1042	Burner 1 - Fan rotation speed at minimum output heat	rpm
1043	Burner 1 - Fan rotation speed at maximum output heat	rpm
1051	Burner 1 - Last recorded lock-up (Loc) (see section 14.10.1) **	/
1052	Burner 1 - Last recorded error (Err) (see section 14.10.2) **	/
1053	Burner 1 - Number of times the burner lost its flame	no.
1055	Burner 1 - Number of failed burner ignitions	no.
1056	Burner 1 - Number of hours worked	h x 10
1057	Burner 1 - Number of hours worked in domestic water with hot water storage tank	h x 10
1059	* interval of time between the last two lockouts (Loc)	1: value in minutes; 2: value in hours; 3: value in days; 4: value in weeks;
1060	* interval of time between the last two errors (Err)	
1062	Burner 1 - Water flow rate	l/min
1101	Multi-burner: Number of burners on	no.
1102	Multi-burner: Manifold temperature	°C
1103	Multi-burner: Number of burners locked (Loc)	no.
1104	Multi-burner: Number of burners in Error (Err)	no.
1106	Multi-burner: Appliance in emergency	Yes/No
1107	Multi-burner: Calculated heating setpoint (only for 115 and 140 models) (see Parameter 1012 for the 70 model)	°C
1120	Multi-burner: Burner 1 modulation level	%
1121	Multi-burner: Burner 2 modulation level	%
1122	Multi-burner: Burner 3 modulation level (N/A)	%
1123	Multi-burner: Burner 4 modulation level (N/A)	%

* How to read the values of parameters 1059 and 1060:

e.g.: If it shows 1:29, it means 29 minutes;

e.g.: If it shows 2:12, it means 12 hours;

e.g.: If it shows 3:15, it means 15 days;

e.g.: If it shows 4:26, it means 26 weeks.

** When the number 255 is displayed, it means there was no lock-up or error.

N/A : Not Applicable.


14.9 - “Installer menu”




WARNING !!! Editing these parameters could cause the appliance and, therefore, the system to malfunction. For this reason, only technicians with in-depth knowledge and awareness of the appliance can edit them.

The appliance command and control board makes this parameter menu available to technicians for operating and appliance adaptation to the system analyses.

To access the “installer menu”, proceed as follows:

- 1.- hold down the RESET and ▼ keys at the same time for 5 seconds until parameter **2001** is displayed. The  symbol appears at the centre of the display to show access to the “installer menu”.
- 2.- you can use the ▲ and ▼ keys to scroll through the parameters in the menu;
- 3.- once the parameter you are interested in is displayed, you can edit it as follows:
 - a.- press the RESET key to access the parameter (display “N” in figure 14-1 will begin flashing);

- b.- edit the parameter value using the ▲ and ▼ keys;
- c.- press the RESET key to confirm the edited data 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 keys are pressed for more than 60 seconds, it automatically exits the menu. Any data changes that are not confirmed with the RESET key will be lost.

For 115 and 140 models, the parameters indicated as “Burner 1” refer only to Burner 1 (Master). To display or edit the same parameters for the other burners, you must connect the display to the burner in question as described in section 15.8.



WARNING !!! In order to facilitate any command and control board replacements, it is essential to make a note of any changes made to the parameters in the “customised values” column in the following table.

The following parameters can be edited or consulted in this menu:

Parameter	Parameter description	U.M.	Setting field	Default value	Customised values
2001	Minimum output heat level	%	From 1 to 50	1	
2002	Maximum output heat level	%	From 1 to 100	100	
2003	Heating operating mode (N/A)	nn	0 = Room thermostat 1 = External probe with TA 2 = External probe TA closure reduces by 2027 3 = Permanent heating TA closure reduces by 2027 4 = 0-10 Volt input 5 = N/A	00	
2004	Stand-by time after differential maximum	sec	From 10 to 30	30	
2005	Heating pump post-circulation	sec	From 10 to 260	60	
2010	Burner 1 - Burner forcing For model 70.	/	Off = No forcing Low = Minimum output heat Ign = Ignition output heat High = Maximum output heat	OFF	
2011	Main circuit pump and motorised 2-way valve forcing (Burner 1)	/	On or OFF	OFF	
2012	Heating circuit pump forcing	/	On or OFF	OFF	
2013	Domestic hot water circuit pump forcing	/	On or OFF	OFF	
2014	Icon test on the display. All the icons on the display come on by pressing the RESET key. The display goes back to normal function by pressing the RESET key again.	/	/	/	
2020	Climatic adjustment: external heating switch-off temperature (N/A)	°C	From 0 to 35	N/A	
2021	Climatic adjustment : external design temperature (winter) (N/A)	°C	From -20 to 5	N/A	
2022	Climatic adjustment: supply temperature corresponding to the external design temperature (winter) (N/A)	°C	From 0 to 80	N/A	
2023	Climatic adjustment : spring external design temperature (N/A)	°C	From 0 to 30	N/A	

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Parameter	Parameter description	U.M.	Setting field	Default value	Customised values
2024	Climatic adjustment: supply temperature corresponding to the spring external temperature (N/A)	°C	From 0 to 40	N/A	
2027	Nighttime Reduction	°C	From 0 to 50	N/A	
2042	Burner 1 - Protection against frequent ignitions: time	sec	From 10 to 900	60	
2043	Burner 1 - Protection against frequent ignitions: temperature differential	°C	From 0 to 20	5	
2062	Domestic water pump post-circulation (N/A)	sec	From 10 to 255	60	
2063	Maximum D.H.W. priority time (N/A)	min	From 1 to 60	N/A	/
2067	D.H.W. production priority (N/A)	/	0 = The priority lasts the amount of time set in parameter 2063; 1 = OFF, domestic water does not have priority over heating; 2 = ON, domestic water always has priority over heating;	N/A	
2100	Display energy saving	min	From 0 to 30 = delay to switch-off in minutes.	5	
2101	Multi-burner: emergency mode	/	Yes or No	Yes	
2102	Multi-burner: Emergency temperature adjustment	°C	from 20 to 65	45	
2103	Multi-burner: ignition delay	sec	from 1 to 900	15	
2104	Multi-burner: switch-off delay	sec	from 1 to 900	15	
2105	Multi-burner: burner ignition temp. delta	°C	from 0 to 20	5	
2106	Multi-burner: burner switch-off temp. delta	°C	from 0 to 20	5	
2107	Multi burner: maximum temp. increase with respect to calculated temp.	°C	from 0 to 20	10	
2108	Multi burner: maximum temp. decrease with respect to calculated temp.	°C	from 0 to 20	20	
2109	Multi-burner: Subsequent burner ignition	%	from 1 to 100	70	
2110	Multi-burner: Subsequent burner switch-off	%	from 1 to 100	10	
2111	Multi-burner: Burner rotation	dd	from 0 to 9	6	
2113	Multi-burner: Modulation start delay	min	from 0 to 60	0	
2114	Burner 1: Main circuit pump shutdown time	sec	from 0 to 255	60	
2200	Forcing: All the Burners together.	\	Off, Low, Ign, High	OFF	
2201	Forcing: Burner 1 (Master).	\	Off, Low, Ign, High	OFF	
2202	Forcing: Burner 2.	\	Off, Low, Ign, High	OFF	
2203	Forcing: Burner 3. (N/A)	\	Off, Low, Ign, High	OFF	
2204	Forcing: Burner 4. (N/A)	\	Off, Low, Ign, High	OFF	

N/A : Not Applicable.

14.10 - Diagnostics

During normal appliance operation, display "N" in figure 14-1 continuously shows the appliance work status via the following indications:

Parameter	Parameter description	Display on display "N" in Figure 14-1
	Antifreeze function active	Boiler temperature (°C)
	Heat request operating state.	Supply temperature (°C)

14.10.1 - Diagnostics: lockouts “Loc”

Lock-up	Lock-up description	Checks	Solutions
Loc 1	No flame detected after 5 consecutive ignition attempts.	Supply gas pressure (see section 13.7);	A - If the pressure is incorrect, it must be restored upstream of the appliance;
		Sparks on the ignition electrodes (see section 15.5);	Check and correct electrode positions (section 15.5);
		Correct gas pressure and CO2 value (see sections 13.7 and 13.8);	Remove any obstructions in the air intake and flue exhaust ducts;
		230Vac power supply to the gas valve;	If the supply current to the gas valve is not 230 Vac, replace the control board;
		0.88 Kohm and 6.59 Kohm electrical resistance of the two gas valve coils	If the resistance does not match, replace the gas valve;
		If the burner ignites and goes out at the end of the ignition attempt, make sure: that the ionisation current value is greater than 4 (follow the procedure in section 15.12)	If the ionisation current does not match, check the CO2 as per section 13.8. Make sure the detection electrode is in good condition and, if necessary, replace it. Make sure the detection electrode connection cable is in good condition and, if necessary, replace it.
Loc 2 (*)	Gas valve not supplied during ignition attempts	Check whether the supply safety thermostat has tripped;	⚠ WARNING !!! If the flue exhaust temperature safety fuse trips, you must contact the appliance manufacturer to avoid serious damage to the exchanger.
		Check whether the flue exhaust safety fuse has tripped;	
Loc 3	Gas valve loses power during operation	Make sure the electrical connections between the gas valve and control board are in good condition;	If the electrical connections are interrupted, restore them;
			If the connections are in good condition, try replacing the gas valve or the control board;
Loc 4	Gas valve relay does not close	Make sure the electrical connections between the gas valve and control board are in good condition;	If the electrical connections are interrupted, restore them;
			If the connections are in good condition, try replacing the gas valve or the control board;
Loc 5 (*)	Gas valve circuit	Check whether the supply safety thermostat has tripped;	⚠ WARNING !!! If the flue exhaust temperature safety fuse trips, you must contact the appliance manufacturer to avoid serious damage to the exchanger.
		Check whether the flue exhaust safety fuse has tripped;	
Loc 6	Safety relay opening error		Replace the command and control board
Loc 7	Safety relay closing error		Replace the command and control board
Loc 11	Locking error exceeding 20 hours	Press the RESET key to see the type of error (Err) and proceed accordingly;	
Loc 12	Fan error	Check the 230Vac power supply to the fan;	If the power supply does not match, replace the control board;
		Check the PWM connection to the fan;	If there is no fan PWM dialogue, replace the control board;
			Try replacing the fan;
Loc 13	Software error inside command board		Replace the command and control board
Loc 14	Software error inside command board		Replace the command and control board
Loc 15	Software error inside command board		Replace the command and control board
Loc 16	Software error inside command board		Replace the command and control board
Loc 17	Software error inside command board		Replace the command and control board
Loc 18	Software error inside command board		Replace the command and control board
Loc 19	Software error inside command board		Replace the command and control board

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Lock-up	Lock-up description	Checks	Solutions
Loc 20	Flame lost three times	Make sure: that the ionisation current is at a value higher than 4 (follow the procedure in section 15.12)	If the ionisation current is not over 4, you must check the CO ₂ (follow section 13.8) and restore the proper value. Check the ionisation glow plug and, if necessary, replace it. Make sure the ionisation current electrical circuit cables are intact.
		Make sure: that the flue exhaust is appropriately protected from obstructions caused by gusts of wind	If the flue exhaust is positioned on a vertical wall, it must be protected by a windproof grid. If the flue exhaust is positioned on the roof, make sure it is not in a reflux area and that the windproof chimney, if any, is actually efficient.
Loc 21	Software error inside command board		Replace the command and control board
Loc 22	Software error inside command board		Replace the command and control board
Loc 23	Software error inside command board		Replace the command and control board
Loc 24	Software error inside command board		Replace the command and control board
Loc 25 (*)	Gas valve circuit	Check whether the heating supply safety thermostat has tripped;	⚠ WARNING !!! If the flue exhaust temperature safety fuse trips, you must contact the appliance manufacturer to avoid serious damage to the exchanger.
		Check whether the flue exhaust temperature safety fuse has tripped;	
Loc 26	Software error inside command board		Replace the command and control board
Loc 27	Flame with gas valve closed		Replace the gas valve
Loc 28	Flame with gas valve closed		Replace the gas valve
Loc 29 (**)	Flue exhaust pressure switch circuit or external safety devices	Check the connection to the external safety device;	Check the external safety devices connected to terminals 103 and 104.
		Check whether the flue exhaust differential pressure switch has tripped;	Check the pressure switch against flue exhaust obstruction and replace if necessary.
		Check whether the flue exhaust is obstructed;	Remove any obstructions from the flue exhaust.
Loc 30	Software error inside command board		Check the pressure switch against flue exhaust obstruction;
Loc 31	Flame lost three times	Check the detection electrode;	Try replacing the detection electrode.
		Make sure that the flue exhaust is appropriately protected from obstructions caused by gusts of wind	Check for and, if necessary, remove any obstructions from the air intake and flue exhaust ducts
		Check for any flue exhaust recirculation	Find the cause of the flue exhaust recirculation
Loc 32	Software error inside command board		Replace the command and control board
Loc 33	Software error inside command board		Replace the command and control board
Loc 34	Software error inside command board		Replace the command and control board
Loc 35	Software error inside command board		Replace the command and control board
Loc 36	Software error inside command board		Replace the command and control board
Loc 37	Software error inside command board		Replace the command and control board
Loc 38	The flue exhaust sensor temperature does not rise when the burner ignites	Make sure the flue gas sensor meets the requirement in section 15.14.	If the flue gas sensor does not meet section 15.14, it must be replaced.
		Make sure that the flue gas sensor (parameter 1006) increases the temperature when the burner ignites.	If the temperature does not rise, replace the flue gas temperature sensor or the command and control board.

(*) = When this error appears in burner "1" (MASTER), it also blocks all the other burners. When instead appears in burners "2", (SLAVE), it blocks only the relative burner.

(**) = When this error appears in burner "1" (MASTER), it also blocks all the other burners. When instead appears in burners "2", (SLAVE), it means that the configuration of menu **3000** is wrong (section 20).

14.10.2 - Diagnostics: errors “Err”

Error	Error description	Checks	Solutions
Err 0	A sensor is out of the measurement range	Make sure all the temperature sensors are in a plausible measurement range	Replace any sensors that are not in the proper temperature range or replace the main board
Err 45	Software error inside command board		Replace the command and control board
Err 46	Software error inside command board		Replace the command and control board
Err 47	Software error inside command board		Replace the command and control board
Err 48	Software error inside command board		Replace the command and control board
Err 49	Software error inside command board		Replace the command and control board
Err 50	Software error inside command board		Replace the command and control board
Err 51	Software error inside command board		Replace the command and control board
Err 52	Software error inside command board		Replace the command and control board
Err 53	Software error inside command board		Replace the command and control board
Err 54	Flame detected at a time in which it should not be		Replace the command and control board
Err 55	Software error inside command board		Replace the command and control board
Err 56	Software error inside command board		Replace the command and control board
Err 57	Software error inside command board		Replace the command and control board
Err 58	Software error inside command board		Replace the command and control board
Err 59 (**)	Low water pressure error	Check the system pressure and, if necessary, increase it.	If the detected pressure is greater than parameter 3022, replace the pressure measuring device.
Err 60	Flue exhaust temperature high error	Check the combustion output of the burner in error; the output must be higher than 97% (referring to the PCI).	If the output is lower than 97%, try cleaning the flue gas side and the water side of the heat exchanger.
		Make sure the flue exhaust temperature sensor resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 61	Return temperature greater than supply temperature	Make sure the return sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 62 (**)	Condensate level sensor error	Make sure the condensate exhaust duct is not obstructed;	Free the condensate exhaust duct of any obstructions;
		Check the state of the condensate neutralizer;	Replace the product contained in the condensate neutralizer;
Err 64	Frequency signal error or WD communication error	Check the signal frequency. It must be between 48 and 52 Hz.	If the frequency does not fall within the values, ask the electrical service provider. Otherwise, try replacing the control board.
		Make sure the grounding and the neutral are at 0 volt	If the neutral is not at zero, restore the correct electrical power supply. If the neutral is at 0 volt, try replacing the board.
Err 65	Polarity inverted between phase and neutral.	Check proper polarity between phase and neutral.	Invert the polarity between phase and neutral.
Err 66	Frequency signal error	A - Check the signal frequency. It must be between 48 and 52 Hz. B - Make sure the grounding and the neutral are at 0 volt	A - If the frequency does not fall within the values, ask the electrical service provider. Otherwise, try replacing the control board. B - If the neutral is not at zero, restore the correct electrical power supply. If the neutral is at 0 volt, try replacing the board.
Err 67	Grounding error	Make sure the appliance is correctly grounded.	Restore correct appliance grounding.
Err 68	Watchdog communication error		Replace the command and control board

Error	Error description	Checks	Solutions
Err 72	Supply sensor open	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
	Exchanger malfunction	Check that the primary heat exchanger temperature fuse has not intervened.	If the primary heat exchanger temperature fuse has intervened (the contact is open), the exchanger must be replaced
Err 73	Return sensor open	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 76	D.H.W. sensor open	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 80	Supply sensor in short circuit	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 81	Return sensor in short circuit	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 84	D.H.W. sensor in short circuit	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 86	Flue exhaust sensor in short circuit	Make sure the sensor electrical resistance matches with the graphic in section 15.14.	If the sensor does not match, it must be replaced.
Err 87	RESET key error	RESET key pressed too many times in 60 seconds	
Err 93	Appliance selection error	Check the 3000 parameters list (section 20)	
Err 107	Software error inside command board		Replace the command and control board
Err 108	Software error inside command board		Replace the command and control board
Err 109	Error to burner 2, 3 or 4	When burner 1 (MASTER) locks up, it stops burners 2, 3 and 4 with error 109	Solve the error to burner 1 (MASTER).
Err 110	Flapper valve not open error		Check for and, if necessary, remove any obstructions in the air intake and flue exhaust ducts; Check the flapper valve (part 31 fig 3-2)
Err 111	Flapper valve not closed error		Check the flapper valve (part 31 fig 3-2)
Err 112	Flapper inlet error	Make sure parameter 3005 is set to 0 or 4	If parameter 3005 is 0 or 4, replace the command board.
Err 113	Software error inside command board		Replace the command and control board
Err 114	Water flow rate too low	Check the flow rate to the burner (parameter 1062), it must be greater than parameter 3035.	Increase the water flow rate to the system; Check for and, if necessary, remove any obstructions from the system.
Err 115	Master board error		Reset via parameter 3013.
Err 116 (**)	Communication error	A - BUS communication interrupted	A - Check the BUS connection.
		A burner is not powered	Restore power to all the burners
NO CONN	Microprocessor locked up	Make sure that the pressure measuring device wires are not short circuiting	If it is not short circuiting, replace the pressure measuring device (or disconnect it via menu 3000).
		Make sure that the supply measuring device wires are not short circuiting	If it is not short circuiting, replace the supply measuring device (or disconnect it via menu 3000).
		Make sure the display is connected to the MASTER	If the display is not connected to the MASTER it shows "NO-CONN". If it is none of the above cases, replace the control board and/or the display.

(**) = When this error appears in burner "1" (MASTER), it also blocks all the other burners. When instead appears in burners "2", (SLAVE), it means that the configuration of menu **3000** is wrong (section 20).

15 - MAINTENANCE

15.1 - General recommendations

This section must be brought to the installer's attention, highlighting the tasks to maintain proper system operation; The installer is also obligated to inform the user that failure to take care of and service this appliance could cause malfunctions.

It is advisable to follow scheduled annual system maintenance for the following reasons:

- to keep appliance output high, thereby saving fuel;
- to keep a high level of working safety;
- to keep the level of fuel environmental compatibility high;



WARNING!!! The appliance must only be serviced by a competent person.



WARNING !!! During maintenance operation, to ensure the smooth operation of the appliance, it is necessary to check the good condition, the correct operation and the possible presence of water leakage of all the air purge valves present in the appliance.



WARNING!!! Before any maintenance operations, disconnect the appliance from the electrical mains using the specific switch located nearby.



WARNING!!! Close the gas supply isolation valve before performing and maintenance operations.

The box below shows the operations to do at every maintenance session.

MAINTENANCE PROTOCOL

- Make sure there are no gas leaks
(Follow section 15.1.1.);
- Make sure the air intake and flue exhaust system is in good conditions
(Follow section 15.1.2);
- Make sure the system water pressure is correct
(Follow section 15.1.3.);
- Check the ignition and detection electrodes
(Follow section 15.1.4.);
- Check the status of the anode
(Follow section 15.1.5.);
- Clean the burner and the flue gas side main exchanger and make sure the heat insulators are in good condition
(Follow section 15.4.);
- Clean the air intake filter
(Follow section 15.6.);
- Clean the condensate exhaust system
(Follow section 15.7.);
- Check appliance performance
(Follow section 15.13.).

15.1.1 - Gas leak check

- 1.- Make sure there are no gas leaks in the system;
- 2.- Check for gas leaks using a leak detector (with bubbles or the like) or an equivalent system, thoroughly checking the entire gas route from the counter to the appliance.



WARNING!!! Do not carry out these checks in the presence of naked flames.

15.1.2 - Checking the condition of the air intake and flue exhaust ducts

1. - Check whether the air intake and flue exhaust ducts have obstructions, signs of corrosion, physical damage, water spots or signs of rust.
2. - Make sure the externally assembled intake grids and flue exhaust outlets have no residue and are clean.

15.1.3 - Checking the system water pressure

- 1.- Make sure the system is full of water and under pressure as shown in section 19 technical features.
- 2.- Make sure there are no leaks in the hydraulic connections.

15.1.4 - Checking the ignition and detection electrodes

- 1.- Remove the burner fan unit (as shown in section 15.3).
- 2.- Clean any operating material build-up from the electrodes.
- 3.- Make sure the electrodes are in the correct position as shown in section 15.5.

15.1.5 - Checking the magnesium anode

The magnesium anode protects the boiler from corrosion. The life of the anode depends on the temperature, on the quantity and, above all, on the water chemistry used.



WARNING!!! Do not remove the anode from the boiler except for inspection and/or replacement. Using the appliance without the magnesium anode installed will reduce its service life.

The anode is to be checked at least once a year and replaced when more than 7 cm of iron core are uncovered. If necessary, increase the frequency of the checks according to its usage.

Proceed as follows to check or replace the anode:

- 1.- Disconnect the appliance from the electricity and gas supply;
- 2.- Make sure the temperature of the water inside the appliance has cooled down;
- 3.- Remove the casing as described in section 15.2;
- 4.- Close the water shut-off valves to isolate the appliance from the system pressure;
- 5.- Empty the appliance through valve "2" in figure 3-3;
- 6.- Disassemble the anode, after checking its status, and replace it if necessary or reassemble it being careful with its gasket;
- 7.- Having done this, restore the initial status of the appliance and restart it.

15 - MAINTENANCE

15.2 - Disassembling the casing and accessing the inner components



WARNING!!! If it has an outdoor covering, remove it as described in section 15

To disassemble the casing, proceed as follows (refer to figure 15-1):

- 1.- Lift cover "A";
- 2.- Unscrew screws "B";
- 3.- Lower front casing "C";
- 4.- Remove lower casing "E";
- 5.- Open panel "D" by unscrewing the clamping screw located on the left and turning it as shown in the figure.
- 6.- Unscrew screw "G";
- 7.- Lift cover "F";
- 8.- Unscrew screws "L";
- 9.- Remove covering "M".

15.3 - Disassembling the burner fan unit

To disassemble the burner fan unit, proceed as follows:

- 1.- close the gas adduction valve and disconnect power;
- 2.- access the inner components following section 15.2;
- 3.- disassemble spark generator "A" in Figure 15-2, unscrewing screws "D" in Figure 15-2 and disconnecting it from the ignition glow plugs.

- 4.- disassemble air manifold "A" in Figure 15-3, turning it clockwise then removing it towards the left;
- 5.- unscrew nut "H" in Figure 15-4, being careful of the gasket on the connection;
- 6.- with the aid of a flathead screwdriver, remove spring "A" in Figure 15-4;
- 7.- remove the electrical plug from the gas valve;
- 8.- pull the gas valve out upwards, being careful of O-ring "L" (see figure 15-4);
- 9.- Unscrew the four bolts "B" in Figure 15-5;
- 10.- remove the fan/burner unit (part "C" in Figure 15-5).

Reassembling the fan/burner unit

To reassemble the burner/fan unit, work backwards compared to the disassembly operations and adopt the following precautions:

- a - replace gasket "M" in Figure 15-4, taking care to thoroughly clean the seat of said gasket, as well as the support seat.
- b - check the state of the gasket of nut "H" and O-ring "L" in Figure 15-4. If they are ruined, they must be replaced.
- c - Once everything has been reinstalled, open the gas supply and run a seal test on nut "H" in Figure 15-4.



WARNING!!! Run the seal test exclusively with a leak detection fluid. Using naked flames is absolutely prohibited.

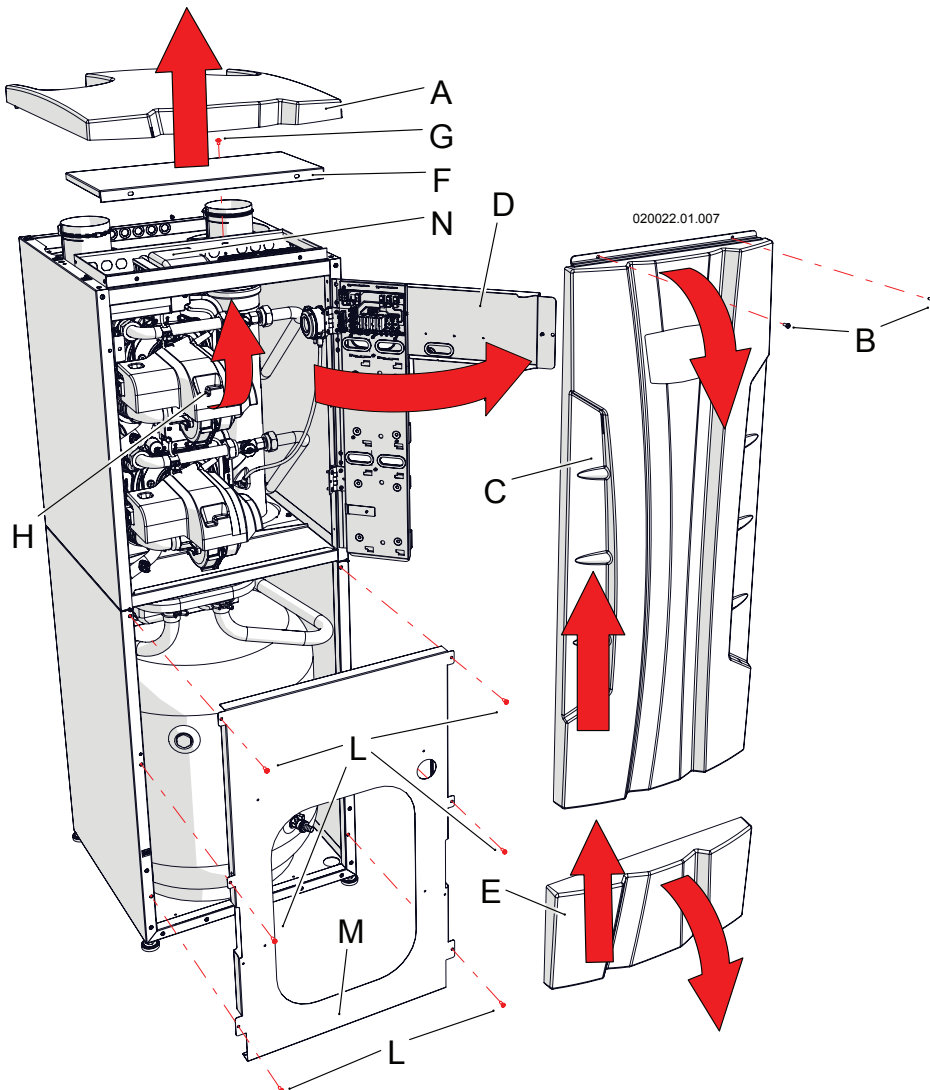


Figure 15-1 - Disassembling the casing and opening the control panel

15.4 - Cleaning the burner and the primary exchanger, flue gas side

To properly clean the burner and the exchanger body (flue gas side), proceed as follows (refer to Figure 15-5 when not otherwise specified):

- 1.- access the inner components following section 15.2;
- 2.- disassemble the fan burner unit following section 15.3;
- 4.- Run a cylindrical brush with nylon bristles inside combustion chamber "H"

WARNING !!! DO NOT use metallic brushes. Only use brushes with nylon or equivalent material bristles.

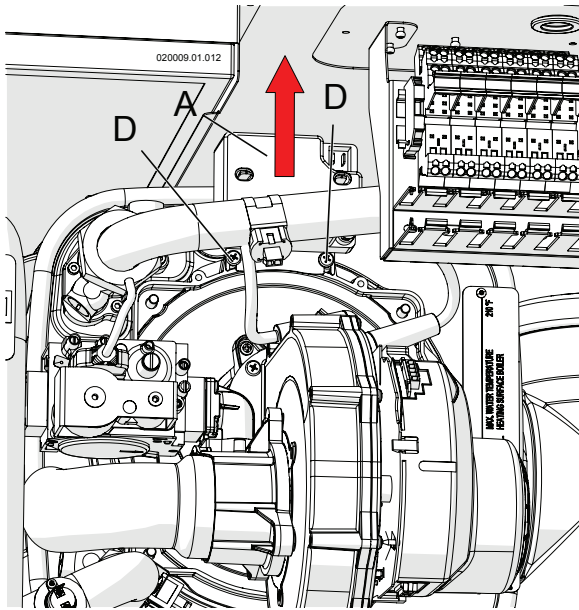


Figure 15-2 - Spark generator disassembly

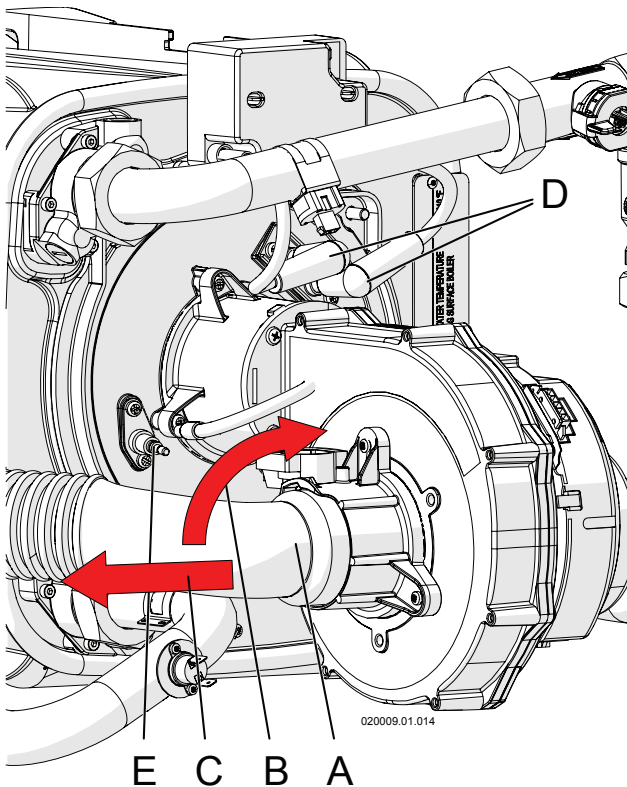


Figure 15-3 - Air manifold disassembly

- 5.- using an extractor, suction the unburnt residues inside combustion chamber "H";
- 6.- using the same extractor, suction the surface of the burner and around the electrodes;
- 7.- reassemble the components in reverse order;
- 8.- open the gas valve;
- 9.- restore power.
- 10.- make sure there are no gas leaks between the removed joints;

WARNING !!! Run the seal test exclusively with a leak detection fluid. Using naked flames is absolutely prohibited.

WARNING !!! Every time you clean the burner and the main exchanger, you must first make sure heat insulators "R" and "S" are in good condition (see figure 15-5). If necessary, replace them along with burner gasket "T" (see figure 15-5).

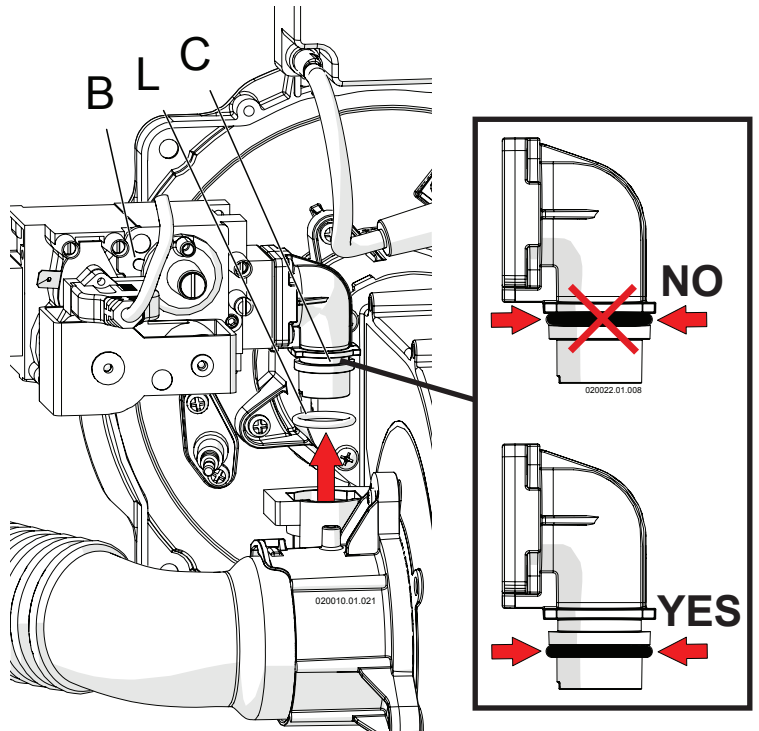
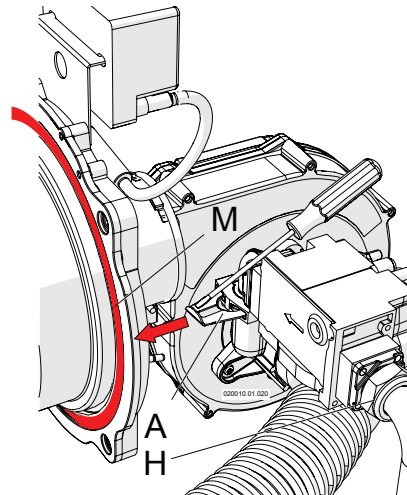


Figure 15-4 - Gas valve disassembly

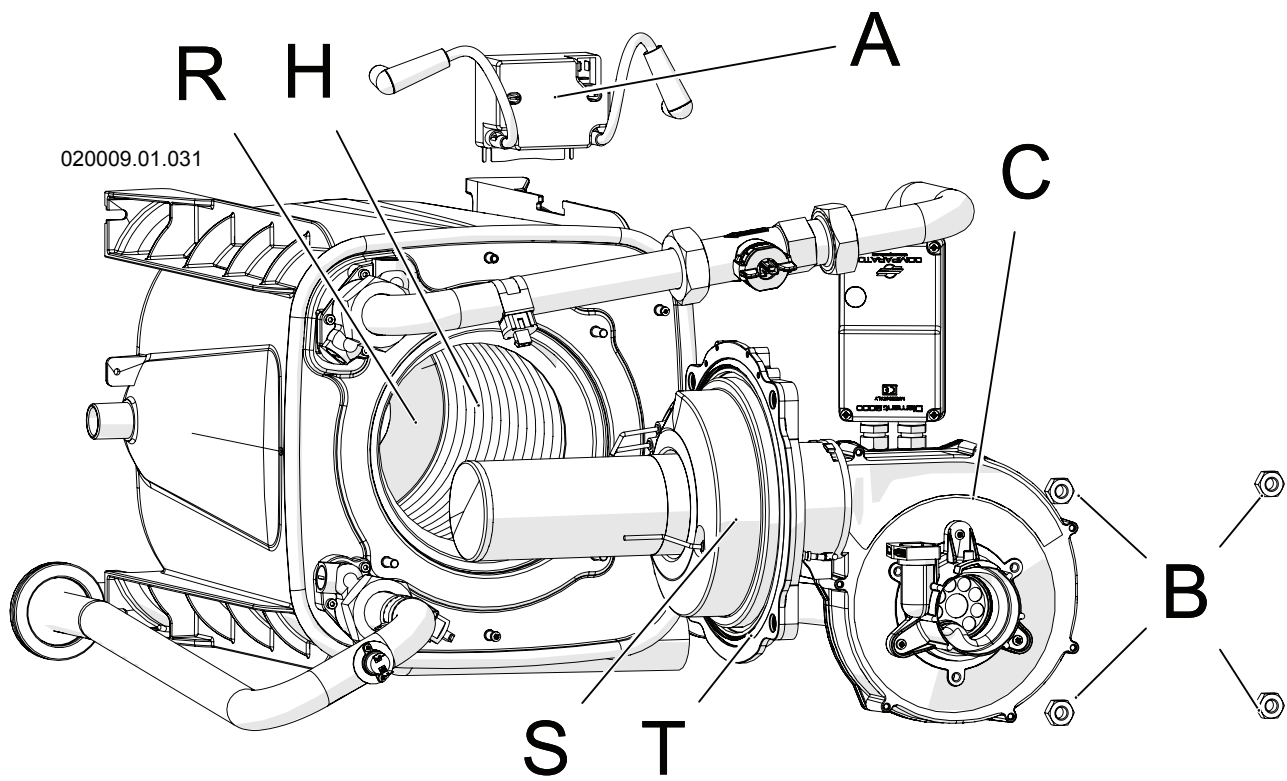
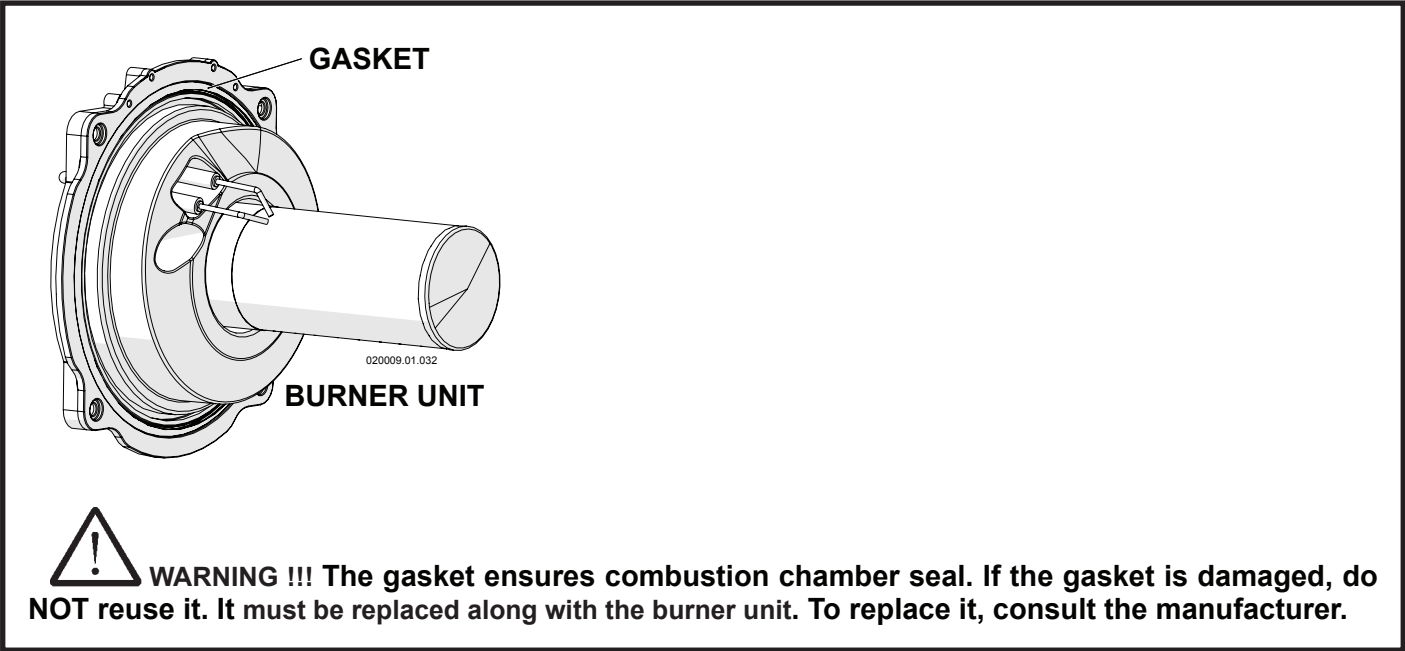


Figure 15-5 - Disassembling the burner fan unit



15 - MAINTENANCE

15.4.1 - Heat insulators

The heat insulators must be checked once a year and replaced if broken or damaged. See figure 15-6 where the insulators (parts "C" and "E") are shown disassembled from the heat exchanger and from the burner.

For replacement see the instructions provided with the spare part.

- A = Clamping screw
- B = Washer
- C = Heat insulator
- D = Stainless steel
- E = Heat insulator
- F = White heat insulator
- G = Burner
- H = Gasket
- L = Ignition electrodes
- M = Screws
- N = Detection electrode
- Q = White heat insulator
- R = Gasket
- S = Gasket

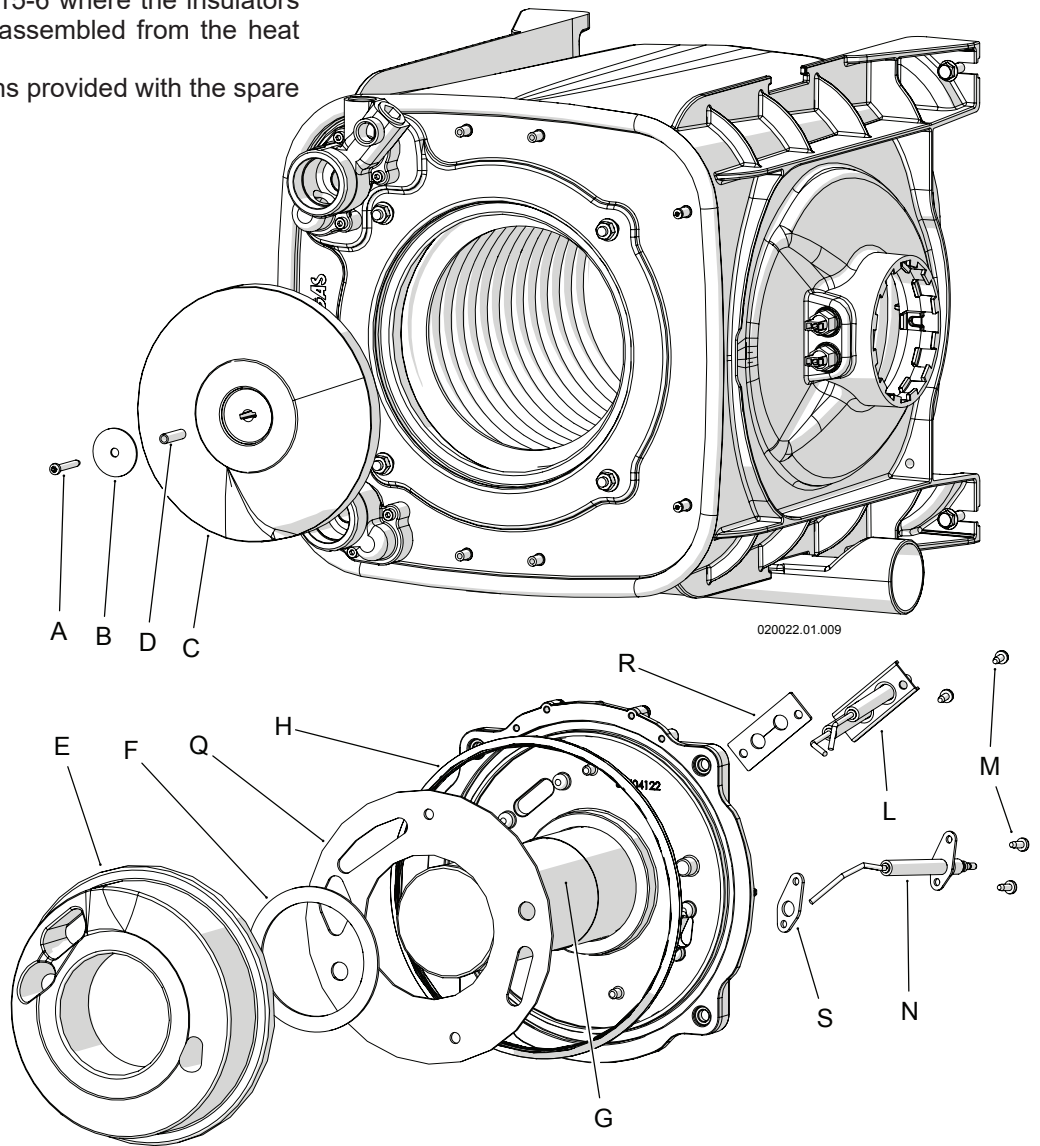


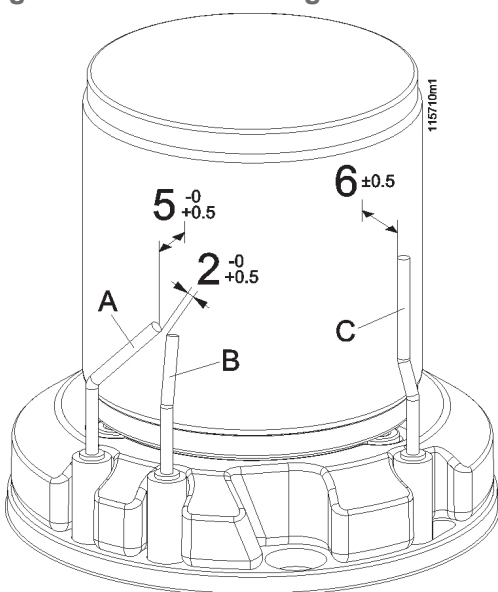
Figure 15-6 - Positioning electrodes on the burner

15.5 - Correct positioning of ignition and ionisation electrodes

For the appliance to work well, it is essential for the electrodes to be positioned properly (refer to Figure 15-7):

- the distance between ignition electrodes "A" and "B" must be between 2.0 and 2.5 mm;
- the distance of the ignition electrodes from the burner surface must be between 5 and 5.5 mm;
- the distance of the ionisation electrode from the burner surface must be between 5.5 and 6.5 mm.

To accurately position the electrodes, it is a good idea to use a vernier caliper to respect the tolerances shown in Figure 15-7.



- A = LH ignition electrode
- B = RH ignition electrode
- C = Detection electrode

Figure 15-7 - Positioning electrodes on the burner

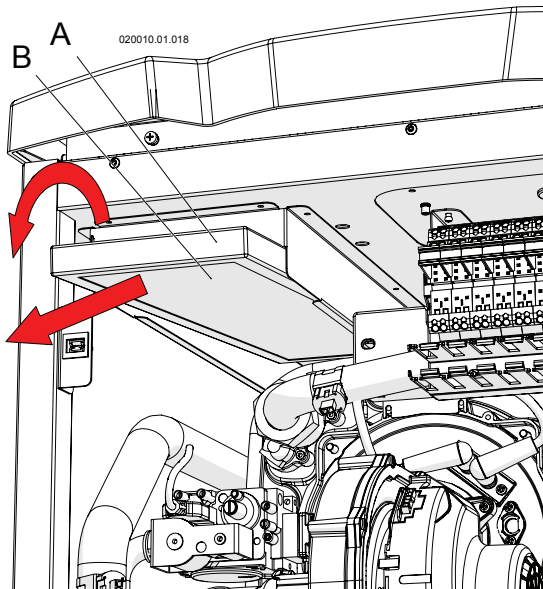


Figure 15-8 - Air intake filter disassembly

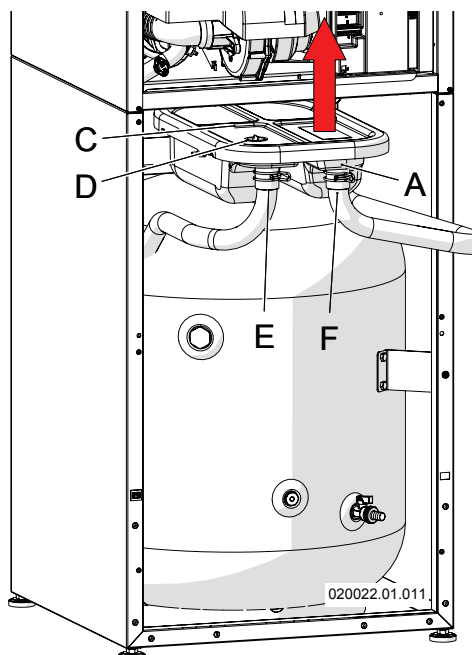
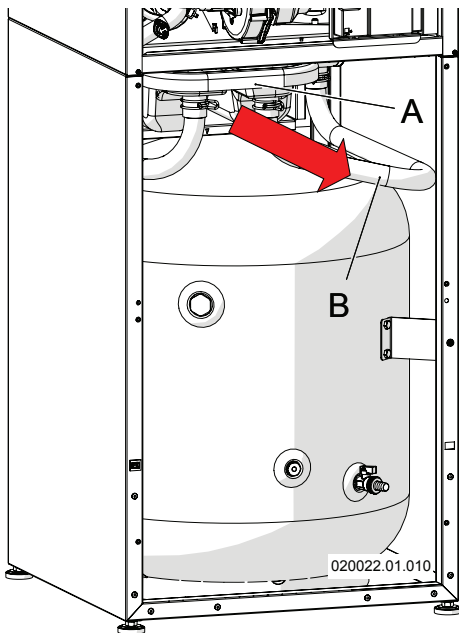


Figure 15-9 - Disassembling and opening the condensate neutralizer box

15.6 - Cleaning the air intake filter

The air filter must be cleaned for the appliance to work properly. Refer to Figure 15-8 and proceed as follows:

- 1.- access the inner components of the appliance by following section 15.2;
- 2.- slide out the filter, part "A", as shown in the figure;
- 3.- clean the filter with compressed area until the surface is cleaned;
- 4.- reassemble the filter and the appliance casing.

15.7 - Condensate drain system maintenance and cleaning

During appliance maintenance, the condensate drain pipe (part "5" in figures 3-3, 3-5 and 3-7) must be disassembled and any residue cleaned. Reassemble the clean pipe and

restore the liquid level in the siphon as per section 13.1.2.

Check the pH level every three years for the first year. To run the test, you can use specific litmus test strips or a specific electronic instrument that allows for more accurate measurement (access the box via plug "E" in figure 9-1). The subsequent frequency of these checks can be reduced to every six months or year, depending on the local standards in force. The neutralising content of the box must be replaced when the pH level drops below the level required by the standards in force. The allowed acidity level goes from pH 5.5 to 9.5.

To replace the neutralizer, proceed as follows:

1. Follow what is shown in section 15.2 to remove covering "E" in figure 15-1;
2. Extract box "A" (Figure 15-9);



WARNING !!! When removing the box, take care to tilt it in order to prevent the liquid from spilling, which could cause damage.

3. Open cover "C" (Figure 15-9) upwards;
4. Make sure the box is in good condition;
5. Make sure the neutralising material is in good condition and, if necessary, add or replace it;
6. Fill it with fresh water until the water begins to flow out of the drain;
7. Reposition the box in the correct seat;



WARNING !!! The neutralisation box must be filled with water to prevent gas from leaking out of the drain during unit operation.

8. Open the gas supply;
9. Restore power to the appliance.

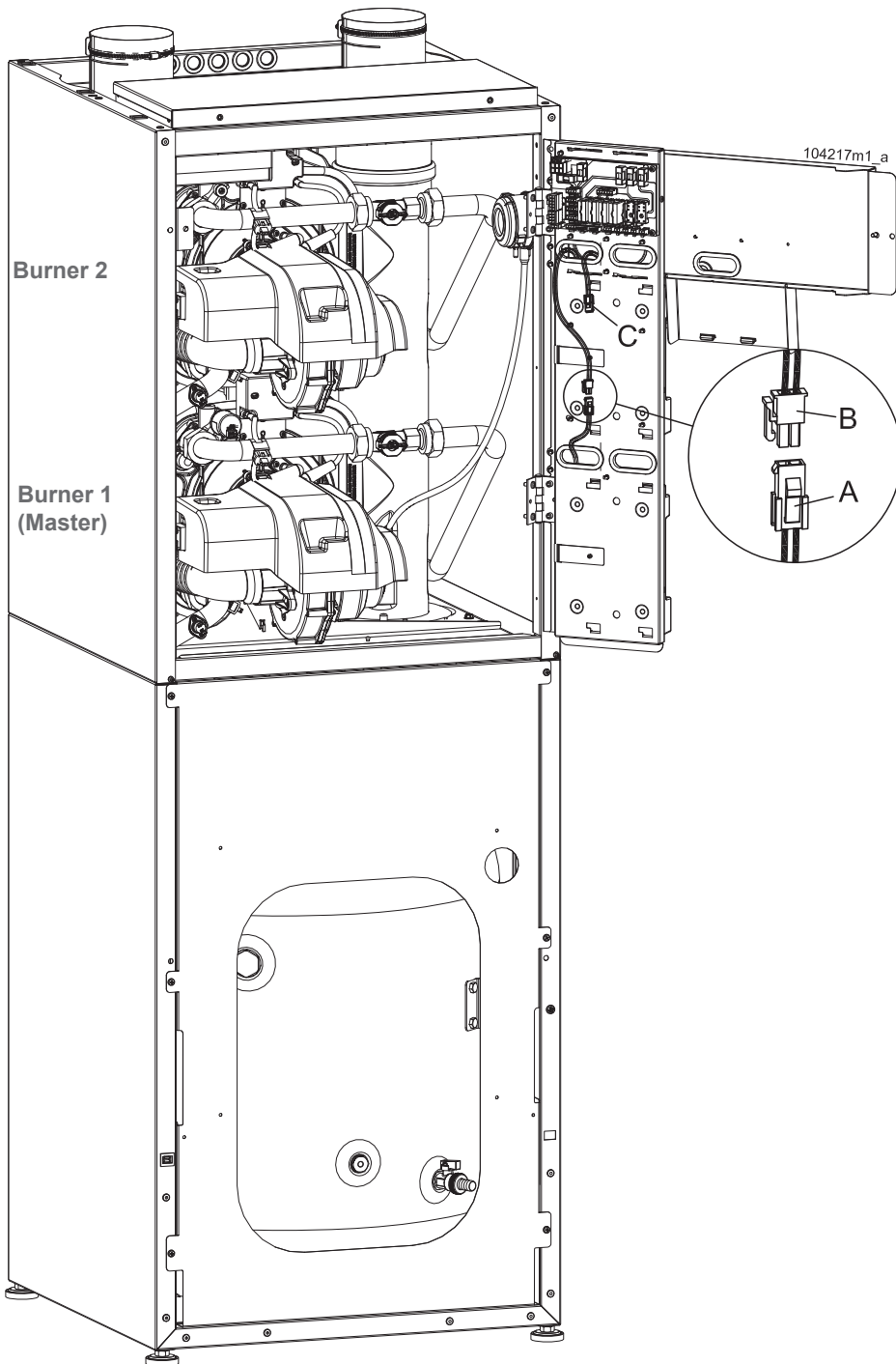


WARNING !!! Follow figure 15-9 carefully to but box "A" back in the right position. **After the above maintenance, restore the liquid level in the siphon as per section 13.1.2.**

15.8 - Connecting the Display to the other burners

In 100 to 140 appliances, being multi-burners, the display in figure 14-1 is always connected directly to "Burner 1 (Master)". All the parameters that can be consulted on the display (sections 14.8, 14.9 and 20) that refer to Burner 1 (Master) exclusively concern this burner. If you wish to see/change the same parameters for the other burners, you must move the display connection from "Burner 1 (Master)" to the burner you wish you view/edit; proceed as follows: (refer to Figure 15-10):

1. Disconnect power to the appliance;
2. Follow what is described in section 15.2 to access the inner components;
3. Disconnect terminal "B" (coming from the display) from terminal "A" (coming from "Burner 1 (Master)");
4. Connect terminal "B" to terminal "C" for "Burner 2";
5. Once the terminal is connected to the burner to be checked, repower the appliance and switch it on;
6. The display will now show all the information regarding the connected burner. Make all consultations or modifications following what is described in sections 14.8, 14.9 and 20.
7. Once the check is complete, reconnect terminal "B" to terminal "A" as it was previously.



A = Connector for Burner 1 (Master) dialogue
B = Connector from display
C = Connector for Burner 2 dialogue (Only in 115 and 140 models)

Figure 15-10 Connecting the display in the other burners

15 - MAINTENANCE

15.9 - How to move a control board

100 to 140 model appliances are configured to be managed by a control board (Burner 1 Master). All the devices are connected on this board: room thermostat, external probe, pump controls, external safety devices and all the internal safety devices: condensate level sensor, flue exhaust differential pressure switch, etc.

If the Burner 1 control board has an error, the appliance stops working. If the technician does not have spares to replace the board, he/she can temporarily replace it with one of the boards from another burner in the appliance so that the latter can be restarted.

To this end, proceed as follows:

(when not otherwise specified, refer to figure 15-10):

1. Turn off the main switch and disconnect power;
2. Access the inner components following what is described in section 15.2;
3. Disconnect connector "B" (connector coming from the display) to connector "A" (connector coming from "Burner 1 (Master)");
4. Disconnect all the other connectors from the Burner 1 (Master) control board;
5. Remove the Burner 1 (Master) control board from the appliance;

6. Follow points 3 to 5 to remove the control board from the burner positioned lower;
7. Assemble the board in place of the Burner 1 (Master) board;
8. Restore all the connections in the new Burner 1 (Master) board;
9. Move selector "S4" as shown in figure 15-11 from the OFF position to the new ON position;
10. Be very careful with the connectors from the board that was removed. They must be insulated to avoid short circuits and damage;
11. Electrically insulate each of these connections;
12. Replace the appliance casing;
13. Reconnect power and turn on the appliance main switch;
14. Access the forced menu, follow section 20 and set all the parameters as per the "Burner 1 (Master)" column.
Parameter **3050** must be reduced by a unit compared to the previous state, as the appliance now has one less Slave Burner.
15. Cut power;
16. Repower the appliance; The new Burner 1 control board now controls the appliance;

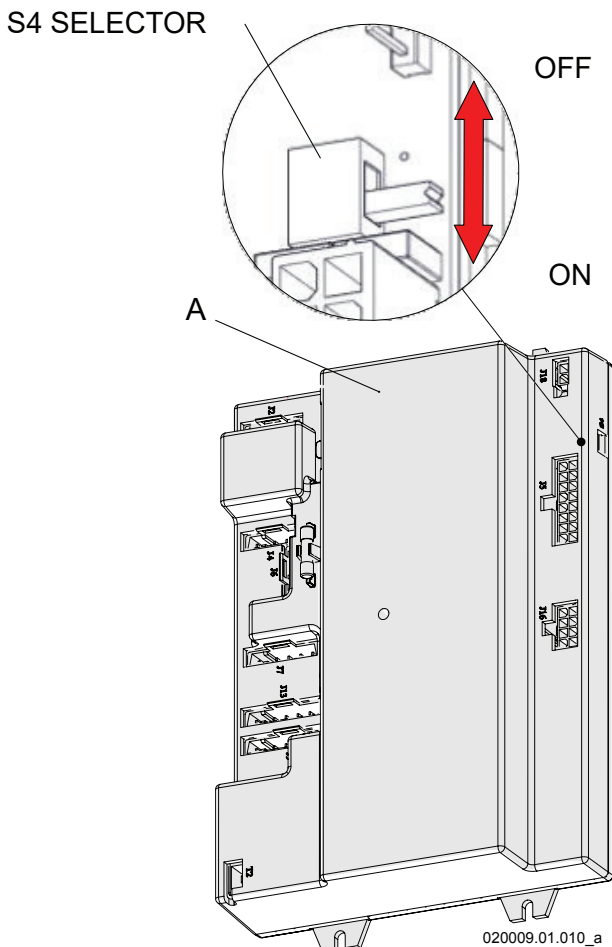


Figure 15-11 - Command board

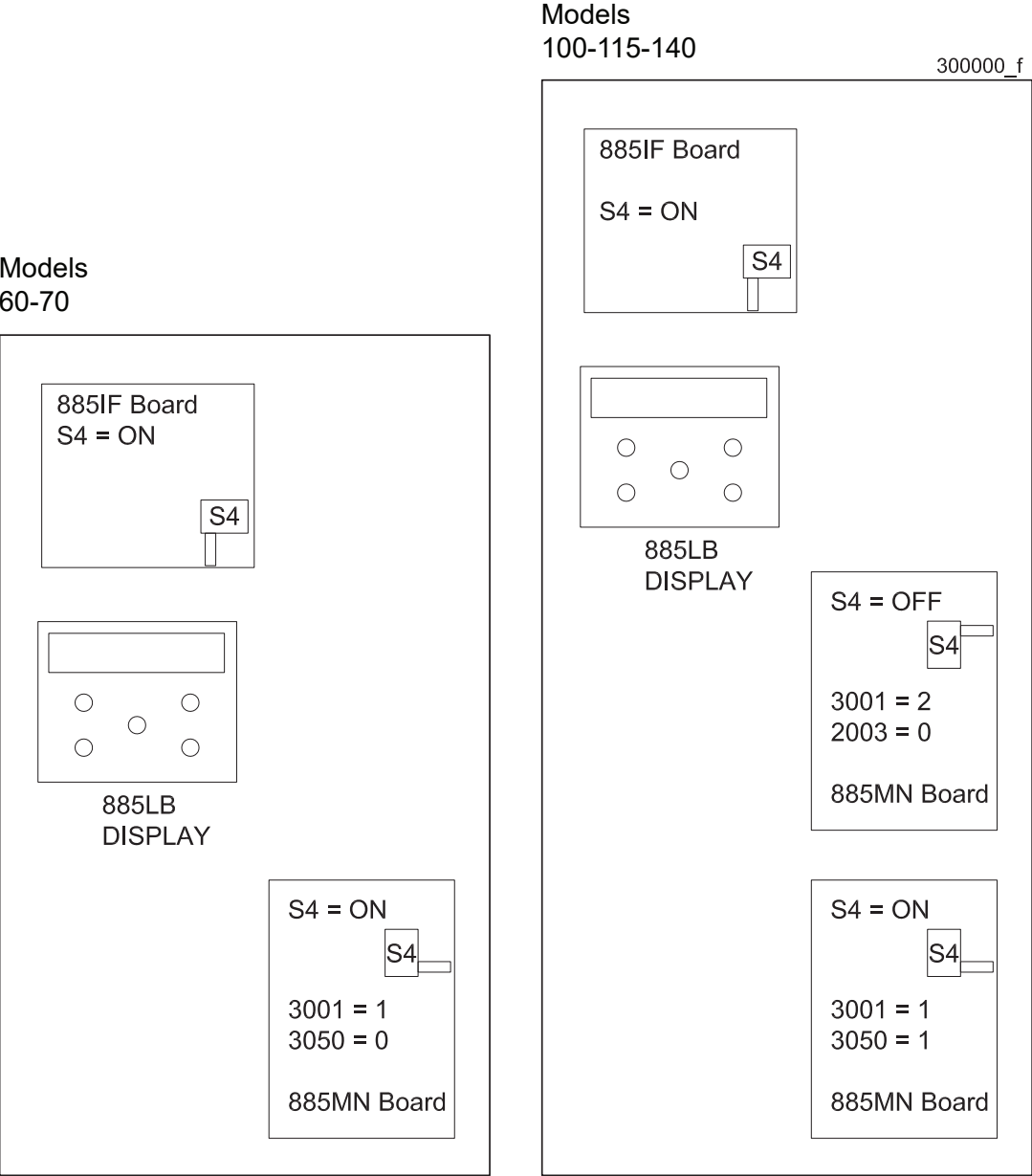


Figure 15-12 Setting parameters 3001, 3050 and selectors S4

15 - MAINTENANCE

15.10 - Emptying the appliance

- 1.- switch off the appliance.
- 2.- close the system loading valve provided for by the installer;
- 3.- connect a rubber hose to drain valve "2" shown in figure 3-3 or 3-6 and convey it into the drain of a sink or similar;
- 4.- wait for the water inside the appliance to cool to below about 40°C;
- 5.- open the drain valve slowly;
- 6.- when all of the water has been drained, close the drain valve.

15.11 - Minimum and maximum output heat

It is possible to force operation to your own minimum, maximum or ignition output heat. Proceed as follows:

- 1.- make sure the heat generated by the appliance can be dissipated by the system;



WARNING!!! During forcing, the supply temperature automatically goes to 93°C to allow the heat generated by the appliance to be assimilated as much as possible. Make sure the system can withstand this temperature.

- 2.- access parameter **20 10** (**2200** for multi-burner models) located in the "installer menu" (see section 14.9);
- 3.- set the parameter to the following value:
 - a) **L 00** to force the burner, or all the burners, to minimum output heat;
 - b) **197** to force the burner, or all the burners, to ignition output heat;
 - a) **H 19H** to force the burner, or all the burners, to maximum output heat;
- 4.- To end forcing, bring parameter **20 10** (**2200** for multi-burner models) back to **0FF** and press the RESET key.



WARNING!!! If, during forcing, the output heat dispensed by the appliance is much greater than the output heat absorbed by the system, the appliance switches off continuously to reach the maximum allowed temperature (93°C).

15.12 - Checking the ionisation current

At any operating state, even during maximum and minimum output heat checks as per section 15.11, it is possible to see

the ionisation current value on parameter **1008** in the "user menu" (section 14.8). This value must be between 4 and 7 uA (microamperes).

Being that parameter **1008** on multi-burner appliances (models from 100 to 140) corresponds to Burner 1 (Master), in order to check the other burners, you must refer to section 15.8.

15.13 - Checking combustion efficiency

Based on national laws on gas appliances, combustion performance must be checked periodically;

To this end, do exactly what is described in section 13.9 and, along with the output heat, check combustion performance, which must be greater than 96%.

15.14 - Water temperature measurement sensors

There are various temperature sensors on the exchanger body. The electrical resistance between the two sensor contacts must match what is shown in Figure 15-13.

The temperature probes are: 1001, 1006 and 1007

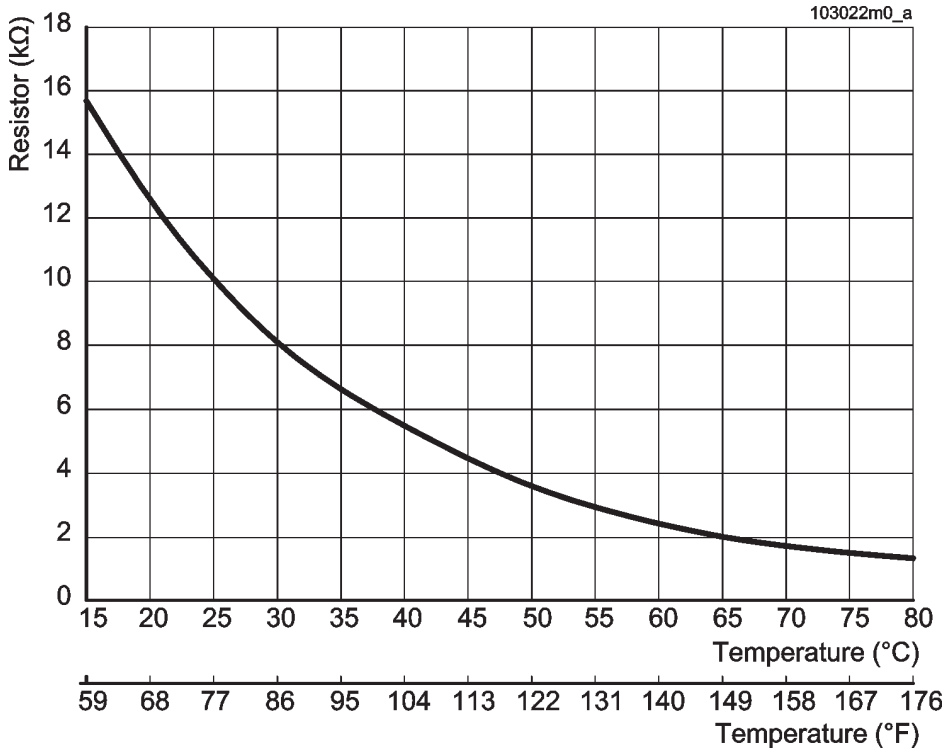


Figure 15-13 - Water sensor curve

15.15 - Multi-wire wiring diagram for model 70T

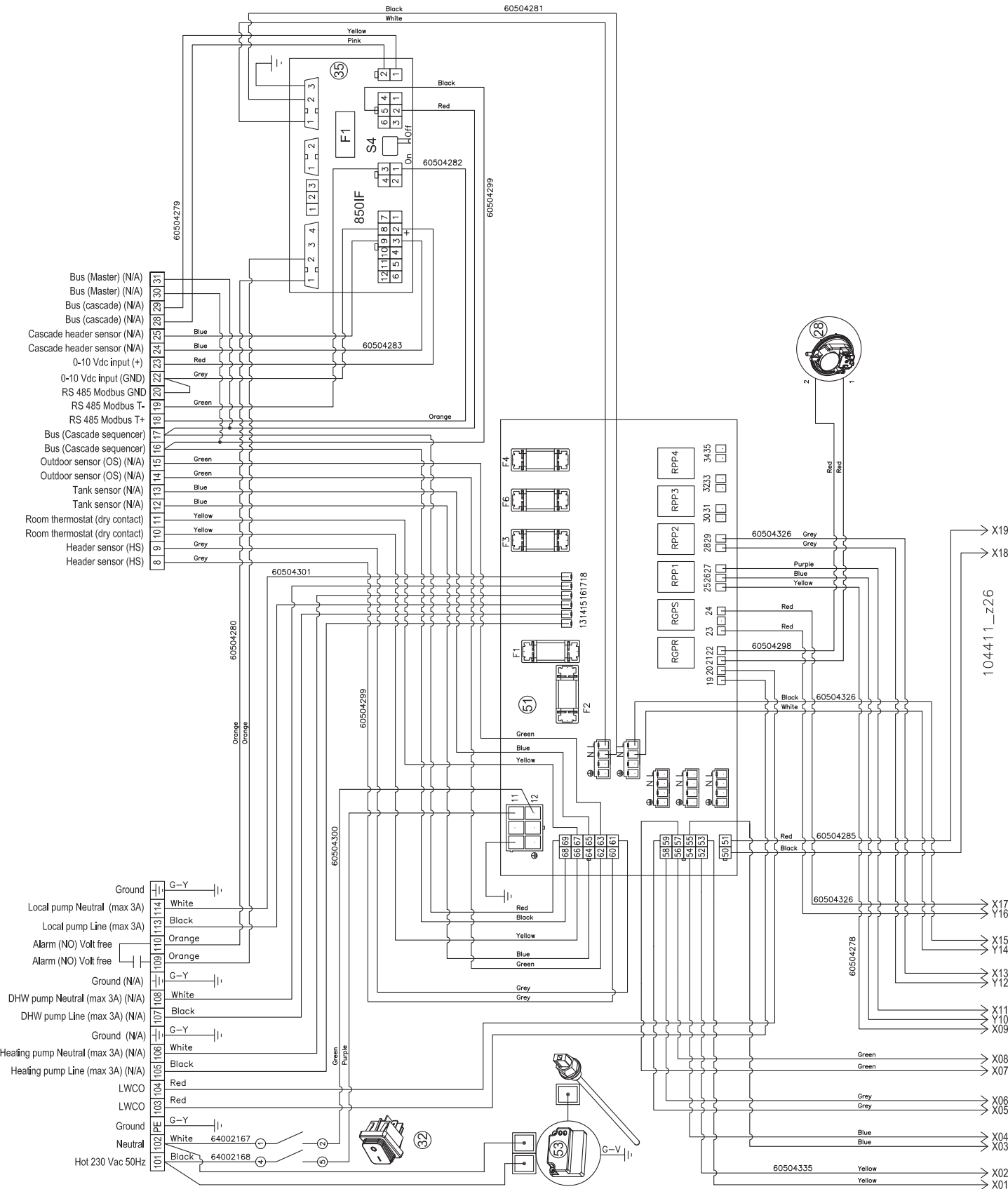


Figure 15-14 - Multi-line wiring diagram part 1 - continues on the following page

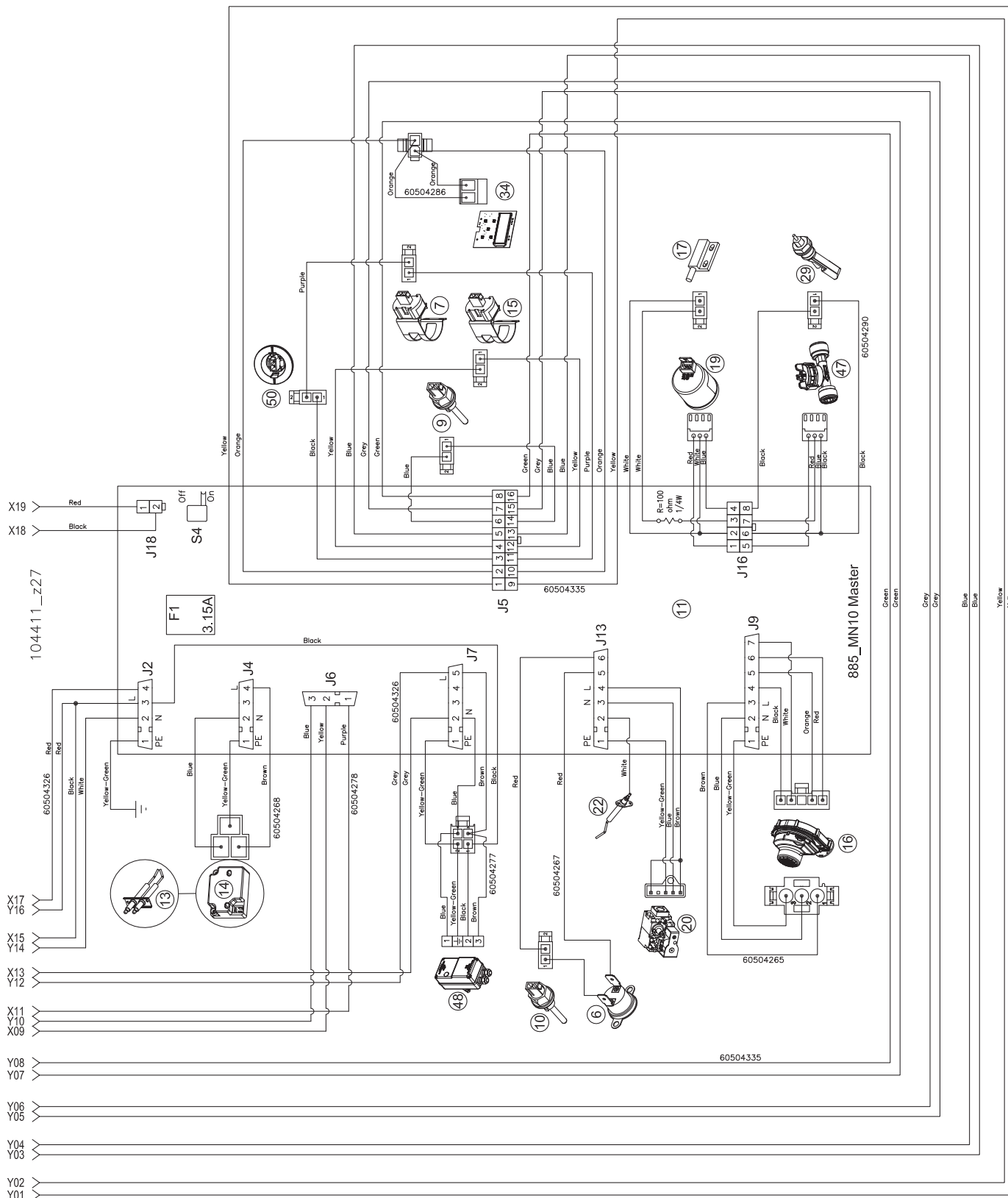


Figure 15-14 - Multi-line wiring diagram part 2 - continued from the previous page

15.16 - Multi-wire wiring diagram
for models 115T and 140T

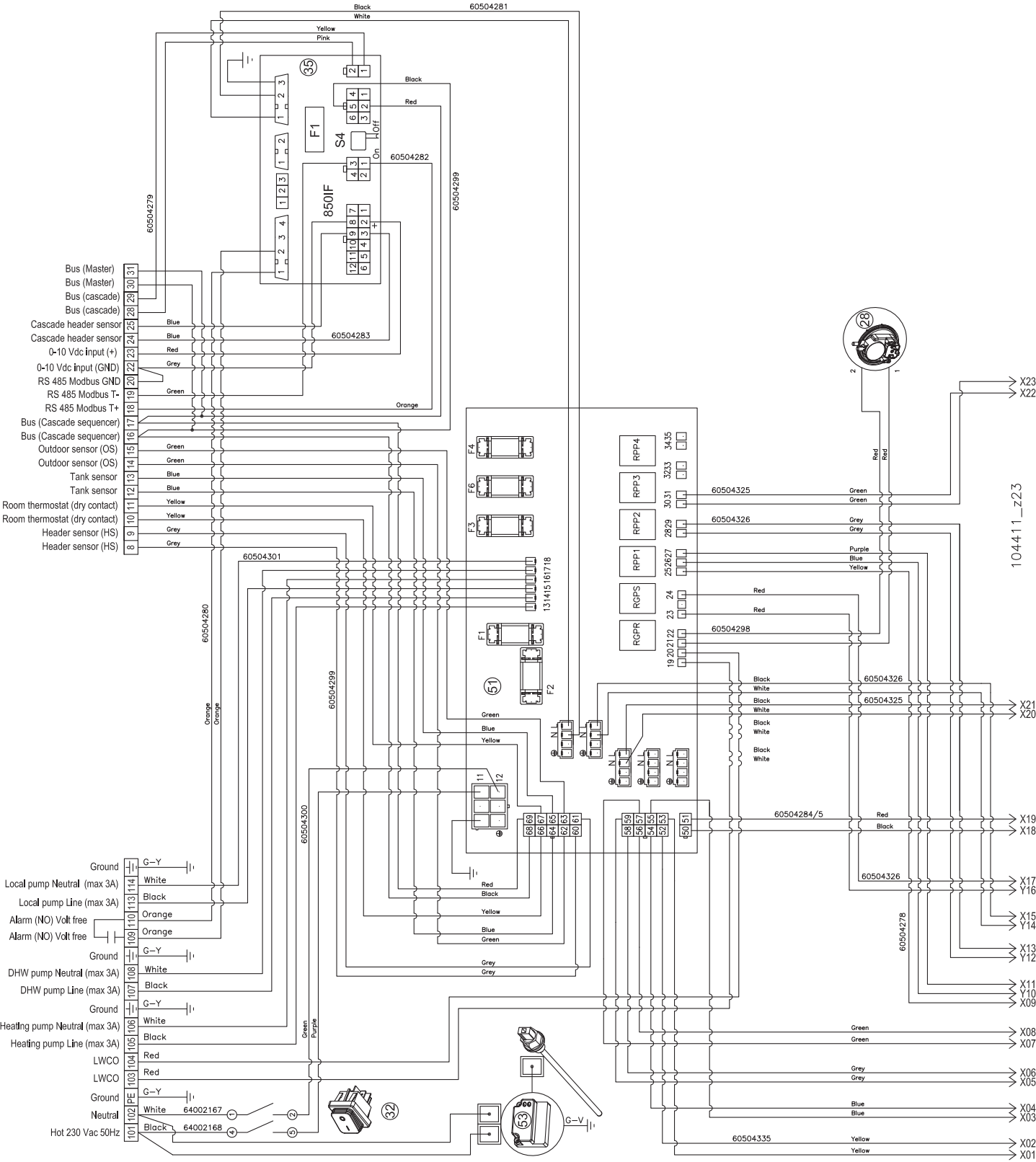
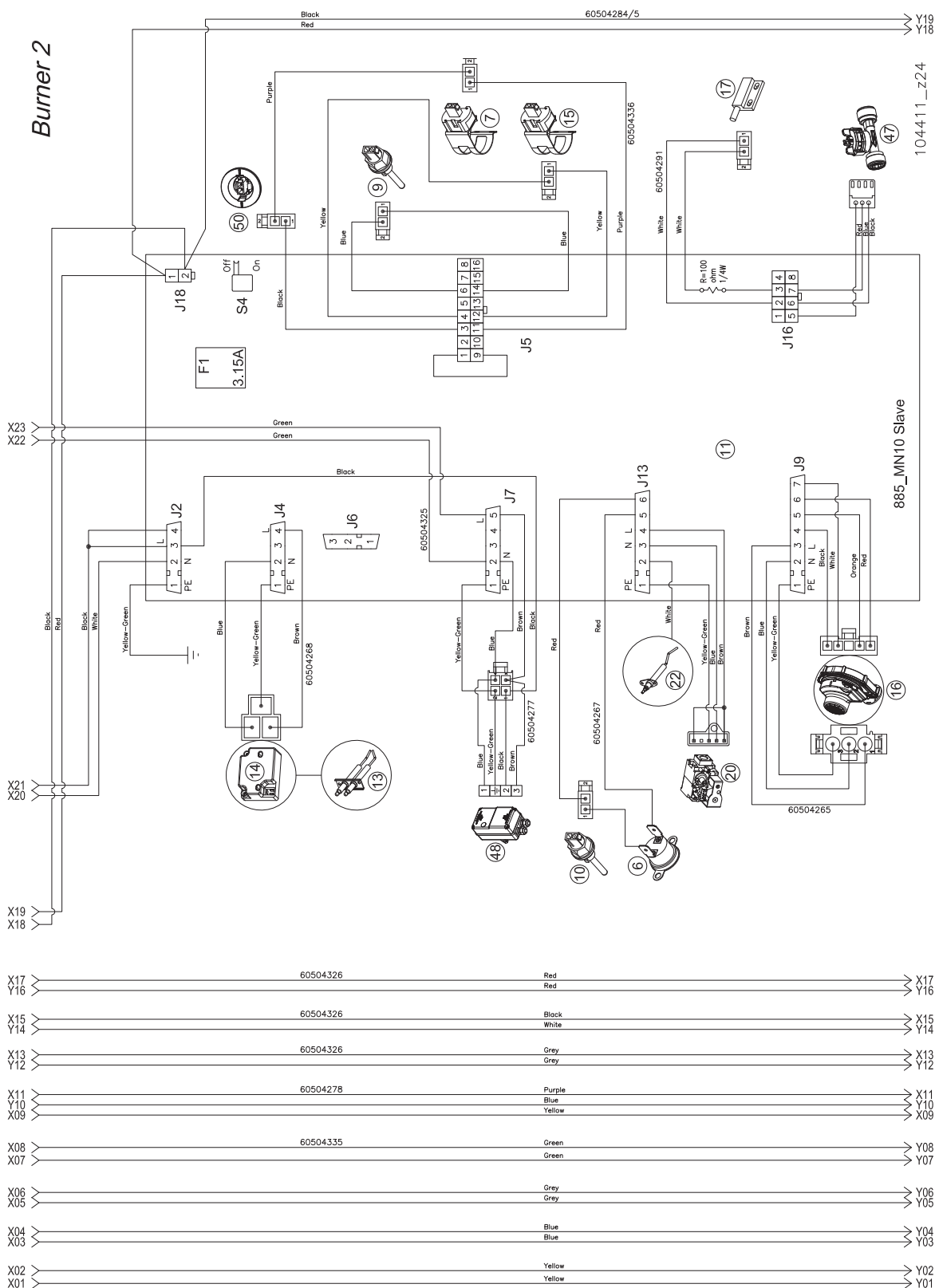


Figure 15-15 - Multi-line wiring diagram part 1 - continues on the following page



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Figure 15-15 - Multi-line wiring diagram part 2 - continues on the following page

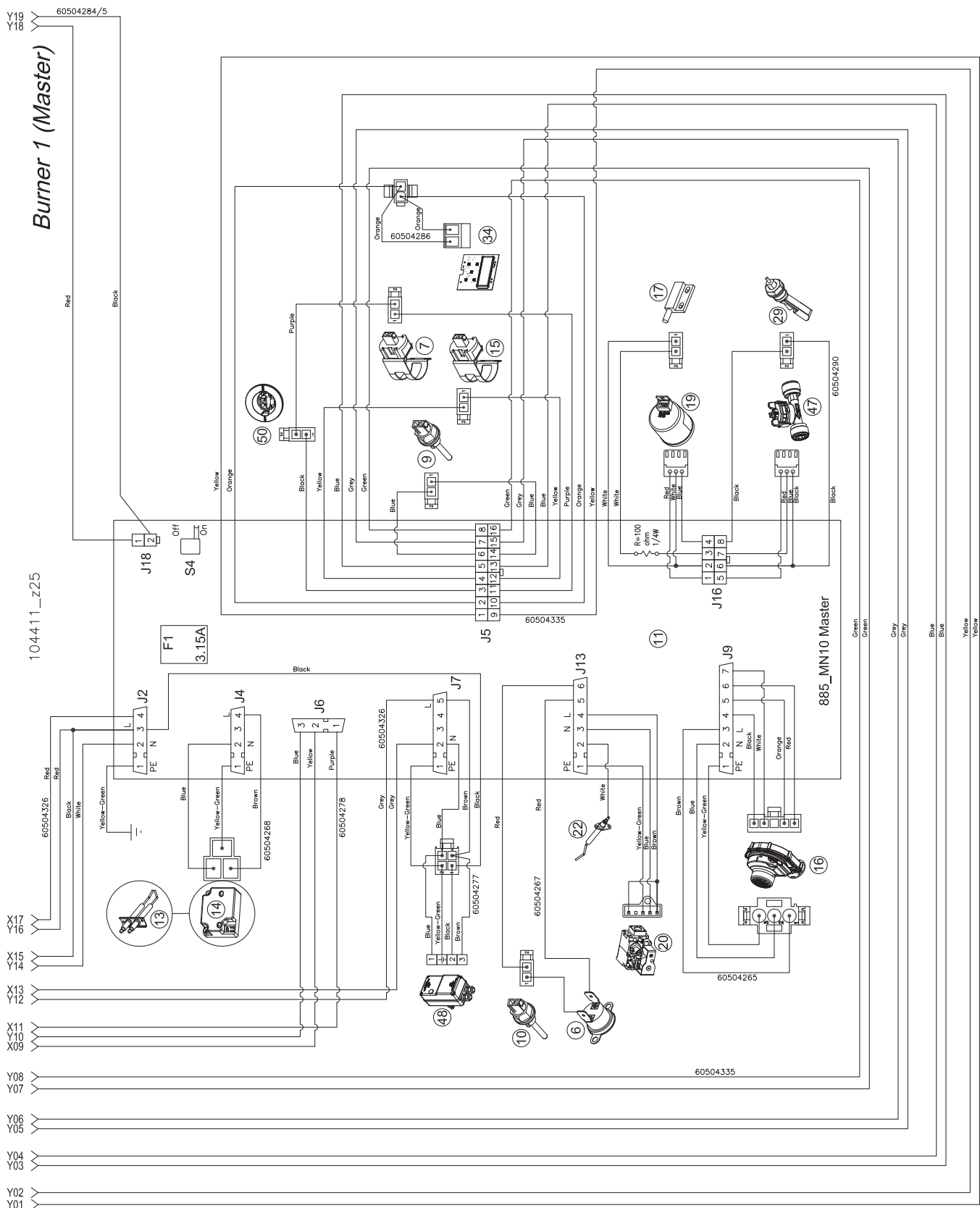


Figure 15-15 - Multi-line wiring diagram part 3 - continued from the previous page

15 - MAINTENANCE

Key to wiring diagrams Figures 15-14 and 15-15

- 6 - Water outlet safety thermostat
- 7 - Water outlet temperature sensor
- 9 - Flue exhaust temperature probe
- 10 - Flue exhaust temperature safety fuse
- 11 - Command and control board
 - Fuse - F1 5x20 3A
- 13 - Ignition electrodes
- 14 - Spark generator
- 15 - Water inlet temperature sensor
- 16 - PWM modulating fan
- 17 - Flapper valve
- 19 - Water pressure measuring device
- 20 - Gas valve
- 22 - Detection electrode
- 28 - Flue exhaust differential pressure switch
- 29 - Condensate level sensor
- 32 - Main ON/OFF switch
- 34 - Display
- 35 - 885 IF board (on request)
 - Fuse - F1 5x20 3A
- 41 - Heating circuit pump relay
- 42 - Domestic hot water circuit pump relay
- 47 - Water flow rate sensor
- 48 - Motorised two-way valve (N/A)
- 50 - Primary heat exchanger temperature fuse
- 51 - Connection diagrams
 - Fuse - F1 5x20 10A
 - Fuse - F2 5x20 10A
 - Fuse - F3 5x20 3A
 - Fuse - F4 5x20 3A
 - Fuse - F6 5x20 3A
- 53 - Anode
- RGPR - Heating circuit pump relay (N/A)
- RGPS - Domestic hot water circuit pump relay (N/A)
- RPP1 - Burner 1 (MASTER) main circuit pump relay
- RPP2 - Burner 2 main circuit pump relay
- RPP3 - Burner 3 main circuit pump relay (N/A)
- RPP4 - Burner 4 main circuit pump relay (N/A)

N/A = Not Applicable

16 - TECHNICAL DATA

AGUAPLUS TECHNICAL DATA		UM	70	115	140
Type (Flue exhaust/air intake type)			B23 ; B23P	B23 ; B23P	B23 ; B23P
Category			II2H3P	II2H3P	II2H3P
UE-type Certificate (PIN)			0476CR1272	0476CR1272	0476CR1272
Max heat capacity PCI (PCS)		kW	69,9 (77,6)	115,6 (128,3)	140,0 (155,4)
Minimum heat capacity PCI (PCS)		kW	14,7 (16,3)	12,0 (13,3)	14,7 (16,3)
Max output heat (50/30) "Pn"		kW	73,5	121,4	147,1
Efficiency at max output heat (50/30) PCI (PCS)		%	105,1 (94,7)	105,0 (94,6)	105,1 (94,7)
Minimum output heat (50/30) "Pm"		kW	15,6	12,8	15,6
Efficiency at minimum output heat (50/30) PCI (PCS)		%	106,3 (95,8)	106,6 (96,0)	106,3 (95,8)
Gas flow rate	G20	m³/h	7,39	12,22	14,80
	G31	kg/h	5,43	8,97	10,87
Gas supply pressure	G20	mbar	20	20	20
	G31	mbar	37	37	37
Gas supply minimum pressure	G20	mbar	17	17	17
	G31	mbar	25	25	25
Gas supply maximum pressure	G20	mbar	25	25	25
	G31	mbar	45	45	45
Main exchanger water content		l	5,7	9,2	11,4
Minimum operating water flow rate		l/h	0	0	0
Instantaneous d.h.w. production (dt 30°C)		l/min	35,3	58,4	70,7
D.H.W. adjustment range		°C	20 - 80	20 - 80	20 - 80
Maximum temperature for safety intervention		°C	95	95	95
Maximum water pressure		bar	11	11	11
Minimum water pressure		bar	1	1	1
Rated power supply voltage		V ~	230	230	230
Rated power supply frequency		Hz	50	50	50
Absorbed electrical power		W	472	542	622
Degree of electrical protection			IP20	IP20	IP20
Degree of electrical protection with outdoor covering			IPX5D	IPX5D	IPX5D

16 - TECHNICAL DATA

AGUAPLUS TECHNICAL DATA		UM	70	115	140
Air intake and flue exhaust duct diameter (split)		mm	110	110	110
Max. flue exhaust duct length (split)		m	10	10	10
Max. air intake duct length (split)		m	10	10	10
Equivalent length of one curve		m	4	4	4
Weighted CO (0% O ₂)	G20	ppm	27	30	27
Weighted NO _x (0% O ₂) (EN 26-2015) PCS	G20	mg/kWh	34	34	34
CO ₂ (%) at minimum / maximum output heat	G20	%	8,5 / 8,7	8,5 / 8,7	8,5 / 8,7
	G31	%	9,8 / 10,2	9,8 / 10,2	9,8 / 10,2
O ₂ (%) at minimum / maximum output heat	G20	%	5,8 / 5,4	5,8 / 5,4	5,8 / 5,4
	G31	%	6,0 / 5,4	6,0 / 5,4	6,0 / 5,4
Maximum flue gas recirculation in case of wind		%	10	10	10
Maximum flue gas temperature at appliance outlet		°C	80	80	80
Minimum flue gas temperature at appliance outlet		°C	30	30	30
Flue gas mass flow rate at maximum output		g/s	32,9	54,4	65,8
Flue gas mass flow rate at minimum output		g/s	7,1	5,8	7,1
Head available at exhaust		Pa	110	110	110
Maximum combustion air temperature		°C	40	40	40
Maximum CO ₂ content in combustion air		%	0,9	0,9	0,9
Maximum over-heating flue gas temperature		°C	95	95	95
Max. admissible vacuum in the flue exhaust/intake system		Pa	110	110	110
Maximum condensate flow rate		l/h	8,8	14,5	17,6
Condensate average degree of acidity		pH	4	4	4
Ambient operating temperature		°C	0,5 ; + 50	0,5 ; + 50	0,5 ; + 50
Weight of the appliance (empty)		kg	98	142	147
Weight of the appliance in operation		kg	230	286	291
Water content of the integrated hot water tank		l	120	120	120

17 - FORCED MENU

				Parameters			
Ref.	Parameter description	Adjustment range	Default value	Individual burner (mod. 70)	Burner 1 (Master) (mod. 115 and 140)	Burner 2 (mod. 115 and 140)	Customised values
3001	Burner operation address	0 = Not in cascade 1 = Burner 1 (Master), 2 to 4 = Burner from 2 to 4 (slave burners)	2	1	1	2	
3002	Fan adjustment range	from 0 to 4	0	70 = 2	115 = 0 140 = 2	115 = 0 140 = 2	
3003	Display unit of measurement	C = °C and bar; F = °F and PSI;	C	C	C	C	
3004	Water pressure switch	0 = Disabled; 1 = Enabled; 2 = N/A; 3 = N/A	1	1	1	0	
3005	Burner flapper valve	0 = Disabled; 4 = Enabled; 8 = N/A; 12 = N/A	4	0	4	4	
3006	Water flow rate sensor	0 = Disabled; 16 = N/A; 32 = N/A; 48 = Enabled	48	48	48	48	
3007	Condensate level sensor	EnAb = Enabled; dISA = Disabled	Enab	Enab	Enab	dISA	
3008	Combustion gas sensor type	SEnS = Sensor; StCH = Switch	SEnS	SEnS	SEnS	SEnS	
3009	External sensor type	10 = 10kohms; 12 = 12kohms;	10	10	10	10	
3010	Other sensor type	10 = 10kohms; 12 = 12kohms;	10	10	10	10	
3011	pump mode	0 = main c pump; 1 = N/A; 2 = N/A; 3 = N/A;	0	0	0	0	
3012	domestic hot water operating mode	0 = only heating; 1 = hot water storage tank; 2 = hot water tank with thermostat; 3 = N/A; 4 = N/A; 5 = N/A	0	0	0	0	
3013	Reset Err 115	EnAb = Enabled; dISA = Disabled	Enab	Enab	Enab	Enab	
3015	Climatic adjustment: heating supply maximum temperature (this parameter is overwritten by parameter 3017)	from 20°C to 90°C	82°C	N/A	N/A	N/A	
3016	Climatic adjustment: heating supply minimum temperature	from 20°C to 90°C	20°C	N/A	N/A	N/A	
3017	Supply maximum temperature (this parameter takes priority with respect to parameter 3015)	from 20°C to 90°C	60°C	60°C	60°C	60°C	
3018	Minimum supply temperature	from 20°C to 90°C	20°C	20°C	20°C	20°C	
3020	Water flow rate sensor type	0 = N/A; 1 = DN8; 2 = DN 10; 3 = DN 15; 4 = DN 20; 5 = DN 25	4	4	4	4	
3022	Minimum water pressure	from 0 to 5 bar	1	1	1	1	
3035	Minimum water flow rate	from 0 to 100 l/min	45	70 = 45	115 = 40 140 = 45	115 = 40 140 = 45	
3050	Slave burner number	from 0 to 3	3	0	1	3	
3085	Modbus address	0 to 126	1	1	1	1	
3086	Number of Stopbits	1 or 2	1	1	1	1	
3100	Material selection	ABS; CPVC; PVC; SST; PP.	PVC	PVC	PVC	PVC	
3101	Nation Selection	US, CA	US	US	US	US	
Switch "S4"	Switch "S4" position (see fig 15-11 and 15-12)	On or Off	On	On	On	Off	

N/A = Not Applicable



WARNING!!! Editing these parameters could cause the appliance and, therefore, the system to malfunction. For this reason, only professionally qualified technicians with in-depth knowledge and awareness can edit them.



WARNING!!! When accessing the forced menu, it is possible for the appliance to start up; ignoring this could cause damage to persons, animals or objects.



WARNING!!! In the event of the multi-burner appliances (100 to 140 models), the display is always connected to burner 1 (MASTER). To set the parameters in the other burners, the display must be connected to them as described in section 15.8.

The forced menu allows the appliance to be set based on the system to serve. Setting occurs by adjusting the available parameters (shown in the table).

To access the forced menu, proceed as follows:

- 1.- Power off the appliance by turning the main switch to the OFF position;
- 2.- Holding down the RESET and ▼ keys at the same time, turn the main switch to the ON position;
- 3.- Wait for the word "INIT" or the 3000 parameters to appear on the display.
- 4.- Using the ▲ and ▼ keys, scroll through the list of 3000 parameters;
- 5.- Navigate the menu using the ▲ and ▼ keys. Once you have selected the parameter, press the RESET key to make it editable via the ▲ and ▼ keys;
- 6.- Press the RESET key to save the changes;
- 7.- Wait 10 seconds;
- 8.- Power off the appliance;
- 9.- Repower the appliance to exit the forced menu and go back to its normal operation.

18 - CONTROL MENU DIAGRAM

Symbol	Description
<div>RESET 0</div> <div></div>	Press and release the RESET key
<div>RESET 2</div> <div></div>	Hold down the reset key for 2 seconds
<div>RESET 5</div> <div></div>	Hold down the reset key for 5 seconds
<div>RESET</div> <div>▼ 5</div>	Hold down at the same time for a time in seconds, indicated by the number, the RESET and ▼ keys
<div>▼</div>	Press and release the ▼ key
<div>▲</div>	Press and release the ▲ key

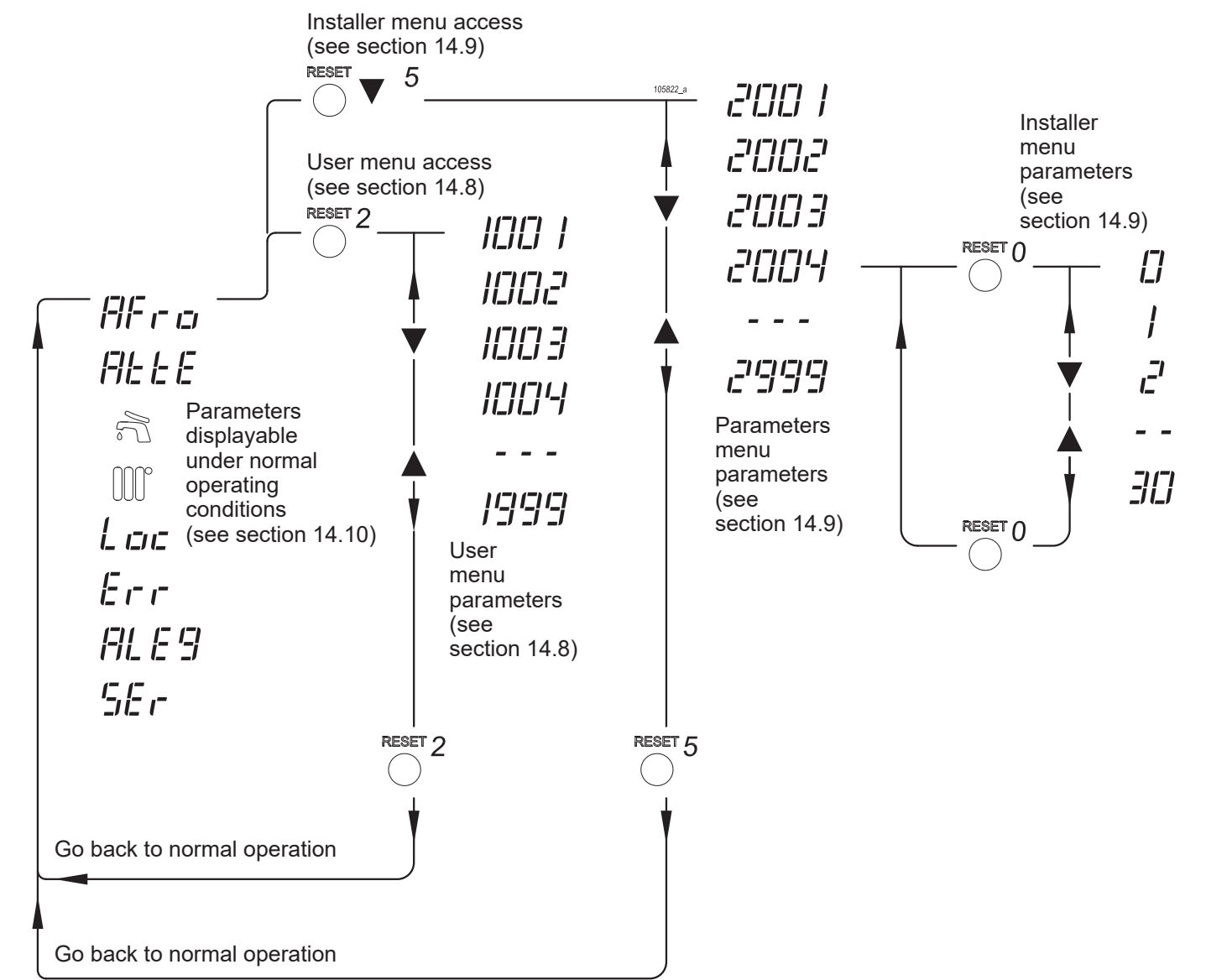


Figure 18-1 - Command menu diagram

19 - PRODUCT FICHE

(a) Supplier's name or trade mark			ADVECO		
(b) Supplier's model identifier			AGUAPLUS		
			70	115	140
(c) Load profile			XXL	XXL	XXL
(d) Energy efficiency class			A	-	-
(e) Water heating energy efficiency	η_{wh}	%	85,2	85,0	85,5
(f) Daily electricity consumption	Qelec	kWh	0,260	0,370	0,360
(f) Annual electricity consumption	AEC	kWh	57	81	79
(f) Daily fuel consumption	Qfuel	kWh	25,354	25,161	25,038
(f) Annual fuel consumption	AFC	GJ	22	22	22
(g) Other load profiles			-	-	-
(g) Water heating energy efficiency *		%	-	-	-
(g) Daily electricity consumption *		kWh	-	-	-
(g) Annual electricity consumption *		kWh	-	-	-
(g) Daily fuel consumption *		kWh	-	-	-
(g) Annual fuel consumption *		GJ	-	-	-
(h) Thermostat temperature settings of the water heater		°C	60	60	60
(i) Sound power level indoors	LWA	dB	70	70	70
(j) The water heater is able to work only during off-peak hours			NO	NO	NO
(k) Any specific precautions that shall be taken when the water heater is assembled, installed or maintained.			Read the installation, use and maintenance manual of the water heater.		
(l) Smart control			N/A	N/A	N/A
Emissions of nitrogen oxides	NOx	mg/kWh	34	34	34

According commission delegated regulation (EU) No 812/2013 and No 814/2013;

* refers to other load profiles (g);

N/A = Not applicable.

The undersigned CEO of the company **COSMOGAS S.r.L.**, with registered office in Via L. Da Vinci no. 16 - 47014 Meldola (FC) ITALY,

DECLARES

under its own responsibility that the instantaneous water heater:

SERIAL No.	
MODEL	
PRODUCTION DATA	

subject of this declaration is in compliance with the **EU** Type Test Certificate, issued by the notified body n° 0476 (Kiwa Cermet Italia SpA), whose data (PIN) are given in the table shown in the “Technical Data” section of this manual and fulfils the requirements of the EU Regulation on Gas Appliances, (**2016/426/EU**) and the **UE 814/2013** regulation applying the standard **EN 89:2015** and the Low Voltage Directive (**2014/35/UE**) applying the standards **EN 60335-1:2012+A11:2014** and **EN 60335-2-102:2016** and the Electro Magnetic Compatibility Directive (**2014/30/UE**) applying the standards **EN 55014-1:2019** ed **EN 55014-2:2016**, Energy labeling regulation (**2017/1369/UE**), Eco-friendly design directive (**2009/125/CE**), Directive on the use of dangerous substances (**2011/65/UE**).

Monitoring of the product was carried out by the notified body No. 0476 according to form C2.

This declaration is issued as stipulated by the aforementioned directives.

The serial number corrisponde to the warranty number.

Meldola (FC) ITALY.



Alessandrini Arturo
CEO

To contact technical support



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